Marshall Electronics

Model No. VSW-2200

4-Input Seamless SDI A/V Switcher

Operating Instructions

Table of Contents

IMPORTANT SAFETY INSTRUCTIONS:

The VSW-2200 4-Input Seamless A/V Switcher has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipment, the VSW-2200 should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit.
  Always unplug the power to the device before cleaning.

1. Overview

The **VSW-2200** 4-Input Seamless A/V Switcher is suitable for use in multimedia presentations, live streaming, teleconferencing, camera switching and many other A/V applications. All four inputs may be simultaneously monitored in a single "Quad-View" display. In addition to the four live inputs, the VSW-2200 can store up to four still images for use as full-screen graphics pages. Switching is seamless between video sources whether interlace or progressive, varying resolutions and differing frame rates. The embedded processor converts signals from various input source formats to match the native resolution of monitors, flat panel displays, projectors, encoders, etc. Program and Quad-view outputs are separately selectable up to 1920x1080 @ 50/60 fps. Program Output is provided in both SDI and HDMI formats while the Quad-view is output only via HDMI.

Flexible control is provided using the front panel buttons, hand-held remote, or connected to USB and Ethernet computer interfaces. The included software control application provides adjustment of Brightness, Contrast, Saturation, Horizontal and Vertical Positioning, Quad-View Layout, Labels and Borders.

2. Features

- **Seamless, glitch-free switching**
- **4x 3G- SDI Video Inputs. Accepts multiple formats, frame rates, interlace and progressive simultaneously**
- **2x Program Outputs: 1x 3GSDI, 1x HDMI**
- **1x HDMI Quad-view Preview Output**
- **Independently selectable Program and Preview Output formats**
- **Pass or mute embedded audio (2 channels, one AES pair)**

3. Package Contents

- VSW-2200 4-Input Seamless A/V Switcher
- Rack Mounting Ears Set
- 12V DC 5A Power Adapter (Universal 120 – 240V AC 50/60Hz source)
- UL AC Power Cord
- IR Remote Control
- IR Receiver Extension Cord
- Application Software CD
- User Manual

4. Specifications

Model Name	VSW-2200 4-Input Seamless SDI A/V Switcher
Video Inputs	4 x BNC (3G,HDSDI)
Input Formats Supported	480i59.94, 576i50, 720p50/59.94, 1080i50/59.94, 1080p23.98/24/25/50/59.94/60
Embedded Audio support	Pass or mute 2-channel or one 5.1 surround mix from SDI (48KHz sample rate)
Video Outputs (Program)	1 x BNC (3G, HDSDI) & 1 x HDMI
Program Output Formats	720p50/59.94/60, 1080i50/59.94/60, 1080p23.98/25/29.97/30/50/59.94/60
Video Output (Preview)	1 x HDMI
Preview Output Formats	720p50/59.94/60, 1080p23.98/25/29.97/30/50/59.94/60
Mechanical	
Housing	Metal enclosure
Dimensions [L x W x H]	**Model:** 239 x 201 x 44 mm [9.4" x 7.9" x 1.8"] **Package:** 376 x 240 x 112 mm [14.8" x 9.4" x 4.4"] **Carton:** 590 x 510 x 405 mm [1.9" x 1.6" x 1.3"]
Weight	**Model:** 1.2kg **Package:** 2kg
Mounting	1RU x ½ width case with rack mounting ears (included)
Power supply	12VDC @ 5A (included)
Power consumption	14.5 Watts Nominal
Operation Temperature	0~40°C [32~104°F]
Storage Temperature	-20~60°C [-4~140°F]
Relative Humidity	20~90% RH [no condensation]
ESD protection	Human body model - ±12kV [air-gap discharge] & ±8kV [contact discharge]

5. Basic Setup

1. Connect desired sources to SDI inputs.
2. Connect display, recorder, streaming encoder, etc. to HDMI and/or SDI Program Outputs.
3. Connect display to HDMI Quad Output.
4. Connect the included +12V DC 5A Power Supply and switch the unit to ON position.
5. Select the desired source using the front panel buttons, confirm choice with Take button (Immediate switch mode is available. See instructions below.)
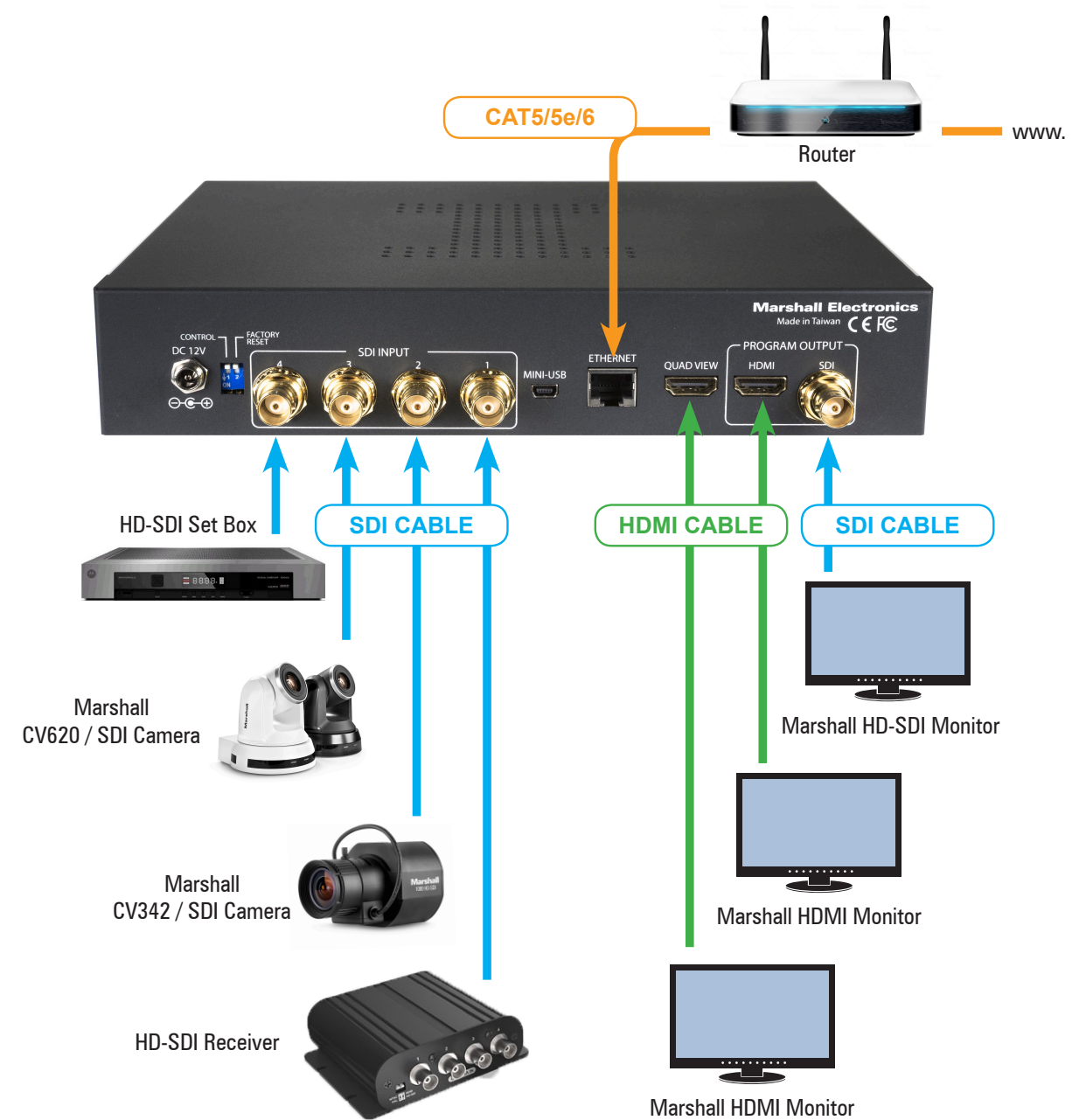
6. Using Controls & Connections on the VSW-2200

The front panel of the VSW-2200 is designed to be clean, uncluttered and easy to use. There are two operating modes: Preset/Take mode and Immediate Take mode. The factory default setting is Preset/Take mode. In this mode, the desired input source is selected by pressing one of the four numbered buttons. The light on the selected button will flash to indicate that the source is ready to Take. The Program video output will change after the Take button is pressed. Alternatively, in Immediate Take mode, the Program video output will change immediately after one of the numbered buttons is pressed.

To change modes, press and hold the Take button for at least 5 seconds. The operating mode can also be changed from a computer using the control application provided with the unit.

VSW-2200 Front Panel

1. **Power Switch:** Power On/Off.
2. **Input Select Buttons:** Select between sources 1~4.
   The button will illuminate when source is selected.
3. **Take Button:** Confirm switch to selected source (dependent upon active operating mode)
4. **Mute Button:** Mute or allow embedded audio pass through.
5. **3.5mm jack for IR Extension:** Attach IR receiver extension cable (included).
6. **IR Sensor:** Built-in IR sensor for receiving commands from the hand-held remote control.

All connections to the VSW-2200 are on the rear panel with the exception of the IR remote jack. Two types of computer control connections are provided (Mini-USB & Ethernet) as well as two types of Program outputs (SDI & HDMI).

VSW-2200 Rear Panel
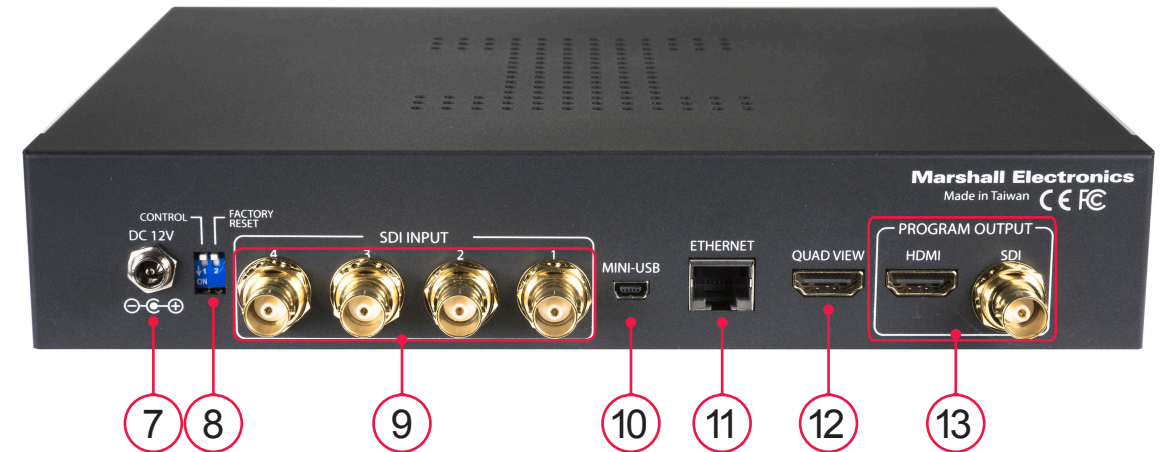
7. **+12V DC:** Connect the included +12V DC Power Supply Unit
8. **Dip Switch:** Used to switch between normal mode or factory reset mode
9. **4x 3G-SDI:** Digital video inputs for 4 source devices
10. **Mini-USB:** Connect to local computer for control, Still-Store image upload or firmware updates
11. **RJ-45 Ethernet:** Connect via Ethernet to local or networked computer for control
12. **HDMI Quad-view Output:** Provides Preview / Quad-View to external monitor
13. **HDMI & 3GSDI Output:** Provides the selected Program Output

7. Using Hand-Held Remote Control

The hand-held remote duplicates all of the functions that are available on the front panel of the VSW-2200 plus Still Store on/off and Quad-View modifications including Border, Label and Layout patterns. The Info button can be used to quickly confirm the current settings. When the Info button is pressed, a status display will appear for a few seconds on the Quad-View Preview display.
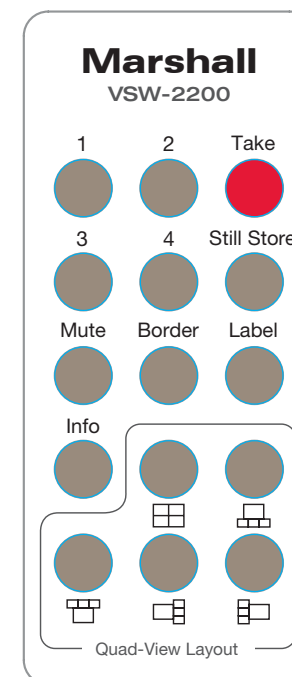
Button	Function
Take	Change Program Output*
Still Store	Turn the Still Store picture on or off
1	Select SDI Input 1
2	Select SDI Input 2
3	Select SDI Input 3
4	Select SDI Input 4
Mute	Mute/unmute embedded audio pass-through
Border	Quad-View display border on/off
Label	Quad-View display labels on/off
Info	Display Current System Settings / On Quad-View Output
⊞	Select Default Quad-View Layout
⊟	Select Alternate Quad-View Layout 1
⊟	Select Alternate Quad-View Layout 2
⊟	Select Alternate Quad-View Layout 3
⊟	Select Alternate Quad-View Layout 4

*Take button action depends on operating mode. See Controls and Connections section for information.

To operate the switcher using the hand-held remote, the remote should be pointed in the direction of the VSW-2200, and should be free of obstructions as it depends on IR Line-of-sight technology. If that is not possible due to the VSW-2200 being located in a cabinet or otherwise not visible, the IR remote sensor cable (included) can be plugged into the front panel of the unit, with the sensor end of the cable placed in a location that is visible in relation to the hand-held remote. When the remote is aimed at the IR sensor, it will function just the same as if it was aimed directly at the VSW-2200.

8. Using a Computer to Control the VSW-2200

A remote control application is included on the CD that is packed with the VSW-2200. This application will run on any computer operating Windows that includes either a USB 2.0 port or an Ethernet port.

Setting up the application

To set up the application, run the installer "VSW-2200 Installer" from the included CD. Follow the prompts. Make sure the "Create Desktop Icon" box is checked. When the installation is complete, there should be an icon like this on the desktop. Double-click this icon to start the Control Application.

Using the application with a USB connection

USB control is convenient when the controlling computer is placed near the VSW-2200 (USB 2.0 has a cable length limit of 5 meters or about 17 feet). Longer distances will require either the use of a USB hub between two cable lengths or an Ethernet connection. It is recommended to try the switcher with a USB connection first, before attempting an Ethernet connection.

Please Note: The USB connection on the rear panel of the switcher is a "Mini-USB" type. This is very similar in size and appearance to the "Micro-USB" type connection. Forcing the wrong type connector into the USB port will damage it. It is important to use a cable with the correct connector type.

When the VSW-2200 is plugged in, power switch ON position and then connected to a computer using a USB cable for the first time, the Windows operating system will respond by installing a new driver. This driver will then create a "Com Port" number. Please be patient as this process can take anywhere from 30 seconds to a minute to complete.

Now that Windows has created a driver, start the supplied application (If it is already running, please close it and any error messages that may pop up and start it again). You should see a screen like this one:

First, check that the Port Selection field says "RS232".

Next, select a Port Number from the Serial COM Port pull down menu.
Note: If there are several COM Port numbers listed, the number at the bottom of the list is typically the correct port to use.
For now, skip past the Ethernet setting and click on the Connect button.

When all is working correctly, you should see the Main Menu screen.

(In the event that the connection didn't work, close the application, open it again, and try another COM Port Number. Once a COM Port is established, it will should remain the same for that particular computer whenever the VSW-2200 is plugged back in).

Using the application with an Ethernet connection

An Ethernet connection can function over much longer distances than a USB connection. With this type of connection, the VSW-2200 may be operated from other rooms, other buildings, and even wirelessly when attached to a wi-fi router, etc. as long as the switcher and the computer are on the same network. There are many networking possibilities when using this type of connection, too many to fully cover in this manual. It is helpful to have some level of networking skill before attempting to set up an Ethernet connection.

The default network settings for the VSW-2200 are:

Network address 192.168.1.110
Subnet Mask 255.255.255.0
Gateway address 192.168.1.1

The easiest method for changing network settings is by connecting via USB first, then accessing the Utilities tab, IP Setting. There you can type in a new address.

Be sure to click the Apply button to activate the changes.

## 9. Menu Settings

Main Menu

Marshall Electronics
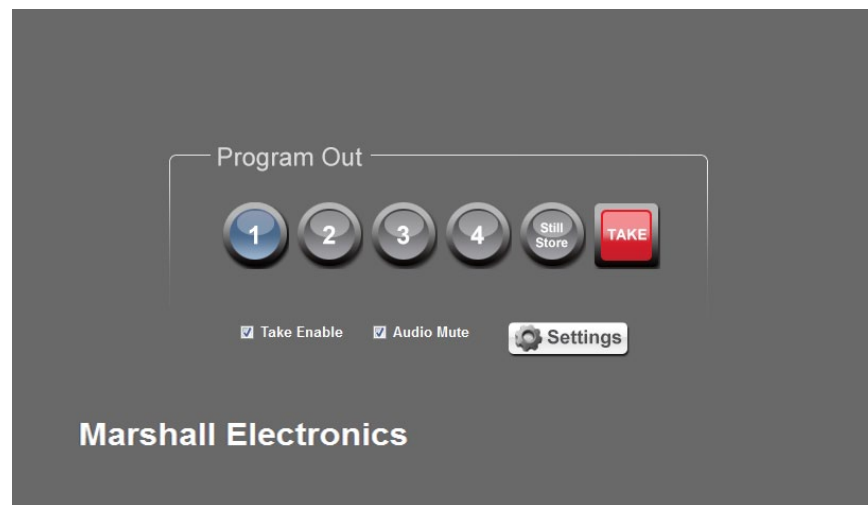
The Main Menu is designed to provide a very simple and clean interface. Operation of this screen is designed to mimic manual operation of VSW-2200, with a few select differences:

- The **Still Store** button turns the stored image on and off. If there is no stored image, the button will have no effect.
- The **Take** Enable check box selects the operating mode. When it is checked, the switcher will be in Preset/Take mode. When unchecked, the switcher is in Immediate Take mode.

- The **Audio Mute** check box works the same as the Mute button on the front panel. The default mode is Mute (box is checked).
- The **Settings** button opens the Settings Menu screen. The Settings Menu provides access to all switcher functions and settings, including those listed in the Main Menu.

Clicking on the Settings button will bring up a screen similar to this:

Menu Settings – (*Quad-View tab selected*)

Marshall Electronics
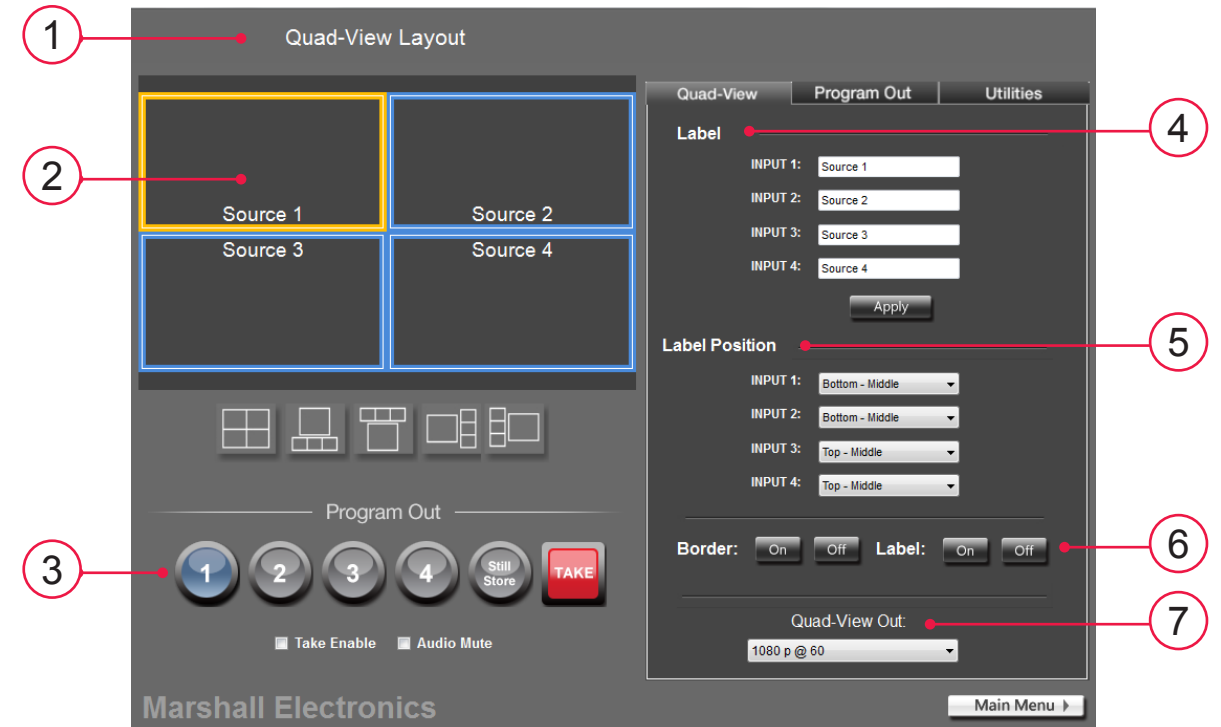
1. **Quad-View Layout area.** This area shows graphically how the Input Sources will be arranged in the Quad-View output (HDMI) from the switcher. This graphic represents the location and text of the labels, as well as the Input which is currently selected as the Program output. The active Input is shown with a highlighted border.
2. **Layout Selection area.** Five different Quad-View layouts are available by clicking on one of the five icons located below the graphic.
3. **Switcher Control area.** This area has the same functions as the Main Menu screen.
4. **Label area.** Type the desired name for each Input here then click on the Apply button to make the label appear on the Quad-View output.
5. **Label Position area.** Select a label position for each label from the pull down menus then click the Apply button.
6. **Border/Label area.** Select whether the Quad-View borders and labels appear on screen.
7. **Quad-View Out.** Select the desired video output format of the Quad-View (HDMI). The format will change immediately, as a selection is made.

Settings Menu – (*Program Out tab selected*)

Settings Menu – (*Utilities tab selected*)
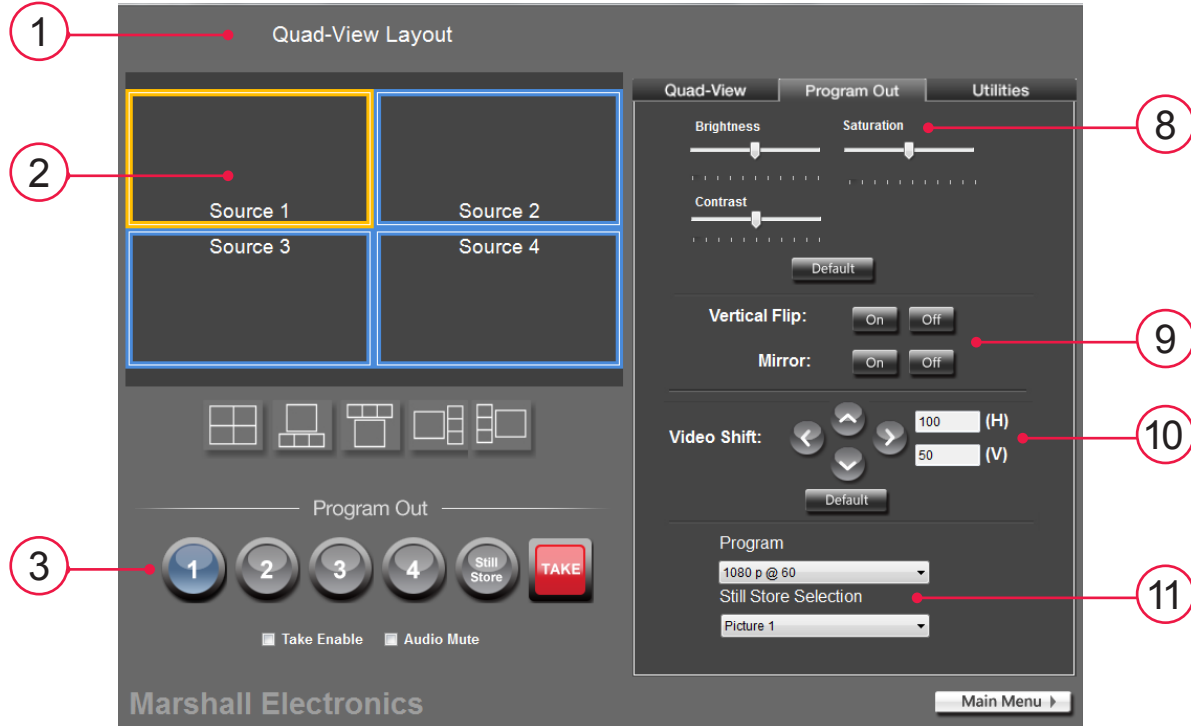
8. **Image Adjust Area**

Use the sliders to adjust Brightness, Contrast and Saturation of the Program Output.
The SDI and HDMI outputs are both affected by these adjustments. Use the Default button to set all sliders back to their mid-positions.

9. **Flip and Mirror Buttons**

Use these buttons to invert the output picture about the Y-Axis (Flip), or the X-Axis (Mirror).
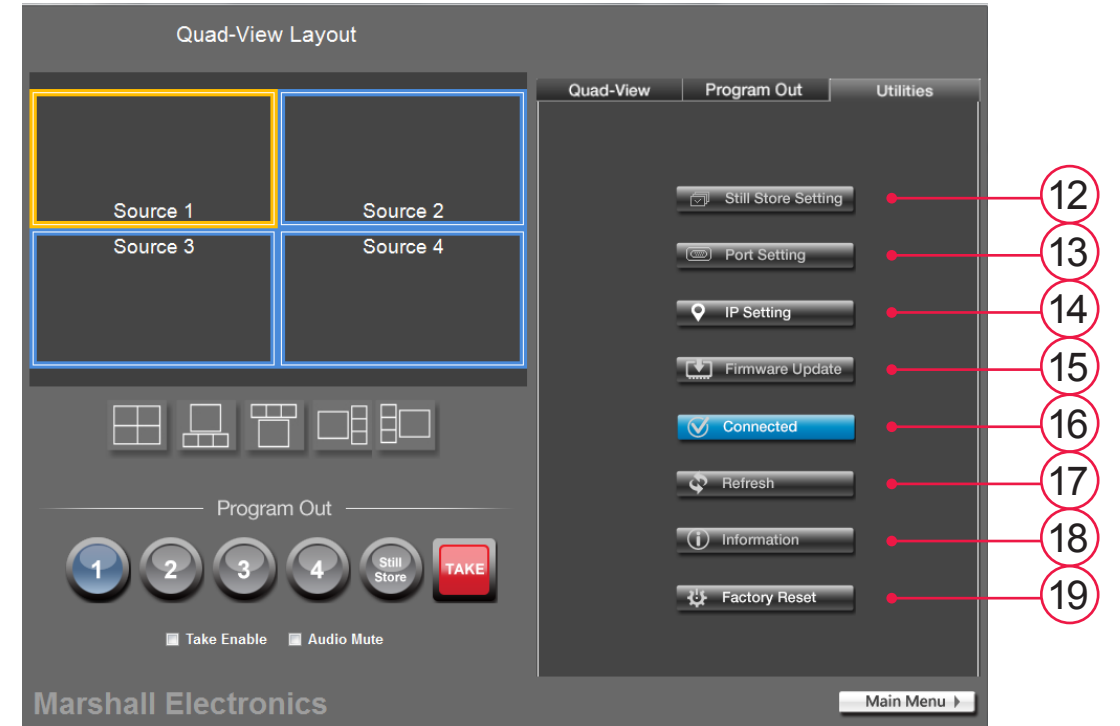These functions may be used individually or at the same time.

10. **Video Shift buttons**

Each time the left, right, up and down buttons are clicked, the image moves one pixel in the desired direction. This can be useful to compensate for video shifts that might occur in the video signal path. Clicking on the Default button will set horizontal and vertical settings to their neutral positions (H = 100, V = 50).

11. **Program output and Still Store Selection**

Use the Program choices to select a video format and frame rate for the Program Output.
The active Still Store image can be chosen from a list of four images. The selected image will appear on the Program output when the Still Store button on either the hand-held remote or the application is clicked.

12. Still Store Setting button

Use this function to transfer a still picture to one of the four internal still store registers using the USB connection. Images are stored in non-volatile memory which means they will remain in the switcher until they are replaced by new image. Please be patient when storing images in this way as they may take a few moments to transfer. The Still Store function is best suited for images that will be accessed frequently such as company logo, program title, etc.
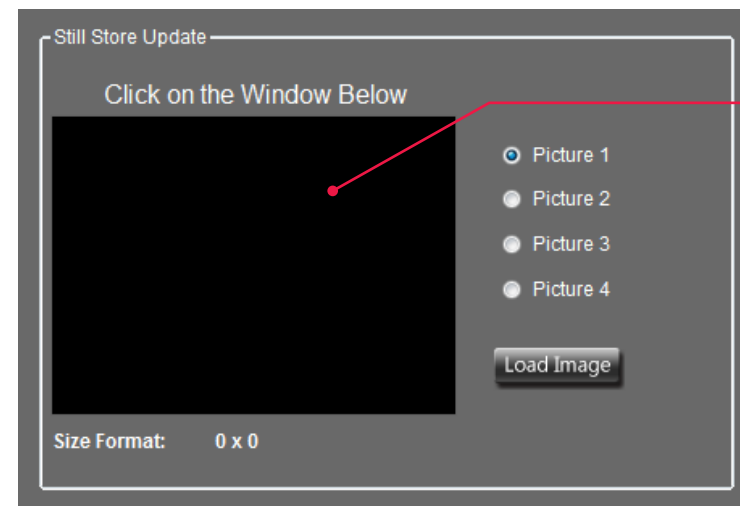

Click here first

Click anywhere in the update window to access the file directory of the computer attached via USB. Browse to and select the desired image file. A small version (thumbnail) of the image will appear in the window.

Compatible files:

- BMP or PNG format
- 1080 x 1920, 1280 x 720, 576 x 720, 576 x 704,
  or 720 x 480 , 640 x 480, 800 x 480 pixels (horizontal pixels divisible by 128)
- 256-bit color or lower

Click on the Update button to start the file transfer.
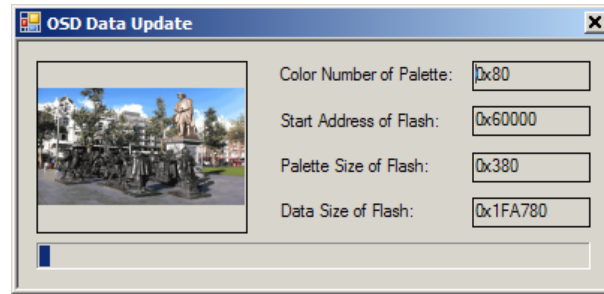
The progress bar will show the current status of the file transfer. Please allow the transfer to complete before closing the window.

13. Port Setting button

The Port Setting button brings up the window that appears when the switcher is first turned on. Please see the sections on USB and Ethernet connections for details. These settings are used to select the way the switcher is controlled from a computer.

14. IP Setting button

Use this function to change the switcher's IP address, Subnet mask or Gateway settings for use on an Ethernet network. Simply type in the desired parameters and click the Apply button. The switcher will respond by briefly recycling. Keep in mind that no matter what address is assigned here, even when a mistake is made, control can be regained and reconfigured using the direct USB connection.
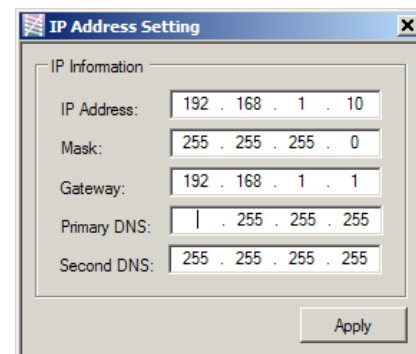
15. Firmware Update button

Use this function to update the features of the VSW-2200 switcher.
Please consult the instructions included with the update files for details.
Firmware updates are made available on the Marshall Electronics website at:
http://www.lcdracks.com/Switchers/index.php

16. Connected button

When the VSW-2200 switcher is properly connected to a computer, either via USB or Ethernet, the Connected button will appear as highlighted in green. Clicking on this button will toggle the connection between the computer and switcher on and off. Clicking again will reestablish the connection as long as neither device (switcher or computer) has been turned off or unplugged.

17. Refresh button

In the rare case where the control application does not indicate selections made on the switcher panel, clicking the Refresh button will re-synchronize the application with the switcher.

18. Information button

In the rare case where the control application does not indicate selections made on the switcher panel, clicking the Refresh button will re-synchronize the application with the switcher.

19. Factory Reset button

Please use this function with care. Once this button is clicked, the reset function will run until it is complete. The reset process takes about 25 – 30 seconds. The switcher will turn off and turn back on during this process which means that Program Output will go off and back on.
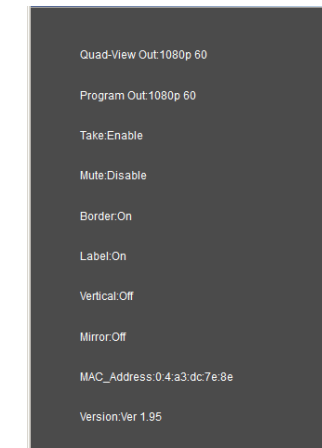
When using the Factory Reset, the settings in the switcher will be set back to their default state.
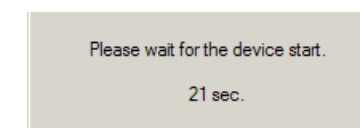
10. F.A.Q. / Tips for Troubleshooting

Q. "When I select a new video source, the button on the switcher only blinks but the video does not change."

A. The switcher is in Preset / Take mode. Press the Take button after selecting the new video source. The switcher operation may be changed to Immediate Take mode by pressing the Take button on the front panel for 5 seconds. In Immediate Take mode, the video changes as soon as the new source is selected.
If a computer is attached, unchecking the Take Enable checkbox in the control application will put the switcher in Immediate Take mode.

Q. "I've connected a computer using a USB cable but I cannot find the correct Com Port number."

A. Try the following things:
    - Close the app completely, disconnect the USB cable, reconnect the cable. Wait one minute, start the app, select "RS-232" at the top of the window and select the Com Port number at the bottom of the pull down list.
    - Try a different USB cable and try connecting again.
    - Disconnect the USB cable, close the app and all screens that may popup from the app. Open the app again and take note of the Com Ports in the pulldown list. Close the app one more time and all popup screens. Connect the USB cable, wait one minute. Open the app and check to see if a new Com Port number is there. Select that ComPort number.
    - If none of the above has worked, please check for updated USB drivers on the Marshall Electronics website at: http://www.lcdracks.com/Switchers/index.php

Q. "How can I use the output of a computer with the VSW-2200"

A. If the computer has an HDMI video output, a simple converter like the Marshall VAC-12HS can be attached between the HDMI connection on the computer and any of the SDI switcher inputs. Due to the powerful automatic scaling and format conversion in the VSW-2200, most computer formats will be ready for use without the need to change screen resolution.

Q. "The switcher lights up but the buttons do not work"

A. Check that the power supply that came with the unit is being used. If the original power supply is not available, a substitute power supply may be connected as long as it is rated 12 Volts DC, 3 Amps or greater and the center conductor of the round power plug is positive "+". The switcher will not operate properly with a power supply rated at less than 3 Amps.

Marshall Electronics, Inc.

1910 East Maple Ave. El Segundo, CA 90245
Tel: (800) 800-6608 / (310) 333-0606 • Fax: 310-333-0688

www.LCDracks.com

support@marshall-usa.com