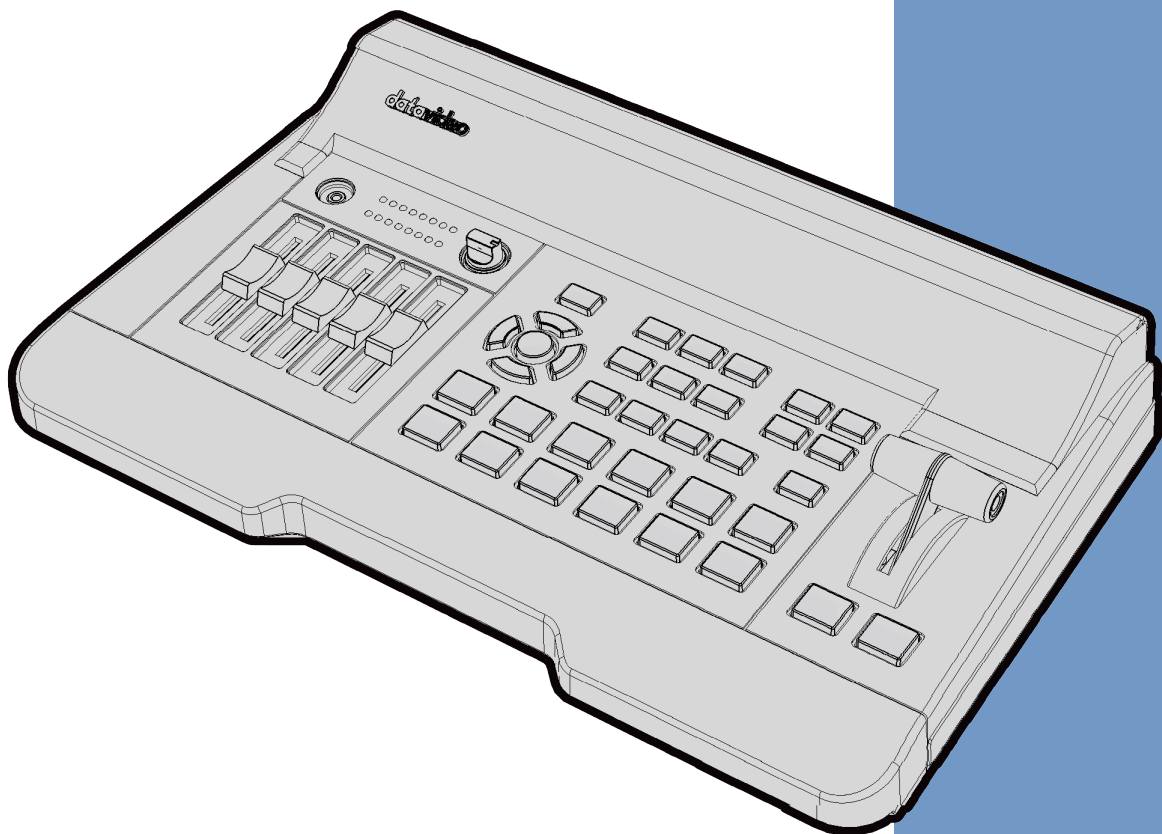


datavideo



HD 4-CHANNEL DIGITAL
VIDEO SWITCHER

SE-650

Instruction Manual

www.datavideo.com

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Disclaimer of Product & Services

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.



Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
 - a. When the power cord is damaged or frayed;
 - b. When liquid has spilled into the unit;
 - c. When the product has been exposed to rain or water;
 - d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
 - e. When the product has been dropped or the cabinet has been damaged;
 - f. When the product exhibits a distinct change in performance, indicating a need for service.

Warranty

Standard Warranty

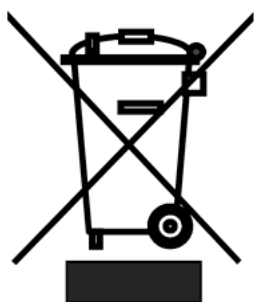
- Datavideo equipment are guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- The product warranty period begins on the purchase date. If the purchase date is unknown, the product warranty period begins on the thirtieth day after shipment from a Datavideo office.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered under warranty.
- Viruses and malware infections on the computer systems are not covered under warranty.
- Any errors that are caused by unauthorized third-party software installations, which are not required by our computer systems, are not covered under warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- Cables and batteries are not covered under warranty.
- Warranty only valid in the country or region of purchase.
- Your statutory rights are not affected.

Three Year Warranty

- All Datavideo products purchased after July 1st, 2017 are qualified for a free two years extension to the standard warranty, providing the product is registered with Datavideo within 30 days of purchase.
- Certain parts with limited lifetime expectancy such as LCD panels, DVD drives, Hard Drive, Solid State Drive, SD Card, USB Thumb Drive, Lighting, Camera module, PCIe Card are covered for 1 year.
- The three-year warranty must be registered on Datavideo's official website or with your local Datavideo office or one of its authorized distributors within 30 days of purchase.



Disposal



For EU Customers only - WEEE Marking

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your

waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



CE Marking is the symbol as shown on the left of this page. The letters "CE" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

Chapter 1 Introduction

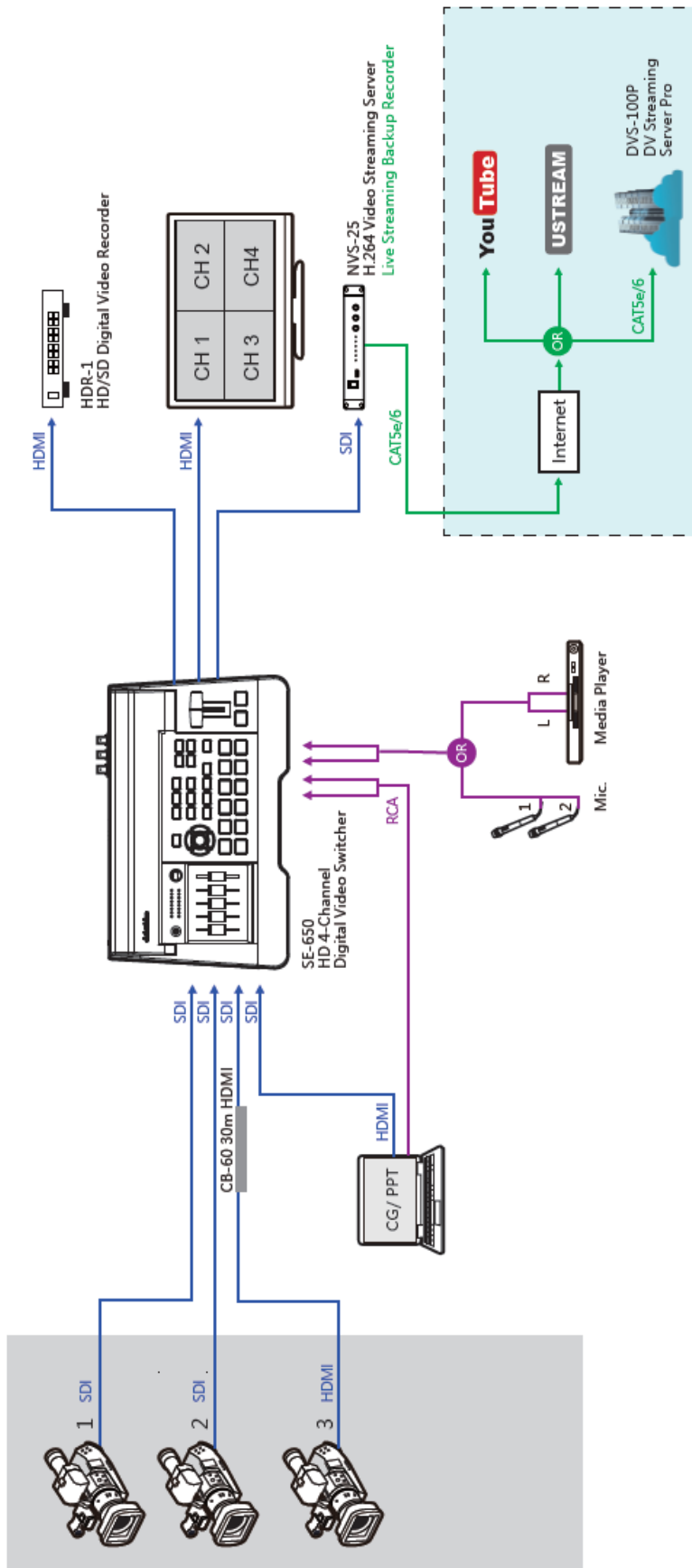
The datavideo SE-650 is a small, cost-effective, HD digital video switcher with easy-to-use professional features. It offers two HD SDI and two HDMI inputs. Output options include one user assignable HD SDI, two HDMI outputs.

The SE-650 also features an audio mixer with microphone and unbalance RCA audio inputs; more features include Chroma Keyer, Luma Keyer, PIP, Wipe Generator, Still stores and Tally.

1.1 Features

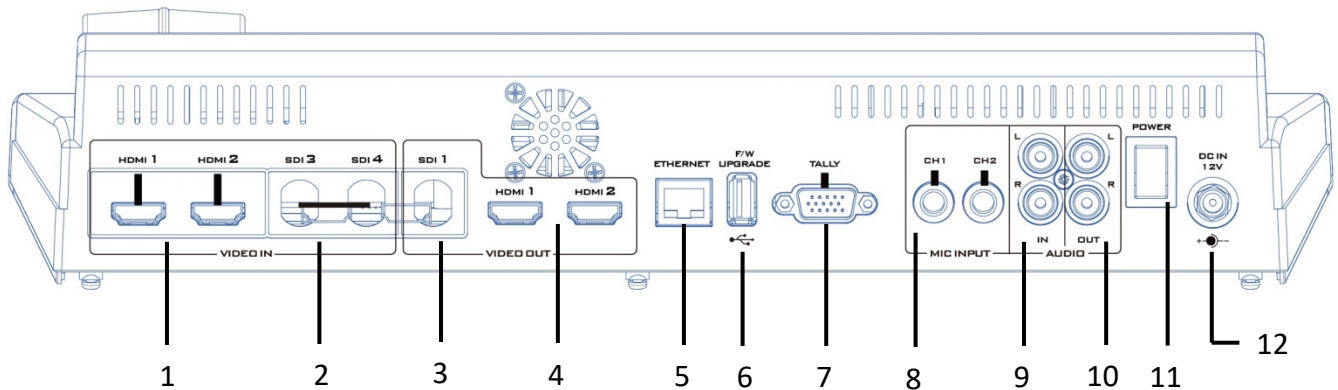
- 4 video Input : HD-SDI x 2 + HDMI x 2
 - Frame Sync on each input
- 3 Video Outputs : HD-SDI x 1 + HDMI x 2
- Audio input : Stereo RCA (L/R) x 1 + Microphone x 2
- Audio Output : Stereo RCA (L/R) x 1 + Stereo headphone mini Jack x 1
- Audio Mixer : MIC x 2 + Stereo x 1 + internal Digital embedded x 1
- Flexible Mix/Effects Processor with
 - 1 Upstream Keyer, supporting Chroma Key & Linear/Luma Key
 - 1 Upstream PIP, supporting Chroma Key & Luma Key Modes as well as unkeyed mode
 - Wipe Generator
 - 32 Wipe Patterns, including Circle & Heart
 - Borders & Softness Control
 - Wipe, Mix & Cut Transitions
 - Full M/E Preview function
 - Logo insertion
- Any Input (1-4) can be used as a Frame store (Stills Store)
- Assignable Outputs
 - Program (w/ DSK)
 - Clean Program (w/o DSK)
 - Clean Preview (w/o DSK)
 - Multiview
 - One of the input signals
- XPT (Cross Point Assignment)
- Tally Output

1.2 System Diagram

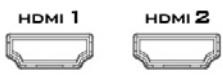



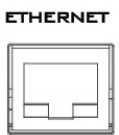




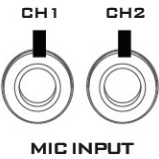


Chapter 2 Connections and Controls

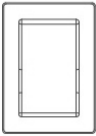

2.1 Rear Panel



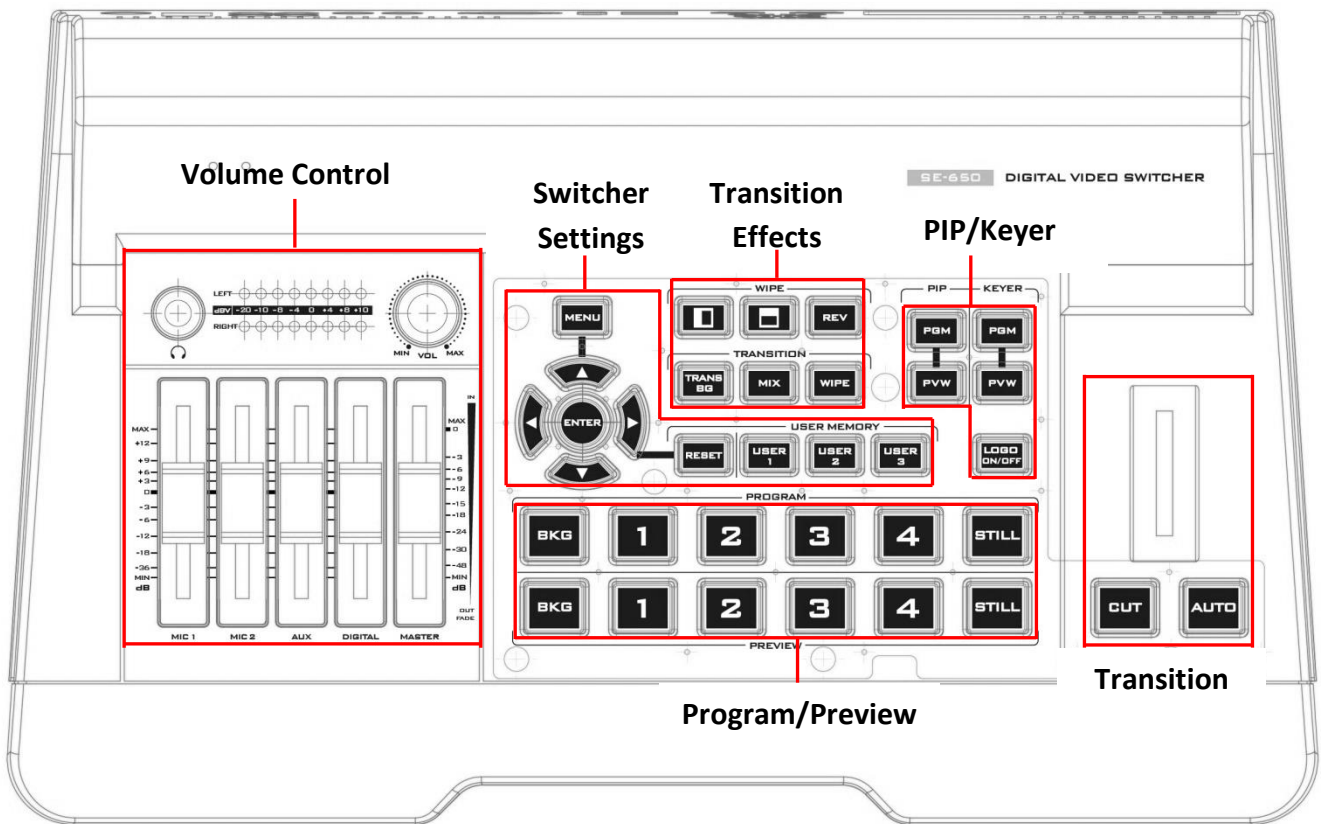
1	HDMI Video Input 1-2	7	TALLY Output Port
2	HD-SDI Video Input 3-4	8	MIC IN – CH1/CH2
3	HD-SDI Video Output 1	9	Audio Input – Stereo RCA (Left/Right)
4	HDMI Video Output 1-2	10	Audio Output – Stereo RCA (Left/Right)
5	Ethernet Port	11	Power Switch
6	USB F/W Upgrade Port	12	DC IN

1		<p>HDMI Video Input 1-2</p> <p>The SE-650 provides two HDMI video input channels for connecting HDMI video sources.</p>
2		<p>HD-SDI Video Input 3-4</p> <p>The SE-650 provides two HD-SDI video input channels for connecting HD-SDI video sources.</p>
3		<p>HD-SDI Video Output 1</p> <p>The SE-650 provides an HD-SDI video output channel which can be connected to an HD-SDI video display.</p>
4		<p>HDMI Video Output 1-2</p> <p>The SE-650 provides two HDMI video output channels which can be connected to any HDMI video monitors. HDMI 1 is user assignable and HDMI 2 outputs Multiview display.</p>
5		<p>Ethernet Port</p> <p>The Ethernet port allows the user to transfer files to and from the switcher on the PC remotely. See Chapter 4 for details on how you can utilize this port or Chapter 3 for system setup using this port.</p> <p>Note: The SE-650 has a default IP address of 192.168.1.101.</p>

6		<p>USB F/W Upgrade Port USB port for firmware upgrade. Please refer to the Firmware Upgrade section for the procedure.</p>															
7		<p>TALLY Output Port Sends Red, and Green tally signals to each channel.</p> <p>Red indicates On-Air, and Green indicates next camera source. Tally output port can connect other Datavideo peripheral devices such as ITC-100, ITC-200, AM-100 or other monitor models, allowing the peripheral device to communicate with the SE-650 or send tally signal to be displayed on the monitor.</p>															
8		<p>MIC IN – CH1/CH2 Two Channels of unbalanced MIC input.</p> <table border="1" data-bbox="555 835 1458 1581"> <thead> <tr> <th>Left Channel</th> <th>Right Channel</th> <th>States</th> </tr> </thead> <tbody> <tr> <td>MIC1</td> <td>MIC2</td> <td>MIC 1(L) and MIC 2(R) are respectively connected to left and right channels.</td> </tr> <tr> <td>MIC1</td> <td>Not Connected</td> <td>When MIC 1 is connected to the left channel and MIC 2 is not connected to the right channel, the right channel switch will replicate MIC 1 signal onto the right channel thus both channels are MIC 1 input signals.</td> </tr> <tr> <td>Not Connected</td> <td>MIC2</td> <td>When no MIC signal is connected to the left channel and only MIC 2 is connected to the right channel, MIC 2 signal will not be replicated onto the left channel which will thus be grounded.</td> </tr> <tr> <td>Not Connected</td> <td>Not Connected</td> <td>When no MIC is connected to the two channels, the left channel switch will ground the left channel to prevent noise from being generated.</td> </tr> </tbody> </table>	Left Channel	Right Channel	States	MIC1	MIC2	MIC 1(L) and MIC 2(R) are respectively connected to left and right channels.	MIC1	Not Connected	When MIC 1 is connected to the left channel and MIC 2 is not connected to the right channel, the right channel switch will replicate MIC 1 signal onto the right channel thus both channels are MIC 1 input signals.	Not Connected	MIC2	When no MIC signal is connected to the left channel and only MIC 2 is connected to the right channel, MIC 2 signal will not be replicated onto the left channel which will thus be grounded.	Not Connected	Not Connected	When no MIC is connected to the two channels, the left channel switch will ground the left channel to prevent noise from being generated.
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Not Connected	Not Connected	When no MIC is connected to the two channels, the left channel switch will ground the left channel to prevent noise from being generated.															
9		<p>Audio Input – Stereo RCA (Left/Right) Connects unbalanced analog audio source (stereo) for streaming and recording.</p>															
10		<p>Audio Output – Stereo RCA (Left/Right) Unbalanced analog audio output (stereo) for monitoring the selected audio input source.</p>															

11		Power Switch Power switch ON/OFF
12		DC IN DC in socket connects the supplied 12V / 19W PSU. The connection can be secured by screwing the outer fastening ring of the DC In plug to the socket.

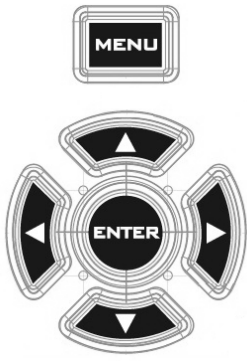


2.2 Front Panel




Switcher Settings	Transition Methods
Menu browsing buttons	T-Bar (manual transition)
RESET button	CUT button
User Memory	AUTO transition button
Transition Effects	Program / Preview Outputs
WIPE transition effect selection	Program row
TRANS BG – Background transition	Preview row
MIX Enable/Disable button	Volume Control
WIPE transition effect Enable/Disable	Volume adjustment sliders
PIP/Keyer	Headphone jack
PIP Enable/Disable buttons	Audio meter





Keyer Enable/Disable buttons	Headphone volume control knob
Logo Enable/Disable button	




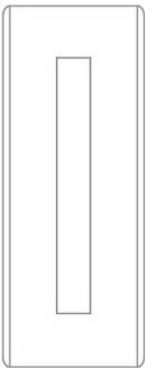


Switcher Keyboard Descriptions

	<p>Menu browsing buttons</p> <p>Press the MENU button to gain access to the menu; use the up/down/left/right arrow buttons to browse through the menu and press ENTER button to select an option or MENU button again to exit.</p>
	<p>Reset Button</p> <p>Mode 1 - When in Menu Select mode (left hand column of the OSD menu), pressing the 'Reset' button will reset all current menu items to their factory defaults.</p> <p>Mode 2 - When in a Sub-Menu, pressing the 'Reset' button will reset the current menu line only.</p>
<p>— USER MEMORY —</p> 	<p>User Memory</p> <p>User Memory buttons 1-3 allow the user to quickly recall and load previously saved switcher settings with a single button press. This includes PIP, Keyer and DSK settings. The switcher loads settings saved to User Memory 0 as default settings used at boot up. See the User Memory section for more information.</p>

Transition Effects

<p>— WIPE —</p> 	<p>WIPE Transition Effect Selection</p> <p>Each Wipe button consists of black and white colors. The white represents the current Program image and the black represents the WIPE-IN image. There are a total of 2 WIPE presets offered on the SE-650; the WIPE buttons allow the user to make a selection directly from the control panel for the first 2 and remaining 30 WIPE effects are selectable from the menu (Start).</p> <p>Pressing the REV button reverses the direction of the WIPE.</p>
---	---

	<p>TRANS BG – Background Transition</p> <p>The TRANS BG button enables Background Transition between Program / Preview. This feature is primarily used in Chromakeyer effect. When enabled, foreground and background will be switched together during transition. The background will be locked when the TRANS BG is disabled, thus only the foreground is switched during the transition and the background will remain unchanged. If you would like to use the switcher function, please enable the “TRANS BG” function.</p>
	<p>MIX Enable/Disable button</p> <p>A MIX, also known as a dissolve, is a transition wherein the Program video is replaced by the Preview video at a smooth rate, and at the same time. Pressing the MIX button will enable the MIX transition effect and automatically disable the WIPE button. To activate the MIX effect, simply press the AUTO button or move the T-Bar.</p>
	<p>WIPE Transition Effect Enable/Disable button</p> <p>Pressing the WIPE button enables the WIPE transition effect after which the WIPE transition effect can be selected. To trigger the WIPE transition effect, simply press the AUTO button or move the T-Bar.</p> <p>Wipe transition effect selection, border and position can be configured in the OSD menu (Start).</p> <p>Note: When WIPE and MIX buttons are enabled at the same time, the SE-650 enters the Clip Transition mode.</p>
PIP/Keyer	
<p style="text-align: center;">— PIP —</p> 	<p>PIP Enable/Disable buttons</p> <p>Picture in Picture puts the selected Sub Video Source in a window on the Main Program view, with control over window size and placement. For PIP configuration, please refer to the PIP section.</p> <p>PIP PGM: Shows the configured PIP on multiview and PGM outputs.</p> <p>PIP PVW: Shows the configured PIP on PVW and multiview outputs. Holding down this button also allows selection of the PIP source from the Preview Source row. The selected source button will flash.</p>

	<p>Note: You are also allowed to apply the chromakey effect to the PIP window. Please refer to the PIP section for chromakey configurations.</p>
<p style="text-align: center;">— KEYER —</p> <div style="text-align: center;">   </div>	<p>Keyer Enable/Disable buttons KEYER PGM: Enables the key (Chroma / Luma / Linear) on multiview and PGM output</p> <p>KEYER PVW: Enables Keyer on PVW and multiview outputs. Press and hold this button until the Preview Source row starts to flash and then select Keyer KEY or FILL sources from the Preview Source row.</p> <p>Please refer to the Keyer section for keyer configurations.</p>
<div style="text-align: center;">  </div>	<p>Logo Enable/Disable button The LOGO ON/OFF button enables the configured Logo on PVW and PGM outputs. Please configure the logo image source in the OSD. Refer to the Logo section for configuration details.</p>
Transition Methods	
<div style="text-align: center;">  </div>	<p>T-Bar (Manual Transition) T-Bar is used to manually perform a transition. PVW and PGM views can be transitioned at your preferred speed. To include the transition effect, simply press the WIPE or MIX button, after which the Transition Effect will be trigger as you move the T-Bar.</p>
<div style="text-align: center;">  </div>	<p>CUT button Pressing the Cut button performs immediate manual switch between PVW and PGM views without any transition effect.</p>
<div style="text-align: center;">  </div>	<p>AUTO button Pressing the Auto button automatically transitions PVW and PGM views according to the selected speed and the configured transition effect.</p>

Program / Preview Outputs



Program Source Row

Pressing the number buttons along the **PROGRAM** row selects a video source for the **PGM** view.

BKG button: Pressing the **BKG** button will switch the background to the **Matte** background or color bars.

Still button: Pressing the **STILL** button will switch the Main Program view to a still picture, which can be selected in the **OSD** menu.

Note: Pressing the **STILL** button repeatedly alternates the Main Program view between Still 1 and Still 2 pictures.



Preview Source Row

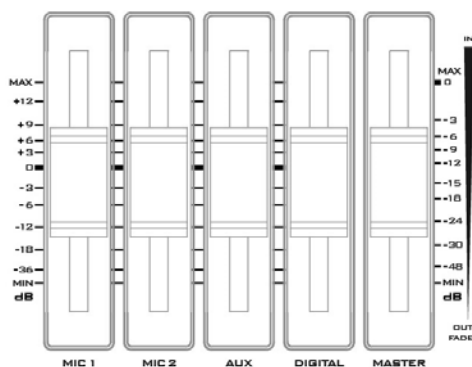
Pressing the number buttons along the **PROGRAM** row selects a video source for the **PGM** view.

BKG button: Pressing the **BKG** button will switch the background to the **Matte** background or color bars.

Still button: Pressing the **STILL** button will switch the Main Program view to a still picture, which can be selected in the **OSD** menu.

Note: Pressing the **STILL** button repeatedly switches the Main Program view between Still 1 and Still 2 pictures.

Volume Control



Volume Adjustment Sliders

Sliders to control audio levels for the Main audio mixer.

MIC 1: Unbalanced MIC IN

MIC 2: Unbalanced MIC IN

AUX: RCA audio input (analog)

Digital: HDMI or SDI audio input (digital)

Master: Main audio output

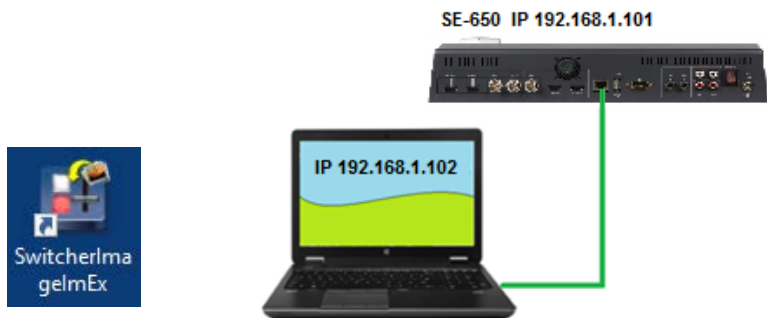
Chapter 3 Network Setup

The Ethernet port on the back panel of the SE-650 allows the user to import Still/Clip image or User memory using the Switcher Image Import/Export software discussed in Chapter 5. This chapter discusses direct connection between the SE-650 and your Windows computer as well as the remote setup in detail. **Please note that the Switcher Image Import/Export software must be installed on your Windows-based computer before using this feature.**

3.1 Switcher Setup with a Windows Computer

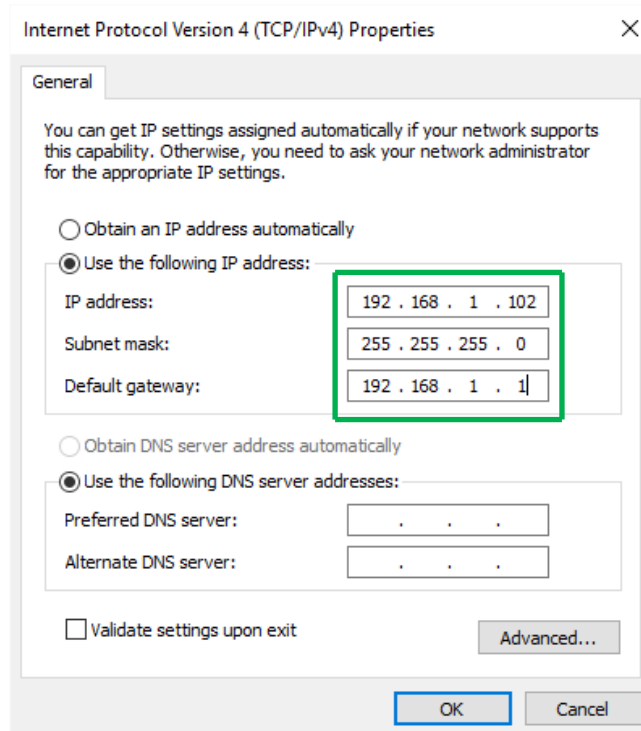
When new from the factory the SE-650 will initially have a static IP address of **192.168.1.101**. The unit can be directly connected to a Windows-based computer using an RJ-45 ethernet cable. The following set up should allow you to initially configure the unit before moving it to an existing DHCP / LAN network.

- An RJ-45 ethernet cable.
- Windows 7/8/10 laptop or PC.
- The Datavideo Switcher Image Import/Export software.



Instructions

1. First connect the SE-650 and the Windows computer together using an RJ-45 ethernet cable.
2. Turn on the Windows computer and set it to **static IP setup** within the **Windows Network and Sharing Centre**. In our example below the computer is given the following IP settings so that the computer matches the same IP range as the switcher.



3. Now install the **Switcher Image Import/Export software** to the computer.

3.2 Installing the Switcher Image Import/Export software to a Windows Computer

The SE-650 can be connected to a simple IP network and accessed using Windows-based software. If you have not already set up the SE-650 with a computer then please follow the instructions in the previous section.

The SE-650 comes with an accessory software CD. If this CD has been lost or has not been supplied then please download the latest software from the Datavideo SE-650 web page. See: www.datavideo.com



SwitcherImageImEx_v0975.msi

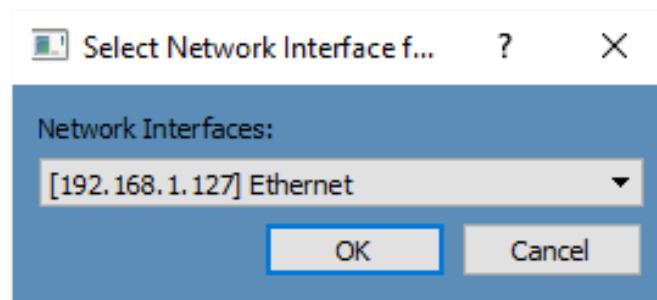
The install executable file [.msi] will be called **SwitcherImageImEx_vXXXX.msi**

The vXXXX represents the latest version number.

Double click this .msi file then **follow the on screen install wizard prompts.**

Once installed launch the **Switcher Image Import/Export software.**

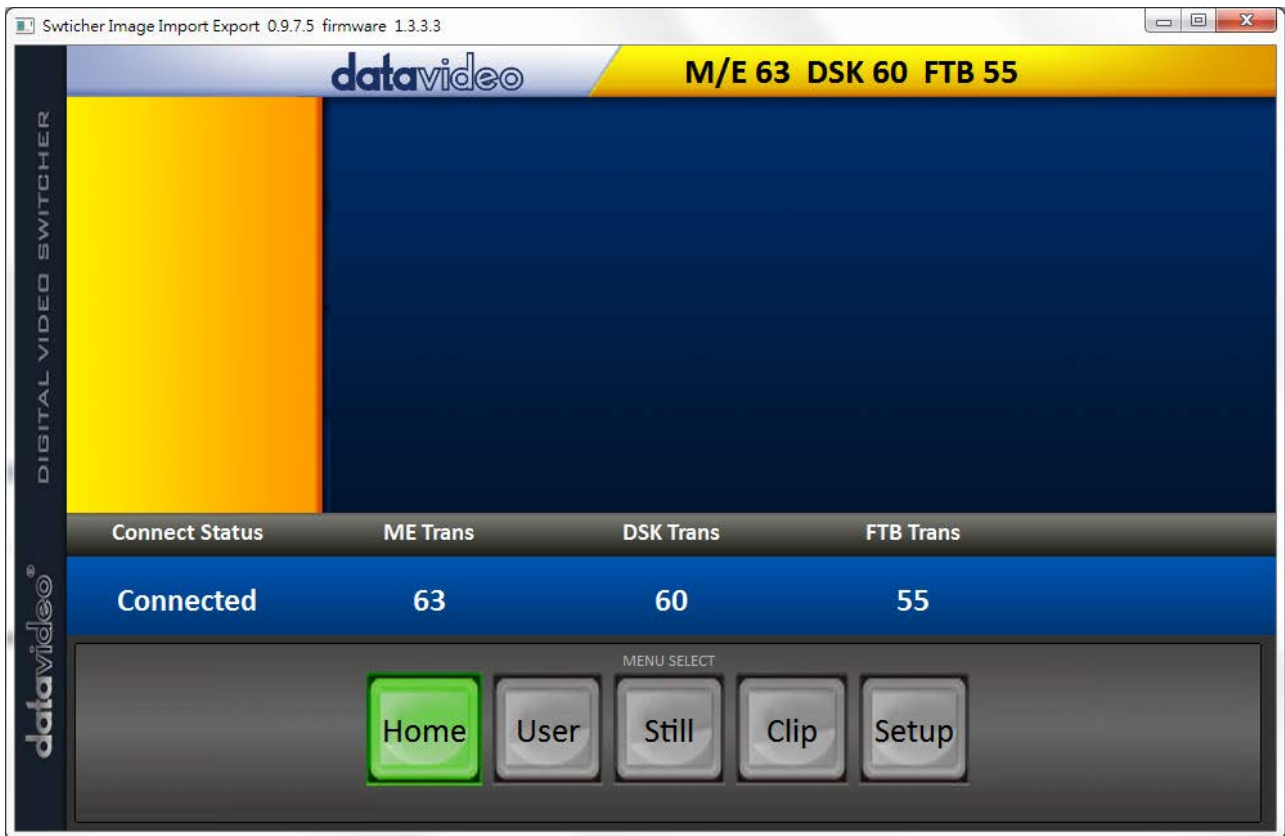
The **Switcher Image Import/Export software** has a built-in IP finder, which is designed for PC with multiple Ethernet cards or DHCP network environment. Please note IP finder can only find devices that are on the same network domain as the PC. If you cannot remember your device IP, please press the **RESET** button to restore the default network settings. Upon launch of the **Switcher Image Import/Export software**, you will be prompted to select one Ethernet Interface Card.



Once selected, click OK to start the scanning process.

Note: Please make sure the selected interface card is on the same network domain as the SE-650 device.

Once the SE-650 device is found, the software will connect with the switcher hardware over the IP set up described in the previous section. If the connection is successfully established, on the software user interface as shown in the diagram below, the **Connect Status** will show **“Connected”** (will display **Not Connected** if disconnected).

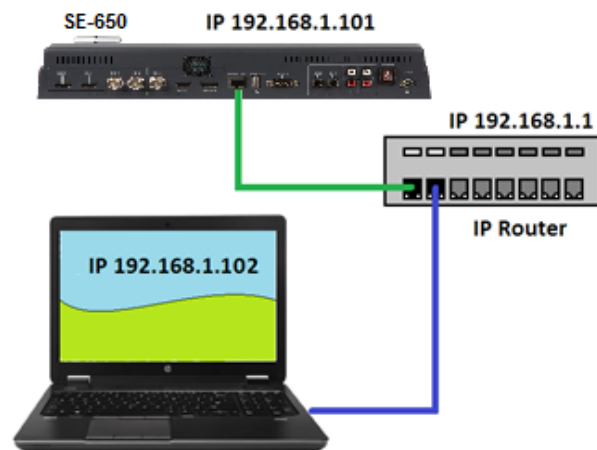
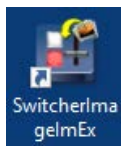


3.2.1 Router Based DHCP Setup

The computer software can also access the SE-650 over an existing TCP/IP LAN type network. In order to initially set up the SE-650, you may need the assistance of your local I.T. specialist to help with the network settings. To help guide you, we have included a simplified network setup example below, further advice may be available through your dealer locally or your Datavideo regional office.

To create this simple dedicated SE-650 IP network you will need:

- An IP router which can assign/give IP addresses.
- Two RJ-45 patch leads.
- Windows 7/8/10 laptop or PC.
- The IP router Administrator login and password.
- The Datavideo Switcher Image Import/Export software.



Instructions

1. First connect the router to the SE-650 and the Windows computer using two RJ-45 patch leads.
2. Turn on the Windows computer and set it to **DHCP setup** within the **Windows Network and Sharing Centre**.
3. Now click the Windows start button and run the CMD prompt window.

4. At the command line > : _ type **IPCONFIG** and press enter.
5. The **DEFAULT GATEWAY** number displayed should be the router's current IP address.
6. Enter the **DEFAULT GATEWAY IP address** into the address bar of the computer's web browser.
7. The web browser should display the login window for the router. Enter the router's login and/or password.
The login details may be written on a sticker on the router itself or noted in the manual for the router.
8. Once logged into the router we need to change the router to supply IP addresses in the **192.168.1.xxx** range. Use the router's **LAN Setup** or **Configure LAN** option to set the router's IP address as **192.168.1.1** and click **save / apply**.
9. Now reboot the router and power ON the SE-650.
10. Log into the router again using the web browser and the router's new IP address **192.168.1.1**
11. Use the router's **LAN Setup** or **Configure LAN** option again, within this option there should be another option called **Address Reservation** or **Client List**.
12. The two devices connected to the router should be listed here, the computer and the SE-650.
13. The computer, because it is set for DHCP, will already have an IP address automatically assigned to it in this list.
14. The SE-650 will also be listed with its default IP address of **192.168.1.101** if it is not changed.
15. Click **save / apply** then reboot the router again.
16. Close the web browser and CMD windows.
17. Now install the **Switcher Image Import/Export software** to the computer.

3.2.2 Setting the Target IP Address with the Switcher Image Import/Export Software

Click **Setup** button in the **MENU SELECT** pane and the current IP Network settings are shown alongside the software version.



If the network settings are wrong then you may not be able to access the SE-650. Always keep a note of the last IP settings used and change these settings carefully to avoid problems.

Target IP address – This IP address is the location on the local network, or the internet, where the software can talk to the SE-650. By clicking the **Target IP address** you can enter a new address, once entered click **Save Setup**. The next time the Image Import/Export Software is opened, it will try to contact the switcher on this new Target IP address.

Network – This option in the yellow menu column allows you to change the network options on the SE-650. When delivered from the factory **the default static IP settings should be:**

Addr Mode: Static (a manually set IP address that does not change even after power cycling the SE-650 unit)

Target IP address: 192.168.1.101

Network Mask: 255.255.255.0

Gateway: 192.168.1.1

DHCP Setup - If the IP set up method is changed to DHCP then each time the SE-650 is started, it may be given a different IP address by the network. Only use this method if you know how to find the SE-650 on the internal IP network. A device on the network (usually a router or server) will automatically assign an IP address to the SE-650. The other settings such as IP address, Subnet Mask and Gateway may appear blank within the **Switcher Image Import/Export software** as these would be automatically set by network router/DHCP server.

Chapter 4 OSD Menu

The switcher's OSD menu allows the user to perform several configurations of image effects, such as Picture-in-Picture, keyers, downstream keys, still pictures and etc. The user can also configure the I/O by selecting the Inputs and Outputs options. In addition, in the setup option, the user is allowed to set the menu color, size, position and language.

The OSD Menu offers the user basic and advanced modes. The basic mode is generally a condensed version of the advanced menu mode. The following sub-sections will show you the various options available in these two modes.

4.1 Start

Start	Transition	M/E	60		
	Type	MIX			
	Wipe Effects	Wipe	1	Soft	0% Width 1%
	Border	Luma	100%	Sat	80% Hue 0
	Position	X	0%	Y	0%
	Matte	Luma	100%	Sat	80% Hue 0

4.1.1 Transition

The **Transition** sub-option allows the user to set the **MIX** effect duration, in frames. If the **M/E** is set to a value of 50 then the transition will take effect over a period of 50 frames or roughly 2 seconds. When the **AUTO button** is pressed, the transition will take the current M/E value defined by the user setting.

4.1.2 Type

The SE-650 provides three major types of transition effect, which are MIX, WIPE and Clip. Please note in addition to selecting the transition effect on the OSD menu, you are also allowed to press the MIX button, WIPE button or press MIX and WIPE buttons at the same time to enable the respective transition effects.

- If **MIX** is selected, set the transition duration in the "**Transition**" sub-option.
- If **WIPE** is selected, set the relevant WIPE settings in the "**WIPE Effects**" sub-option.
- If **Clip**, also known as the **Stinger Effect**, is selected, please load the clip in the "**User Mem**s" sub-option.

4.1.3 Wipe Effects

This sub-option allows the user to select the Wipe Effect and configure the wipe's border softness and width.

- **Wipe** – Selection of a WIPE effect from a set of 32 WIPE transition effects.
- **Soft** – A low value results in a solid edge border and a high value gives a soft diffused border.
- **Width** – A low value results in a thin border and a high value gives a wide border.

4.1.4 Border

In this sub-option, the user will be allowed to fine-tune the border color by adjusting the **Luma**, **Saturation** and **Hue** values.

4.1.5 Position

Position allows the user to adjust the center position of some wipes (e.g Circle & Elipse). **X** represents the horizontal position and **Y** is the vertical position.

Horizontal Position (X)

Positive value moves the wipe center to the right.

Negative value moves the wipe center to the left.

Zero value positions the wipe center at the screen center

Vertical Position (Y)

Positive value moves the wipe center up.

Negative value moves the wipe center down.

Zero value positions the wipe center at the screen center.

4.1.6 Matte

The user can configure the Matte by adjusting **Luma**, **Saturation** and **Hue** in this sub-option.

4.2 Keyer

Keyer of the SE-650 provides the user with the capability of image keying.

Advanced mode options

Keyer	Keyer	Chroma	Self	Priority	Top
	Keyer Ctrl	Lift 0%	Gain 1.0	Opac	100%
	Key Source	Input 1	Fill Black		
	CK Setup	CK Auto	Hue 140	Luma	101%
		K Range 160	K Fgnd 10%	K Bgnd	90%
		Hi-Light 0%	Lo-Light 0%	Bg-Supp	OFF
	Mask	Left 0%	Right 0%		
		Top 0%	Bot 0%		

4.2.1 Keyer

There are three keying modes available: **Linear**, **Luma**, and **Chroma**.

Linear keying mode is usually chosen for sharp images. For non-sharp images, please select **Luma** keying. **Chroma** keying mode allows you to remove the green or blue backdrop from the image.

After the keying mode is chosen, select **Self** if only one source is enabled for the keyer, which is Key source. Select **Split** if two sources are enabled for the keyer, which are Key and Fill sources.

Priority sets the key image to either the top layer or bottom layer.

4.2.2 Keyer Control

“**Keyer Control**” adjusts **lift**, **gain** and **opacity** of the key image.

Lift adjusts the dark/black areas of the key image.

Gain adjusts the light/white areas of the key image.

Opac adjusts the transparency of the overall foreground key image.

4.2.3 Key Source

This sub-option allows the user to assign the key source; various options are listed below:

- Bars
- Matte – Set in Start/Matte
- Freeze
- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- Black

4.2.4 Fill Source

This sub-option allows the user to assign the fill source; various options are listed below:

- Bars
- Matte – Set in Start/Matte
- Freeze
- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- Black

4.2.5 CK Setup

In this sub-option, the user will be able to find all the parameters needed to perform chromakeying of the green or blue backdrop.

CK Auto: This function automatically calculates the best Hue & Luma values for the current Keyer source.

Hue: This parameter adjusts the color of the chroma key. A typical green screen value will be around 120. Blue screen value will be around 240.

Luma: This parameter adjusts the luma value of the chroma key

K Range (Key Range): Key Acceptance sets the range of hues or colors (0 – 360 degrees) that closely match the background color to be keyed. The user can start with a value of 120 degrees and this value can be fine-tuned up or down depending on the setup of the green or blue screen studio.

K Fgnd (Key Foreground): **Key Foreground** adjusts the performance of the chroma key in light or white areas. Apply more **Key Foreground** if the light areas are becoming too transparent.

K Bgnd (Key Background): **Key Background** adjusts the performance of the chroma key in dark or black areas. Apply more **Key Background** if the dark areas are becoming too transparent.

Hi-Light: Hi-light boosts the foreground key in high luminance area.

Lo-Light: Lo-light boosts the foreground key in low luminance area.

Bg-Supp: **Background Suppress** removes the Luma (Brightness) of the background from the final image. **Bg-Supp** turns ON/OFF background suppression.

4.2.6 Mask

The Mask feature basically shrinks the camera image by removing the borders from the final image. This feature allows the user to configure the Mask in chroma, luma or linear mode.

- **Left** – Left sets the left edge of the keyer mask.
- **Right** – Right sets the right edge of the keyer mask.
- **Top** – Top sets the top edge of the keyer mask.
- **Bottom** – Bottom sets the bottom edge of the keyer mask.

4.3 P-In-P

Picture-In-Picture (P-In-P) places a sub window on the PGM or PVW screens and allows you to configure various parameters of the PIP window.

Advanced mode options

P-in-P	P-in-P Src	Input 2					
	Position	X	-31%	Y	-14%	Size	32%
	Border	Luma	100%	Sat	80%	Hue	0
	Border	Width	2%				
	Crop	Left	0%	Right	0%	Size	0%
		Top	0%	Bot	0%		

4.3.1 P-In-P Source

This sub-option allows the user to assign the P-In-P source; various options are listed below:

- Bars
- Matte – Set in Start/Matte
- Freeze
- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- Black

4.3.1 Position

The user can adjust the position of the PIP screen by adjusting values of **X**, **Y** and **SIZE**, where X is the horizontal position, Y is the vertical position and Size is the PIP screen size.

Horizontal Position (X)

Positive value moves the PIP window to the right.

Negative value moves the PIP window to the left.

Zero value positions the PIP window at the screen center.

Vertical Position (Y)

Positive value moves the PIP window up.

Negative value moves the PIP window down.

Zero value positions the PIP window at the screen center.

PIP Window Size (Size)

This parameter ranges from 0 to 100 with 1% being the smallest and 100 being the largest. Therefore 50% would represent a PIP image which is half the size of the background image. 100% would see the PIP image totally cover the background image unless offset to one side.

4.3.2 Border

PIP border color can be set by adjusting the **Luma**, **Saturation** and **Hue** values. The **Width** of the border can also be adjusted. A width of zero (0) will turn the PIP border off.

4.3.3 Crop

The PIP image crop can be adjusted by modifying the following parameters:

- **Left** – Adjusts the position of the left edge of the PIP image.
- **Right** – Adjusts the position of the right edge of the PIP image.
- **Size** – Adjusts the PIP image crop size.
- **Top** – Adjusts the position of the top edge of the PIP image.
- **Bot** – Adjusts the position of the bottom edge of the PIP image.

4.4 P-In-P Keyer

P-In-P Keyer basically allows you to remove the green backdrop from the PIP image by adjusting Chromakeyer parameters. The OSD menu options for P-In-P Keyer are shown below.

Advanced mode options

P-in-P Keyer	P-in-P Src	Input 2	Priority	Bot	
	Keyer	Full			
	Keyer Ctrl	Lift 0%	Gain 1.0	Opac 100%	
	CK Setup	CK Auto	Hue 110	Luma 80%	
		K Range 160	K Fgnd 10%	K Bgnd 20%	
		Hi-Light 0%	Lo-Light 0%		
	Mask	Left 0%	Right 0%		
		Top 0%	Bot 0%		

4.4.1 P-In-P Source

This sub-option allows the user to assign the **P-In-P source**; various options are listed below:

- Bars
- Matte – Set in Start/Matte
- Freeze
- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- Black

Priority sets the key image to either the **top** layer or **bottom** layer.

4.4.2 Keyer

The “**Keyer**” option defines the keyer mode, which is either **Chroma** or **Full** mode.

Chroma Mode: Chromakeying on PIP screen

Full Mode: Enabling of full PIP screen mode with the PIP window covering the entire screen.

4.4.3 Keyer Control

Keyer Control adjusts lift, gain and opacity of the key image.

Lift adjusts the dark/black areas of the key image.

Gain adjusts the light/white areas of the key image.

Opacity adjusts the transparency of the overall foreground key image.

4.4.4 CK Setup

CK Auto: This function calculates the best Hue & Luma values for the current Keyer source.

Hue: This parameter adjusts the color of the chroma key. A typical green screen value will be around 120. Blue screen value will be around 240.

Luma: This parameter adjusts the luma value of the chroma key.

Key Range (K Range): Key Range sets the range of hues or colors (0 – 360 degrees) that closely match the background color to be keyed. The user can start with a value of 120 degrees and this value can be fine-tuned up or down depending on the setup of the green or blue screen studio.

Key Foreground (K Fgnd): This parameter adjusts the performance of the chroma key in light or white areas. Apply more Key Gain if the light areas are becoming too transparent.

Key Background (K Bgnd): This parameter adjusts the performance of the chroma key in dark or black areas. Apply more Key Lift if the dark areas are becoming too transparent.

Hi-Light: Hi-light boosts the foreground key in high luminance area.

Lo-Light: Lo-light boosts the foreground key in low luminance area.

4.4.5 Mask

The Mask feature shrinks the camera image by removing the borders from the final image. This feature allows the user to configure the Mask in chroma or full mode.

- **Left** – Left sets the left edge of the P-in-P keyer mask.
- **Right** – Right sets the right edge of the P-in-P keyer mask.
- **Top** – Top sets the top edge of the P-in-P keyer mask.
- **Bottom** – Bottom sets the bottom edge of the P-in-P keyer mask.

4.5 Logo

The user is allowed to use the Logo option to set the logo image signal source. The OSD menu options for logo are shown below.

Logo	Logo	Luma	Self	
	Logo Ctrl	Lift 0%	Gain 16.0	Opac 100%
	Logo Src	Still 2	Fill Still 1	
	Mask	Left 0%	Right 0%	
		Top 0%	Bot 0%	

See section 5.2 for detailed information on how you can insert the logo to your program.

4.5.1 Logo Image

You may apply linear or luma keyer to the logo image. **Linear** keying mode is usually chosen for sharp images. For non-sharp images, please select **Luma** keying.

After the keying mode is chosen, select **Self** if only one source is enabled for the logo, which can be set in the **Logo Src** option. Select **Split** if two sources are enabled for the logo, which can be respectively set in the **Logo Src** and **Fill** options.

Note: We do not recommend using the two-source logo (Split) as it requires two physical connection ports.

An example of Linear Keyer in Self mode: HDMI input port is connected to a Windows notebook running Datavideo's CG-200 software.

4.5.2 Logo Control

Logo Control adjusts lift, gain and opacity of the logo image.

Lift adjusts the dark/black areas of the logo image.

Gain adjusts the light/white areas of the logo image.

Opacity adjusts the transparency of the overall foreground logo image.

4.5.3 Logo Source (Logo Src)

Select **Logo Source** from the list below.

- Bars
- Matte – Set in Start/Matte
- Freeze
- Still 1

- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- Black

4.5.4 Fill Source

Select the **Fill Source** from the list below.

- Bars
- Matte – Set in Start/Matte
- Freeze
- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- Black

4.5.5 Mask

The Mask feature removes unnecessary borders of the Logo image. The user is allowed to configure the Mask in **Luma** or **Linear** mode.

- **Left** – sets the left edge of the logo image.
- **Right** – sets the right edge of the logo image.
- **Top** – sets the top edge of the logo image.
- **Bottom** – sets the bottom edge of the logo image.

4.6 Stills

Still allows the user to load images from the memory, save images to the memory, and save the images captured.

Advanced mode options

Stills	Load Still	Load	Still Num 10	Still 1
		Thumbnail Picture - 1	Thumbnail Picture	Thumbnail Picture + 1
	Save Still	Save	Still 1	Still Num 10
	Grab Still	Grab	Still 1	
	Freeze	1 Live	2 Live	3 Live
		4 Live		

See section 5.3 for detailed information on how you can import, export and load the still image to your program.

4.6.1 Load Still

Upon selecting “**Load Still**”, the user can then choose the memory location from which the still image is loaded. The system memory can store up to 500 still images. The following are the destinations to which the still image can be loaded:

- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1

Select “**Load**” to load the still image to the determined destination.

Image Preview is available below the “**Load Still**” row. “**Image Preview – 1**” allows the user to preview the previous image, “**Image Preview**” displays the image that will be loaded when “**Load**” is selected, and “**Image Preview + 1**” shows the next image.

Note: The user is allowed to import still picture files. It is recommended to use 24-bit without Alpha bmp, png and jpg formats.

4.6.2 Save Still

“**Save Still**” allows the user to save the still image to a specific memory location. The user should determine the source of the still image first. The available sources are listed below:

- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1

To complete the save, the user can simply select “**Save**” after determining the memory location.

Note: Pressing the **STILL** button repeatedly switches between Still 1 and Still 2 pictures.

4.6.3 Grab Still

“**Grab Still**” function grabs an instant of the video image on the Program view to the destinations listed as follows.

- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1

After determining the destination to which an instant of the video image is captured, simply select “**Grab**” to trigger the image grab.

4.6.4 Freeze

“Freeze” function allows the user to select an image source in **Input 1-4 windows** from one of the four sources listed as follows:

- Still – A still picture must be loaded to Inputs 1-4 first.
- Freeze – Freezes the videos in the Input 1-4 windows.
- Live – Playback of videos in the Input 1-4 windows.
HDMI 1 video is displayed in the Input 1 window.
HDMI 2 video is displayed in the Input 2 window.
SDI 3 video is displayed in the Input 3 window.
SDI 4 video is displayed in the Input 4 window.

4.7 User Mems

In this option, the user is allowed to **load** previously saved settings and **save** the currently configured settings.

Advanced mode options

User Mems	Load Mem	Memory 13	Load	
	Save Mem	Memory 13	Save	
	Load Clip	Load	Clip 0	
		Thumbnail Picture - 1	Thumbnail Picture	Thumbnail Picture + 1

See section 5.4 for detailed information on how you can import and load clips and user memory presets to the switcher.

4.7.1 Load Memory

Use the up/down arrow to scroll to the desired memory location and load the saved setting by selecting “**Load**”.

Note: The user can also press one of the USER memory shortcut buttons (1-3) on the control panel as a quick way of loading those previously saved User configurations.

4.7.2 Save Memory

Use the up/down arrow to scroll to the desired memory location and save the current setting by selecting “**Save**”.

4.7.3 Load Clip

In this sub-option, use the Up/Down arrows on the physical keyboard of the switcher to browse the clip files. Once “**Load**” is pressed, the selected clip will be loaded into the Still 2 window and replace the previously displayed video or image.

Note: The SE-650 comes with pre-loaded clip files. The SE-650 also allows the user to import customized clip files. It is recommended to use 32-bit with Alpha png format.

Preview of clip videos is below the “**Load Clip**” sub-option. You can preview three clip videos at the same time. **To enable the Clip (Stinger) transition mode, please turn ON the MIX and WIPE buttons at the same time.**

4.8 Inputs

This feature allows the user to configure the color of the Inputs 1-4. In addition, the user can shuffle the contents of Inputs 1-4 and Stills.

Advanced mode options

Inputs	Input 1	Black	0	White	100	Chrom	1.0
	Input 2	Black	0	White	100	Chrom	1.0
	Input 3	Black	0	White	100	Chrom	1.0
	Input 4	Black	0	White	100	Chrom	1.0
	Freeze	1	Live	2	Live	3	Live
		4	Live				
	Crosspoint	1	Input 1	2	Input 2	3	Input 3
		4	Input 4	5	Still 1	6	Still 2

4.8.1 Input 1-4

By selecting the corresponding input (Inputs 1-4), the user will then be allowed to configure the colour of the input 1-4 by adjusting its Black Level, White Clip and Chroma Gain parameters.

4.8.2 Freeze

“Freeze” function allows the user to select an image source in **Input 1-4 windows** from one of the sources listed as follows:

- Still – A still picture must be loaded to Inputs 1-4 first.
- Freeze – Freezes the videos in the Input 1-4 windows.
- Live – Playback of videos in the Input 1-4 windows. When Crosspoint is in its default settings, HDMI 1 video is displayed in the Input 1 window.
HDMI 2 video is displayed in the Input 2 window.
SDI 3 video is displayed in the Input 3 window.
SDI 4 video is displayed in the Input 4 window.

4.8.3 Crosspoint

Crosspoint gives the user the ability to shuffle the contents of Inputs 1-4 and Stills. In other words, the user will be able to flexibly assign any of the sources of Inputs 1-4 and Stills to the 5 input buttons (1, 2, 3, 4, and Still) of the Program and Preview rows as desired.

4.9 Outputs

This option allows the user to configure various output settings such as video output, audio output, and Tally mode.

Advanced mode options

Outputs	Outputs	Sdi	Pgm		HDMI	MultiV
					HDMI	1080P
	Audio	Mode	Analog	Level	Auto	Src Follow
		Sdi	On		HDMI	On
	Tally Mode		Normal			
	Multiviewer	AutoNum	Off	Label Inf	Off	Trns Lab Off

4.9.1 Outputs

In general, there are three output ports (**SDI 1**, **HDMI 1** and **HDMI 2**) available, wherein SDI 1 and HDMI 1 can be configured to output one of the following:

- Still 1
- Still 2
- Input 4
- Input 3
- Input 2
- Input 1
- CLN PVW (Clean PVW)
- CLN PGM (Clean PGM)
- PG + DSK (LOGO)
- PV + DSK (LOGO)
- PVW
- PGM
- MultiV (Multi view)

In addition to selecting your output source, you are also allowed to set different resolutions to the HDMI output port. The two available resolutions are 1080i and 1080p.

Note: Currently there is no configuration option for HDMI 2 as it has been hard coded as Multiview output.

Please note that when HDMI OUT is set to 1080i, image will be enlarged on the DELL 24" monitor (Wide Mode = 1:1), exceeding the viewable screen area (overscan). In 1080p and 720p modes, image overscan and shifts are seen on BENQ 37"/SONY 42" TV.

4.9.2 Audio

In this sub-option, you can turn ON/OFF the embedded audio component at the **SDI-out** and **HDMI-out**.

Mode (Off/Analog): The SE-650 can only accept external audio using the analogue RCA inputs on the rear panel. By changing the **Mode** sub-option from Analogue to OFF will mute the incoming RCA audio.

Level (EBU/SMPTE/AUTO): There are two different audio standards available for selection. The user can either select the EBU or SMPTE standard. By selecting AUTO allows the device to automatically detect the audio standard. When the image is 50 Hz, the audio follows EBU standard and when the image is 59.94/60 Hz, the audio follows SMPTE standard.

Src: If "**Follow**" is selected, the audio will enter Audio follow Video mode, i.e. playback of the audio of the output video. If "**Src**" is selected, the SE-650 will play all enabled audio sources.

4.9.3 Tally Mode

Tally output port generally sends two tally signals to each channel. In Datavideo products, **Red** indicates On-Air, and **Green** indicates next camera source.

The SE-650 provides two tally modes:

Normal: If in normal mode, tally lights of all camera sources displayed on the PGM monitor will be turned ON (**Red**). These sources include PGM, PIP and Key sources. While transition is in progress, the

next video will be seen on the PGM monitor, tally light of the PVW source camera will thus also be turned ON (**Red**).

Audio Mixer: If Audio Mixer mode is selected, tally light of the PGM source camera selected on the keyboard panel will be turned ON (**Red**). While transition is in progress, the tally light color will remain unchanged. The tally light color will only change (**Red/Green**) after the transition of PGM and PVW views is complete.

4.9.4 Multiviewer

AutoNum: The Multiview windows can be automatically numbered, and this sub-option turns ON/OFF automatic numbering.

Label Inf: This sub-option turns ON/OFF Label information. Input label is followed by information which describes the input as still, live or frozen image.

Trns Lab: This sub-option turns ON/OFF Label Transparency. Once enabled, the background of the label is then turned from a solid colour to transparent.

4.10 Setup

In the “Setup” menu, the user can change the **resolution**, switch between full and simplified menu versions, reset the SE-650 to its **Factory Default** values, adjust the **menu preferences**, enable/disable **Auto Save**, choose the preferred OSD menu **language**, **upgrade firmware** and view the **current firmware versions** (Interface, Mainboard and Keyboard).

Advanced mode options

Setup	Standard	1080i/50	Save Setup	
	Menu Mode	Advanced		
	Menu Pref	Blue	Transp 1	Size Normal
	Menu Pos	Bot		
	Auto Save	Off		
	Factory Def	Reset	Reset Names	
	Language	English		
	Software	Upgrade	(Available only when the USB storage device containing the latest firmware file is inserted)	
	s/w: v1.1.1.1	f/w: 2015-08-03		Kbd: v2.15

4.10.1 Standard

This option allows the user to choose the appropriate output resolution such as 1080i/50. Once done, simply select “Save” to confirm the selected output resolution. The available resolutions are 1080i/50/59.94/60, 720p/60/59.94/50.

4.10.2 Menu Mode

The user is allowed to switch between full and simplified menu versions. Select “Advanced” for full menu display or “Basic” to display a condensed version of the OSD menu.

4.10.3 Menu Preference

In menu preference, the user is allowed to set the menu color, menu transparency level, menu size and the display position.

Menu color: the available options are blue and grey

Options of **Menu Transparency** are listed below:

0: No Transparency

1: Background 50% Transparent (buttons not Transparent)

2: All Menu 50% Transparent

Menu Size

The menu size options are:

1. Normal

2. Small (1080i Mode)

3. Large (720p Mode)

Menu Position

Menu Position gives the user ability to select several positions for the Menu area on the Screen. The current options are Centre, Top, Left, Right and Bottom.

4.10.4 Auto Save

When enabled, your last settings will be automatically saved before the machine is shut down. At the next boot, the machine will automatically load the last saved settings. In addition, a Still Load will cause the auto save to occur.

4.10.5 Factory Default

Reset: This option resets the machine to the factory default settings.

4.10.6 Reset Names

This resets the Multiviewer labels (Input 1-4) to their default settings.

4.10.7 Language

The available languages for OSD menu are English, Traditional Chinese and Simplified Chinese.

4.10.8 Software

This option is only available when the USB storage device containing the latest firmware file is inserted. Select Upgrade to start the firmware upgrade process. Refer to the [FIRMWARE UPGRADE](#) section for more details.

At the bottom of the menu, you will be able to view the version number of the latest firmware installed.

Chapter 5 Applications

5.1 Chromakeyer

Performing the configuration steps below will allow you to press KEYER PGM or KEYER PVW buttons to directly preview the keyer effect.

1. Set up studio equipment including lights and the backdrop (Green/Blue).
2. Press the “MENU” button to open the Keyer Setting Menu.

Keyer	Keyer	Chroma	Self	Priority	Top
	Keyer Ctrl	Lift 0%	Gain 1.0	Opac	100%
	Key Source	Input 1	Fill Black		
	CK Setup	CK Auto	Hue 140	Luma	101%
		K Range 160	K Fgnd 10%	K Bgnd	90%
		Hi-Light 0%	Lo-Light 0%	Bg-Supp	OFF
	Mask	Left 0%	Right 0%		
		Top 0%	Bot 0%		

3. Select “Chroma” and “Split” under the “Keyer” sub-option.
4. Select the camera signal to be chromakeyed under the “Key Source” sub-option.
5. Adjust the left, right, top and bottom values of the “Mask” sub-option to set the chroma key range based on the green or blue backdrop size.
6. CK Setup
 - Key Range defines a color range close to the color (blue/green) of the studio backdrop.
 - Key Foreground adjusts the opaqueness and transparency.
 - Key Background adjusts the chromakey performance to achieve perfect chromakeying.
 - Hi-Light and Lo-Light adjust luma value of the chroma key.
 - Bg-Supp removes foreground and background luma (brightness) from the final image.
7. Chroma Key setting is complete.

Remarks: The SE-650 is equipped with auto chromakeying function so if after following the above steps, a clean chromakeying effect cannot be achieved, you may first use the CK Auto function under the CK Setup sub-option and then fine-tune other parameters to achieve perfect chromakeying.

5.2 Logo Insertion

The SE-650 allows the user to place a logo on the video by enabling the logo feature. First of all, create a 1920x1080 (16:9) logo against a black or white background on a laptop. Once the logo is created, please follow the steps outlined as follows to insert the logo layer.

Note: If the logo is dark, choose a white background; if the logo consists primarily of bright colors, choose a black background.

1. Connect the laptop to one of the switcher’s HDMI input ports, for example **HDMI Input Port 1**.
2. Switch the Program View to the HDMI input 1 (laptop source) and you will see that the logo is displayed on the Program OUT.

Note: Please make sure PIP, keyer and logo are turned off.

3. Press the **MENU** button to open the OSD menu on the Multiview display.
4. In the **Stills** option, browse to **Grab Still** and select **GRAB** to grab the logo to a desired location, for example **Still 2**.

Note: You are allowed to select a location for Grab/Save/Load Still features. The Stinger (Clip) feature does not allow you to select the destination, which is fixed to Still 2 only.

5. Browse to **Save Still** after the logo is grabbed and save **Still 2** to a memory location on the machine.

Note: To make sure the saved logo will be loaded to **Still 2** on the next machine boot, before rebooting your machine, please first go to **Load Still** and load the logo saved at Step 5 to **Still 2**.

6. Browse to the **Logo** option and select **Still 2** as the logo source (**Logo Src**). **Logo Fill** should be assigned to **Still 2** as well.
7. In the **Logo** sub-option, select keyer type as **Luma** and **Self**. The recommended **Lift** is 0% and **Gain** is 2.0.
8. After the logo is successfully configured, pressing the **Logo ON/OFF** button allows you to turn ON/OFF the logo. Once enabled, the logo will appear on the **PVW** and **PGM** views at the same time.

5.3 Still Images

This section will show you how to import still images from the PC to the switcher and load the imported file to the switcher. You are also allowed to export still images from the switcher to the PC for file editing.

5.3.1 Export/Import Still Images to/from the PC

The switcher's Image Import/Export software (**SwitcherImagelmEx_vx.x.x.msi**) allows the user to import still pictures from the PC to the designated Still number of the switcher and vice versa. **The software installation package can be downloaded from the product page.** Features of the Import/Export software are listed as follows:

- Supported file formats are BMP, JPG, PNG, and PIC.
- Minimum resolution is 1280 x 720.
- Independent exported still pictures in BMP format.

Please follow the steps below to set up the system before installing the software.

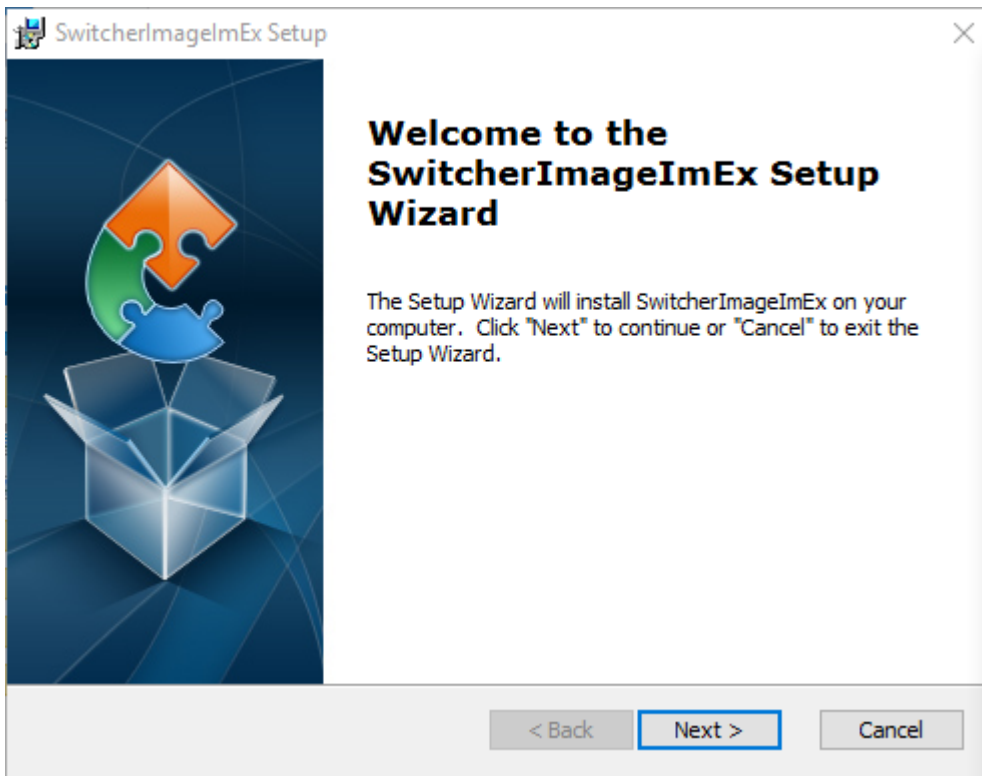
- First connect the SE-650 to a Windows computer using an RJ-45 Ethernet cable.
- Since the SE-650 has a default IP address of 192.168.1.101 so the computer should be given the IP settings that match the same IP range as the switcher.
- Turn on the Windows computer and manually set the IP to 192.168.1.X within the **Windows Network and Sharing Centre**.

After the connection is successfully established, the system setup is complete. Now install the **Switcher Image Import/Export utility** on the computer.

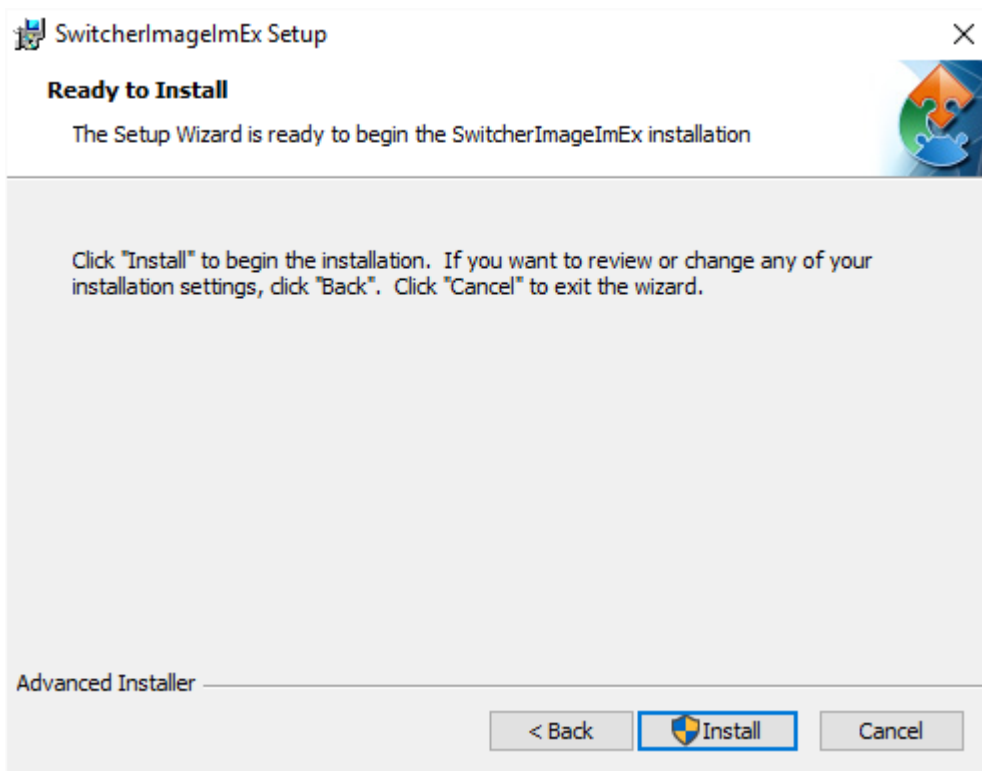
Installation

1. Download **SwitcherImagelmEx_vx.x.x.msi** from the product page and save it on the local disk.

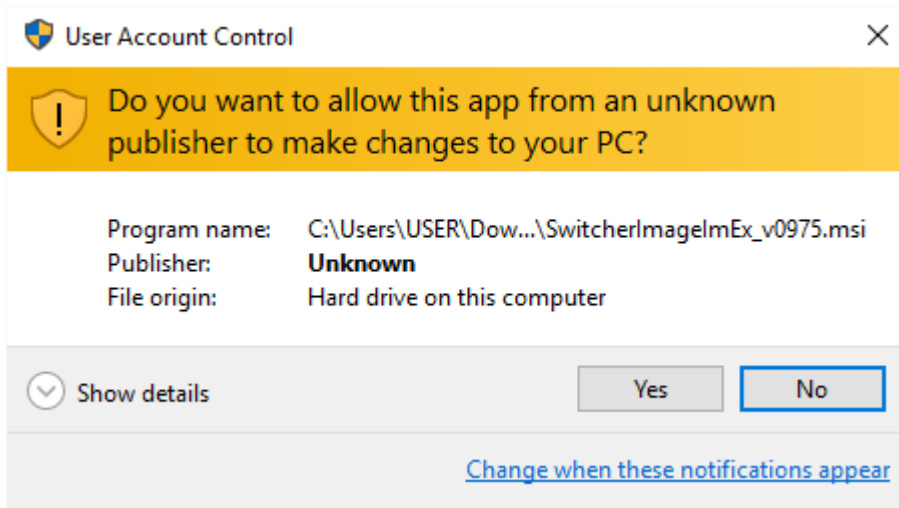
2. Click the installation file icon to start the Setup Wizard.
3. Click **“Next”**



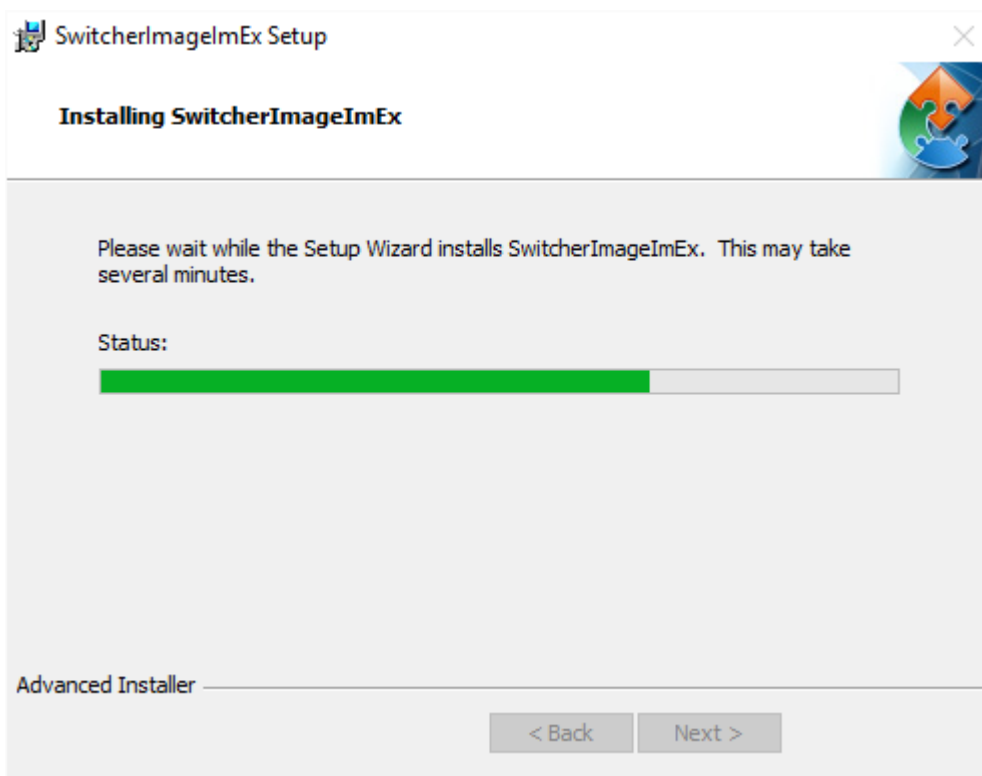
4. Click **“Install”**



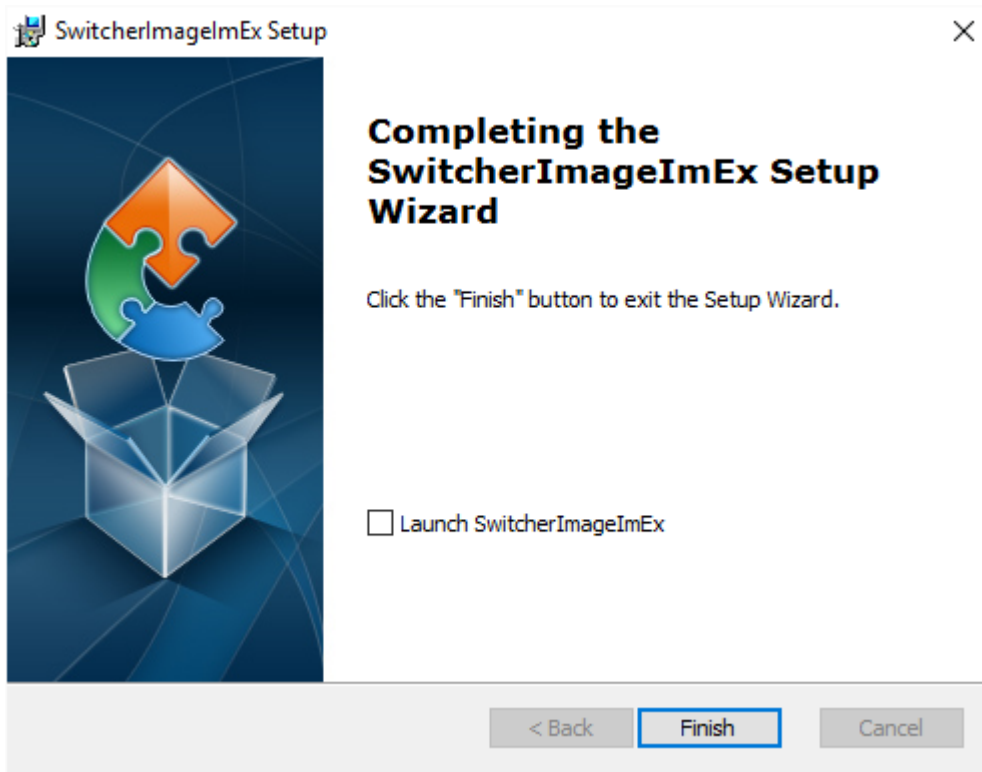
5. When you see the safety warning requesting for permission to allow an unknown publisher to make changes to the PC, please click **“Yes”** to continue.



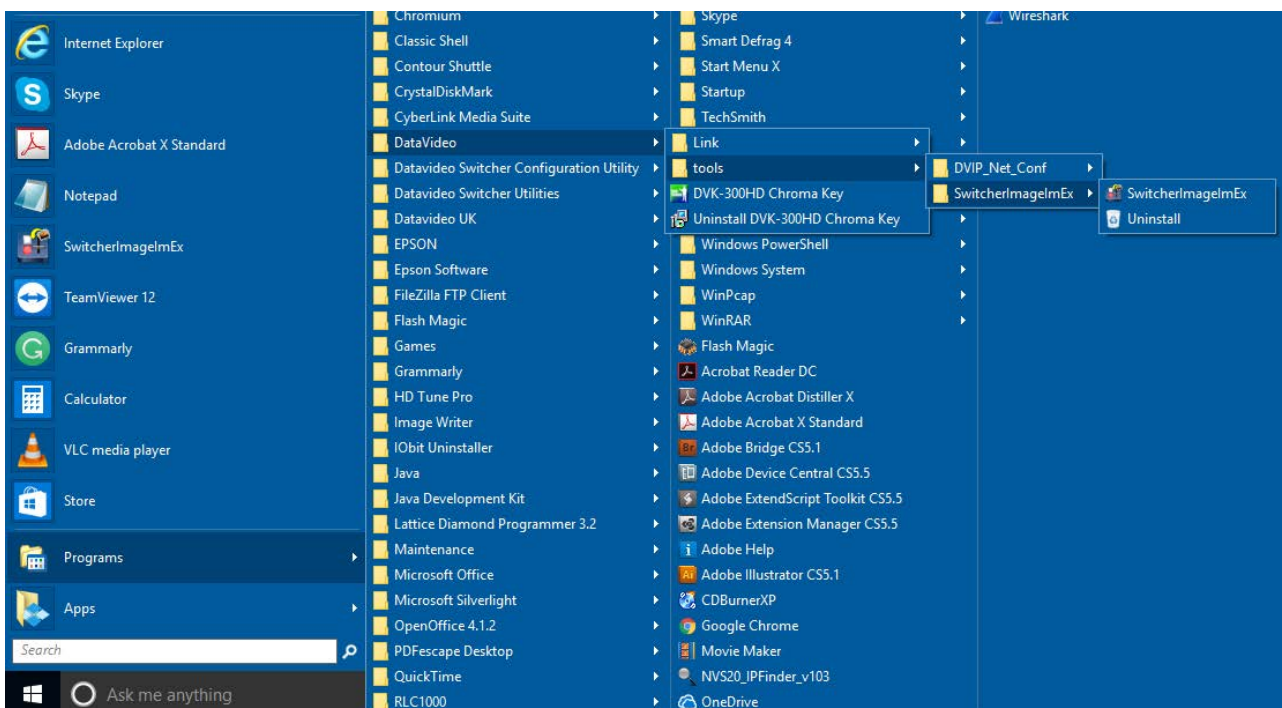
6. Wait for the installation to finish.



7. After the setup is complete, you will see the following window; click "Finish" to launch SwitcherImageImEx immediately.



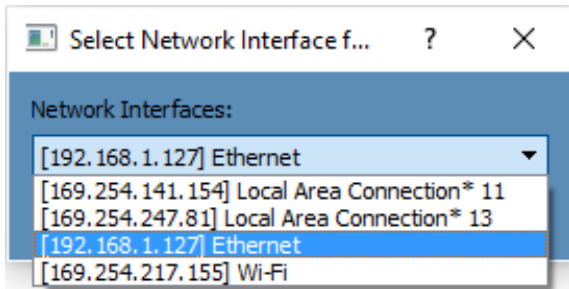
- After the setup is finished, a shortcut will be created in Start Menu > Programs > datavideo > tools > SwitcherImageImEx



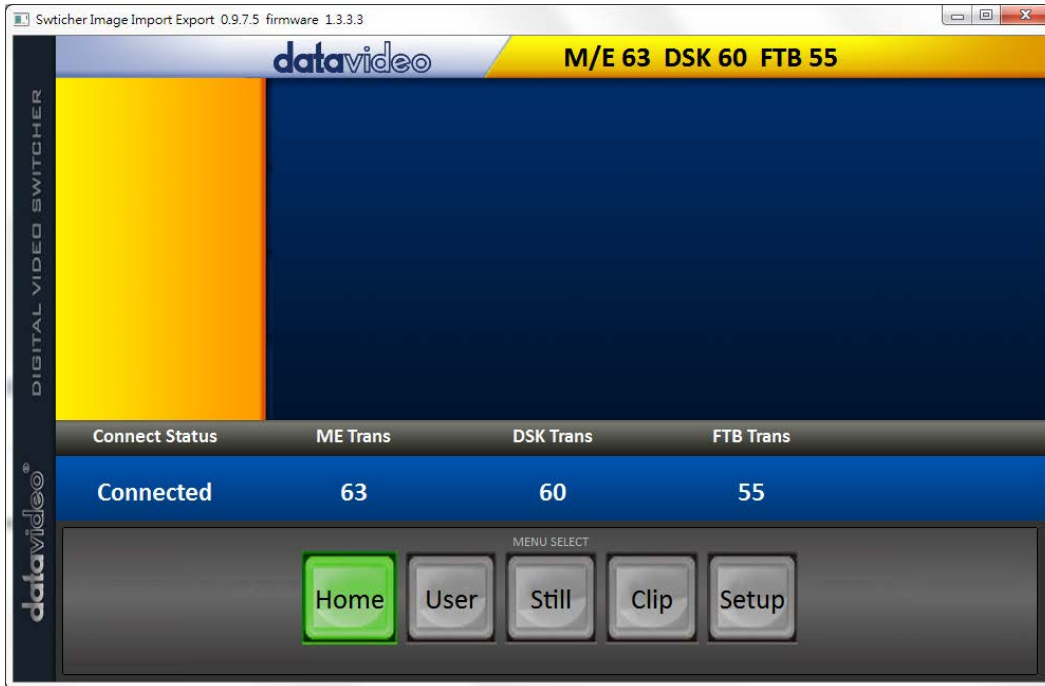
- Click SwitcherImageImEx to open the program.

How to use

- When the program is executed for the first time, it will automatically scan the network and if multiple network interface cards are found, please select the card that is on the same network as the device.



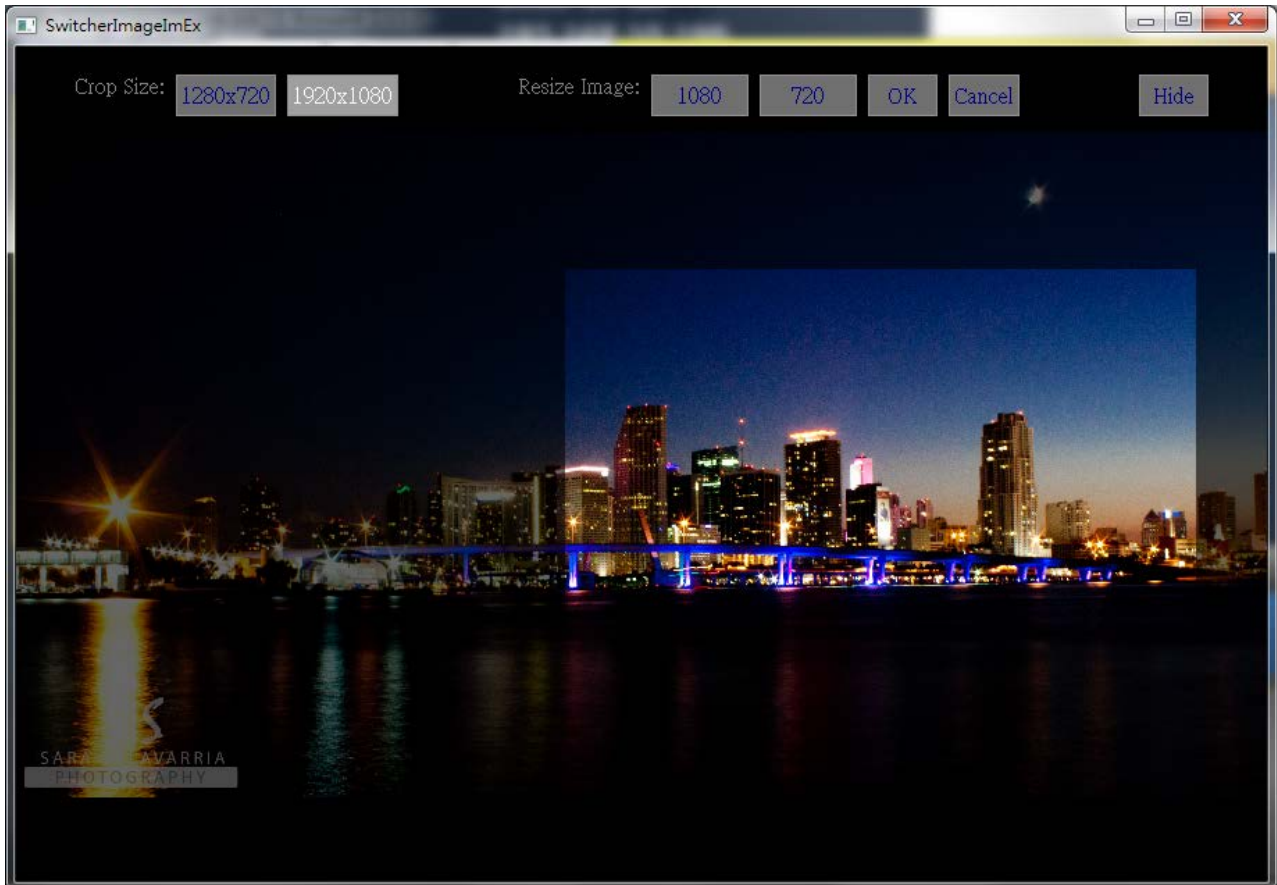
- If the available device is scanned and found, the connection will be automatically established. After the connection is successfully established, the **Connect Status** will show **“Connected”** (will display **Not Connected** if disconnected).



- After clicking the **Setup** button, the network information will be displayed in the blue area (identical to the SE-1200 MU user control interface).



4. After clicking **Import-Export**, you will be able to see four options which are **Import Still**, **Import User**, **Import Clip** and **Export**.
5. When in Import Still, click a Still number first and enter a location for storing the still. Then click Import Still again, the interface for selecting picture files will appear. If the selected picture is not 1920x1080 or 1280x720, the following interface will be displayed to allow you to crop or enlarge the picture.



Crop Size: Select the right crop

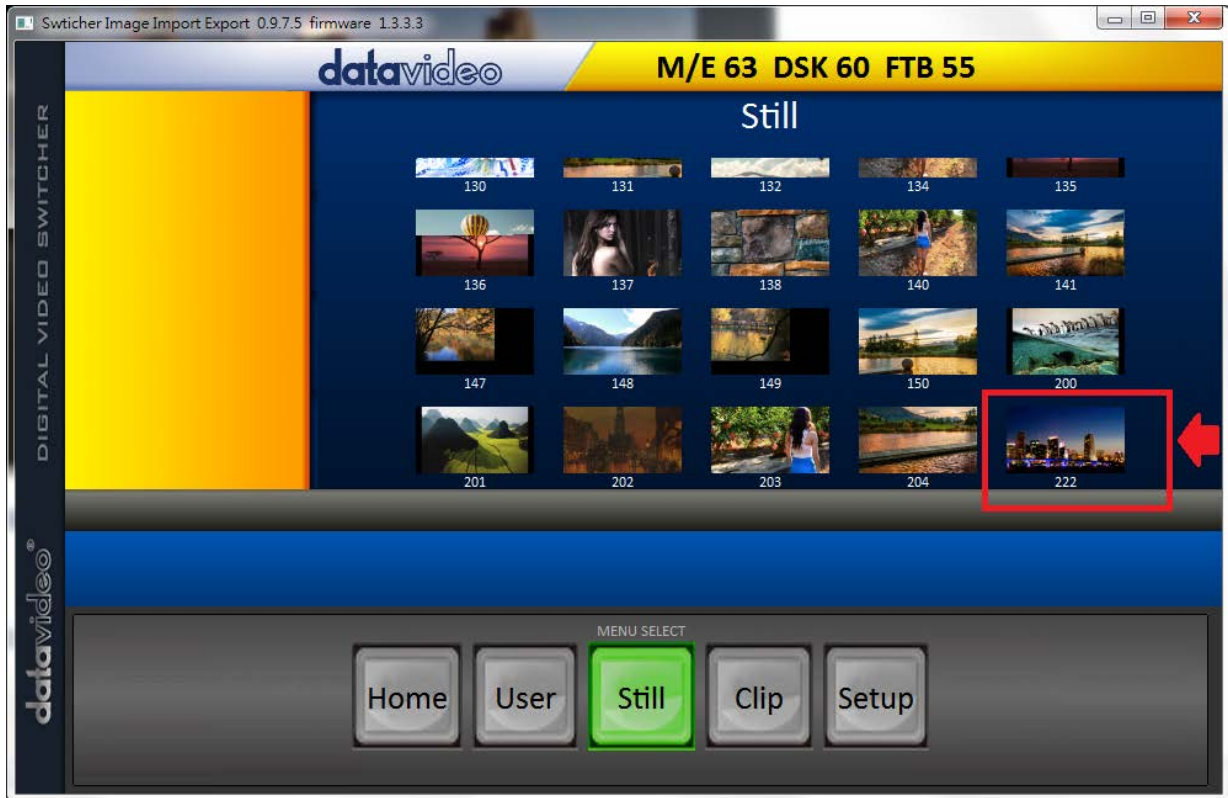
Resize Image: You will be allowed to select two sizes, large (1080) or small (720), and zoom the picture to 1920 x 1080 or 1280 x 720.

OK: Confirm the setting and apply in the switcher.

Cancel: Cancel the selection

Hide: Hide the interface

6. After the right crop is selected or the resolution is correctly configured, the new settings will be automatically applied to the switcher. To confirm, click the **Still** button on the **MENU SELECT** pane to view the thumbnails.



In addition to still picture import and export, the user is also allowed to import and export user memory slots to and from the PC. The **Import User** has the identical steps; select .mem file to import. The **Import Clip** allows the user to import the clip sequential files from the PC. The sequential files are numbered using the last five characters. Select one file and the system will automatically grab the file and the rest after that. The supported clip file formats are **BMP, JPG, PNG and PIC** and the optimal resolution is 1920 x 1080.

The software supports multiple languages which are English, Traditional Chinese and Simplified Chinese.

Note: The latest software version can be downloaded from the product page. To update the software, it is recommended to remove the existing program first. Click “**Start Menu > Programs > datavideo > tools > Uninstall**” to remove the program. If the program is not removed, the user will be prompted that the PC already contains the same program during the reinstallation process. Click “**Remove**” to remove **SwitcherImageImEx** from your computer.

5.3.2 Loading still images

The SE-650 allows the user to load still images saved on the machine to the Multiview screen. Please follow the steps outlined below to load the still picture.

1. Press the **MENU** button to open the OSD menu on the Multiview display.
2. Open the **Stills** menu option as shown below.

Stills	Load Still	Load Thumbnail Picture - 1	Still Num 10 Thumbnail Picture	Still 1 Thumbnail Picture + 1

	Save Still	Save	Still 1	Still Num 10
	Grab Still	Grab	Still 1	
	Freeze	1 Live	2 Live	3 Live
		4 Live		

- In the **Load Still** sub-option, first select the still picture that you would like to load (**Still Num**). The still picture preview is shown in the row right below the **Load Still** row.
- Select **Load** to load the still picture to one of the following destinations:
 - Still 1
 - Still 2
 - Input 4
 - Input 3
 - Input 2
 - Input 1

5.4 Stinger Transition Effect

The Stinger Transition Effect is basically an animated effect added during transition of two video sources. The animated effect is generated by a clip file which consists of a series of sequential files in **bmp/jpg/png/pic** formats. In this section, you will be shown how you can load the existing clip on the switcher, and import the clip to the switcher from the PC.

5.4.1 Loading the existing Clip for Stinger Transition Effect

The SE-650 allows you to generate the stinger transition effect. To do this, the user should first load the clip saved on the machine to the **Still 2 window** of the Multiview screen first. Please follow the steps outlined below to load the clip.

- Press the **MENU** button to open the OSD menu on the Multiview display.
- Move to the **User Mems** menu option as shown below.

User Mems	Load Mem	Memory 13	Load	
	Save Mem	Memory 13	Save	
	Load Clip	Load	Clip 0	
		Thumbnail Picture - 1	Thumbnail Picture	Thumbnail Picture + 1

- In the **Load Clip** sub-option, first select the clip that you would like to load. The **Clip Preview** is shown in the row right below the Load Clip row.
- Select **Load** to load the clip to the **Still 2 window**. The load progress prompt "**Loading Clip XX/XX ...**" will appear. Once loaded, the previously displayed video or image will be replaced.

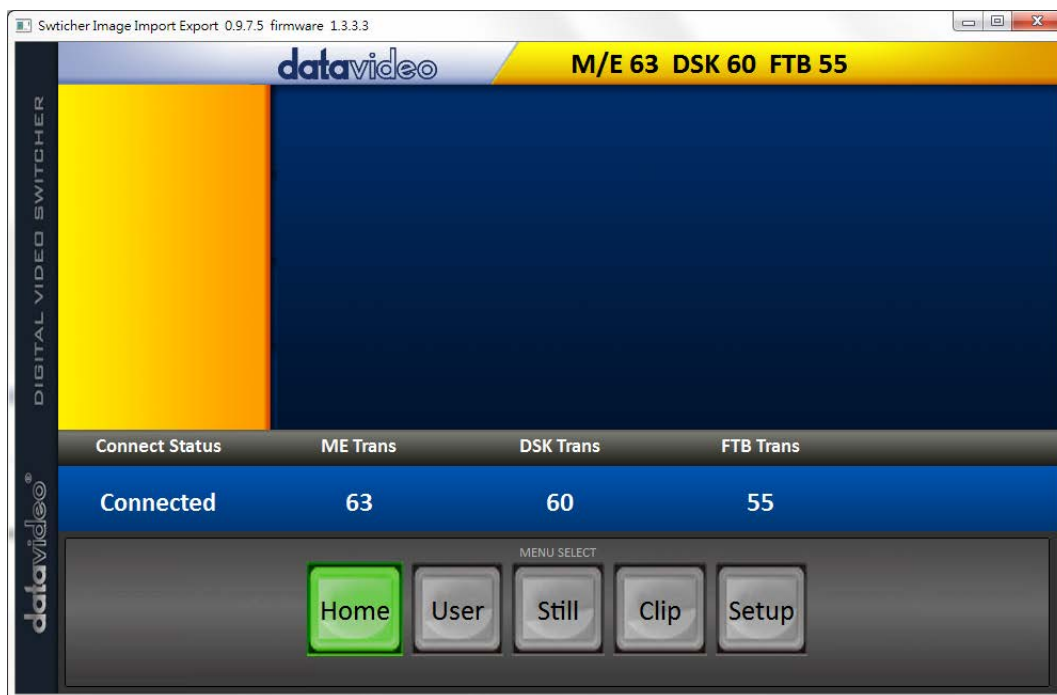
Note: The load process can take up to tens of seconds.

- To enable the Clip or Stinger transition mode, please press the **MIX** and **WIPE** buttons at the same time.

5.4.2 Importing the Clip for Stinger Transition Effect from the PC

On the SE-650, you will be able to add a clip between sources. Besides using the existing clips on the machine, you are also allowed to import your own clip (a series of **bmp/png/jpg/pic** files) to the SE-650 from the PC using the **Switcher Image Import/Export utility**, which can be downloaded from the SE-650 product page.

- First connect the SE-650 to a Windows computer using an RJ-45 Ethernet cable.
- Since the SE-650 has a default IP address of 192.168.1.101 so the computer should be given the IP settings that match the same IP range as the switcher.
- Turn on the Windows computer and manually set the IP to 192.168.1.X within the **Windows Network and Sharing Centre**.
- Now install the **Switcher Image Import/Export utility** on the computer.
- After the utility is installed, click and open the user interface as shown below.

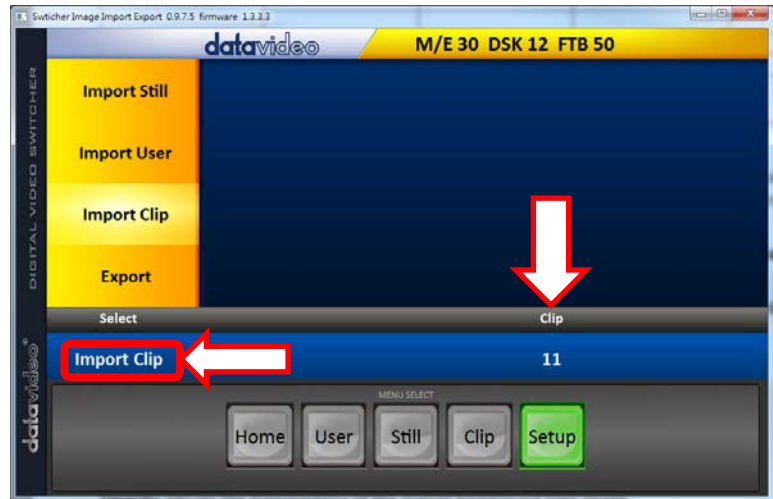


Click **Setup** on the **MENU SELECT** pane and if the connection between the SE-650 and the PC has been successfully established, you will be able to see the network information of your switcher.

Select **Import-Export** from the yellow menu options.



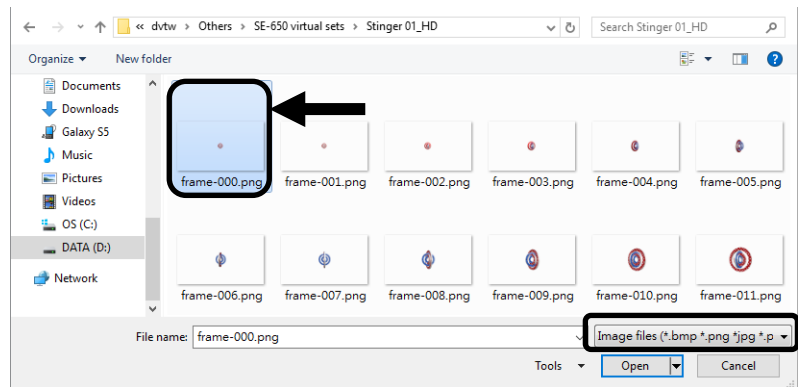
The clip number allows you to select a location where you can save the clip. To import a clip from the computer into the SE-650, select **Import Clip**.



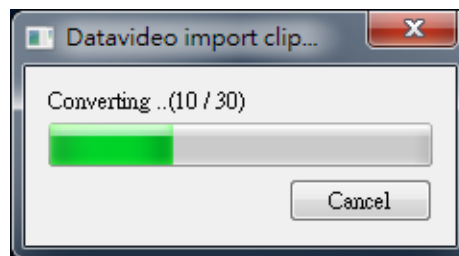
Note: The **Switcher Image Import/Export utility** does the conversion from bmp/png/jpg to the .pic file format. All you need is to give the utility a starting file location and it will give the utility an idea where to start linking all images up into a sequential animation file.

Importing Clips

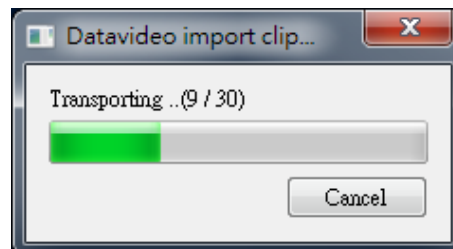
Select “**Import Clip**” will open a file browser window. Browse to the directory where your clip files are saved and then select the file at the zeroth location, in our example on the right, the file name is **frame-000.png**.



Click **Open** to start the clip import. If your files are not the .pic format, they will be automatically converted to .pic format by the **Switcher Image Import/Export utility** first.



After the file conversion, the clip import will then start. After the import is complete, the progress dialog will be automatically closed.



Note: Clip Conversion and Clip Import have progress dialogs that show progress & number of frames done. These dialogs also have a cancel button which allows the user to cancel the import at any stage. If the import is cancelled, then the partially imported data will be deleted.

5.4.3 How to Create the PNG Sequence for Stinger Transition Effect

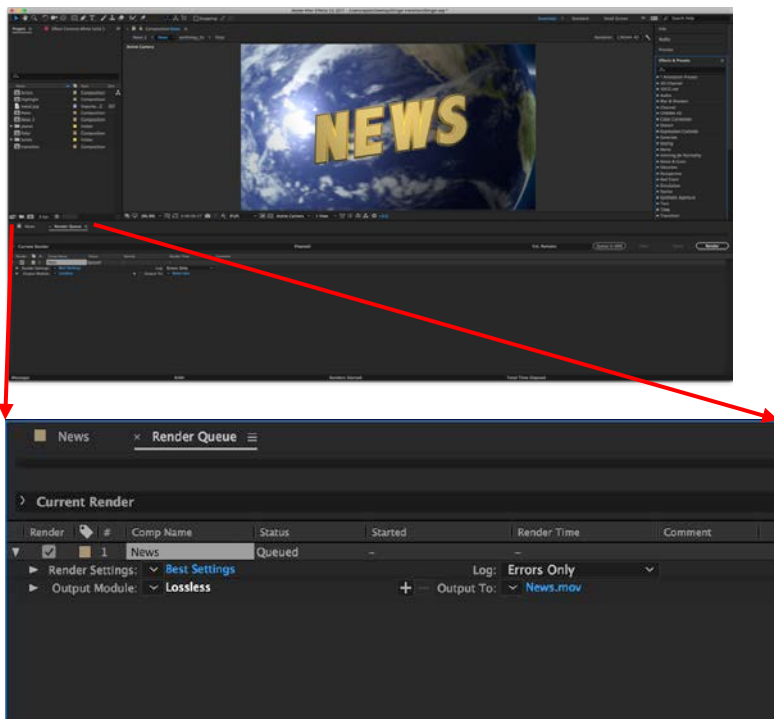
Adobe After Effects is a motion graphics application that can be used for creating the clip file for stinger transition effect. After the clip file is created, there are two ways to convert the file to the PNG sequence format readable by the SE-650 switcher in Adobe After Effects. In this section, we will show you how you can create the PNG sequence for the Stinger transition effect.

Adobe After Effects

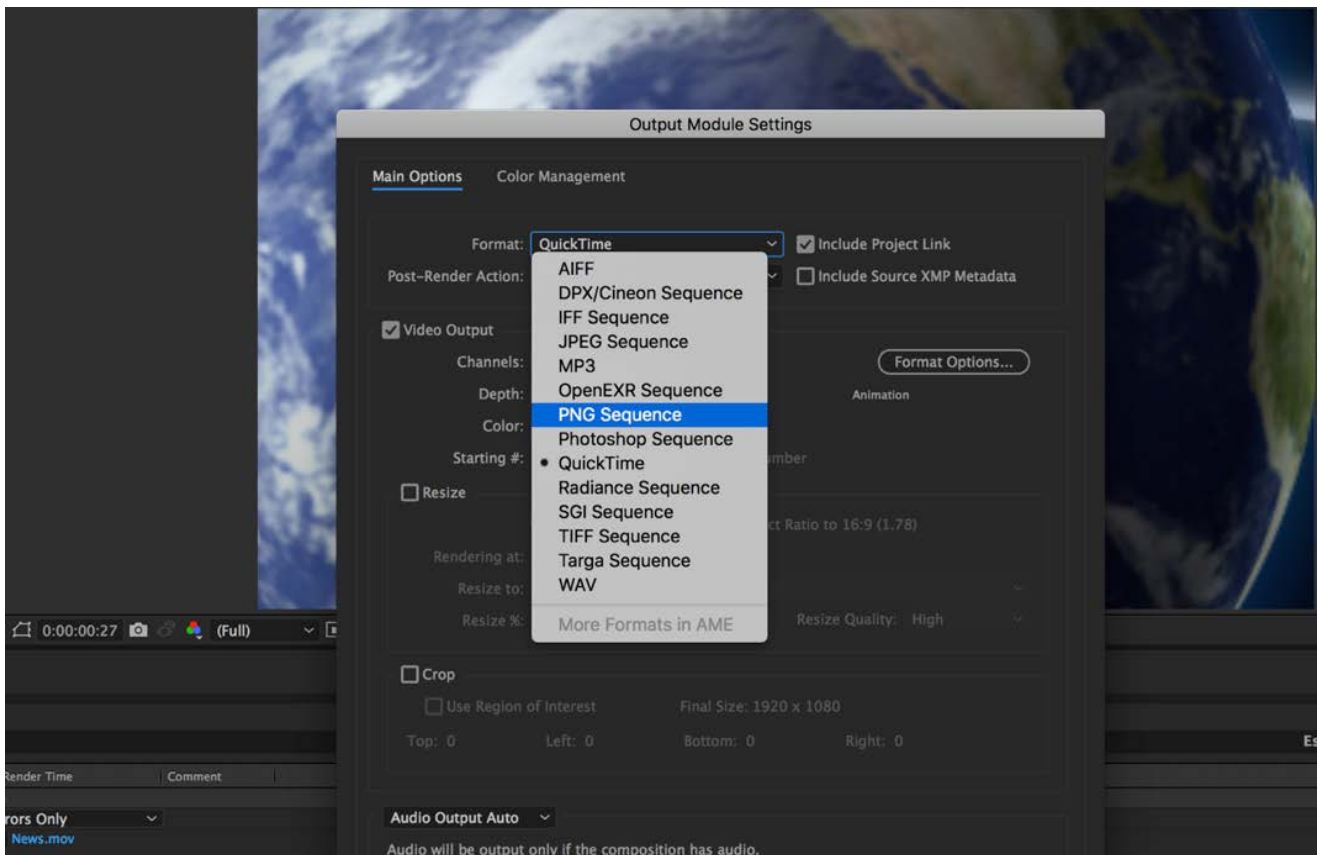
1. Click **File** → **Export** → **Add to Render Queue** (or alternatively, you can also click **Composition** → **Add to Render Queue**).



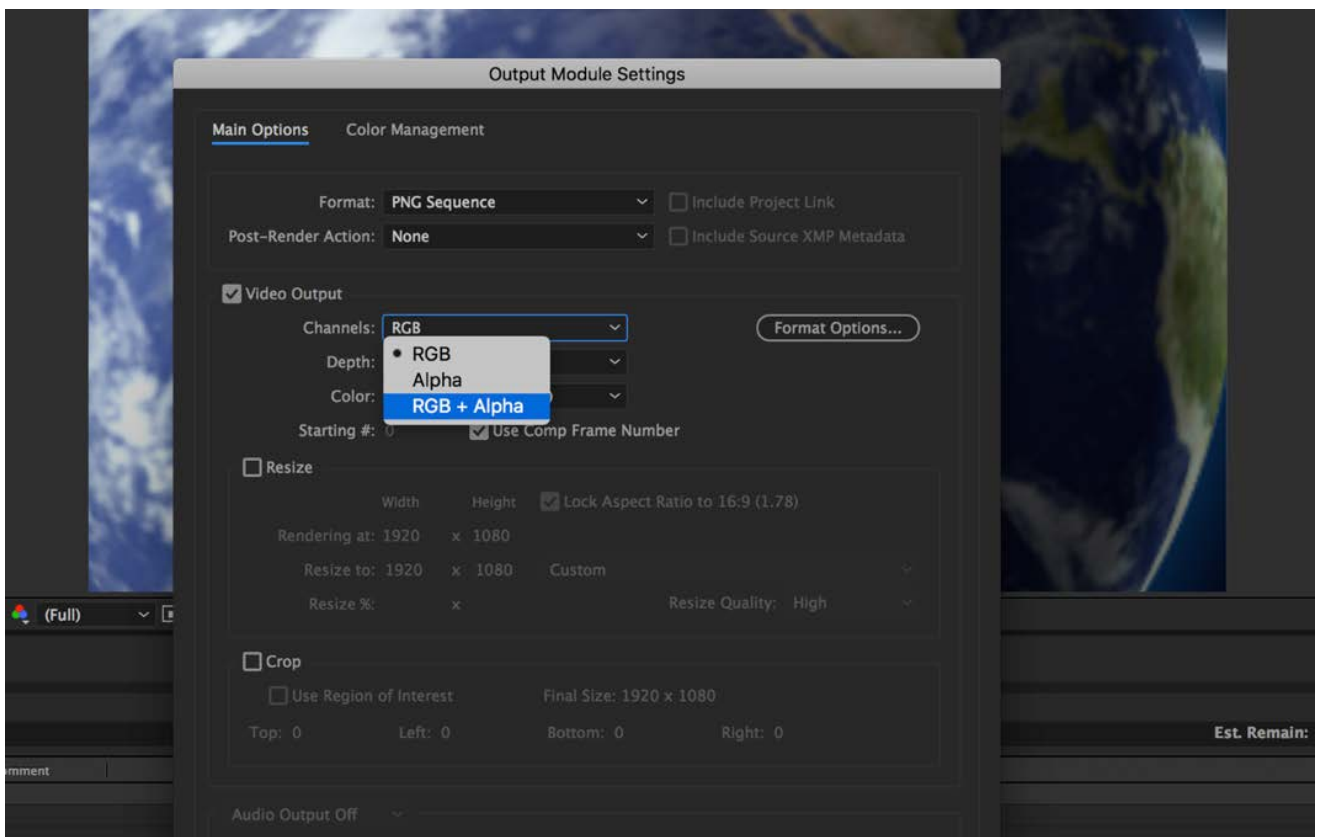
2. The Render Queue will be displayed in the bottom pane.



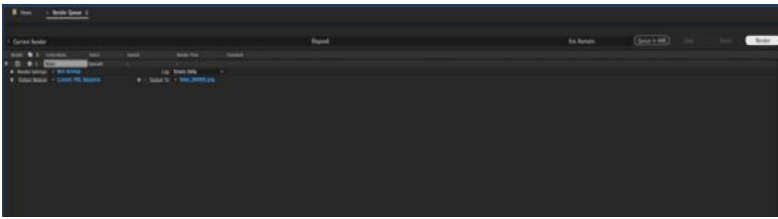
3. Click **Output Module** and on the **Main Options** window, click the **Format** dropdown list and select **PNG Sequence**.



4. Click the **Channels** dropdown list and select the **“RGB + Alpha”** option.



5. Click **“Output To”** and then change the location where your files are rendered. Click **Render** after that.



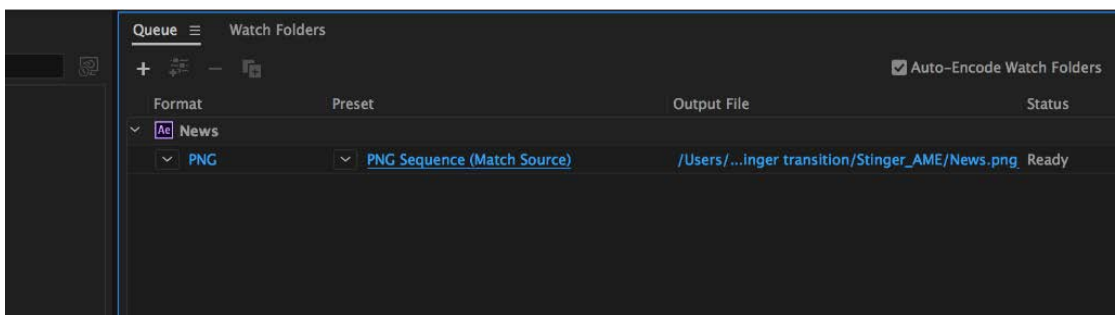
The next section outlines the file conversion procedure using the **Media Encoder CC**.

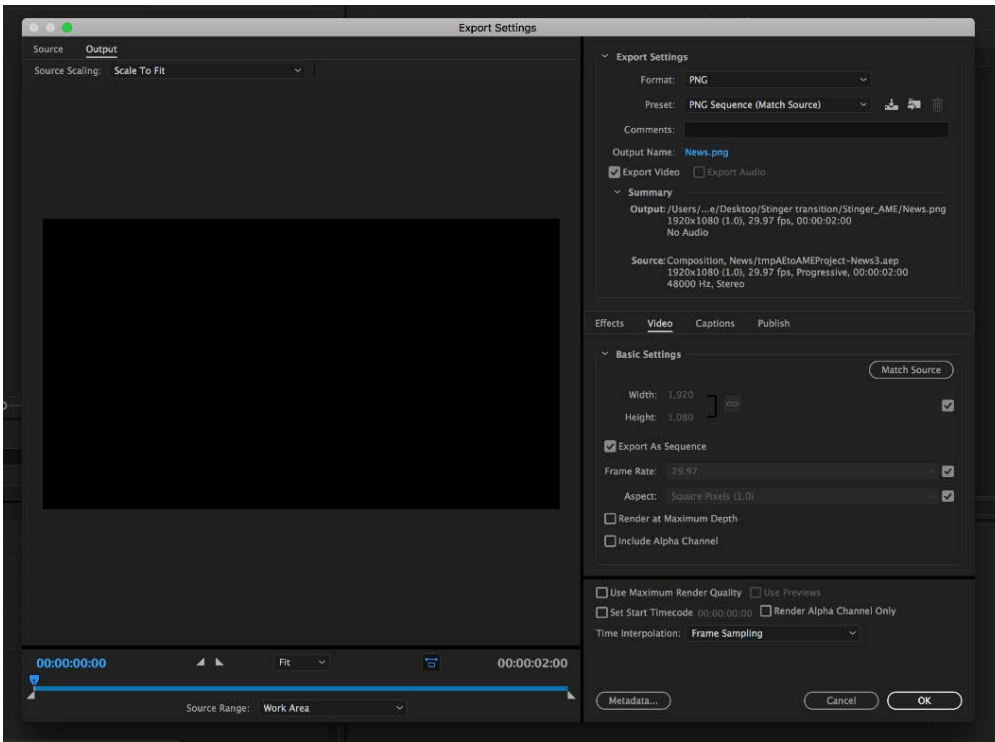
Media Encoder CC

1. Click **Composition → Add to Media Encoder Queue** (or alternatively, you can also click **File → Export → Add to Media Encoder Queue**).

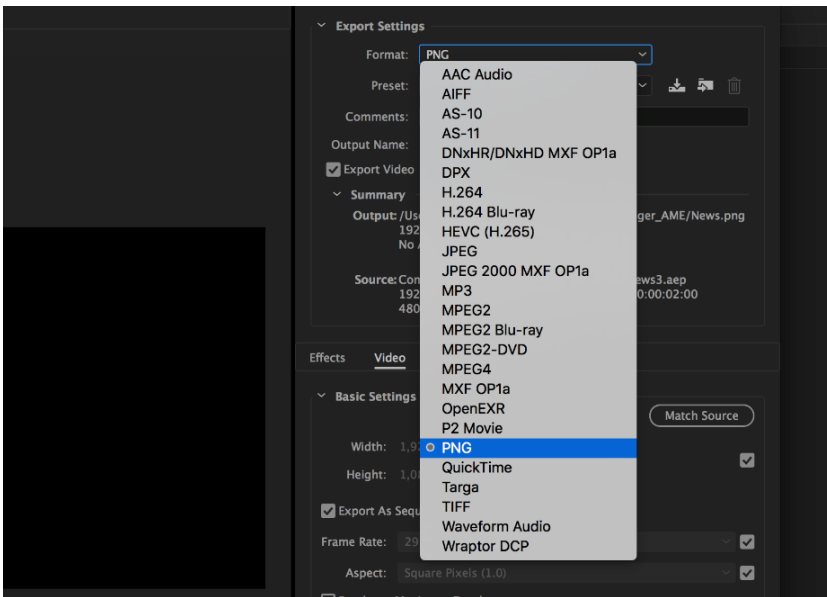


2. Click blue fonts in **Format/Preset** fields to open the **“Export Settings”** window.

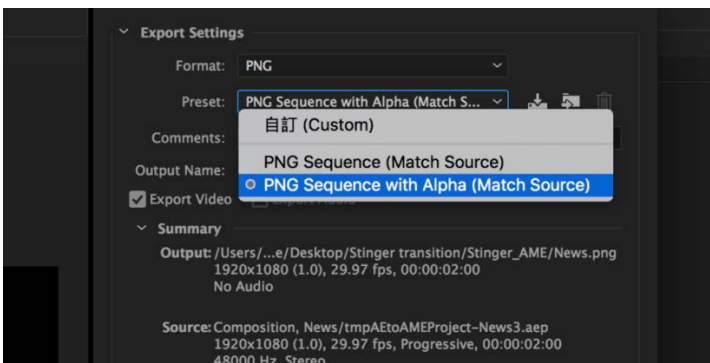




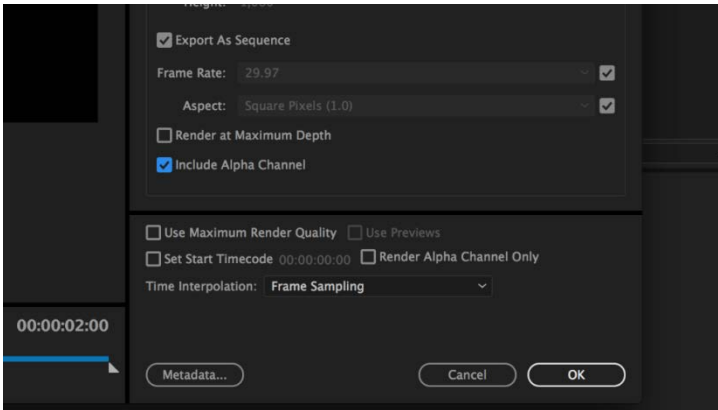
3. Click the **Format** dropdown list and then select **PNG**.



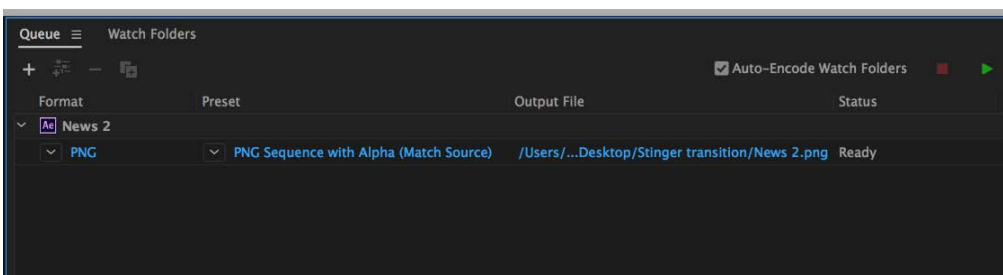
4. Click the **Preset** dropdown list and select “**PNG Sequence with Alpha.**”



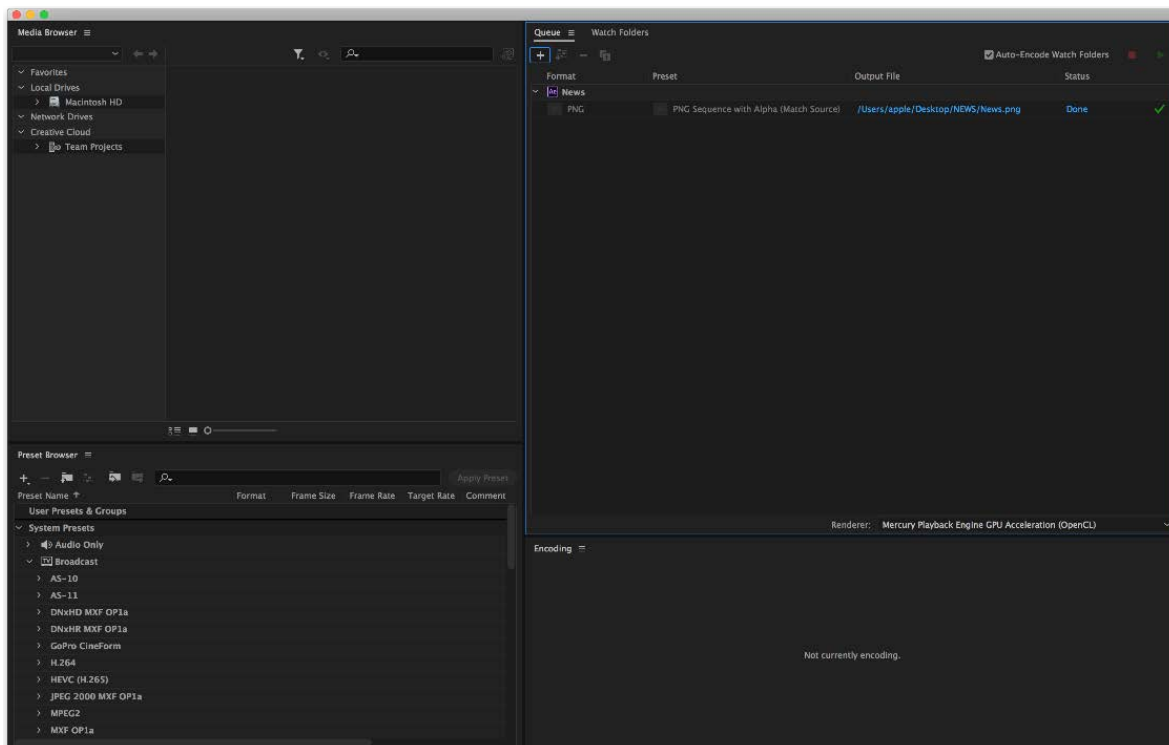
5. Make sure **“Export As Sequence”** and **“Include Alpha Channel”** are checked and then click **OK**.



6. Select **“Output File”** to choose the render files destination. Click the green button to render.



7. Once completed, the status will display **“Done.”**



After the sequential files are created and ready, see section 5.4.2 to import the Clip file to the switcher.

5.5 User Memory

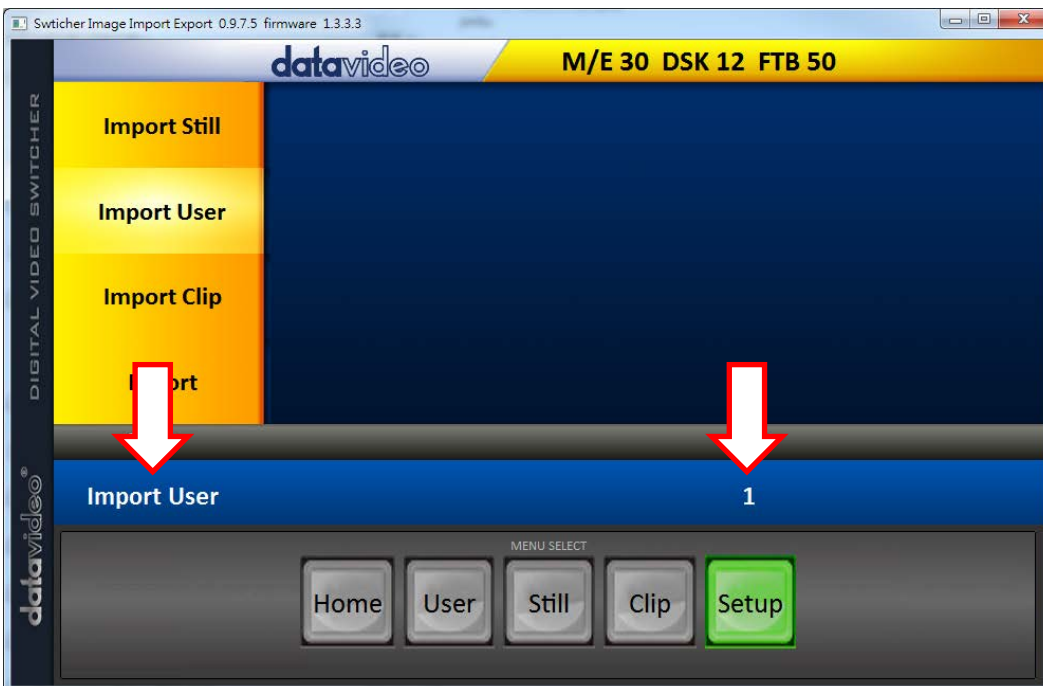
The user memory allows the user to save the current switcher settings to different presets. You will be able to import/export these memory presets from/to the PC. In this section, we will show you how you can import and export these user memory presets step by step.

5.5.1 Export/Import User Memory Preset to/from the PC

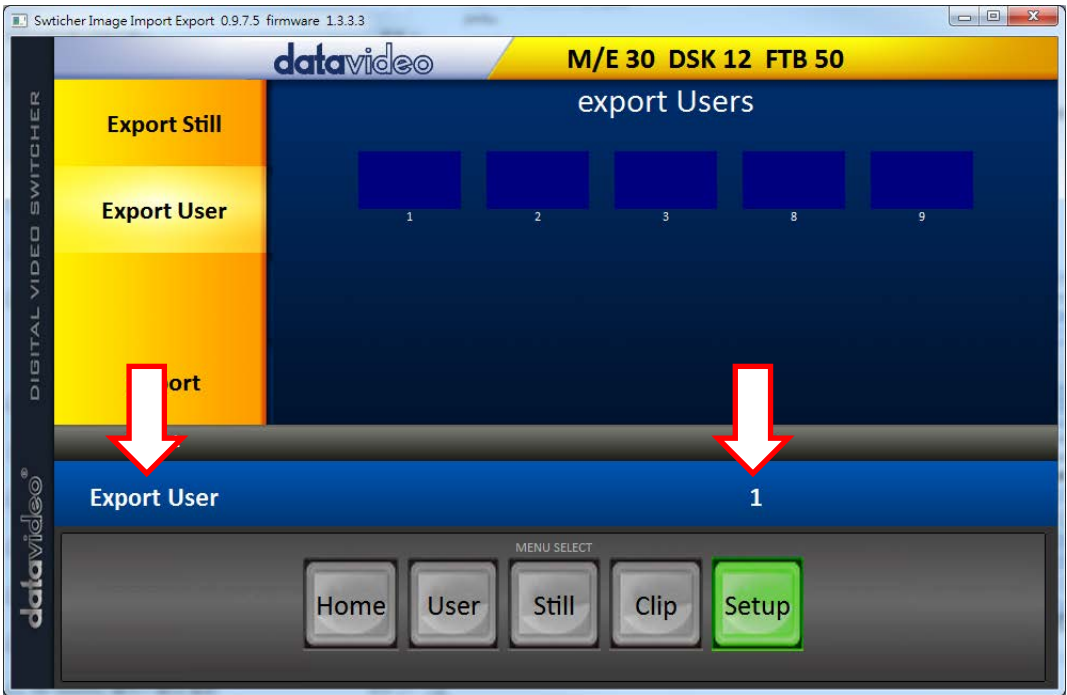
1. On the **Switcher Image Import/Export** interface, click **Import-Export**.



2. After entering the **Import-Export** option, first select a preset number in the **User** option and then click "Import User."



3. As soon as “**Import User**” is clicked, the PC hard disk browser window will open; select a .mem file to import a user settings file.
4. To export, simply click “**Export**” and the following window will open; select a preset number to export the user settings to the PC in .mem file. Click “**Export User**” to open the file browser window.



5. On the PC hard disk browser window, select a directory in which the .mem file can be saved.

5.5.2 Loading User Memory Preset

The SE-650 allows the user to load user memory presets saved on the machine to the Multiview screen. Please follow the steps outlined below to load the user memory preset.

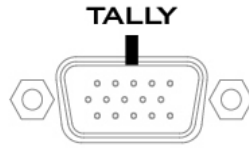
1. Press the **MENU** button to open the OSD menu on the Multiview display.
2. Open the **User Mems** menu option as shown below.

User Mems	Load Mem	Memory	13	Load	
	Save Mem	Memory	13	Save	
	Load Clip	Load		Clip	0
		Thumbnail Picture - 1		Thumbnail Picture	Thumbnail Picture + 1

3. In the **Load Mem** sub-option, first select the **Memory Preset** that you would like to load (**Memory**).
4. Select **Load** to load the preset settings to the machine.

Chapter 6 Appendices

Appendix 1 Tally Outputs



The SE-650 has a D-sub 15 pin female tally output port. These connections provide bi-colour tally information to a number of other Datavideo products, such as the ITC-100 eight channel talkback system and the TLM range of LCD Monitors. The ports are open collector ports and as such do not provide power to tally light circuits.

The pin outputs are defined as follows:

PIN No.	Signal Name	Input/Output	Description of Signal
1	Program 1	Open collector output	Tally output of input video Program 1
2	--	--	No Function
3	Preview 1	Open collector output	Tally output of input video Preview 1
4	RCOM (GND)	Ground	Ground
5	Program 4	Open collector output	Tally output of input video Program 4
6	Program 2	Open collector output	Tally output of input video Program 2
7	--	--	No Function
8	Preview 2	Open collector output	Tally output of input video Preview 2
9	GND	Ground	Ground
10	--	--	No Function
11	Program 3	Open collector output	Tally output of input video Program 3
12	--	--	No Function
13	Preview 3	Open collector output	Tally output of input video Preview 3
14	YCOM (GND)	Ground	Ground
15	Preview 4	Open collector output	Tally output of input video Preview 4

Appendix 2 Firmware Upgrade

Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. Customers can either download the SE-650 firmware as they wish or contact their local dealer or reseller for assistance.

This section outlines the firmware upgrade process which should take ***approximately 10 minutes to complete***.

The existing SE-650 settings should persist through the ***firmware upgrade process, which should not be interrupted once started*** as this could result in a non-responsive unit.

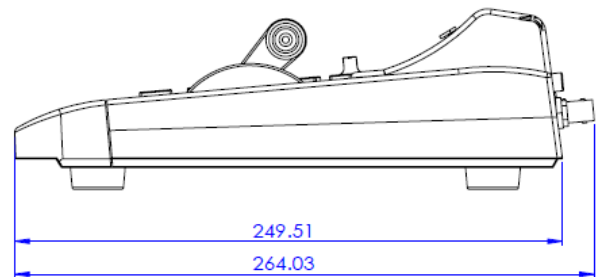
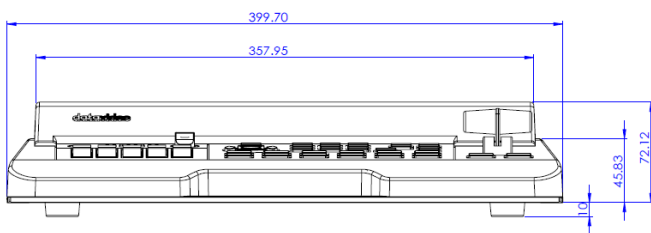
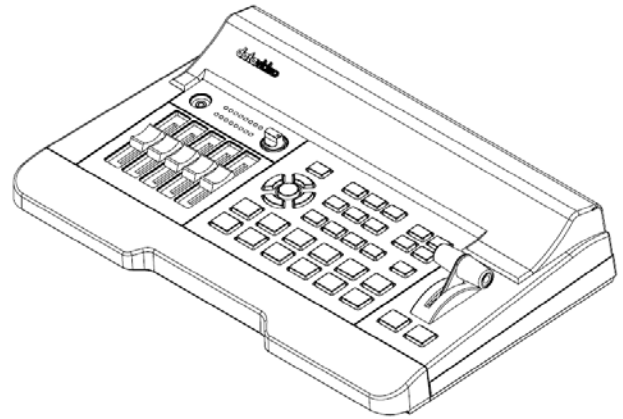
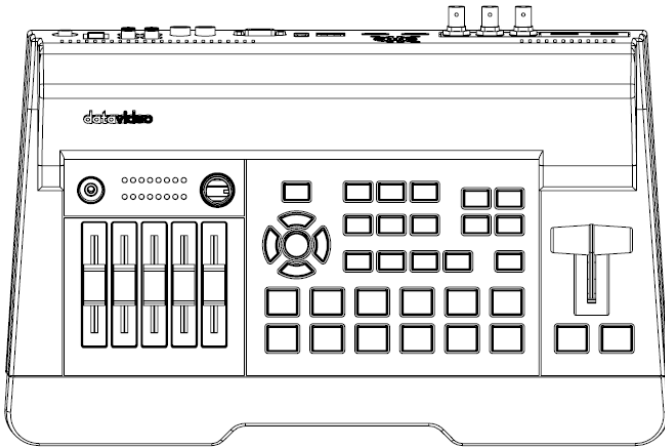
1. Please visit www.datavideo.com and download the latest version of firmware.
2. Save the latest version of firmware in the root directory of the thumb drive.
3. Connect the thumb drive containing the latest SE-650 firmware to the **F/W UPGRADE** Port.
4. Enter “**MENU**” and select “**SETUP**” option.
5. In the “**SETUP**” option, select “**UPGRADE**” and press the “**ENTER**” button to start the upgrade.
6. When the “**UPGRADE**” sub-option turns to green from red, it indicates that the firmware upgrade is complete.
7. Reboot the SE-650 to complete the firmware upgrade.

Appendix 3 Frequently-Asked Questions

This section describes problems that you may encounter while using **SE-650**. If you have any questions, please refer to related sections and follow all suggested solutions. If problem still exists, please contact your distributor or the service center.

No.	Problems	Solutions
1.	Exiting MENU immediately after the MENU is opened results in slow button response.	<p>Basically only the first menu open/exit will result in slow button response.</p> <p>Exiting MENU immediately after the MENU is opened will NOT result in slow button response if the machine is ON for at least 30 seconds.</p> <p>If slow button response is experienced, simply wait about 10 seconds for the system to restore normal operation. It is expected that the new version of firmware will correct this issue.</p>

Appendix 4 Dimensions



All measurements in millimeters (mm)

Appendix 5 Specifications

Interfaces	
Video Inputs	4 sets of input 2 x HDMI 2 x HD-SDI
Video Outputs	2 x HDMI (HDMI 1 is user assignable / HDMI 2 is Multiview) 1 x HD-SDI (User assignable)
Audio Inputs	1 x Stereo RCA (L/R) 2 x Mono Microphone De-embedded Digital Audio (2 CH)
Audio Outputs	1 x Stereo RCA (L/R) 1 x Stereo headphone (Mini Jack with volume control) Embedded Digital Audio (2 CH / Channel 1 & 2)
Tally	Yes / D-Sub 15 male connector
Software Update	USB Port
Audio Mixer	
Audio Fader	5 VR (Variable Resistor) 6 Channel (3 Pair) Audio Mixer
Audio LED Meter	2 Rows (Left/Right)
Standards	
Supported Input Format	1080p 50/59.94/60 (HDMI Only) 1080i 50/59.94/60 720p 50/59.94/60
Supported Output Format	1080i/50, 1080i/59.94, 1080i/60 720p/50, 720p/59.94, 720p/60
Internal Processing	YUV 4:2:2 10-bit
Extras	
Keyers	2 Keyers (2 Chroma Keyers); linear and luma keyers
Upstream Keyers	2 (M/E Keyer & PIP)
Chroma Keyers	2 High Quality Chroma Keyers; available in Keyer and PIP
PIP	1 x PIP with adjustable size, position, and crop. Border with adjustable width & color
WIPES	32 Wipe Patterns such as Circle and Heart. Variable border width with Softness control.
Stills	Any unused channel can also be used as a still buffer. Stills can be stored internally
Stinger Transitions	Yes
Logo	1

Service & Support

It is our goal to make owning and using Datavideo products a satisfying experience. Our support staff is available to assist you to set up and operate your system. Contact your local office for specific support requests. Plus, please visit www.datavideo.com to access our FAQ section.

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