



# User Manual

DV-HDSS-41-TX

4x1 4K Scaling Presentation Switcher with Dual Outputs



**NOTE:** See FSR LIT1628 API manual for serial commands.

# Important Safety Instructions



**1.** Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.



**6.** Clean this apparatus only with dry cloth.



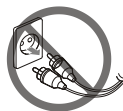
**2.** Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.



**7.** Unplug this apparatus during lightning storms or when unused for long periods of time.



**3.** To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.



**8.** Protect the power cord from being walked on or pinched particularly at plugs.



**4.** Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



**9.** Only use attachments/ accessories specified by the manufacturer.



**5.** Do not place sources of naked flames, such as lighted candles, on the unit.



**10.** Refer all servicing to qualified service personnel.



# Table of Contents

Important Safety Instructions .....	2
Overview .....	4
Features .....	5
Package Contents.....	5
Panel Description .....	6
Dipswitch Setting.....	9
Scaler Setting.....	10
HDBaseT Cable Distances & Resolutions:.....	11
Connection and Installation .....	12
Switch and Lamp Connection Diagram.....	13
Typical Application .....	14
Functional Block Diagram.....	15
Audio Hookup.....	15
Dimensions .....	16
Operation .....	16
Input Select.....	17
CEC Display Control .....	18
Audio Controls .....	19
API Control.....	19
Transition Effect (Freeze Mode) .....	20
Specifications .....	21
Limited Warranty.....	22
Contact Information:.....	23

# Introduction

## Overview

The FSR DV-HDSS-41-TX is an advanced four-input, multi-format converter, switcher, scaler and extender with built in 4K UHD scaling, in a compact 1RU half-rack enclosure. It offers two HDMI inputs, one DisplayPort input and one VGA input with Stereo Audio; Scaled HDMI output plus EDID controlled HDBaseT mirrored output to allow signal extension over Catx cable to reach a remote display, or additional HDBaseT signal management system. Additionally, one balanced or unbalanced stereo audio de-embedded output generated from the scaled HDMI video output.

The unit supports two control options and two auto switching options, push buttons on the front panel, contact closures with lamp feedback and API. It also has built-in CEC control that can automatically turn a CEC enabled display on/standby by auto-detecting input signal status. The built in 4k@30Hz scaler on the HDMI output is controlled by a rotary switch that allows seamless switching with freeze or black to enhance presentations by eliminating distractions during switching giving a choice of switching transitions.

The FSR DV-HDSS-41-TX simplifies classroom and small office system integration, for installation beneath conference tables and in lecterns, to provide localized presentation switching support.

## Features

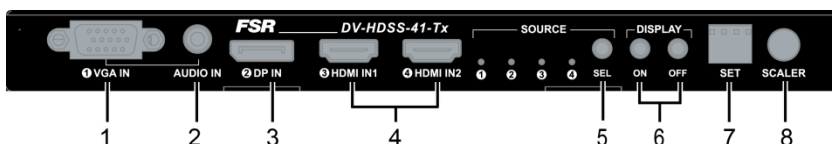
- 1xVGA+Stereo Audio, 1 x DisplayPort and 2x HDMI inputs, HDMI and HDBaseT mirrored outputs
- HDMI and DP input up to 4k UHD, 2160P (3840x2160) @30Hz and HDCP 1.4, VGA input up to 1920x1200@60Hz
- Local HDMI out with 4K@30Hz scaler built in and de-embedded balanced stereo audio out
- HDBaseT mirrored out, supports PoH with PSE module to power remote FSR 100 Meter HDBaseT receiver
- HDMI out supports seamless and fast switching within 2-3 seconds, the last frame frozen or black
- Auto-switching when detecting any input connected or disconnected to last connected or priority mode
- CEC controller built in to turn a display on/off by auto-detecting the inputs status, with delay adjustment
- Push buttons and Contact Closures provided to switch sources or turn display on/standby manually or through CEC
- DIP switch provided to adjust automatic or manual operation mode
- Rotary switch provided to adjust auto-scaler or fixed resolutions out
- Provides RS232, and front panel buttons to control the device
- Provides the complete API commands to the third party control system for integration
- DC 12V 3A adapter universal power supply

## Package Contents

- 1 x DV-HDSS-41-TX Switcher
- 1 x power adapter (DC 12V 3A)
- 1 x AC cable with US standard
- 3 x Phoenix Male Connector (3.81 mm, 3 pins)
- 3 x Phoenix Male Connector (3.81 mm, 5 pins)
- 1 x Mounting Brackets (Pair)

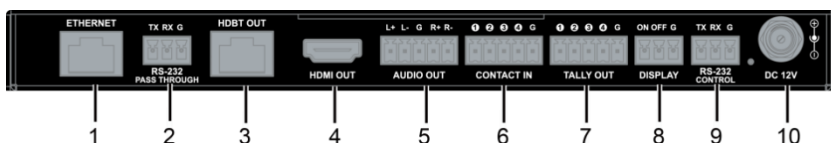
## Panel Description

### Front Panel



No.	Name	Description
1	VGA IN	Connects to VGA source device
2	AUDIO IN	Stereo audio (embedded with VGA inputs)
3	DP IN	Connects to DisplayPort source device NOTE: Turn off HDCP if image does not display. May not be compatible with some computers.
4	HDMI IN	Connects to HDMI source device.
5	SOURCE Selection Button and LEDs	<b>Selection button:</b> press the button to select the desired input. <b>LED:</b> The selected source LED lights.
6	DISPLAY Selection Button	On: Turn on the TV via CEC Off: Turn off the TV via CEC <b>Note:</b> Used for TV that support CEC
7	4 Pin DIP SET	Dipswitch for setting options
8	SCALER	Switch to desired scaler setting. Read on power up and hot plug only.

## Back Panel



No.	Name	Description
1	ETHERNET	LAN to/from HDBaseT Receiver
2	RS232 Pass Through	Connects to a RS232 controller or RS232 controllable device to pass through RS232 commands to HDBaseT Receiver
3	HDBT OUT Port	Connects to a HDBaseT Receiver
4	HDMI OUT Port (LOCAL)	Connects to HDMI display device NOTE: This local output is not compatible with HDBT transmitters. If a remote output is needed, use an FSR HDMI DA between the output of the DV-HDSS-41 and an FSR HDBaseT Transmitter, or use an FSR DR (active fiber) cable.
5	AUDIO OUT Ports	Connects to audio output device such as an amplifier, powered speakers for HDMI audio de-embedding output
6	CONTACT IN Ports	Connects to a push buttons for input source switching <b>No.1:</b> Press this button to select VGA IN <b>No.2:</b> Press this button to select DP IN <b>No.3:</b> Press this button to select HDMI1 IN <b>No.4:</b> Press this button to select HDMI2 IN <b>G:</b> Connects to Ground (>1mA but <5 mA)

No.	Name	Description
7	TALLY OUT Ports	<p>Connects to LEDs on the keypad to indicate the selected source</p> <p><b>No.1:</b> LED for VGA input</p> <p><b>No.2:</b> LED for DP input</p> <p><b>No.3:</b> LED for HDMI1 input</p> <p><b>No.4:</b> LED for HDMI2 input</p> <p><b>G:</b> Connects to Ground (&lt;100 mA)</p>
8	DISPLAY	<p>Connects to keypad to output CEC power commands</p> <p><b>Note:</b> The display devices must support CEC and must be enabled</p>
9	RS232 CONTROL	Connects to a PC or a third-party control system to control this device via API commands
10	Power Input	DC 12V 3A power input.



# Dipswitch Setting

4 Pin DIP switch



DIP Position		Function
Switch 1	Audio De-embedded	<b>UP:</b> Audio out de-embedded from HDMI output (Default)
		<b>DOWN:</b> Reserved
Switch 2	Source Switch Mode	<b>UP:</b> Enable Auto-Switch with Manual Override Control (Default)
		<b>DOWN:</b> Manual Switch only
Switch 3	CEC Control	<b>UP:</b> Enable Auto-CEC Control with Manual CEC Override Control (Default)
		<b>DOWN:</b> Manual CEC Control only
Switch 4	Control Mode	<b>UP:</b> Enable API control and manual control (Default) See FSR LIT1628 API manual for serial commands.
		<b>DOWN:</b> Manual Control only

## Scaler Setting

### NOTE:

Scaler Dial adjustment is only for the HDMI scaled output. To adjust the input EDID for both the scaler and the HDBaseT connection, please refer to the API manual for the codes that need to be sent. This will require a serial connection to the DV-HDSS-41-Tx device. The input EDID is set to pass-thru mode (copy) by default and may need to be changed for your system.



Position	Functions
0	Scaler Set to Automatic Mode (default)
1	Fixed 1024 x 768@60Hz as native video
2	Fixed 1280 x 720@60Hz as native video
3	Fixed 1280 x 800@60Hz as native video
4	Fixed 1366 x 768@60Hz as native video
5	Fixed 1600 x 1200@60Hz as native video
6	Fixed 1920 x 1080@60Hz as native video
7	Fixed 1920 x 1200@60Hz as native video
8	Fixed 3840 x 2160@30Hz as native video
9	API Control

## **HDBaseT Cable Distances & Resolutions:**

CAT-5e / CAT-6:

100 Meters: 1080p @60 Hz (36 BPP [bits per pixel])

70 Meters: 1080p @60 Hz (48 BPP [bits per pixel]), 3D, 4K UHD / 2160p  
3840 x 2160) @ 30Hz. (4:2:0 8-bit)

CAT-6A / CAT-7 (Shielded):

100 Meters: 1080p @60 Hz (48 BPP [bits per pixel]), 3D, 4K UHD / 2160p (3840  
x 2160) @ 30Hz. (4:2:0 8-bit)

## Connection and Installation

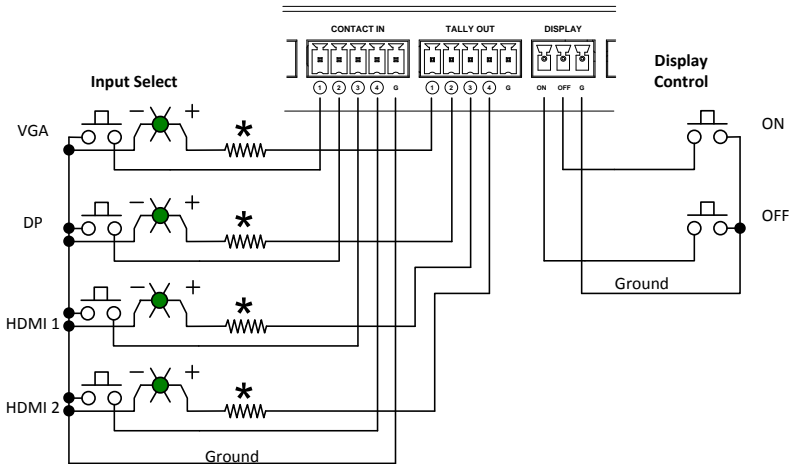
1. Using only good quality VGA/DP/HDMI cables firmly connect a 4K or HD source device to the VGA/DP/HDMI input ports of the switcher.
2. Firmly connect HDMI OUT of the Switcher to HDMI IN of 4K or HD display devices ensuring both source and display devices are compatible and correctly configured to output and accept the required signal resolution.
3. Connect a good quality, well-terminated CAT-6A shielded cable between the HDBaseT OUT of the Transmitter switcher to the HDBT IN Input of an HDBaseT Receiver.
4. Insert the included power supply, Check the front panel power LED to indicate the switcher is ready to use.
5. Connect the CONTACT IN and TALLY OUT ports to a remote controller such as a keypad using the supplied connectors.

### Note:

- External momentary contact closure referenced to GND should be  $>1\text{mA}$  but  $<5\text{ mA}$ .
  - Open circuit voltage  $3.3\sim 12$  volts will be acceptable.
  - Protected against application of external voltages is in the range of  $\pm 24\text{V W.R.T. GND}$ .
  - Minimum contact closure time is 50 ms (It is able to ensure detection of external closure).
  - LED output voltage is +12 volts (Typical 10.4 volts when loaded), maximum output current is 100 mA. External LED's must use a current limit resistor to set the appropriate drive current.
6. Switch between sources using the switch buttons in front panel, via CONTACT IN control, or RS232.

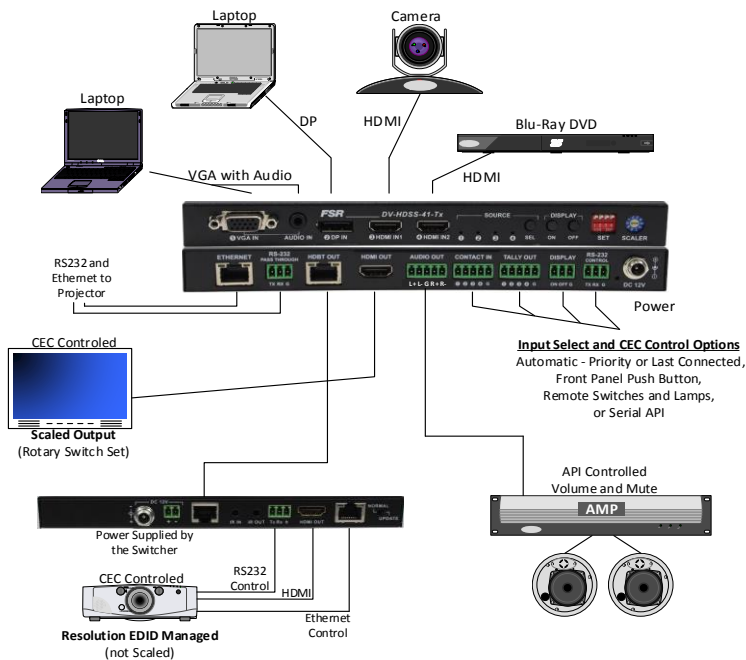
Switcher can be directly connected to FSR HV-T6 Table Box following wiring chart below.

# Switch and Lamp Connection Diagram

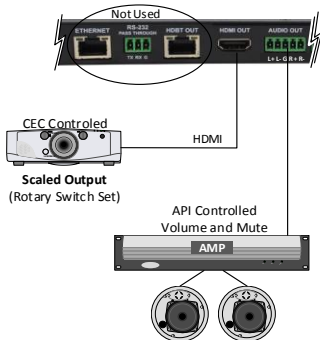


- \* - Typical resistor value is 680 to 1.2k ohm.  
Select value for desired brightness.

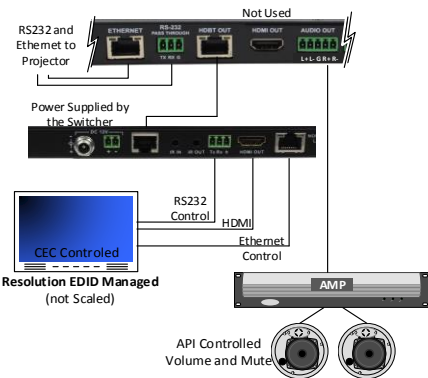
# Typical Application



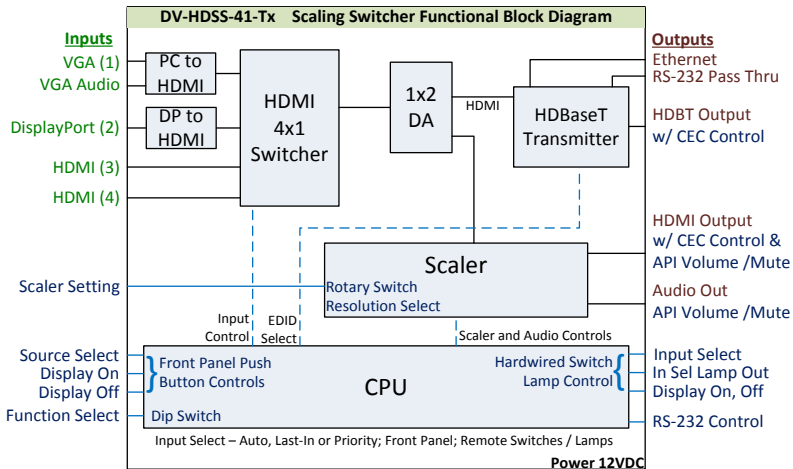
## Single Scaled Output Variation



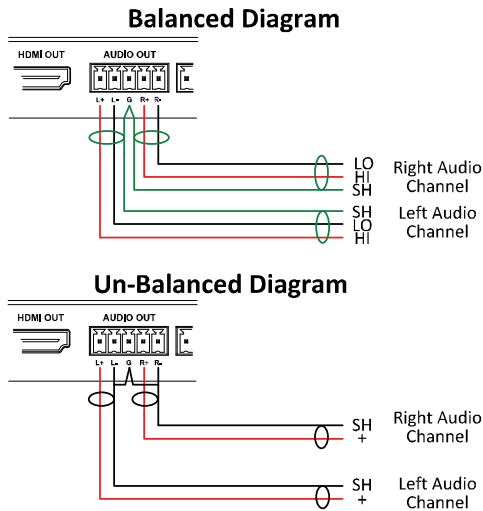
## Single EDID Managed Output Variation



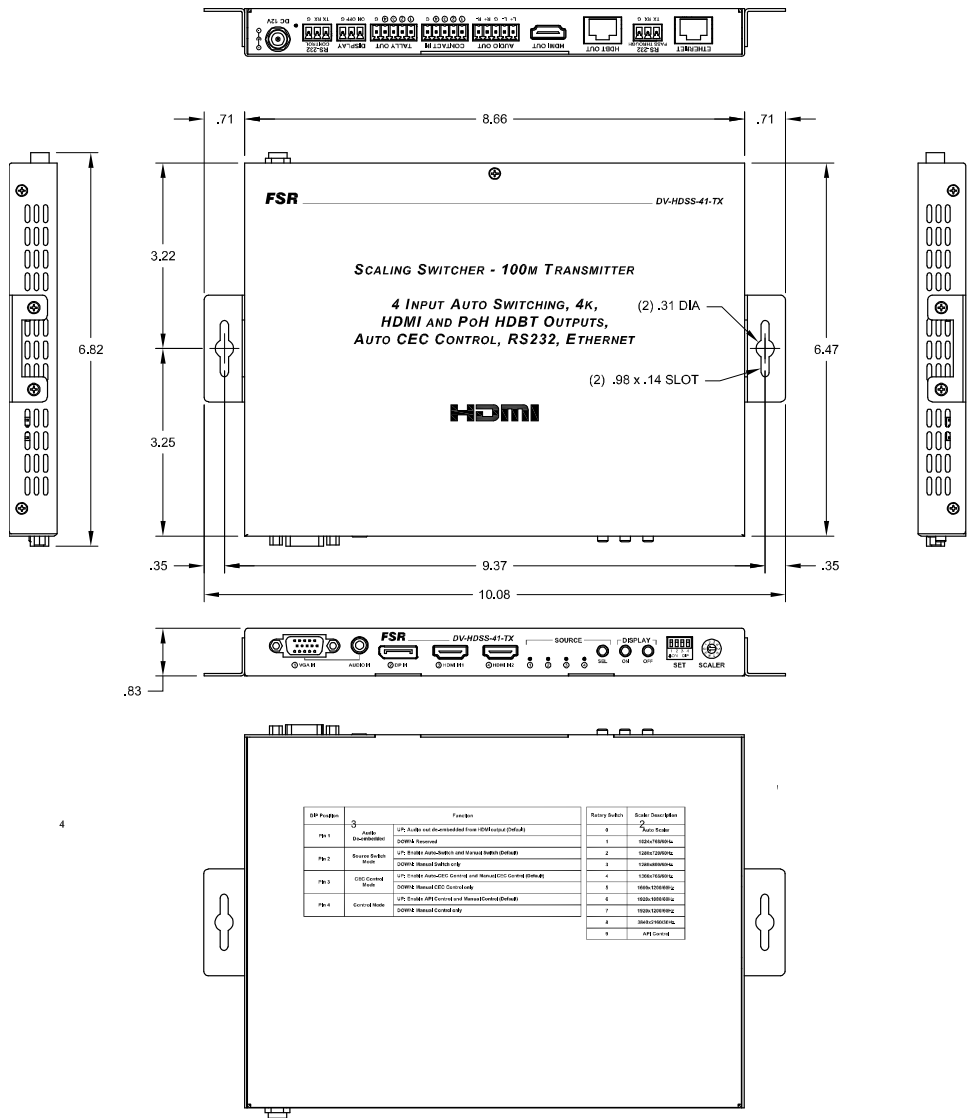
# Functional Block Diagram



# Audio Hookup



Dimensions





# Operation

## Input Select

The input source can be selected via 2 different types of Auto Mode, where the unit detects the connection, disconnection and signal presents or through the front panel push button, RS232 serial command or momentary contact closures. When pressing the front panel switch the unit will step through the active inputs in the following order: VGA->DP->HDMI1->HDMI2. When direct access to an input is requested via RS232 or a contact input the unit will switch to that input only if it as an active signal present. If the requested source is not active the LED indicator will flash twice to indicate the source is not active and will not switch.

To enable Auto-Mode Dip Switch Pin 2 should be switch UP. The unit is programmed with 2 Auto Mode operation options; Priority and Last Connected. The unit is shipped from the factory in the priority mode. The Auto Mode type can be changed via a serial API command.

Auto Mode 1 (priority mode): VGA->DP->HDMI1->HDMI2

1. When power is applied to the switcher it will default to the VGA channel unless there is another active source connected. If multiple sources are already connected it will auto switch to the active source with the highest priority.
2. When a new source is connected the switcher will auto switch depending on the priority of the input signals.
3. When a currently selected source is removed the unit will auto switch to the next lower priority input.
4. Manual and API switching is also valid in the Priority Mode. The front panel button will switch through the active sources. Any switch command via the Contact Closures inputs or API commands will be performed on inputs with active sources only. If the selected source is not active the LED

indicator will flash twice to indicate the source is not active and will not switch.

Auto Mode 2 (Last Connected):

1. When power is applied to the switcher it will default to the VGA channel. If multiple active sources are present at power up the unit will auto-switch to the input with the highest priority.
2. When any new active source is connected the unit will auto switch to this source.
3. When a currently selected source is removed the unit will auto switch to the active source with highest priority, or remain on the current input if no any active sources are present.
4. Manual and API switching is also valid in the Last Connected Mode. The front panel button will switch through the active sources. Any switch command via the Contact Closures inputs or API commands will be performed on inputs with active sources only. If the selected source is not active the LED indicator will flash twice to indicate the source is not active and will not switch.

## **CEC Display Control**

Consumer Electronics Control (CEC) is an HDMI feature designed to allow the user to control any CEC-enabled device that is connected via HDMI. CEC allows for CEC-enabled devices to be controlled without user intervention.

The switcher generates CEC commands to turn on or off the display(s) connected to the HDMI and HDBT outputs. When the option for CEC is enabled by setting Dip Switch pin 3 UP the switcher will send out a Power On command when any device with a valid video signal is detected. The unit will also send out a Power Off or Standby command when no valid video signals are present for 2 minutes (default). The Power Off Timer can be changed to any time between 1 minute and 30 minutes via a serial API command.

CEC commands can also be generated by depressing the Display On, Off

buttons on the front of the unit, by a remote key switch connected to the rear terminal or by a serial API command to the unit.

**NOTE:** Not all displays support CEC, and of those that do, not all support both “display on” and “display “off” commands. Most CEC compatible displays require that CEC be turned on in the settings menu. Be sure to specify a compatible display if you intend to use this feature.

## Audio Controls

Separate volume and mute audio controls are available for the HDMI and Analog Audio outputs via serial API commands. There are no audio controls available on the HDBT output. When controlling the volume setting, serial commands should be sent 500 ms. apart.

## API Control

**See FSR LIT1628 API manual for serial commands.**

API commands are sent to the unit on the RS232 port marked "Control". The second RS232 port is used to send serial commands to the HDBT receiver only. The two serial ports can be jumped for control surfaces originating at the end of the HDBT output by connecting Tx to Rx and Rx to Tx.

The RS232 port settings are:

1. Baud Rate – 57600
2. Data Bits – 8 bits
3. Parity – None
4. Stop Bits – 1 bit
5. Flow Control – None

Note: The data format is ASCII.

#### Available Command Categories:

API Control	Audio Controls	Input Selection
Video Settings	CEC Control	System Info
HDCP Setup	Update Info	EDID Setup
Transition Effect Control (Freeze Mode)		

## Transition Effect (Freeze Mode)

The local, scaled HDMI output of the DV-HDSS-41-Tx can be configured in one of two modes to select the transition effect when switching between two sources. The modes supported are “Freeze” and “Black”. When set to freeze mode “on”, the last video frame of the source being switched away from will be frozen on the screen while the new source is being acquired. This provides a more subtle switching effect when sources are static images, or are something other than a live presenter.

When freeze mode is set to “off”, the scaled output will go to black while the new source is being acquired. This mode is usually better for applications where a camera is trained on a live presenter.

# Specifications

<b>Supported Formats</b>	
HDMI Resolutions (max.)	SMPTE: 720 x 480P (59.94Hz/60Hz.), 720 x 576P(50Hz.), 1280 x 720P (50Hz./59.94Hz/60Hz.), 1920 x 1080P (50Hz./59.94Hz/60Hz.), 3840 x 2160P (24Hz./25Hz./30Hz./50Hz)
VGA Resolutions	VESA: 800 x 600, 1024 x 768, 1280 x 768, 1280 x 800, 1280 x 960, 1280 x 1024, 1360 x 768, 1366 x 768, 1440 x 900, 1600 x 900, 1600 x 1200, 1680 x 1050, 1920 x 1200 (all @60Hz.)
Maximum Data Rate	10.2 Gbps
Output Resolutions (max.)	Supports up to 4K UHD / 2160p (3840 x 2160) @ 30Hz. (4:2:0 8-bit)
Video Impedance	100 Ω
<b>Connectors</b>	
Video Input	2 x HDMI (1.4) Type A 19-pin, female
	1 x DisplayPort (1.2)
	1 x HD-15, female
Audio Input	1 x 3.5mm Mini Stereo Jack (embedded with VGA Input)
HDMI Output	1 x HDMI (1.4) Type A 19-pin, female
HDBaseT Output	1 x RJ-45 (Shielded) HDBaseT 1.4
Audio Output	1 x 5-pin captive screw terminal
Audio Formats	HDMI Out: PCM 2.0 and Dolby 5.1
	HDBaseT Out: Multi-channel digital audio supports up to 7.1 DTS Master HD & Dolby True HD
	Audio Out: Balanced Stereo Audio Left/Right PCM 2.0
Ethernet	1 x RJ-45 (Shielded) 100Base-T Ethernet
RS-232 Pass Through	1 x 3-pin captive screw terminal (Tx/Rx/Ground)
RS-232 Control	1 x 3-pin captive screw terminal (Tx/Rx/Ground)
Contact Closure In	1 x 5-pin captive screw terminal (4 Inputs & Ground)
Tally Out (Lamp/LED)	1 x 5-pin captive screw terminal (4 Inputs & Ground)
Display	1 x 3-pin captive screw terminal (On/Off/Ground)
Power Input	12VDC locking screw terminal
<b>General</b>	
Power Supply	DC 12V 3A
Power Consumption	22w (max.)
Operating Temperature	32°F to 113°F (0°C to 45°C)
Storage Temperature	-4°F to 158°F (-20°C to 70°C)
ESD Protection	Human-body Model: ±8kV(Air-gap discharge)/±4kV(Contact discharge)
Dimensions (W x D x H)	8.66"W (220 mm) x 6.46"D (164.4 mm) x 0.83"H (21 mm)
Unit Weight	1.80 lbs. (0.82 kg)
<b>HDBaseT Cable Distances &amp; Resolutions:</b>	
CAT-5e / CAT-6:	
100 Meters:	1080p @60 Hz (36 BPP [bits per pixel])
70 Meters:	1080p @60 Hz (48 BPP [bits per pixel]), 3D, 4K UHD / 2160p (3840 x 2160) @ 30Hz. (4:2:0 8-bit)
CAT-6A / CAT-7 (Shielded):	
100 Meters:	1080p @60 Hz (48 BPP [bits per pixel]), 3D, 4K UHD / 2160p (3840 x 2160) @ 30Hz. (4:2:0 8-bit)
<i>For best resolution and ESD performance Shielded CAT-6A cable is recommended</i>	

## Limited Warranty

The DV-HDSS-41-Tx Switcher is warranted against failures due to defective parts or faulty workmanship for a period of three years after delivery to the original owner. During this period, FSR will make any necessary repairs or replace the unit without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner. Return-shipping charges (via UPS Ground) will be paid by FSR.

This warranty applies only to the original owner and is not transferable. In addition, it does not apply to repairs done by other than the FSR factory or Authorized Repair Stations.

This warranty shall be cancelable by FSR at its sole discretion if the unit has been subjected to physical abuse or has been modified in any way without written authorization from FSR. FSR's liability under this warranty is limited to repair or replacement of the defective unit.

FSR will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service below.

## SERVICE

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number and a description of the problem.

NOTE: all equipment being returned for repair must have a Return authorization (RMA) Number. To get a RMA Number, please call the FSR Service Department (1-800-332-FSR1).

Please display your RMA Number prominently on the front of all packages.

## Contact Information:

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Order Desk Fax: (973) 785-4207

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