

The Multi MSV 2 Control Application





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Overview

The Multi Scaler Viewer 2, or MSV 2, is a 4k (4096x2180) large monitor manager video tool built to easily control and display multiple sources, and offers unique customizability and easy use in a health care setting. A web-based GUI allows a user to select from a number of desired presets, control the size, brightness, overlay, etc. Users are even able to create custom preset designs based on the needs of the user.

While the MSV 2 system is easy to use and adaptive, there is a hardware limitation that restricts the number of sources to 4. Knowing this may not be satisfiable for some OR's, FSN has designed an application to use up to 5 MSV 2's at once in order to expand the number of sources to up to 16. A Main MSV 2, which has up to 4 Sub MSV 2's connected via HDMI.

In order to control all of the group of MSV 2 (both the Main and sub boxes) in one place, FSN has created the Multi MSV 2 Control Application. The majority of controls will remain on the MSV 2 web controls including creating/changing presets, sizing, brightness, window labeling, etc., but this one window application will allow a user to select presets, preview each sub MSV 2, and quick access to launch the MSV 2 web controls.

Multi MSV 2 Controls:

- Quick select established presets
- Launch web controls for Main MSV 2 box
- Preview Sub MSV 2 boxes
- Rename Presets for Main MSV 2 box
- Launch web controls for Sub MSV 2 boxes

MSV 2 Web Controls:

- Create new preset layouts
- Change sizes for individual sources
- Rename windows
- Adjust overlay
- Adjust brightness of individual sources
- Power cycle controls for MSV 2 box

Required Hardware:

- 1. MSV 2 boxes (a minimum of 2 boxes and a maximum of 5 boxes) see Page 5 for additional information.
- 2. Computer running Windows 10
- 3. HDMI or DP



Application Diagram





Box Requirements

The Multi MSV 2 set is highly configurable, based on the number of sources you need to manage. This represents the minimum box requirements when building out your MSV 2 package:

1-4 Sources Software: MSV2 Web Controller	ा ह <u>िल्ला</u> । 12	=:••• ↑ ↑ 3 4
5-7 Sources Software: MSV2 Web Controllers Multi MSV2 Control Application	Master	Sub Sub Sub Sub Sub Sub Sub Sub
8-10 Sources Software: MSV2 Web Controllers Multi MSV2 Control Application	Master	Sub #1
11-13 Sources Software: MSV2 Web Controllers Multi MSV2 Control Application	Master 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sub #1 Sub #1 2 3 4 5 Sub #3 Sub #3 Becala algo algo algo algo algo A A A A Y 10 11 12 13
14-16 Sources Software: MSV2 Web Controllers Multi MSV2 Control Application	Master	Sub #1



Initial Setup

Before setting up the Control Application the first time, make sure the Hardware set up is complete. All MSV 2 boxes should be powered up and connected to each other by HDMI. Once the hardware is complete, proceed to software set up.

1) Locate the Configurator File:

MultiMSV2ControlApplication -> 'MSV2_4ConfigurationFile.txt'

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MultiMSV2Cc	resources	6/1/2020 10:56	File folder		
MultiMSV2Cc	styles	6/1/2020 10:56	File folder		
release	translations	6/1/2020 10:56	File folder		
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> 🖹 Documents	h moc_predefs.h	5/21/2020 10:5	C++ Header file	1 KB	
> 🕹 Downloads 🛛 🖂	MSV2_4ConfigurationFile.txt	5/21/2020 12:4	Text Document	1 KB	
> 👌 Music	🗟 opengl32sw.dll	6/14/2016 7:00	Application exte	20,433 KB	
> Distures	Qt5Core.dll	6/1/2020 10:56	Application exte	6,021 KB	~
38 items 1 item selected 337 b	oytes				

The Configurator file provides important background information for the Control Application to work effectively. Most importantly, this is where the application recognizes the IP addresses for each MSV 2 box. Additionally, the administrator can change the number of presets available on the application on the Main MSV 2 box and the corresponding Sub MSV 2 boxes, and the names of the Presets on the Main MSV 2 box presets.



2) Open the Configurator file through a text editor such as Notepad. When opened for the first time, the configurator file will look like this:

MSV2_4ConfigurationFile.txt - Notepad			-	×
File Edit Format View Help				
//MSV2+4 Config - Enter IPAddress for Main MSV2 (Mandatory) and each	additional MSV2 used	by Input connected to	(1-4)	^
Version,1.0.				- 11
Preset_Control,8				- 11
Main0_MSV2_IPADDRESS,000.000.000.000				- 11
Input1_MSV2_IPADDRESS,000.000.000.000				- 11
Input2_MSV2_IPADDRESS,000.000.000.000				- 11
Input3_MSV2_IPADDRESS,000.000.000.000				
Input4_MSV2_IPADDRESS,000.000.000.000				
Sub_Preset_Control,8				
Preset_Naming_Channel_1, Preset 1				
Preset_Naming_Channel_2,Preset 2				
Preset_Naming_Channel_3, Preset 3				- 11
Preset_Naming_Channel_4, Preset 4				
Preset_Naming_Channel_5, Preset 5				
Preset_Naming_Channel_0, Preset 6				
Preset_Naming_Channel_/, Preset /				
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Main Presets and Sub Presets are assigned to the maximum eight (8) automatically. All IP Addresses are set at '000.000.000.000'.

- 3) Input IP address for each MSV 2 box.
 - Main MSV 2 IP address should be entered on the 4th line, labeled "Main0_MSV2_IPADDRESS" after the ','. Make sure this is entered correctly; otherwise this will result in the application failing to connect.
 - b. Sub MSV 2 IP Addresses should be entered on the subsequent lines, starting with "Input(1-4)". If there is no MSV 2 box connected for the specific input, leave "0" after the ','.



A completed Configurator file with 4 sources attached to it will appear like this:

```
MSV2_4ConfigurationFile.txt - Notepad
                                                                                                                                                                                                                ×
File Edit Format View Help
//MSV2+4 Config - Enter IPAddress for Main MSV2 (Mandatory) and each additional MSV2 used by Input connected to (1-4)
Version.1.0.
Preset_Control,5
Main0_MSV2_IPADDRESS,192.168.200.100
Input1 MSV2 IPADDRESS, 192.168.200.128
Input2_MSV2_IPADDRESS, 192.168.200.181
Input3_MSV2_IPADDRESS, 192.168.200.196
Input4_MSV2_IPADDRESS,192.168.200.173
Sub Preset Control,8
Sub_rreset_Lontrol,8
Preset_Naming_Channel_1,Dr.Andreson's Preset
Preset_Naming_Channel_2,Dr.Schultz's Preset
Preset_Naming_Channel_4,Dr.Wesley's Preset
Preset_Naming_Channel_5,Left Side
Preset_Naming_Channel_6,Right Side
Preset_Naming_Channel_7,All Sources
Preset_Naming_Channel_8,Main Souces
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```

**ADDITIONAL- At any time, the administrator may choose to limit the number of presets on the Main MSV 2. This is done by opening this Configurator file and changing the number on line #3. At release, this is set to the maximum number of 8, but can be changed to as few as 0. Administrator will simply enter the desired number other side of the ','. Setting this to 0 will result in not being able to change presets on the program, leaving it to function solely as a preview window. Do not change this unless you specifically wish to have fewer presets available for the application user.

**Administrator is also able to assign names for Presets for the Main MSV 2 box, you may enter them on lines 10-17, labeled "Preset_Name_Channel", after the ','. This is also something a user can do in the application (see below on page 19).



4) Launch and test application.

Run the application titled 'testApplication.exe'.

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🕂 Downloads 🖈	Qt5	5Gui.dll		11/8/2019 10:3	Application exte	6,357 KB			
🗎 Document: 🖈	Qt5	5Network.dll		11/8/2019 10:3	Application exte	1,297 KB			
📰 Pictures 🛛 🖈	Qt5	5Positioning.dll		11/9/2019 2:33	Application exte	316 KB			
🕳 Google Dri 🖈	Qt5	5PrintSupport.dll		11/8/2019 10:3	Application exte	317 KB			
MultiMSV2Cc	Qt5	5Qml.dll		11/9/2019 1:52	Application exte	3,930 KB			
MultiMSV2Cc	Qt5	5Quick.dll		11/9/2019 1:52	Application exte	3,705 KB			
iviuitiivisv2Ct	Qt5	5QuickWidgets.dll		11/9/2019 1:52	Application exte	78 KB			
release	Qt5	5SerialPort.dll		11/9/2019 1:31	Application exte	85 KB			
Screen Shots	Qt5	5Svg.dll		11/9/2019 1:31	Application exte	331 KB			
OneDrive	Qt5	5WebChannel.dll		11/9/2019 2:14	Application exte	121 KB			
	Qt5	5WebEngineCore.dll		11/9/2019 7:20	Application exte	78,144 KB			
This PC	Qt5	5 WebEngineWidgets	.dll	11/9/2019 7:20	Application exte	227 KB			
🧊 3D Objects	Qt5	5Widgets.dll		11/8/2019 10:3	Application exte	5,462 KB			
Desktop	🔳 QtV	WebEngineProcess.e	xe	11/9/2019 7:20	Application	25 KB			
Documents	🗹 🗉 test	tApplication.exe		5/21/2020 10:5	Application	60 KB			
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items 1 item selected	59.5 KB				_				÷

5) Potential Error Message.

Certain machines may show an error message when Application is first opened. The error message will display as follows:



If this error message is to appear, a Microsoft plug in simply needs to be installed on the computer before the Application can run. Locate 'vc_redist.x64.exe' and double click to run. It will ask if you would like to proceed with the installation. Follow the prompts and it will install fairly quickly, closing once it is complete.



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MYLINUXLIVE (E)		QtWebEngineProcess.ex	e 11/9/2019 7:20 PM	Application	25 KB			
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	-	vcruntime140_1.dll	3/18/2020 10:54 AM	Application extens	44 KB			
	0	vcruntime140d.dll	1/8/2020 12:09 AM	Application extens	163 KB			
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Once the update is installed, go back to step 4 and run 'testApplication.exe'.



Application Interface:

D.COL	1010121		Master MSV2 Controls	
			Advanced	Settings
		3.00	Preset 1	Preset 2
			Preset 3	Preset 4
			Preset 5	Preset 6
			Preset 7	Preset 8
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Box 1 Full Screen Box 2 Full Screen	Box 3 Full Screen E	Box 4 Full Screen		
			Se	ettings Close Application
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Box 1 Box 2 Prest 1 Pr	Box 3 Prest	Exx 4	Master MSV2 Controls Advanced S Prest 1 Prest 3 Prest 5 Prest 7 Box 1 Controls Box 1 Advanced Prest 1 Prest 3 Prest 3 Prest 3 Prest 3 On 1 On 2 Ext Se	ettings Preset 2 Preset 4 Preset 8 Preset 4 Preset 6 Preset 8 Ch. 3 Ch. 4 Up
Box 1 Box 2 Full Screen Box 2 Full Screen	Dox 3 Full Screen	Dox 4	Master MSV2 Controls Advanced S Prest 1 Prest 3 Prest 5 Prest 7 Box 1 Controls Box 1 Advanced Prest 1 Prest 3 Prest 7 On 1 On 2 Ext Sectors	ettings Preset 2 Preset 4 Preset 6 Preset 4 Preset 4 Preset 6 Preset 8 Ch. 3 Ch. 4 Up
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When the application is fully configured and running, it will display as shown above. Designed to be scalable and simple to operate, the Multi MSV 2 Control Application has access to fast switching between presets on the Main MSV 2, previewing of the feeding MSV 2 windows, and quick access to the full tool kit via your preferred web browser.





1. Preview Window.

This is where the live preview will display. Whichever preset is selected, or sub MSV 2 window preview is active, it will display in this area.

2. Advanced Settings Button.

This will launch the web controls, which holds more of the complex, customizable features. This will run on Google Chrome, Mozilla Firefox, or any other preferred web browsers. When launched, enter the login credentials and proceed to make any changes required. Application will continue to operate while web browser is active.

The Advanced Settings is meant for Administrator controls. A confirmation pop up window will asks the user to confirm they wish to proceed. If user does not have administrative controls, the confirmation window will prevent them from proceeding.

🕶 MSV2 Login 🗶 🕈		- D >
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3. Preset Buttons for Main MSV 2 box

This is the main way a user will quickly switch between presets on the Main MSV 2 box. By selecting a different Preset, the display window will automatically shift to that layout.

The number of presets available is set up in the Configurator file. The Application will automatically display 8 presets, unless the administrator sets a different number of available presets. For instance, when the number is set to 0, there will be no buttons appearing below the 'Advanced Settings' button, or if the administrator sets the number of presets to 5, the button layout will appear like this:

Master MSV2 Cor	ntrols					
Advanced	Advanced Settings					
Preset 1	Preset 2					
Preset 3	Preset 4					
Preset 5						

4. Box Buttons.

These buttons will give control access to the sub MSV 2 boxes if the user wishes to change its layout, or launch its advanced settings (see below #7-#9). When a Box is



selected, the selected box will be highlighted in dark grey and a new box will appear on the right side of the screen under the Main MSV 2 buttons. This box will include several important controls for the selected Sub MSV 2 box including 'Advanced Settings', sub Box Presets, individual source selection for Sub MSV 2 boxes:

		1 Million 21		M	aster MSV2 Contro	sls
					Advance	d Settings
				[Preset 1	Preset 2
					Preset 3	Preset 4
					Preset 5	Preset 6
		101cmai	8.00		Preset 7	Preset 8
				Bc	x 1 Controls	
					Box 1 Adv	ranced Settings
					Preset 1	Preset 2
					Preset 3	Preset 4
					Preset 5	Preset 6
					Preset 7	Preset 8
Box 1	Box 2	Box 3	Box 4		Ch. 1 Ch. 2	Ch. 3 Ch. 4
Preset 1	Preset 1	Preset 1	Preset 1		Đđ	t Set Up
Box 1 Full Screen	Box 2 Full Screen	Box 3 Full Screen	Box 4 Full Screen			
						Settings Close Applica
					_	

If there are fewer than 4 Sub MSV 2 boxes, or if there is a box with an incorrect IP address, the Application will not show these buttons. You will only be able to access the web controls to verified MSV 2 boxes. An example of having fewer than 4 Sub MSV 2 boxes will appear like this:

Box 1	Box 2		Box 4
Sub Preset 1	Set Preset 1		Sub Preset 1
Box 1 Full Screen	Box 2 Full Screen	Box 3 Full Screen	Box 4 Full Screen

5. Activity Indicator.

This is an indicator to establish what is displayed in the preview window. If a different Sub preset is selected for a Sub MSV 2 box, the activity label will allow the user to keep track of this.



6. Box Full Screen Buttons.

This will allow you to isolate an individual Sub MSV 2 or source in the display. If the user only wants to select an individual MSV 2 sources, this will allow that particular Sub MSV 2 box to take up the full display window. Additionally, if the user is unfamiliar with the set up of the Main Preset and wishes to figure out which Sub box is in which quadrant, this will act as a quick preview.

				Master MSV2 Con	trols
				Advanced	Settings
1	-	-		Preset 1	Preset 2
				Preset 3	Preset 4
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Carlos					
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	19(3)		D CH		
		State Street, S			
Box 1	Box 2	Box 3	Box 4		
		Active Preview			
		Roy 2 Full Carpon	Pay 4 Full Careen		
Box 1 Full Screen	Boy 2 Full Corport		LIGA & FUIL SUIPPIL		
Box 1 Full Screen	Box 2 Full Screen	box 5 rui screen		Se	ttings Close Application

7. Box Indicator Label

- 7A This label indicates the control buttons work on the Main MSV 2 box. These will be the most commonly used presets.
- 7B This label will indicate which sub MSV 2 box is active for button control. Since the user will only be able to control one sub box at any given time, this indicator will remind the user which box is active, along with the Sub Box turning to dark grey highlight.

8. Box (#) Advanced Settings Button.

Similar to the Advanced Settings button (#2 above), this will launch the web controls for the selected sub MSV 2 box. Again, this is for administrative use only, so a confirmation prompt will appear when button is pressed.



9. Box (#) Preset Buttons.

This will allow the user to select a different preset for the specific Sub MSV 2 box selected. User has 4 presets they may select from. When a different preset is selected from the Main, the Activity Indicator will keep track of what is on display for the User:

Box 1	Box 2	Box 3	Box 4
Sub Preset 1	Sub Preset 2	Sub Preset 1	Sub Preset 1
Box 1 Full Screen	Box 2 Full Screen	Box 3 Full Screen	Box 4 Full Screen

10. Channel #1-#4.

The Channel buttons will route a single source to that particular Sub box's quadrant. Similar to selecting a "Box # Full Screen button", however instead of taking up the full viewing area, this will only affect the quadrant of the box. If that single source is the lone desired source to display in full screen, simply select:

Box # -> the desired channel to be active -> Box # Full Screen button.

11. Exit Set Up.

When User is no longer making changes to the Sub MSV 2 layout, they may press the Exit Set Up button which will have the Sub MSV 2 controls disappear. Selecting a Preset button on the Main MSV 2 will also cause the Sub MSV 2 buttons to disappear.

12. Settings.

Settings will open a pop up control window with advanced features for the application. The main function of this is for users to change/save new names for presets. See further instructions below (page #19).



13. Close Application button

In order to exit application, click "Close Application" button. A pop up window will confirm that you wish to proceed.

Close Ap	plication? \times	
Are you sure?		
Yes	No	

Select "Yes" to close application, and "No" to return to the Application.



Presets:

You can establish up to 8 Main presets in the configurator file. These are predesigned layouts that already take into account the source inputs, scale of each source, brightness and position on monitor. If you would like to manage fewer available layouts at any time, simply adjust the number of Main presets in the configurator file.

In order to change a Main preset:

- 1) Click "Launch MSV 2 Web" button.
- 2) Sign into the admin account.
- 3) Go to users.
- 4) Make the changes.
- 5) Save and exit out of web browser.

Changing the layout in a sub MSV 2 box:

- 1) Identify which sub box you would like to change. (hint: if you are unsure which window you wish to change, cycle through the "Window Preview" buttons until the window you wish to adjust is displayed in the preview area.)
- 2) Press the "Window" button to launch the MSV 2 Web Controls for that particular MSV 2 box.
- 3) Sign into the admin account.
- 4) Make changes, either through that sub MSV 2 available presets, or by following the directions above to create a new preset.
- 5) Once the layout of this sub MSV 2 is selected, exit out of the web browser. The preset of this particular box will now be shown in that window of the Main MSV 2 layout.



Preset Naming:

The application allows for users to rename and save names for desired presets directly on the Multi MSV 2 Control Application. This is useful if a doctor has a preferred layout and wants to save it under their name, or if there is a specific layout for each procedure. Now Users will not have to go into the back pages of the program to change the names.

1. Opening Settings. Select "Settings" button. A pop up window will appear like this:

📧 Dialog			?	×
Number of Prese	ts:			
				-
Preset Names:				_
1st Preset	Preset 1			
2nd Preset	Preset 2			
3rd Preset	Preset 3			
4th Preset	Preset 4			
5th Preset	Preset 5			
6th Preset	Preset 6			
7th Preset	Preset 7			
8th Preset	Preset 8			
Save	/Exit	Cancel		

2. Entering new names. When the User wishes to change the name, simply replace the current name in the corresponding text box. User is able to change as many names they would like at the same time. A completed renaming set may look like this:

Dialog	?	×			
Number of Pres					
Preset Names:					
1st Pres Dr. Andrew					
2nd PreseDr. Phillips					
3rd Prese Dr. Chaing					
4th Prese Dr. Joseph					
5th Prese Check This					
6th Prese Targeted					
7th Pres Left Source					
8th Pres Right Source					
Save/Exit Cance	I				



3. Cancel. Should User wish to dismiss the names they changed and keep the original names, simply hitting cancel will close the Settings window without making any changes. When User hits Cancel, this pop up confirmation will appear:



Selecting "Yes" will close the Settings window will close, and User will be able to access the regular functionality of the Application without any changes being made.

Selecting "No" will bring the User back to the Settings window.

4. Save & Exit. Once User has reviewed their changes and would like to keep them, simply select the button "Save/Exit". A pop up confirmation window will appear like this:

Save Changes	×
Apply changes to Multi MSV 2 Co	ontrol Application?
	Yes No

Selecting "Yes" will close the pop up Settings window, and show the new names instantly on the Application.

Selecting "No" will bring the User back to the Settings Window.



5. Instant Change to Application. Once user choses to save new names and confirms, they will be brought back to the Application with the Preset's displaying their new names:

a 01	•	4 DR	Master MSV2 Controls		
				Advanced Settings	
				Dr. Andrew	Dr. Phillips
				Dr. Chaing	Dr. Joseph
				Check This	Targeted
				Left Source	Right Source
		9 CH4			
Box 1	Box 2	Box 3	Box 4		
Box 1 Full Screen	Box 2 Full Screen	Box 3 Full Screen	Box 4 Full Screen		
				Se	ettings Close Applicatio

These names will remain even after application is closed and reopened, until they are changed in the Settings Window.





For Sales Support, Contact:

FSN Medical Technologies Head Quarters 2210 E. Winston Rd. Anaheim, CA 92806 Tel. 714-300-0540 Fax: 714-300-0546

For Tech Support, Contact:

FSN Medical Technologies, Chicago Office 191 Waukegan Rd., Suite #340 Northfield, IL 60093 Tel. 847-386-7350

www.FSNMed.com

