User Guide

Fiber Optic Extenders

FOXBOX SR HDMI

Fiber Optic Scaling Receiver for HDMI, Audio, and RS-232

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-1990-01 Rev. A
10 12

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.

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关于我们产品的安全指南、遵循的规范、EMI/EMF 的兼容性、无障碍使用的特性等相关内容，敬请访问 Extron 网站 **www.extron.com**，参见 Extron 安全规范指南，产品编号 68-290-01。

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注意 ⚠ 若產品上使用此符號，是為了提醒使用者。

有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊，請瀏覽 Extron 網站：**www.extron.com**，然後參閱《Extron 安全性與法規遵守手冊》，準則編號 68-290-01。

Japanese

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注意: この記号 ⚠ が製品上に表示されている場合は、本機の取扱説明書に記載されている重要な操作と保守(整備)の指示についてユーザーの注意を喚起するものです。

安全上のご注意、法令遵守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイトwww.extron.comより『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

Korean

경고: 이 기호 ⚠, 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

주의: 이 기호 ⚠, 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(www.extron.com)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

FCC Class A Notice

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 guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference; the user must correct the interference at his own expense.

NOTE: This unit was tested with shielded I/O cables on the peripheral devices. Shielded cables must be used to ensure compliance with FCC emissions limits.

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.

Specifications Availability

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

Conventions Used in this Guide

Notifications

WARNING: A warning indicates a situation that has the potential to result in death or severe injury.

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

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,,Op1 scene 1,1 ^B 51 ^W^C
```

```
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
```

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

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" represents the capital letter "o."

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

```
Reply from 2Ø8.132.18Ø.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.

Contents

Introduction

WARNING: **Risk of eye injury**: The FOXBOX SR HDMI outputs continuous invisible light, which may be harmful to the eyes; use with caution.

- ***Do not look*** into the rear panel fiber optic cable connectors or into the fiber optic cables themselves while the receiver is powered on.
- Plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

About this Guide

This guide contains information about the ultra-high performance Extron FOXBOX SR HDMI scaling fiber optic receiver (see figure **1**).

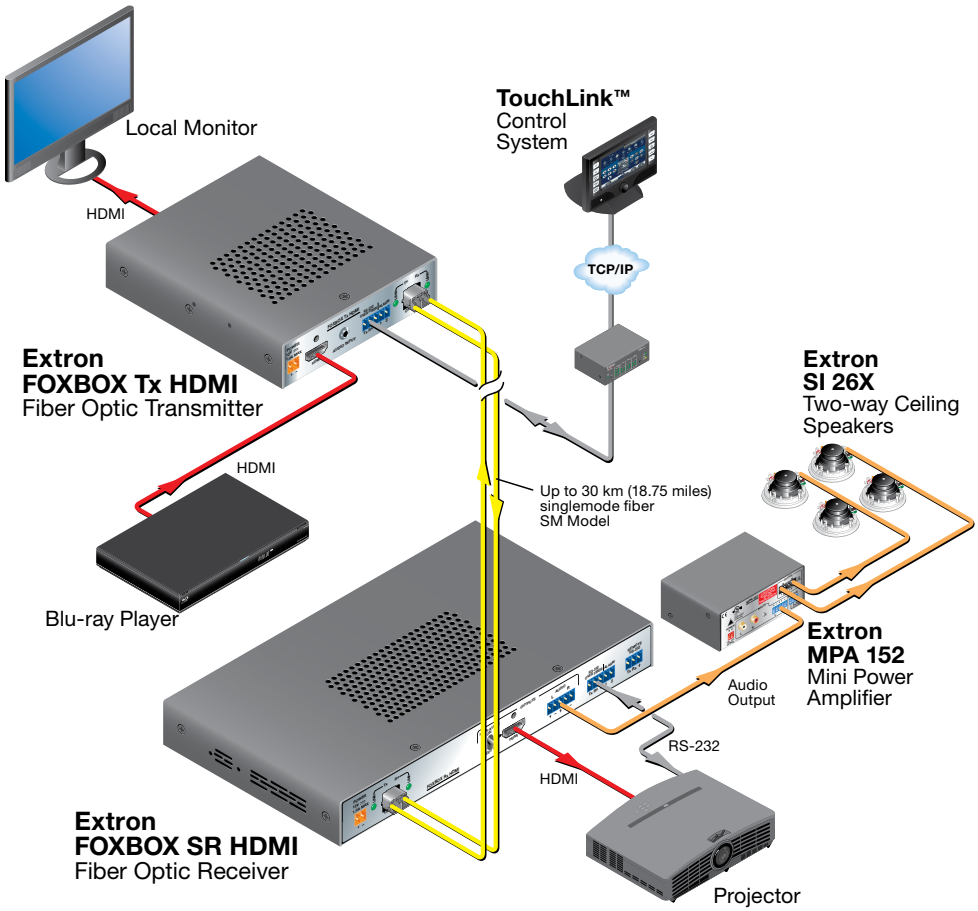


Figure 1. Typical FOXBOX SR HDMI Application

About the FOXBOX SR HDMI

The FOXBOX SR HDMI is an ultra-high performance scaling fiber optic receiver that accepts a proprietary optical signal on a single LC connector from a compatible fiber optic transmitter or daisy-chained receiver located up to 30 km (18 miles) away.

The receiver outputs a single link of HDMI video, digital audio (embedded in the HDMI output), analog audio, and RS-232 serial commands. The receiver can scale its video output to one of several resolutions and rates.

NOTE: For HDCP compliance:

- A FOXBOX SR HDMI receiver must be paired with a FOXBOX HDMI or PowerCage FOX HDMI transmitter.
- You must connect both fiber optic cables between the transmitter and receiver.
- A signal **cannot** be daisy-chained and retain HDCP compliance.
- The bidirectional Consumer Electronics Control (CEC) is **not** supported.

If the receiver is appropriately configured and has a second fiber optic cable installed, it also can either:

- Receive an RS-232 return from a controlled device and send it to the transmitter via a proprietary optical signal, or
- Output a daisy-chained signal to another receiver.

If either RS-232 return or daisy-chained communications are implemented, the receiver outputs a proprietary signal on the second fiber optic cable carrying the signal.

For video resolutions up to 1600 x 1200, 1080p, or 1920 x 1200, the video output of the receiver is a perfect, pixel-for-pixel recreation of the video signal input from the transmitter.

The single link of HDMI video output by a FOXBOX SR HDMI can be converted to DVI-D video with the appropriate adapter.

The receiver has built-in color bars, crosshatch, grayscale, alternating pixels, and crop test patterns, which are available under RS-232 Simple Instruction Set (SIS™) control, to assist in setting up the display equipment and image and audio adjustments. The receiver has image, audio, fiber light status, and lost-light alarm indicators.

System Compatibility

The FOXBOX SR HDMI receiver operates interchangeably with all HDMI, DVI, and VGA transmitters in the Extron FOXBOX, PowerCage FOX, and FOX 500 families, including Plus and non-Plus units.

NOTES:

- Although the receiver can operate with non-HDMI transmitters, the video output is not HDCP-compliant.
- The receiver is not compatible with the FOX AV, PowerCage FOX AV, FOX 3G HD-SDI, PowerCage FOX 3G HD-SDI, and FOX 3G DVC transmitters.

Cable Transmission Modes

The receiver is further categorized by the type of fiber optic cable, multimode or singlemode, which defines the effective range of transmission:

- **Multimode (MM)** — Long distance, up to 2 km (6,560 feet) (depending on the fiber cable)
- **Singlemode (SM)** — Very long distance, up to 30 km (18.75 miles)

> **NOTE:** The multimode and singlemode units are physically and functionally identical, with the exception of the effective range of transmission. In this manual, any reference applies to either transmission mode unless otherwise specified.

Features

Ultra high performance — The FOXBOX SR HDMI receives pixel-for-pixel HDMI or DVI-D (with an adapter) video transmission, up to 1920 x 1200 at 60 Hz.

Video output — The receiver outputs a single link of HDMI video.

Compatible with the FOX Matrix Switchers, and FOX 500, FOXBOX, and PowerCage FOX transmitters and receivers (with the exception of the FOX DA6, FOX 2G, and FOX 3G HDSDI products)

Analog audio output — The receiver outputs balanced or unbalanced stereo audio on a 5-pole captive screw connector and digital audio embedded in the HDMI output.

Links monitoring — The receiver panel has indicators for monitoring image and audio transmission and the fiber optic link.

Loss-of-light alarms — The receivers panel has discrete outputs that indicate if either of the fiber optic links has suffered a loss of the light signal.

Signal Processing Product Control Program — For RS-232 remote control from a PC, the Extron Signal Processing Product Control Program, which runs under Microsoft® Windows®, provides a graphical interface with drag-and-drop, point-and-click operation.

Simple Instruction Set — The receiver uses SIS commandsfor easy remote control operation.

Analog audio level — The analog audio output is at the consumer level (-10 dBV).

Auto Image™ — The auto imaging feature automatically sizes and centers the input to fill the screen.

Upgradable firmware — The firmware that controls the operation of the receiver can be upgraded in the field via an RS-232 link without taking the unit out of service. Firmware upgrades are available for download on the Extron website, **www.extron.com**, and they can be installed using the Signal Processing Product Control Program.

Memory presets — 30 memory presets are a time-saving feature that lets you store input size and position settings relative to a specific input resolution. You can then recall those settings, when needed, using the SIS or the control software.

LockIt™ HDMI Cable Lacing Bracket — The receiver includes a LockIt bracket to secure the HDMI cable to the unit.

Rack mounting — The receiver is rack mountable in any conventional 19-inch wide rack, using an Extron 9.5-inch or 6-inch deep rack shelf.

Power — The 100 VAC to 240 VAC, 50-60 Hz external power supply provides worldwide power compatibility.

Installation

This sections details the installation of the FOXBOX SR HDMI, including:

- Rear Panel Features
- Front Panel Configuration Port

Rear Panel Features

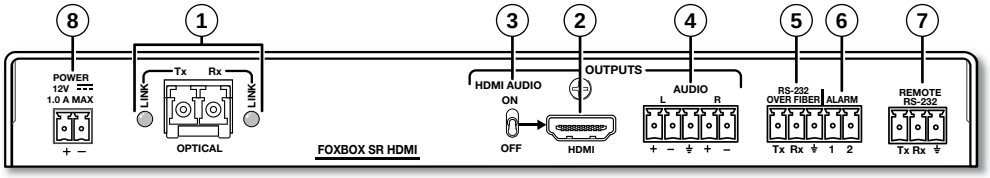


Figure 2. FOXBOX SR HDMI Scaling Receiver Rear Panel Features

① **Fiber optic connectors and LEDs** —

WARNING: **Risk of eye injury**: The FOXBOX SR HDMI outputs continuous invisible light, which may be harmful to the eyes; use with caution.

- ***Do not look*** into the rear panel fiber optic cable connectors or into the fiber optic cables themselves while the receiver is powered on.
- Plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

NOTE: You can connect the transmitter to one or more receivers in one of three ways:

- **One-way (transmitter Tx to receiver Rx) only** — Connect fiber cable ⑱ from the transmitter Tx connector **only**.
- **Two-way (transmitter to receiver and return)** — Connect fiber cable ⑱ from the transmitter Tx connector and fiber cable ⑱ back to the transmitter Rx connector (see figure **3**).
- **One-way (transmitter to receiver) with daisy chain (receiver to receiver)** — Connect fiber cable ⑱ from a fiber optic source and cable ⑱ to the next receiver in the daisy chain (see figure **4**). Set each receiver in the daisy chain to daisy chain mode. Up to 10 properly-configured receivers can be connected in a daisy chain to a single transmitter.

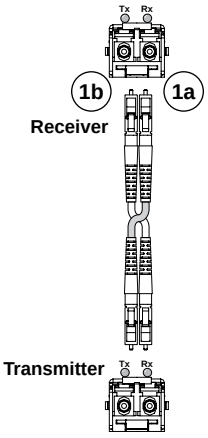


Figure 3. Two Way Configuration

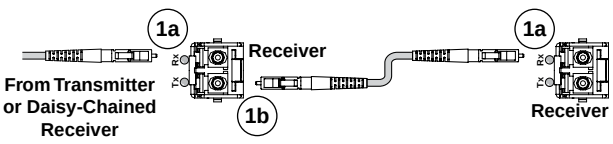


Figure 4. Daisy Chain Configuration

NOTES:

- Ensure that you use the proper fiber cable for your transmitter/receiver pair. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- Only one fiber optic cable, transmitter-Tx-to-receiver-Rx, is required for video, audio, and serial command transmission. **However**, if you connect only one fiber optic cable, or if your receiver is configured to daisy-chain the optical signal:
  - The HDMI signal output by the receiver **is not** HDCP-compliant.
  - You **will not** receive RS-232 reports from the controlled device.

  To receive responses from the controlled device and for HDCP compliance, you need to install both fiber optic cables and leave link 2 enabled (via an **SIS command** to the receiver or using the **Signal Processing Product Control Program**).

(1a) **Rx** — For all one-way video, audio, and serial communications from the transmitter to the receiver, connect a fiber optic cable to the Rx LC connector.

Connect the free end of this fiber optic cable to the Tx connector on a FOXBOX Tx transmitter or to any other compatible Extron FOXBOX device.

(1b) **Tx (optional)** — Connect a fiber optic cable to the Tx LC connector for either of the following functions:

Normal configuration — For all one-way return serial communications from the receiver to the Rx connector on a compatible transmitter (see figure **3**).

Daisy chain configuration — For daisy-chained video, audio, and serial communications to the Rx connector on another receiver (see figure **4**).

NOTE: The Tx connector emits light in either case and the Rx port receives light.

Connect the free end of this fiber optic cable to either of the following:

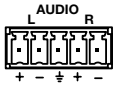
- The Rx connector on a compatible transmitter or to any other compatible Extron FOX device
- The Rx connector on another receiver in the daisy chain

Tx Link and Rx Link LEDs — When lit, the link is active (light is received).

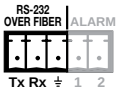
(2) **HDMI Output connector** — Connect a video display to this HDMI connector (see "**HDMI connector**" on page 7 for pin assignments).

(3) **HDMI Audio switch** — This switch mutes (Off position) and unmutes (On position) the embedded audio output on the HDMI output connector. The audio on the captive screw output always remains active regardless of the setting of this switch.

(4) **Audio output connector** — Connect audio devices, such as an audio amplifier or powered speakers to this 5-pole, 3.5 mm captive screw connector to output the transmitted, unamplified, line level audio (see "**Audio output connector**" on page 9 to wire a captive screw connector for the appropriate output type and impedance level).

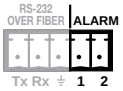


⑤ **RS-232 Over Fiber port** — If you want the FOXBOX to pass serial command signals to a slave device, for serial control of a projector for example, connect the slave device to the receiver via the first three leftmost poles (Tx, Rx, and ⏚) of this 5-pole captive screw connector (see "**RS-232 connections**" on page 8 to wire this connector).



NOTES:
- If you connect only one fiber optic cable (**item** ⑯, on the previous page), or you configure the receiver for daisy-chaining, you will not receive reports from the controlled device. To receive responses from the controlled device, you must install two fiber optic cables and leave link 2 enabled (via an **SIS command** [see page 25] or using the **Signal Processing Product Control Program** [see page 31]).
- The FOXBOX can pass RS-232 commands and responses at rates up to 115200 baud.

⑥ **Alarm outputs port** — For remote monitoring of the status of fiber optic link 1, connect a locally-constructed or furnished monitoring device to the receiver via the two rightmost poles (1 and 2) of this 5-pole captive screw connector. When the receiver does not detect a light link on fiber cable Rx, pin 1 and pin 2 of this port are shorted together (see "**Alarm outputs connection**" on page 8 to wire this connector).



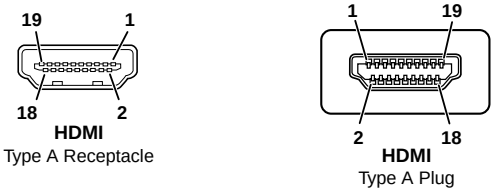
⑦ **Remote RS-232 port** — For serial control of the receiver, connect a host device, such as a computer, touch panel control, or RS-232 capable PDA, to the transmitter via this 3-pole captive screw connector (see "**RS-232 connections**" on page 8 to wire this connector (see "**Remote Control**" on page 20 for SIS commands and software control).

⑧ **DC power connector** — Plug the included external 12 VDC power supply into this connector (see "**Power supply wiring**" on page 10, to wire the connector).

Making Connections

HDMI connector

Figure **5** defines the HDMI pin assignments.



Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2+	7	TMDS data 0–	13	CEC control
2	TMDS data 2 shield	8	TMDS data 0 shield	14	Reserved (NC)
3	TMDS data 2-	9	TMDS data 0-	15	SCL
4	TMDS data 1+	10	TMDS clock+	16	SDA
5	TMDS data 1 shield	11	TMDS clock shield	17	DDC / CEC Ground
6	TMDS data 1-	12	TMDS clock-	18	+5 V power
				19	Hot plug detect

Figure 5. HDMI Connectors

HDMI signals run at a very high frequency and are especially prone to errors caused by bad video connections, too many adapters, or excessive cable length. To avoid the loss of an image or jitter, follow these guidelines:

- Do not exceed 16.4 feet (5 meters) on the input of the transmitter or the output of the FOXBOX SR HDMI scaling receiver.
- Use only the cable designed for HDMI signals that is supplied by Extron.
- Limit or avoid the use of adapters.
- Use only cables specifically intended for HDMI or DVI signals. Use of non-HDMI or non-DVI cables or modified cables can result in a missing video output.

To securely fasten an HDMI cable to a device:

1. Plug the HDMI cable into the panel connection (see ① in figure **6**).

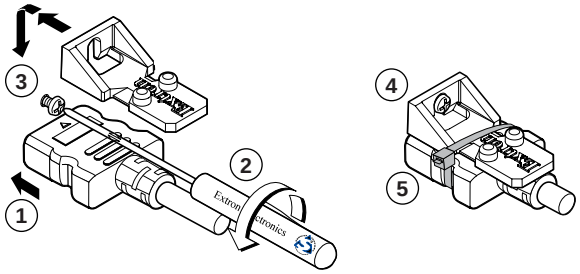


Figure 6. Installing the LockIt Lacing Bracket

2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (②). The screw does not have to be removed.

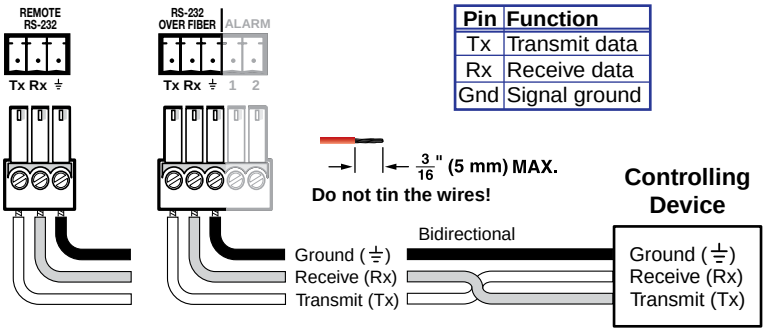
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket (③).

ATTENTION: Do not overtighten the HDMI connector mounting screw. The shield to which it fastens is very thin and can easily be stripped.

4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket (④).
5. While holding the connector securely against the lacing bracket, use pliers or similar tools to tighten the tie wrap, then remove any excess length (⑤).

RS-232 connections

The Remote RS-232 port on the receiver **only** is for remote control of the receiver. The RS-232 Over Fiber port on both units is for transmission of serial signals, such as projector control signals, between the transmitter and receiver (see figure **7** to properly wire the connectors).



Pin	Function
Tx	Transmit data
Rx	Receive data
Gnd	Signal ground

NOTE: Cross the Tx and Rx lines once between the source and the target.

Figure 7. RS-232 Over Fiber Connector

NOTE: The length of exposed wires is critical. **The ideal length is 3/16 inch (5 mm)**.

- Longer bare wires can short together.
- Shorter wires are not as secure in the connectors and could be pulled out.

Alarm outputs connection

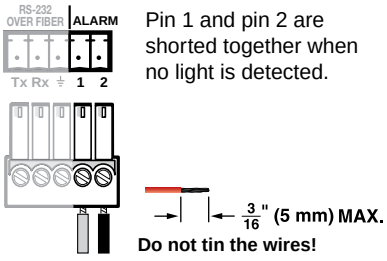


Figure 8. Alarm Connector

NOTE: The length of exposed wires is critical (see the second RS-232 connector **NOTE**, above.)

Audio output connector

See figure **9** to properly wire a captive screw output connector. The connector is included with the receiver, but you must supply the audio cable. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

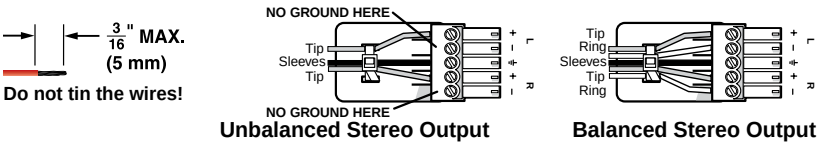


Figure 9. Captive Screw Connector Wiring for Stereo Audio Output

ATTENTION: For unbalanced audio, connect the sleeves to the ground contact. ***DO NOT*** connect the sleeves to the negative (-) contacts.

NOTE: The length of exposed wires is critical (see the RS-232 connector **NOTE** on page 8 for more information.)

Power supply wiring

ATTENTION: Always use power supplies specified by Extron for the FOXBOX units. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the unit.

Figure **10** shows how to wire the power connector.

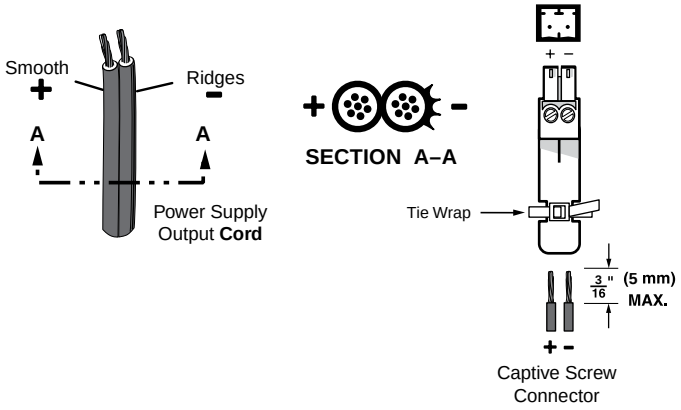


Figure 10. Power Connector Wiring

ATTENTION:
- This product is intended to be supplied by a Listed Power Unit marked "Class 2" or "LPS," rated 12 VDC, 1.0 A minimum. Always use power supplies supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to a building structure or similar structure.
- Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (figure **10**) identify the power cord negative lead.

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

CAUTION: **Electric shock hazard**: The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.

ATTENTION: The length of the exposed (stripped) copper wires is important. **The ideal length is 3/16 inch (5 mm)** (see the second RS-232 Connections **NOTE** on page 8 for more information).

NOTE: Do not tin the power supply leads before installing them in the captive screw connector. Tinned wires are not as secure in the connectors and could be pulled out.

Use the supplied tie wrap to strap the power cord to the extended tail of the connector.

Alternatively, an optional Extron PS 124 Universal 12 VDC Power Supply, part number **60-1022-01**, can power multiple Extron 12 VDC devices using only one AC power connector.

Front Panel Configuration Port

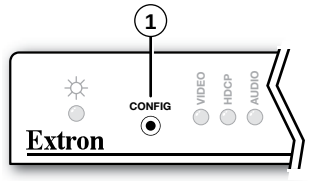
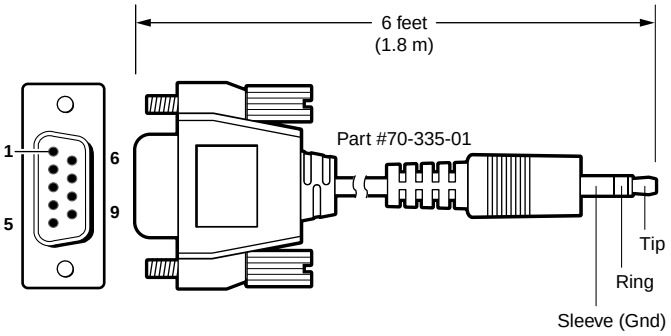


Figure 11. FOXBOX SR Scaling Receiver Front Panel Features

① **Configuration port** — Connect a controlling device, such as a PC, to this port via a 2.5 mm mini jack TRS RS-232 cable for RS-232 protocol control of all FOXBOX functions.

The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part number **70-335-01** (figure **12**) can be used for this connection.

NOTE: This port is for remote control of the receiver, not for the over fiber RS-232 link.



9-pin D	Connection	TRS Plug
Pin 2	Rx line on the computer	Tip
Pin 3	Tx line on the computer	Ring
Pin 5	Signal ground on the computer	Sleeve

Figure 12. 9-pin TRS RS-232 cable

This port is RS-232 only, with the following protocols:

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

NOTE: The maximum distances from the transmitter or receiver to the controlling device can vary up to 200 feet (61 m). Factors such as cable gauge, baud rates, environment, and output levels (from the unit and the controlling device) all affect transmission distance. Distances of about 50 feet (15 m) are typically not a problem. In some cases, the unit may be capable of serial communications via RS-232 up to 250 feet (76 m) away.

See "**Remote Control**" on page 20 for definitions of the SIS commands (serial commands to control the transmitter via this connector) and software control.

Operation

This sections details the installation of the FOXBOX SR HDMI, including:

- **Front Panel Indications and Controls**
- **Operation**

Front Panel Indications and Controls

The receiver has front panel LEDs that indicate power and signal status (see figure 13) and a menu system that is operated using the front panel controls and displayed on the connected output device.

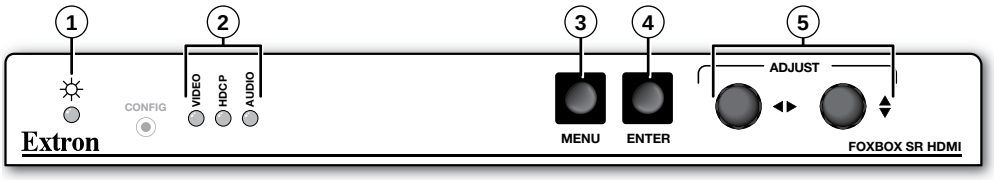


Figure 13. FOXBOX SR HDMI Front Panel Indications and Controls

① **Power LED** — This LED lights to indicate that power is applied to the unit.

② **Signal indicators** —

Video LED — This LED lights when the receiver accepts a video signal on the fiber optic input.

HDCP LED — This LED lights when the output signal is HDCP encrypted.

Audio LED — This LED lights on the receiver when the transmitter detects an audio signal above a –35 dB minimum threshold. It returns to unlit if the audio signal drops below the threshold for 10 seconds.

③ **Menu button** — The Menu button enters the main menu system of the receiver and backs out of the currently active submenu or selection.

> **NOTE:** See "**Menu and Submenus**" on page 14 for the detailed menu system interoperability of the Menu button, Enter button (④), and Adjust knobs (⑤). The menu system is displayed on the connected video output device (see figure 14 on the next page).

④ **Enter button** — The Enter button selects and deselects a highlighted submenu or function in the receiver main menu system and saves a changed value.

⑤ **Adjust ◂▸ (horizontal) and Adjust ▴▾ (vertical) knobs** — The Adjust ◂▸ and Adjust ▴▾ knobs change settings when used in conjunction with the menu system.

Operation

After the transmitter, all receivers, and their connected devices are powered up, the system is fully operational. If any problems are encountered, verify that the cables are routed and connected properly, and that all display devices have identical resolutions and refresh rates. If your problems persist, call the Extron S3 Sales & Technical Support Hotline (see the **contact numbers** on the last page of this guide for the Extron office nearest you).

Menu System Overview

Access the various adjustments and test patterns available in the FOXBOX receiver via the menu system. The menus and submenus are displayed on the connected video output device (see figure 14).

Figure 14. Menu System Display

Menu and Submenus

Figure 15 shows a flowchart of the submenus in the main menu system. Each submenu leads to one or more a series of submenus or to "slider" type status indicator bar controls that accomplish individual tasks or groups of tasks.

NOTE: In figure 15, and all other flowcharts in this chapter, solid lines indicate screen changes initiated by the operator. Dashed lines indicate screen changes that are the result of a timeout function.

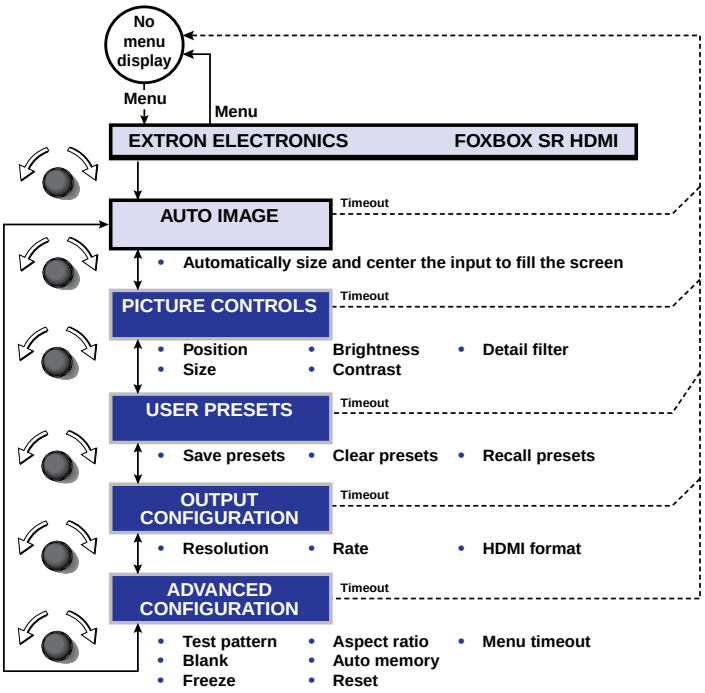


Figure 15. Menu System Flowchart

Menu button — Press the Menu button to activate the menu system and to back out of a selected menu or submenu.

Enter button — Press the Enter button to select a highlighted menu or submenu and to execute or save a selected variable.

Adjust ◄► and Adjust ▲▼ knobs — When the menu system is active, rotate the Adjust ◄► knob and Adjust ▲▼ knob to scroll through the main menu or selected layer of submenus and to adjust a selected setting.

Press the Menu button to activate the main menu in the on-screen display. Rotate either Adjust knob to select (highlight) the desired selection and then press the Enter button. The submenus for that menu item appear. Rotate either Adjust knob to select (highlight) the desired submenu and press the Enter button.

NOTES:
- If you press the Menu button while a submenu is active, the on-screen display backs up to display the main menu from which that submenu was selected.
- From any menu or submenu, after a user-selectable period of inactivity, the scaler saves all adjustment settings and deactivates the on-screen display.
- The Adjust knobs have no mechanical limits to their rotation.

Auto Image submenu

Figure 16 shows an overview of the Auto Image submenu and executing the Auto-Image™ function. Select Auto Image and press the Enter button twice to automatically size and center the input to fit the output resolution.

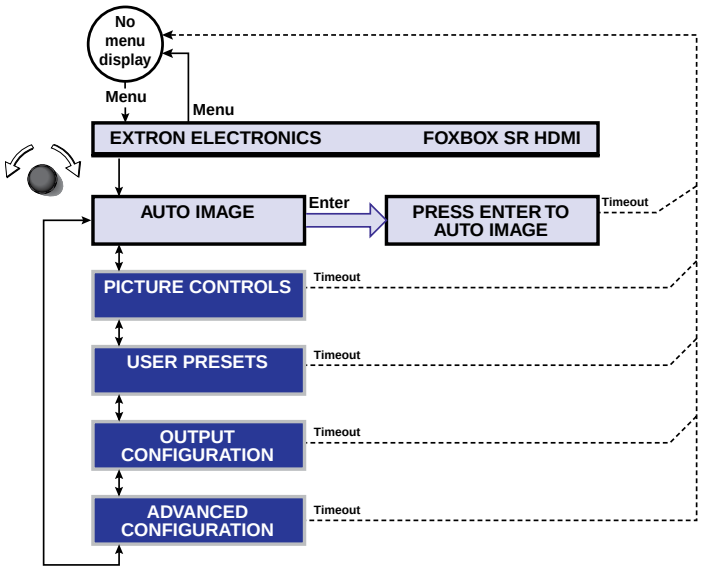


Figure 16. Auto Image Submenu Flowchart

Picture Controls submenu

Figure 17 shows an overview of the Picture Controls submenu and the available selections.

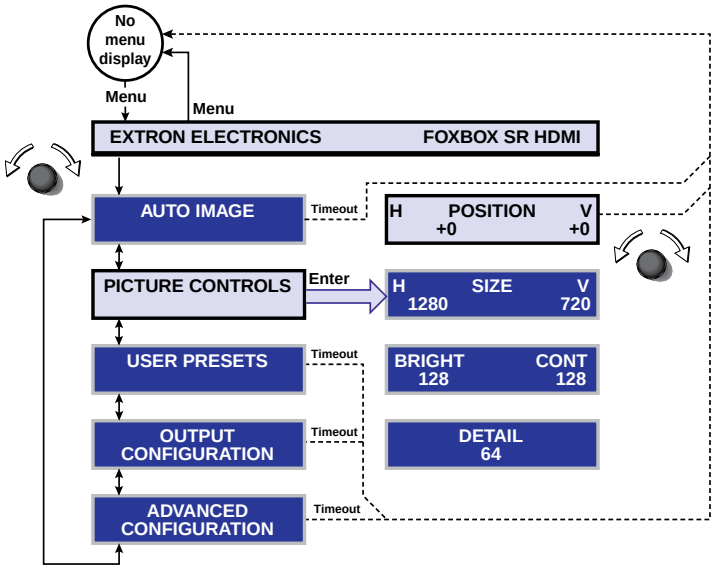


Figure 17. Picture Controls Submenu Flowchart

Position selection

The Position selection allows you to adjust the horizontal and vertical position of the image. Rotate the Adjust ◄► knob while this submenu is active to shift the image horizontally and the Adjust ▲▼ to shift the image vertically.

Size selection

The Size selection allow you to adjust the horizontal and vertical size of the output. Rotate the Adjust ◄► knob while this submenu is active to size the image horizontally and the Adjust ▲▼ to size the image vertically.

Brightness and Contrast selection

Rotate the Adjust ◄► knob while this submenu is active to increase and decrease the image brightness, from 0 through 255. Rotate the Adjust ▲▼ to increase and decrease the image contrast, from 0 through 255.

Detail selection

Rotate either Adjust knob while this submenu is active to increase and decrease the detail filter, from 0 through 127.

User Presets submenu

Figure **18** shows an overview of the User Presets submenu and the available selections.

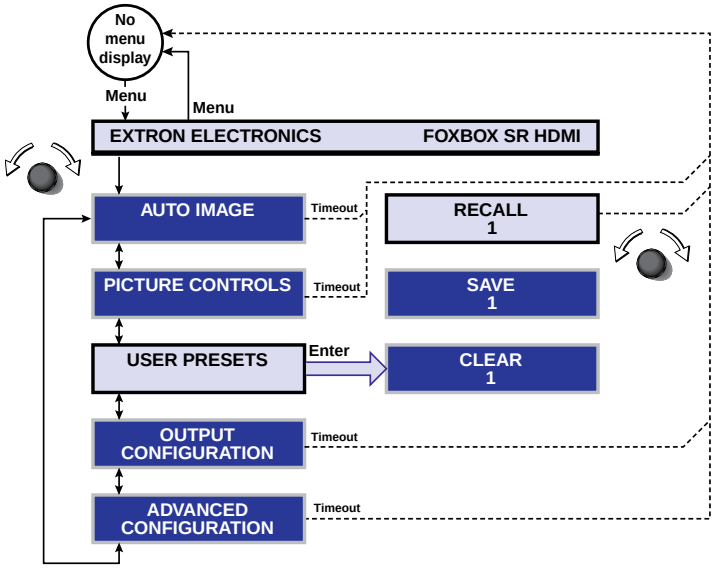


Figure 18. User Presets Submenu Flowchart

User presets are saved in nonvolatile memory; when the receiver is powered down and later powered back up, the settings are available for selection. Saving the settings to a preset overwrites the settings previously written to that preset.

NOTE: The User Preset is tailored for the selected output rate. If you change the output rate and then recall a preset that was saved for a different rate, the preset adjustments have no effect on the video output. If, however, you then change to the rate for which the preset was saved, the effects of the adjustments appear on the screen.

Recall submenu

Rotate either Adjust knob while this submenu is active to select a preset number, from 1 through 30, and press the Enter button to recall the selected preset to be the current settings. Allow the screen to timeout without pressing the Enter button to exit without recalling the settings.

Save submenu

Rotate either Adjust knob while this submenu is active to select a preset number, from 1 through 30, and press the Enter button to save the current settings to the selected preset. Allow the screen to timeout without pressing the Enter button to exit without saving the settings.

Clear submenu

Rotate either Adjust knob while this submenu is active to select a preset number, from 1 through 30, and press the Enter button to erase the selected preset. Allow the screen to timeout without pressing the Enter button to exit without erasing the settings.

Output Configuration submenu

Figure **19** shows an overview of the Output Configuration submenu and the available selections.

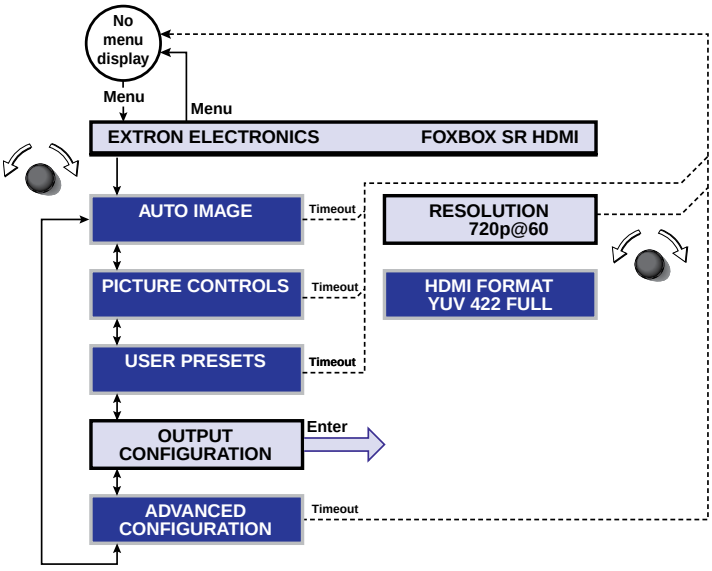


Figure 19. Output Configuration Submenu Flowchart

Resolution submenu

Rotate either Adjust knob while this submenu is active to select the output resolution and refresh rate (see the table for variable X7 on page 24 for a list of available selections).

HDMI Format submenu

Rotate either Adjust knob while this submenu is active to select an HDMI format for the output (see the list below for available selections).

- Auto (HDMI 444 or DVI 444)
- HDMI RGB 444 limited
- HDMI YUV 422 full
- DVI RGB 444
- HDMI YUV 444 full
- HDMI YUV 422 limited
- HDMI RGB 444
- HDMI YUV 444 limited

Advanced Configuration submenu

Figure **20** shows an overview of the Advanced Configuration submenu and the available selections.

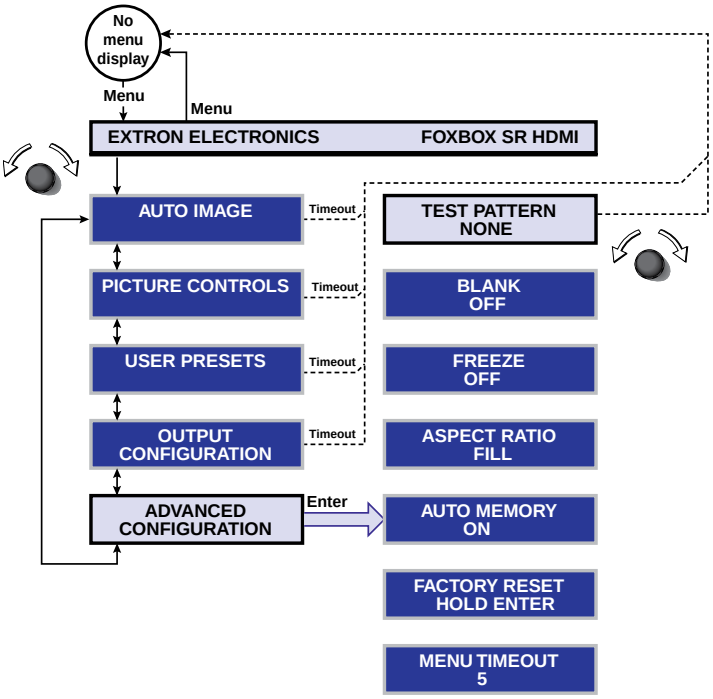


Figure 20. Advanced Configuration Submenu Flowchart

Test Pattern submenu

The Test Pattern submenu lets you select from among several test patterns. The test patterns are helpful when you are adjusting the connected displays for color, convergence, focus, resolution, contrast, grayscale, and aspect ratio.

Rotate either Adjust knob while this submenu is active to select a test pattern or to turn the test pattern off (none). The available test patterns are: color bars, crosshatch, grayscale, alternating pixels, and crop (see figure **21**). The crop pattern available from the submenu varies depending on the aspect ratio of the output rate.

Figure 21. Test Patterns

Blank submenu

The Blank submenu controls the video mute function. Rotate either Adjust knob while this submenu is active to select either On to blank the screen or Off to output video.

Freeze submenu

The Freeze submenu lets you freeze and unfreeze the video output. Rotate either Adjust knob while this submenu is active to select either On (freeze) or Off (unfreeze).

NOTE: The freeze function has no effect on the audio output.

Aspect Ratio submenu

The Aspect Ratio submenu lets you specify how the scaler handles the aspect ratio of a scaled output. Rotate either Adjust knob while this submenu is active to select either Fill to force the input to automatically fill the output raster or Follow Input to display the input in its native aspect ratio.

Auto Memory submenu

The Auto Memory submenu provides a means to toggle the auto memory feature on or off. by rotating either Adjust knob while this submenu is active.

Auto memory saves and recalls centering, sizing, and filtering information, based on the input frequency. Auto memory settings may conflict with user preset settings. When you use a control system to switch inputs and then recall a user memory, the delay in recalling the auto memory settings could result in the recalled auto memory settings overwriting the recalled user preset settings. To prevent this conflict, turn auto memory off.

Factory Reset submenu

The Factory Reset submenu forces the receiver to reset to the default values. Press and **hold** the Enter button while this submenu is active for about 3 seconds, then release the Enter button.

Menu Timeout submenu

The Menu Timeout submenu lets you set how long the receiver outputs the on-screen display before clearing it. Rotate either Adjust knob while this submenu is active to select among 0 (never timeout) and 1 through 64 seconds.

Remote Control

This section describes the remote control operation of the FOXBOX SR HDMI, including:

- **Simple Instruction Set Control**
- **Signal Processing Product Control Program**

The receiver has two serial ports: the front panel Configuration port, a 2.5 mm mini stereo jack (see "**Front panel Configuration Port**" on page 11); and a rear panel Remote RS-232 port, a 3-pole captive screw connector (see "**RS-232 connections**" on page 8). Either of these ports can be connected to a host device such as a computer running the HyperTerminal or DataViewer utility, or a control system to make serial control of the receiver possible.

The protocol for all ports is as follows:

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

Simple Instruction Set Control

Host-to-Unit Instructions

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the unit executes the command and sends a response to the host device. All responses from the unit to the host end 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.

Symbol Definitions

↵ = CR/LF (carriage return/line feed)
← = Carriage return (no line feed)
| = Pipe (can be used interchangeably with the ← character)
• = Space (hard) character
Esc = Escape key (hex 1B)
W = Can be used interchangeably with the Esc character

X1	= Mute status	Ø = off (unmute) 1 = on (mute video and sync)	2 = on (mute video)
X2	= Contrast and brightness	ØØØ through 255 (default 128)	
X3	= Detail	ØØØ through 128 (default 64)	
X4	= Horizontal and vertical position	Range depends on selected output size	
X5	= Size	Range depends on selected output size	
X6	= Aspect ratio	1 = fill	2 = follow
X7	= Scaler resolution (EDID)	See the **table** on page 24.	
X8	= HDMI output format	Ø = Auto (HDMI 444 or DVI 444) 1 = DVI 444 2 = HDMI RGB 444 3 = HDMI RGB 444 Limited	4 = HDMI YUV 444 Full 5 = HDMI YUV 444 Limited 6 = HDMI YUV 422 Full 7 = HDMI YUV 422 Limited
X9	= Screen saver mode	1 = Black screen (default)	2 = Blue screen with on-screen display
X10	= Screen saver timeout	ØØØ = No screen saver 5Ø1 = Never timeout (default)	ØØ1 to 5ØØ (seconds)
X11	= Screen saver status	Ø = Input active, timer not running 1 = No active input, timer running 2 = No active input, output sync disabled	
X12	= On and off status	Ø = off	1 = on
X13	= Memory preset number	Ø1 to 3Ø	
X14	= Test pattern	Ø = none 1 = color bars 2 = grayscale	3 = 4x4 crosshatch 4 = alternating pixels 5 = crop
X15	= Rx link and daisy chain enable	Ø = disable 1 = return link enable	2 = daisy chain enable
X16	= Video delay (0 plus six steps at 0.25 seconds per step)	Ø = 0 second 1 = 0.25 second **2 = 0.5 second (default)** 3 = 0.75 second	4 = 1.0 second 5 = 1.25 second 6 = 1.5 second
X17	= On-screen display timeout	ØØ = No display timeout	Ø1 to 64 (seconds)
X18	= Switch position	Ø = off (down)	1 = on (up)
X19	= Link status	Ø = light or signal input not detected	1 = light or signal detected
X20	= Temperature	*nnn*F•*nn*C	
X21	= Vendor/manufacturer name		
X22	= Transmit output power in milliwatts		
X23	= Receive optical power in milliwatts		
X24	= SFP temperature	*nn*C	
X25	= Transmission mode	SM = singlemode	MM = multimode
X26	= Firmware version	*v.vv*	

Unit-initiated Messages

When a local event, such as an equipment power-up, occurs, the unit responds by sending a message to the host. The unit-initiated messages are listed below:

`(c) Copyright 20`*nn*`, Extron Electronics FOXBOX SR HDMI` *yy*`, V`*n.nn*`, 60-1187-`*xx*`↵↵`

The receiver issues the copyright message (above) when it first powers on. *yy* is `SM` or `MM`. V*n.nn* is the firmware version number; `60-1187-`*xx* is the part number of the connected unit.

`1Lnk`X19`•2Lnk`X19`•Vid`X12`•Aud`X12 X25`•SR↵↵`

The unit sends the status message whenever a change in the fiber link and video connection occurs. X19 and X12 are the connection status and X25 is the transmission mode (MM or SM).

`EmbedAud`X18`↵`

The unit sends the `EmbedAud` message whenever a change in the position of the receiver rear panel HDMI Audio switch (X18) occurs.

`Ssav`X9`↵`

The unit sends the Ssav message whenever it enters or exits screen saver mode (X9).

`Hplg0↵`

The unit sends the `Hplg` message whenever it detects a hot plug event on an output.

Error Responses

When the unit receives a valid SIS command, it executes the command and sends a response to the host device. If the unit is unable to execute the command because the command is invalid or it contains invalid parameters, the unit returns an error response to the host. The error response codes are:

`E10` – Invalid command
`E11` – Invalid preset number
`E13` – Invalid parameter
`E14` – Invalid command for this configuration

Using the Command and Response Table

The command and response table begins on the next page. Either uppercase or lowercase letters are acceptable in the command field except where indicated for the audio level (gain and attenuation) commands. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The ASCII to Hex conversion table below is for use with the command and response table.

Space →

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

Command and Response Table for SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Video mute			
Mute video output	1B	Blk1↵	Blank the video output.
Mute video and sync output	2B	Blk2↵	Blank the video and suspend sync.
Unmute video output	ØB	BlkØ↵	Output video and sync.
Show video mute status	B	X1↵	Video mute status is X1.
Contrast			
Set a contrast value	Esc X2 CONT←	Cont X2↵	Set the contrast level to X2.
Increment value	Esc +CONT←	Cont X2↵	Increase the setting by one.
Decrement value	Esc –CONT←	Cont X2↵	Decrease the setting by one.
View contrast setting	Esc CONT←	X2↵	View the current setting.
Brightness			
Set a brightness value	Esc X2 BRIT←	Brit X2↵	Set the brightness level to X2.
Increment value	Esc +BRIT←	Brit X2↵	Increase the setting by one.
Decrement value	Esc –BRIT←	Brit X2↵	Decrease the setting by one.
View brightness setting	Esc BRIT←	X2↵	View the current setting.
Detail filter			
Set a detail filter value	Esc X3 HDET←	Hdet X3↵	Set the detail filter level to X3.
Increment value	Esc +HDET←	Hdet X3↵	Increase the setting by one.
Decrment value	Esc –HDET←	Hdet X3↵	Decrease the setting by one.
View detail filter setting	Esc HDET←	X3↵	View the current setting.
Horizontal shift			
Set a horizontal position	X4 H	Hph X4↵	Set horizontal centering to X4.
Increment position	+H	Hph X4↵	Shift the image one pixel to the right.
Decrement position	–H	Hph X4↵	Shift the image one pixel to the left.
Show position	H	X4↵	
Vertical shift			
Set a vertical position	X4 /	Vph X4↵	Set vertical centering to X4.
Increment position	+ /	Vph X4↵	Shift the image down one line.
Decrement position	– /	Vph X4↵	Shift the image up one line.
Show position	/	X4↵	
Horizontal size			
Set a horizontal size	Esc X5 HSIZ←	Hsiz X5↵	Set the horizontal size to X5.
Increase horizontal size	Esc +HSIZ←	Hsiz X5↵	Make the picture wider.
Decrease horizontal size	Esc –HSIZ←	Hsiz X5↵	Make the picture narrower.
Show horizontal size	Esc HSIZ←	X5↵	Horizontal size is X5.
Vertical size			
Set a vertical size	Esc X5 VSIZ←	Vsiz X5↵	Set the vertical size to X5.
Increase vertical size	Esc +VSIZ←	Vsiz X5↵	Make the picture taller.
Decrease vertical size	Esc –VSIZ←	Vsiz X5↵	Make the picture shorter.
Show vertical size	Esc VSIZ←	X5↵	Vertical size is X5.
Auto-Image			
Execute	Ø*A	ImgØ↵	Execute Auto-Image and follow the current aspect ratio.
Execute and fill	1*A	Img1↵	Execute Auto-Image and fill the entire output.
Execute and follow	2*A	Img2↵	Execute Auto-Image and follow the input aspect ratio.
Aspect ratio			
Set for fill	Esc 1ASPR←	Aspr1↵	**Fill**: Input automatically fills the output raster.
Set for follow	Esc 2ASPR←	Aspr2↵	**Follow**: Input is displayed in its native aspect ratio.
View aspect ratio setting	Esc ASPR←	X6↵	

NOTE:

X1 = Mute status	Ø = off (unmute) 1 = on (mute video)	2 = on (mute video and sync)
X2 = Contrast and brightness	ØØØ through 255 (default = 128)	
X3 = Detail	ØØØ through 128 (default = 64)	
X4 = Horizontal and vertical position	Range depends on selected output size.	
X5 = Size	Range depends on selected output size.	
X6 = Aspect ratio	1 = fill 2 = follow	

Command and response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Output scaler rate			
Set the output rate	Esc X7 RATE ←	Rate X7 ↵	Select the output resolution and rate to X7 (see the table below the Show command).
Show the output rate	Esc RATE ←	X7 ↵	See the table below.

X7	Source or value	X7	Source or value	X7	Source or value	X7	Source or value	X7	Source or value
1Ø	640x480 @ 50 Hz	11	640x480 @ 60 Hz	12	640x480 @ 75 Hz	13	800x600 @ 50 Hz	14	800x600 @ 60 Hz
15	800x600 @ 75 Hz	16	852x480 @ 50 Hz	17	852x480 @ 17 Hz	18	852x480 @ 75 Hz	19	1024x768 @ 50 Hz
2Ø	1024x768 @ 60 Hz	21	1024x768 @ 75 Hz	22	1024x852 @ 50 Hz	23	1024x852 @ 60 Hz	24	1024x852 @ 75 Hz
25	1024x1024 @ 50 Hz	26	1024x1024 @ 60 Hz	27	1024x1024 @ 75 Hz	28	1280x768 @ 50 Hz	29	1280x768 @ 60 Hz
3Ø	1280x768 @ 75 Hz	31	1280x800 @ 50 Hz	32	1280x800 @ 60 Hz	33	1280x800 @ 75 Hz	34	1280x1024 @ 50 Hz
35	1280x1024 @ 60 Hz	36	1280x1024 @ 75 Hz	37	1360x765 @ 50 Hz	38	1360x765 @ 60 Hz	39	1360x765 @ 75 Hz
4Ø	1360x768 @ 50 Hz	41	1360x768 @ 60 Hz	42	1360x768 @ 75 Hz	43	1365x768 @ 50 Hz	44	1365x768 @ 60 Hz
45	1365x768 @ 75 Hz	46	1366x768 @ 50 Hz	47	1366x768 @ 60 Hz	48	1366x768 @ 75 Hz	49	1365x1024 @ 50 Hz
5Ø	1365x1024 @ 60 Hz	51	1365x1024 @ 75 Hz	52	1440x900 @ 50 Hz	53	1440x900 @ 60 Hz	54	1440x900 @ 75 Hz
55	1400x1050 @ 55 Hz	56	1400x1050 @ 60 Hz	57	1680x1050 @ 50 Hz	58	1680x1050 @ 60 Hz	59	1600x1200 @ 50 Hz
6Ø	1600x1200 @ 60 Hz	61	1920x1200 @ 50 Hz	62	1920x1200 @ 60 Hz	63	480p @ 59.94 Hz	64	480p @ 60 Hz
65	576p @ 50 Hz	66	720p @ 25 Hz	67	720p @ 29.97 Hz	68	720p @ 30 Hz	69	720p @ 50 Hz
7Ø	720p @ 59.94 Hz	71	720p @ 60 Hz	72	1080i @ 50 Hz	73	1080i @ 59.94 Hz	74	1080i @ 60 Hz
75	1080p @ 23.98 Hz	76	1080p @ 24 Hz	77	1080p @ 25 Hz	78	1080p @ 29.97 Hz	79	1080p @ 30 Hz
8Ø	1080p @ 50 Hz	81	1080p @ 59.94 Hz	82	1080p @ 60 Hz	83	2048x1080 @ 23.98 hz	84	2048x1080 @ 24 Hz
85	2048x1080 @ 25 Hz	86	2048x1080 @ 29.97 Hz	87	2048x1080 @ 30 Hz	88	2048x1080 @ 50 Hz	89	2048x1080 @ 59.94 Hz
9Ø	2048x1080 @ 60 Hz								

HDMI output format			
Set the output format	Esc X8 VTPO ←	Vtpo X8 ↵	Set the video output format (color space).
Show the output format	Esc VTPO ←	X8 ↵	
Screen saver (active when there is no active video)			
Set screen saver mode	Esc M X9 SSAV ←	SsavM X9 ↵	
View screen saver mode	Esc MSSAV ←	X9 ↵	
Set timeout duration	Esc T X10 SSAV ←	Ssav X10 ↵	
View timeout duration	Esc TSSAV ←	X10 ↵	
VIew screen saver status	Esc SSSAV ←	X11 ↵	
Freeze			
NOTE: The receiver unfreezes, returning to motion video, when the screen saver starts, when you cycle receiver power, and when you perform a reset.			
Freeze the output	1F	Frz1 ↵	Freeze the output (still video output).
Unfreeze the output	ØF	FrzØ ↵	Unfreeze the output (output motion video).
Show the freeze status	F	X12 ↵	

NOTE:

X7 = Scaler resolution (EDID)	See the table beneath the Output Scaler Rate commands, above.		
X8 = HDMI output format	Ø = Auto (HDMI-RGB 444 or DVI-RGB 444)	4 = YUV 444 Full	
	1 = DVI RGB 444	5 = YUV 444 Limited	
	2 = RGB 444	6 = YUV 422 Full	
	3 = RGB Limited	7 = YUV 422 Limited	
X9 = Screen saver mode	1 = Black screen (default)	2 = Blue screen with on-screen display text	
X10 = Screen saver timeout	ØØØ = No screen saver	ØØ1 to 5ØØ (seconds)	
	5Ø1 = Never timeout (default)		
X11 = Screen saver status	Ø = Input active, timer not running	2 = No active input, output sync disabled	
	1 = No active input, timer running		
X12 = Freeze status	Ø = off (video in motion)	1 = on (video frozen)	

Command and response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Test pattern			
Output color bars	Esc1TEST←	Test1↵	Set the unit to output the color bars test pattern.
Output grayscale	Esc2TEST←	Test2↵	Set the unit to output the grayscale test pattern.
Output crosshatch	Esc3TEST←	Test3↵	Set the unit to output the crosshatch test pattern.
Output alternating pixels	Esc4TEST←	Test4↵	Set the unit to output the alternating pixels test pattern.
Output crop	Esc5TEST←	Test5↵	Set the unit to output the crop test pattern.
Turn test pattern off	EscØTEST←	TestØ↵	Set the unit to output the input video (no test pattern is selected).
Show test pattern status	EscTEST←	X14↵	View the current test pattern.
Memory presets			
Save preset	X13,	SprX13↵	Command code is a comma.
Recall preset	X13.	RprX13↵	Command code is a period.
Auto memory			
Disable auto memory	EscØAMEM←	AmemØ↵	
Enable auto memory	Esc1AMEM←	Amem1↵	Default condition.
Show auto memory status	EscAMEM←	X12↵	
Audio mute			
Mute the audio	1Z	Amt1↵	Silence the audio output of the receiver.
Unmute the audio	ØZ	AmtØ↵	The receiver outputs audio.
Show audio mute status	Z	X12↵	Audio mute status is X12.
Disable and enable return link and daisy chain			
Disable return link	66*Ø*Ø#	Rle*Ø*Ø↵	Disable link 2.
Enable return link to transmitter	66*Ø*1#	Rle*Ø*1↵	Enable link 2 (default setting).
Enable daisy chain	66*Ø*2#	Rle*Ø*2↵	Enable receiver daisy chain mode.
Show return link and daisy chain status	66*Ø#	Ø*X15↵	
HDCP notification			
Enable notification	EscN1HDCP←	HdcpN1↵	Default condition.
Disable notification	EscNØHDCP←	HdcpNØ↵	
View notification status	EscNHDCP←	X12↵	
Video shutdown delay			
NOTES: • The Set Video Delay command delays the digital video to help monitors sync correctly during an input rate change. • **Only** video is delayed; embedded audio is **not** delayed.			
Set delay	3*X16#	DlyX16↵	Delay video by an interval of X16.
Example:	3*3#	Dly3↵	Delay video by an interval of 0.75 seconds (3 x 0.25 seconds).
View delay	3#	X16↵	
Front panel lockout (Executive mode)			
Lock front panel	1X	Exe1↵	Lock all front panel controls except for using the Menu and Enter buttons to unlock the panel only.
Unlock front panel	ØX	ExeØ↵	
View lock status	X	X12↵	

NOTE:
X12 = Lock, Auto memory, mute, and HDCP notification status — Ø = off; 1 = on
X13 = Memory preset number — Ø1 to 3Ø
X14 = Test pattern — Ø = none; 1 = color bars; 2 = grayscale; 3 = crosshatch; 4 = alternating pixels; 5 = crop
X15 = Rx link and daisy chain enable — Ø = disable both; 1 = enable return link; 2 = enable daisy chain
X16 = Video delay (0 plus six steps at 0.25 seconds per step) — Ø = 0 second; 1 = 0.25 second; **2 = 0.5 second***; 3 = 0.75 second; 4 = 1.0 second; 5 = 1.25 second; 6 = 1.5 second
*** = default**

Command and response table for SIS commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
On-screen display timeout			
Set menu timeout	Esc X17 MDUR ←	Mdur X17 ↵	Set the duration of the on-screen display.
View menu timeout	Esc MDUR ←	Mdur X17 ↵	View the duration of the on-screen display.
Switch and signal status requests			
Request Audio switch status	Esc STAT ←	EmbedAud X18 ↵	Show the position of the Audio switch: Ø = off (embedded audio is muted) or 1 = on (unmute).
NOTE: The audio on the captive screw audio output always remains active regardless of the setting of this switch.			
Check audio embed	Esc 5STAT ←	X19 ↵	Show if audio is embedded in the video stream: Ø = not detected or 1 = detected.
View link 1 (Tx-to-Rx) status	1S	X19 ↵	
View link 2 (Rx-to-Tx) status	2S	X19 ↵	
View input video status	3S	X12 ↵	
View input audio status	4S	X12 ↵	
View all signal status	5S	SigI X19 •SigO X19 •HdcpI X19 •HdcpO X19 ↵ Report the status of the HDMI input, HDMI output, HDCP encoding on the input, and HDCP encoding on the output.	
View HDMI signal status	6S	SigI X19 •SigO X19 ↵	Report the status of the HDMI input and HDMI output.
View HDCP status	7S	HdcpI X19 •HdcpO X19 ↵	Report the status of the HDCP encoding on the input and HDCP encoding on the output.
View temperature	20S	X20 F•X20 C ↵	Show temperature in degrees Fahrenheit and Celsius.
View SFP module status	40S	X21 •X22 •X23 •X24 ↵	
Example:	40S	JDSC•4.156mw•Ø.30mw•32C	
Information requests			
Information request	I	1Lnk X19 •2Lnk X19 •Vid X12 •Aud X12 •X25 •SR ↵ The unit responds with the current status (signal detected) of optical link 1, optical link 2, the video input, and the audio link; and the fiber optic transmission mode (singlemode or multimode).	
Show firmware version	Q	X26 ↵	
Example:	Q	1.23 ↵	The factory-installed firmware version is 1.23 (sample value only).
Request part number	N	60-1187-*nn* ↵	See "**Part Numbers**" on page 36.
Resets			
Reset image settings	Esc ZI ←	Zpi ↵	Reset (clear) all image adjustments.
System reset	Esc ZXXX ←	Zpx ↵	Reset all settings to factory defaults.

NOTE:

X12 = On and off status	Ø = off		1 = on
X17 = On-screen display timeout	Ø = No display timeout	Ø1 to 64 (seconds)	
X18 = Switch position	Ø = off (down)	1 = on (up)	
X19 = Link status	Ø = light or signal input not detected		1 = light or signal detected
X20 = Internal temperature	*nnn*F•*nn*C		
X21 = Vendor/manufacturer name			
X22 = Transmit output power in milliwatts			
X23 = Receive optical power in milliwatts			
X24 = SFP temperature	*nn*C		
X25 = Transmission mode	SM = singlemode	MM = multimode	
X26 = Firmware version	*v.vv*		

Signal Processing Product Control Program

The Extron Signal Processing Control Program, which communicates with the receiver via its Configuration port or Remote RS-232 port, provides an easy way to operate the receiver.

The program is compatible with Windows 2000, Windows XP®, or later. Updates to this program can be downloaded from the Extron website (**www.extron.com**).

Installing the Software

The program is contained on a DVD. To install the software, insert the DVD into the drive. The Extron software DVD window should appear automatically. If it does not self-start, run Launch.exe from the DVD. Click the **Software** tab, scroll to the desired program, and click **Install**. Follow the instructions that appear on the screen. By default, the installation creates a `C:\Program Files` [`Program Files (x86)` for Windows 7]`\Extron\Signal Processing` directory, and it places five icons into a group folder named "Extron Electronics\FOX Extender Control Program." The five installed icons are:

- **Check for Signal Processing Updates**
- **Image Quick Capture**
- **Signal Processing Products Control Program Help**
- **Signal Processing Products Control Program**
- **Uninstall Signal Processing Products Control Program**

Starting the Program

Start the Extron Signal Processing Product Control Program as follows:

1. Click **Start** > **Programs** > **Extron Electronics** > **Signal Processing** > **Signal Processing Product Control Program**.

   The Communication Setup window appears (see figure **22**).

Figure 22. Communication Setup Window

2. Select the Com port to which your or receiver is connected. Click **OK**. The Signal Processing Product Control Program window appears (see figure **23**).

> **NOTE:** The receiver does not have an Ethernet port. Do not select **TCP/IP**.

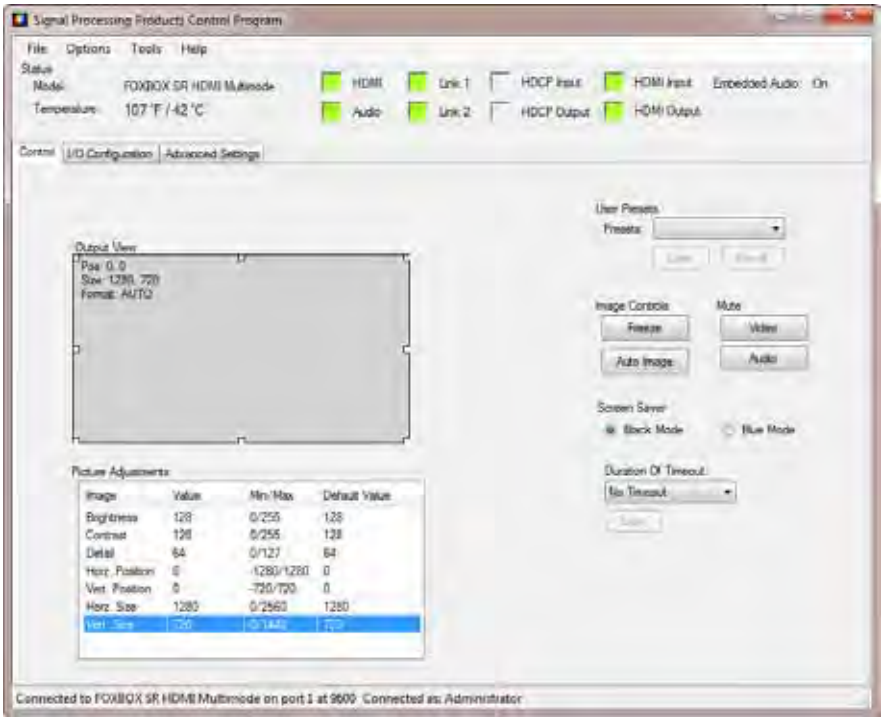


Figure 23. Signal Processing Product Control Program Window

Status area

Figure 24. Status Area

The status area provides indications of the connection status.

- **HDMI indicator** — This indicator is green when the transmitter detects a sync signal on its HDMI video input. The transmitter reports the status on the fiber cable.
- **Audio indicator** — This indicator is green when the transmitter detects an audio signal above a –35 dB threshold. It returns to unlit if the audio signal drops below the threshold for 10 seconds. The transmitter reports the status on the fiber cable.
- **Link 1 indicator** — This indicator is green when the receiver detects light on the fiber optic cable connected to the Tx port.
- **Link 2 (Optional) indicator** — This indicator is green when the transmitter detects light on the fiber optic cable connected to the Rx port. The transmitter reports the status on the fiber cable.

> **NOTE:** The transmitter detects the receiver-Tx-to-transmitter-Rx light. It reports the status to the receiver via the Tx cable.
>
> If the PC is connected to the receiver **and** *either* the primary (transmitter-Tx-to-receiver-Rx) cable is disconnected *or* the receiver is in the daisy chain mode, the Link 2 indicator in the control program will not show green (detected), whether the transmitter detects the link or not.

The Status area also shows the receiver model (multimode or singlemode), and the position of the HDMI Audio (embedded audio) switch.

Control tab functions

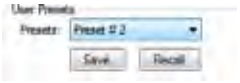
Click the **Control** tab to access the functions described below.

Output View area

NOTE: The Output View area controls are available only if the receiver is connected to a transmitter with an active video input.

The Output View area provides controls that let you scale and change the position of the displayed image. To scale the image, use the mouse cursor to grab (⧅) and drag one of the handles at the corner, top, bottom, or side of the area. To change the position of the image, use the mouse cursor to grab (⤧) and drag inside the image area.

Memory Preset area



The Memory Preset area provides a means to save and recall memory presets. Memory presets are stored values of the horizontal and vertical position saved in nonvolatile memory. When the receiver is powered down and later powered back up, the settings are available for selection using the **Recall** button. Saving the settings to a preset using the **Save** button overwrites the settings previously written to that preset.

Mute area

Click the **Video** button, the **Audio** button, or both in the Mute area to toggle the video and audio mutes on and off.

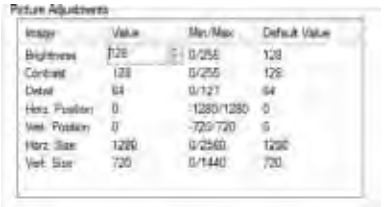
Image Controls area

- Click the **Freeze** button in the Image Controls area to toggle the image freeze on and off.
- Click the **Auto Image** button to execute the Auto-Image function (automatically size and center the input to fill the screen).

Screen Saver area

Select either the **Black Mode** or the **Blue Mode** radio button in the Screen Saver area. Select from **1 Seconds** to **64 Seconds** in the **Duration of Timeout** drop-down menu to select how long to wait before the screen saver replaces the video image (or select **No Timeout**). Click the **Save** button to save the changes.

Picture Adjustments area



The Picture Adjustments area lists the variables available in the receiver, with their minimum and maximum settings (for the input resolution, where appropriate), and the default value; and provides the tools to make adjustments. To change a value, click in the Value column for the desired variable and then either highlight the variable and type in a new value or click the ▲ and ▼ buttons.

I/O Configuration tab functions

Click the **I/O Configuration** tab to access the functions described below.

HDCP Notification area

The HDCP Notification function enables a connected display to show a green or black screen if the transmitted HDMI video is HDCP encrypted and the display is not HDCP capable.

Output Configuration area

The Output Configuration area provides tools to select the output resolution, refresh rate, and HDMI format for the scaler (see figure **25**).

Figure 25. Output Configuration Drop-Down Boxes

NOTE: Figure **25** is not an accurate depiction of the Output Configuration area layout.

Menu Time Out area

The Menu Time Out drop-down menu allows you to set the duration of the on-screen display.

Advanced tab functions

Click the **Advanced Settings** tab to access the functions described below.

Test Patterns area

Select one of five built-in test patterns (**Color Bars**, **Grayscale**, **4x4 crosshatch**, **Alternating Pixels**, or **Crop**) from the **Test Pattern** drop-down menu as necessary to help adjust the color, brightness, contrast, and focus of the display. Select **Off** to output the video that is input to the connected transmitter, scaled as selected by the receiver.

Advanced Functions area

Select the **Executive Mode** checkbox to lock all front panel controls except for using the Menu and Enter buttons to unlock the panel only. Select the **Auto Memory** checkbox to automatically apply saved position settings when the sensed input resolution changes.

Aspect Ratio area

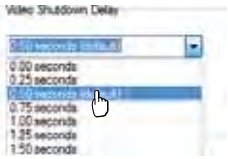
Select the **Fill** radio button to force the input to automatically fill the output raster. Select the **Follow** radio button to display the input in its native aspect ratio.

Enable/Disable/Daisy Chain Link #2 area

Select among the radio buttons in this area to define the function of the Tx LC connector on the receiver:

- **Enable** — The connector routes RS-232 over fiber to the transmitter.
- **Disable** — The connector has no function.
- **Enable Daisy Chain** — The connector routes the signal received on the Rx LC connector to the next receiver in a daisy chain.

Video Shutdown Delay area



The Video Shutdown Delay setting delays the digital video to help monitor sync correctly during an input rate change. **Only** video is delayed; embedded audio is **not** delayed.

Firmware Upgrade

Receiver firmware can be upgraded via the front panel Configuration port using the Extron Firmware Loader utility from the Windows-based control program.

Downloading the firmware from the website

To obtain the latest version of firmware for your FOXBOX unit:

1. Visit the Extron website, **www.extron.com**, click the **Download** tab, and then click the **Firmware** link on the left sidebar menu (see figure **26**).

Figure 26. Location of Firmware Upgrade Files

2. On the Download Center screen (see figure **27**), click the link for the appropriate firmware file.

Figure 27. Finding Scaling Receiver Firmware

3. Complete the Personal Information form (see figure **28**) and click the **Download** button.

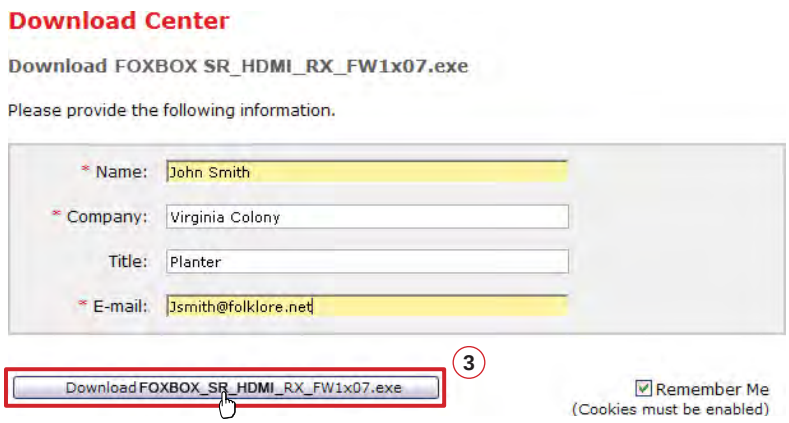


Figure 28. Personal Information Form

TIP: Select the **Remember Me** checkbox to avoid filling out this form in the future.

4. Follow the instructions on the rest of the download screens to download the firmware update from the Extron website, start the Extron Installation Program to extract the firmware file, and place it in a folder identified in the program window.

NOTE: Note the folder to which the firmware file is saved (see figure **29**).

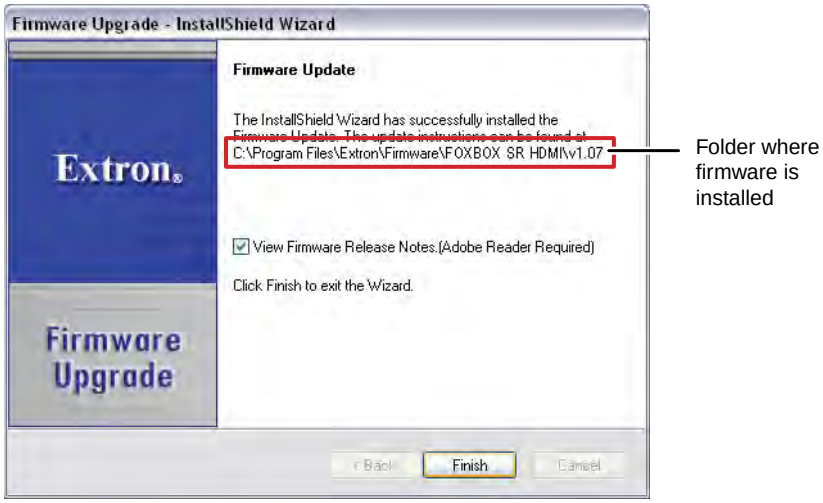


Figure 29. Location of the Firmware File

Loading the firmware

To load a new version of firmware to your receiver, call the Firmware Loader software from within the Signal Processing Product Control Program. The serial port on your computer must be connected to the Configuration port on the unit (see "**Front panel Configuration port**" on page 11 for more information).

1. In the Signal Processing Product Control Program, click the Firmware Loader button ( ) on the tool bar.

NOTE: If the Firmware Loader button does not appear on the tool bar, the Firmware Loader software is not installed. Install it as follows:

- **a.** On the Extron website, click the **Download** tab.
- **b.** On the Download Center page, click **Software** on the left sidebar menu.
- **c.** Locate the "Firmware Loader" line and click the **Download** link at the far right.
- **d.** Follow the instructions on the download screens to save the installer file to your computer.
- **e.** In Windows Explorer or another file browser, locate the Firmware Loader executable file in the file system on your computer and double-click it to open it.
- **f.** Follow the instructions on the Installation Wizard screens to install the Firmware Loader on your computer. Unless you specify otherwise, the installer program places the Firmware Loader file, "FWLoader.exe" in `C:\Program Files\Extron\FWLoader`.

  If the Extron and FWLoader folders do not yet exist in your Program Files folder, the installer creates them.

2. If you have not previously updated firmware for the FOXBOX unit, on the Add Device screen (see figure **30**), select the **RS-232** tab.

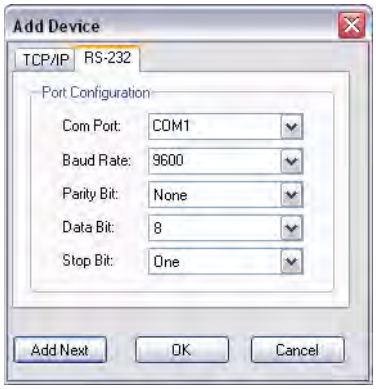


Figure 30. Add Device Screen

If you have previously updated firmware for this model, click **Cancel**. The Firmware Loader window appears. Proceed to step **5**.

NOTE: The receiver does not have an Ethernet port. Do not select **TCP/IP**.

3. From the drop-down menus on the RS-232 screen, select the appropriate Com port number and baud rate (the default is 9600).
4. Click **OK**. The Firmware Loader window appears (see figure **313**).

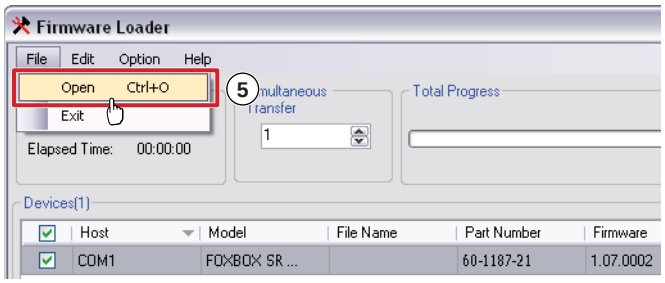


Figure 31. Extron Firmware Loader Window

5. Select the FOXBOX receiver and click **File** > **Open**. The Choose Firmware File screen appears (see figure **32**).

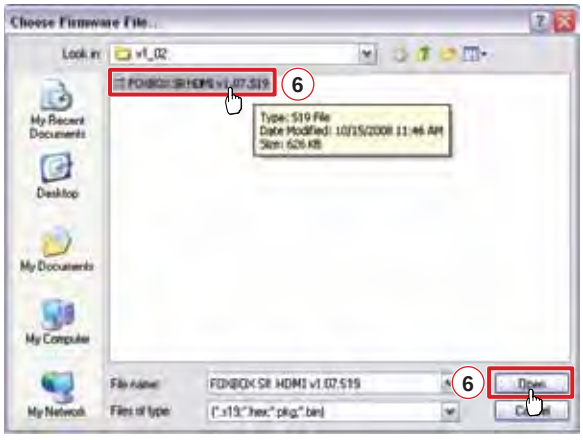


Figure 32. Choose Firmware File Window

6. Navigate to and select the new firmware file. Click **Open**. The Choose Firmware File window closes.

NOTE: When downloaded from the Extron website, the firmware is placed in a subfolder of `C:\Program Files\Extron\Firmware`.

ATTENTION: The firmware file must have a .S19 extension. Other file types can cause the unit to stop functioning.

7. In the Firmware Loader window, click **Begin** (see figure **33**).

   The Total Progress and Progress status bars show the progress of the upload. The firmware upload to the unit may take several minutes. Once the status bars have progressed from **0%** to **100%**, and Status is listed as **Completed**, the firmware loader utility resets the unit.

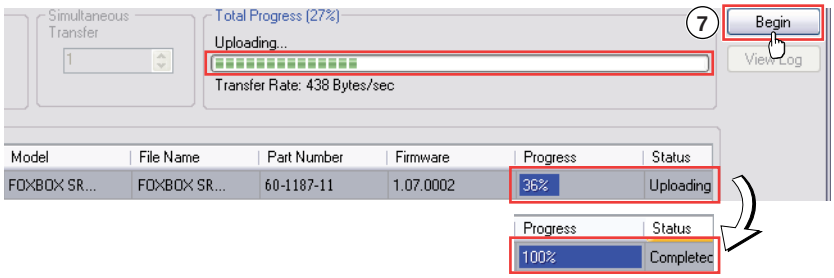


Figure 33. Firmware Loader Screen

8. Click **Exit** to close the Firmware Loader.

Reference Information

This section discusses the specifications, part numbers, and accessories for the FOXBOX SR HDMI. Topics that are covered, include:

- **Part Numbers**
- **Mounting the Unit**

Part Numbers

FOXBOX SR HDMI Part Numbers

The FOXBOX receiver is available in a singlemode (SM) and multimode (MM) model:

FOXBOX SR HDMI	Part number
FOXBOX SR HDMI SM	60-1187-22
FOXBOX SR HDMI MM	60-1187-21

Included Parts

These items are included in each order for a FOXBOX SR HDMI receiver:

Included parts	Part number
12V, 1A external power supply, with IEC power cord (qty. 1)*	
SFP Module (SM or MM, depending on the model)	
LockIt Lacing Bracket and tie-wrap (qty. 1)	21-235-01LF
Captive screw 5-pole connectors (qty. 2)	10-703-12
Captive screw 3-pole connector (qty. 1)	10-319-13LF
10' LC-LC duplex patch cable (SM or MM, depending on the model)	
Rubber feet (qty. 4)	
Extron Software Products DVD (Signal Processing Product Control Program)	
FOXBOX SR HDMI Setup Guide	

* ZipClip 100 Mounting Kit available separately, see "**Mounting Accessories**," on the next page.

Mounting Accessories

Mounting Kit	Part Number
ZipClip 100 Mounting Kit for PS Series Power Supplies (qty. 10)	101-002-01
RSU 126 6-inch deep 1U universal rack shelf kit	60-190-10
RSB 126 6-inch deep 1U basic rack shelf	60-604-11
RSU 129 9.5-inch deep 1U universal rack shelf kit	60-190-01
RSB 129 9.5-inch deep 1U basic rack shelf	60-604-02
MBU 125 under-desk mount kit	70-077-01
MBD 129 through-desk mount kit	70-077-02
PMK 300 projector mount kit	70-374-03
PMK 350 low profile projector mount kit (black, white)	70-563-02, 03

Cables

HDMI and DVI cable assemblies

Accessory	Part number
HDMI M-M Pro Series HDMI male to male cable	26-650-*nn*
HDMI M-DVI-D M/6 HDMI male to DVI-D male, 6' (1.8 m)	26-614-02
DVID SL Pro Series DVI-D male-to-male cable	26-649-*nn*

Fiber cable assemblies

MHR Mini High Resolution Cable	Part Number
4LC MM LC to LC Multimode Fiber Optic Cable Assemblies	26-652-*nn*
2LC OM4 MM P LC to LC Laser-Optimized Multimode Fiber Optic Cable Assemblies — Plenum	26-671-*nn*
2LC SM P LC to LC Bend-Insensitive Singlemode Fiber Optic Cable Assemblies — Plenum	26-670-*nn*

Bulk fiber cable and termination tools

RG6 Super High Resolution Cable	Part Number
OM4 MM P/2K Plenum 2 km (6,562 feet) Spool	22-225-02
SM P/2K Plenum 2 km (6,562 feet) Spool	22-223-02
Fiber Optic Termination Kit Termination Kit	100-656-01
QLC MM/10 Multimode, qty. 10	101-018-01
QLC SM/10 Singlemode, qty. 10	101-017-01

Adapters

Accessories	Part number
HDMIF-DVIDM HDMI female to DVI-D male adapter	26-616-01
HDMIM-DVIDF HDMI male to DVI-D female adapter	26-617-01

Mounting the Unit

ATTENTION: Installation and service must be performed by authorized personnel only.

Either of the 1-inch high, half-rack width unit can be placed on a tabletop, mounted on a rack shelf, mounted to a projector bracket, or mounted under or through a desk or other furniture.

Tabletop Use

Affix the four included rubber feet to the bottom of the unit and place it in any convenient location.

Mounting

If desired, mount the unit using any of the following optional kits:

- RSU 126 6-inch deep universal rack shelf kit (part number 60-190-10)
- RSB 126 6-inch deep basic rack shelf (part number 60-604-11)
- RSU 129 9.5-inch deep universal rack shelf kit (part number 60-190-01)
- RSB 129 9.5-inch deep basic rack shelf (part number 60-604-02)
- MBB 100 Back of the rack mounting kit (part number 70-367-01)
- MBU 125 under-desk mounting kit (part number 70-077-01)
- MBD 129 through-desk mounting kit (part number 70-077-02)
- PMK 300 projector mount kit (part number 70-374-01)
- PMK 350 low profile projector mount kit (black, white) (part number 70-563-02, 03)

Follow the instructions included with the kit.

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of a FOXBOX SR HDMI into a rack.

1. **Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by Extron (Tma = +122 °F [+50 °C]).
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits 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)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Extron Warranty

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

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

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

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

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

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

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

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

USA: 714.491.1500 or 800.633.9876
Europe: 31.33.453.4040
Asia: 65.6383.4400
Japan: 81.3.3511.7655

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

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

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

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