



**MSV2**

4K HDMI / DP Multi Scaler Viewer

Customer :

**Specification for**

**Model: MSV2**

**(4K HDMI / DP Multi Scaler Viewer)**

Revised: July 15, 2019  
Original Release Date: September 7, 2017

**OPHIT**

## Revision History

Version Number	Revision Date	Author	Description of Changes
0.1	Sep.07.2017	EB LEE	- Initial Version
0.2	Apr.05.2018	EB LEE	- Hardware configuration change according to Main IC changed. - User Control(Web control, OSD) added.
0.3	Oct.19.2018	EB LEE	- Layout mode configuration has been changed. - Ivory colored cases have been added.
0.4	Feb. 18. 2019	JS JEONG	- Resolution information updated.
0.5	Apr. 18. 2019	JS JEONG	- Assembly 2D drawing for MSV2 updated.
0.6	Jul. 12. 2019	JS JEONG	- Input, output resolution updated.
1.0	Jul. 15. 2019	JS JEONG	- Absolute Maximum Ratings, Electrical Specification and LED features are updated.

## TABLE OF CONTENTS





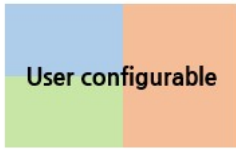
<b>1. General Description</b> .....	<b>4</b>
<b>2. General Specification</b> .....	<b>5</b>
2.1 Video Input Specification	
2.1 Video Output Specification	
<b>3. Absolute Maximum Ratings</b> .....	<b>7</b>
<b>4. Electrical Specification</b> .....	<b>8</b>
4.1 Electrical Specification	
4.2 Input/Output Port Pin Assignment	
4.2.1 DisplayPort	
4.2.2 HDMI	
<b>5. Mechanical Specification</b> .....	<b>10</b>
5.1 Dimension	

## 1. General Description

The 4K HDMI / DisplayPort(DP) Multi Scaler Viewer (Model : MSV2) is an advanced video processor for multimedia presentations. It is a video signal processing device that can one output of 4 input video signals to one video display device and provides 4 screen output modes.

4ch Inputs of MSV2 have 2 HDMI ports and 2 selectable ports(HDMI or DisplayPort), the user can select the input video the DisplayPort 1.2a or HDMI 2.0 Basically, it supports various output resolutions including up / down scale and supports seamless channel change.

- Input : HDMI x 2  
HDMI / DP x 2 (selectable)
- Output : HDMI x 1
- Full range of input and output format (Up to 4K@60Hz)
- 4 preset modes and 5 user modes
- HDMI 2.0, DisplayPort 1.2a Compliant
- Supports DisplayPort 1, 2, 4 lanes
- Supports HDMI 1.4 / 2.0
- Compliant with HDMI 2.0, data rate up to 6Gbps
- HDCP 1.4 / 2.2 Compliant
- User control : Web, OSD, RS232
- 1U Rack type

Preset mode	Layout	Preset mode	Layout
Quad		3 side	
3 bottom		Full screen mode (CH 1 ~ 4)	
5 User modes			

## 2. General Specification<sup>1</sup>

### 1.1 Video Input Specification

Items	Values / Description
Port Type	<ul style="list-style-type: none"> <li>HDMI x 2</li> <li>HDMI / DisplayPort x 2 (selectable)</li> </ul>
Resolutions	<ul style="list-style-type: none"> <li>4096x2160p@60Hz (Maximum)</li> </ul>
Signal Formats	<ul style="list-style-type: none"> <li>HDMI, DP</li> </ul>

- Supporting Input resolutions

MSV2 INPUT RESOLUTION				
Resolution	HDMI 1,2	HDMI 3,4	DP 1,2	
TV Format				
480i@59.94/60	○	○	X	
576i@50	○	○	X	
1080i@50/59.94/60	○	○	○	
480p@59.94/60/119/120/239.76/240	○	○	○	
576p@50/100/200	○	○	○	
720p@29.97/30/50/59.94/60/100/119.88/120	○	○	○	
1080p@23.976/24/25/29.97/30/50/59.94/60/100/119.88/120	○	○	○	
2160p@23.976/24/25/29.97/30/50/59.94/60	○	○	○	
720x576@50/100/200	○	○	○	
1680x720@23.976/24/25/29.97/30/50/59.94/60/100	○	○	○	
2560x1080@23.976/24/25/29.97/30/50/60/119.88/120	○	○	○	
4096x2160@23.976/24/25/29.97/30/50/59.94/60	○	○	○	
PC Format				
640x350@85	○	○	○	
640x400@85	○	○	○	
640x480@59.94/60/67/72/75/85	○	○	○	
720x400@70/85	○	○	○	
800x600@56/60/72/75/85	○	○	○	
832x624@75	○	○	○	
848x480@60	○	○	○	
852x480@60	○	○	○	
1024x576@60	○	○	○	

1024x768@60/70/75/85	○	○	○
1152x864@75	○	○	○
1152x870@75	○	○	○
1280x720@60	○	○	○
1280x768@60/75/120	○	○	○
1280x768@85	○	○	○
1280x800@60/75/85/120	○	○	○
1280x960@60/85	○	○	○
1280x1024@60/75/85	○	○	○
1280x1024@96	○	X	○
1360x768@60	○	○	○
1366x768@60	○	○	○
1400x788@60	○	○	○
1400x1050@60	○	○	○
1440x900@60/75/85	○	○	○
1440x960@72	○	○	○
1600x900@60	○	○	○
1600x1024@60	○	○	○
1600x1200@50/60/65/70/75/85	○	○	○
1680x1050@60	○	○	○
1792x1344@60/75	○	○	○
1856x1392@60/75	○	○	○
1920x1080@60	○	○	○
1920x1200@50/60	○	○	○
1920x1440@60/75	○	○	○
2048x1152@60	○	○	○
2048x1280@60	○	○	○
2560x1600@60/85	○	○	○
2048x1080p@23/24/25/29/30/50/59/60	○	○	○
3840x2160p@23/24/25/29/30/50/59/60	○	○	○
4096x2160p@23/24/25/29/30/50/59/60	○	○	○

Up to 4096x2160@60Hz(The interlace is red.)

Resolutions not listed in the table may not be supported.

**1.2 Video Output Specification**

Items	Values / Description
Port Type	<ul style="list-style-type: none"> <li>HDMI x 1</li> </ul>
Resolutions	<ul style="list-style-type: none"> <li>4K (4096x2160, 24Hz/30Hz/60Hz)</li> <li>4K (3840x2160, 25Hz/30Hz/50Hz/60Hz)</li> <li>1080p(1920x1080, 50Hz/60Hz)</li> <li>720p(1280x720, 50Hz/60Hz)</li> <li>1920x1200@60Hz</li> <li>1680x1050@60Hz</li> <li>1650x1050@60Hz</li> <li>1600x1200@60Hz</li> <li>1400x1050@60Hz</li> <li>1360x768@60Hz</li> <li>1280x1024@60Hz</li> <li>1280x960@60Hz</li> <li>1280x768@60Hz</li> <li>1024x768@60Hz</li> </ul>
Signal Formats	<ul style="list-style-type: none"> <li>HDMI</li> </ul>

**3. Absolute Maximum Ratings**

Parameter	Rating
Operating temperature	0°C ~ +40°C
Power Supply	+12 V
Relative Humidity	20 ~ 80 %, Non-Condensing

**NOTICE**

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

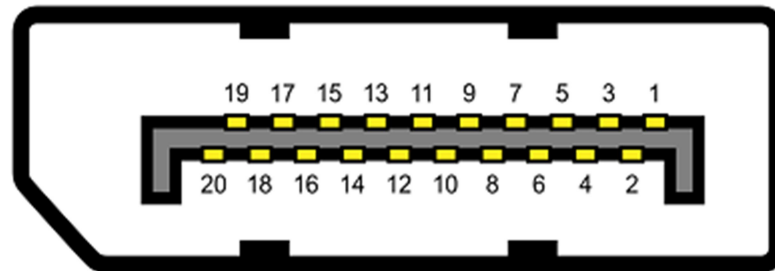
## 4. Electrical Specification

### 4.1 Electrical Specification

Parameter		Symbol	Min	Typ	Max	Units	Condition
P O W E R	Supply Voltage (Option External Power)	Vcc		+12		V	
	Supply Current	Icc		2.1		A	
	Power Dissipation	Po		25.2		W	

### 4.2 Input/Output Port Pin Assignment

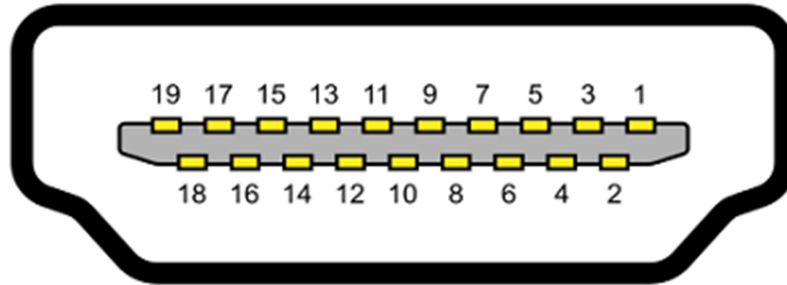
#### 4.2.1 DisplayPort Connector



Pin	Signal Assignment	Pin	Signal Assignment
1	Main Link Lane 0 (Positive)	11	Ground
2	Ground	12	Main Link Lane 3 (Negative)
3	Main Link Lane 0 (Negative)	13	Config1 (Ground)
4	Main Link Lane 1 (Positive)	14	Config2 (Ground)
5	Ground	15	AUX Channel (Positive)
6	Main Link Lane 1 (Negative)	16	Ground
7	Main Link Lane 2 (Positive)	17	AUX Channel (Negative)
8	Ground	18	Hot Plug
9	Main Link Lane 2 (Negative)	19	Return
10	Main Link Lane 3 (Positive)	20	DP_PWR (+3.3V input)



## 4.2.2 HDMI Connector



Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS DATA2+	9	TMDS DATA0-	17	DDC
2	TMDS DATA2 SHIELD	10	TMDS CLOKE+	18	+5V
3	TMDS DATA2-	11	TMDS CLOKE SHIELD	19	HPD
4	TMDS DATA1+	12	TMDS CLOKE-		
5	TMDS DATA1 SHIELD	13	CEC		
6	TMDS DATA1-	14	HEAC		
7	TMDS DATA0+	15	SCL		
8	TMDS DATA0 SHIELD	16	SDA		

## 5. Mechanical specification

### 5.1 Dimension

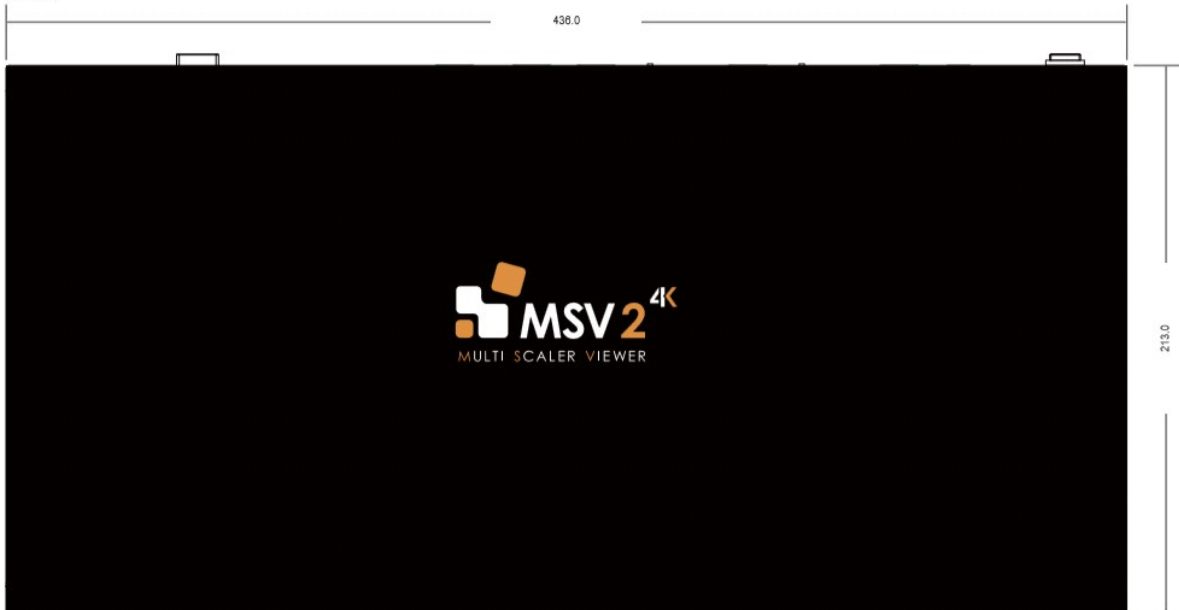
- MSV2 case construction features
  - Button : Power, Layout select buttons, Layout / OSD control buttons
  - LED : CH 1~4 Input signal check LEDs, Active/Ready check LEDs
  - Switch : Input signal select switches
  - Input video : HDMI x 2  
HDMI / DisplayPort x 2 (selectable)
  - Output video : HDMI x 1
  - Size : 436(W) x 44(D) x 213(H)mm
  - Color : black, ivory

▷ MSV2 ( Color : Black ) ◁

REAR VIEW



TOP VIEW



FRONT VIEW



▷ MSV2 ( Color : Ivory ) ◁

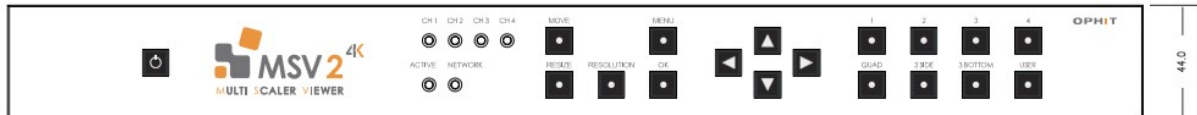
REAR VIEW



TOP VIEW



FRONT VIEW



## 6. Ordering Information

Part Number	Description
MSV2-A	4K HDMI / DP Multi Scaler Viewer / IVORY COLOR
MSV2-B	4K HDMI / DP Multi Scaler Viewer / BLACK COLOR

6. RoHS



The European Union Directive 2011/65/EC, Restriction of Hazardous Substances (RoHS2) legislation restricts the use of certain substances in electrical and electronic equipment.

On June 4, 2015, the EU Commission published new Directive (EU) 2015/863 which adds 4 phthalate substances to the list of 6 already in RoHS II. These phthalates will be restricted from use starting July 22, 2019 from most electrical and electronic equipment.

Product Name : MSV2

Hereby we guarantee that we do not intentionally use the substances described below and based on third party chemical analysis the thresholds of the substances as indicated are not exceeded for our products.

Substance	RoHS Limity by Weight	RoHS Limity by % (PPM)
Lead (PB)	1000mg/kg	0.1% (1000 PPM)
Mercury (Hg)	1000mg/kg	0.1% (1000 PPM)
Hexavalent Chromium (CR VI)	1000mg/kg	0.1% (1000 PPM)
Polybrominated Biphenyls (PBB)	1000mg/kg	0.1% (1000 PPM)
Polybrominated Diphenyl Ethers (PBDE)	1000mg/kg	0.1% (1000 PPM)
Cadmium (Cd)	100mg/kg	0.01% (100 PPM)
Bis(2-Ethylhexyl) phthalate(DEHP)	1000mg/kg	0.1% (1000 PPM)
Benzyl butyl phthalate(BBP)	1000mg/kg	0.1% (1000 PPM)
Dibutyl Phthalate(DBP)	1000mg/kg	0.1% (1000 PPM)
Disobutyl Phthalate(DIBP)	1000mg/kg	0.1% (1000 PPM)

Banned Substances by RoHS Directive 2011/65/EU+2015/863/EU, EN50581:2012

**Signature : Jong-kook, Moon** *Jong-kook, Moon*  
**Title/Date: President/Jul.19.2019**

Company Name : OPHIT CO LTD

301,302,501,502Ho,77,Deogyong-daero 1471beon-gil,Yeongtong-gu,Suwon-si, Gyeonggi-do,KOREA

Contact Person : Eui-Seok, Kang/Q.A Manager/82-31-205-4191/ Contact E-mail : onlyqa@ophit.com

## 7. REACH



**The European REACH Regulation 1907/2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals(REACH), Annex XV II** entered into Force in June 2009, and affects all companies producing, Importing, using, or placing Products on the European market. The aim of the REACH regulation is to ensure a high Level of protection of human health and the environment from chemical substances.

OPHIT Co., Ltd substances management system follow and complies with the current revision of the REACH Regulation on the substances as identified by ECHA(European Chemical Agency).

OPHIT Co., Ltd products are considered articles as defined in REACH Article 3(3). These products/articles under normal and reasonable conditions of use do not have intended release of substances. Therefore the requirement in REACH Article 7(1)(b) for registration of substances contained in these products/articles does not apply.

OPHIT Co., Ltd products/articles, do not contain **Substances of very High Concern** or if there **SVHC** in the product/article, the content is less than the 0.1%(wt/wt) as defined by REACH Article 57, Annex XIV, Directive 67/548/EEC. Therefore the requirement in REACH Article 7(2) to notify ECHA if a product/article contains more than 0.1% wt/wt of an SVHC and tonnage exceeding 1 tone per importer per year is not applicable.

OPHIT's European operations do not manufacture or import chemicals, therefore OPHIT Co., Ltd has no obligation to register substances.

**Model : MSV2**



---

Jong-Kook, Moon/President

**OPHIT Co., Ltd ACCEPTS NO DUTY TO NOTIFY USERS OF THIS OF DECLARATION OF UPDATES OR CHANGES TO THIS DECLARATION.**

Company Name : OPHIT CO LTD

301,302,501,502Ho,77,Deogyong-daero 1471beon-gil,Yeongtong-gu,Suwon-si, Gyeonggi-do,KOREA

Contact Person : Eui-Seok, Kang/Q.A Manager/82-31-205-4191/ Contact E-mail : onlyqa@ophit.com