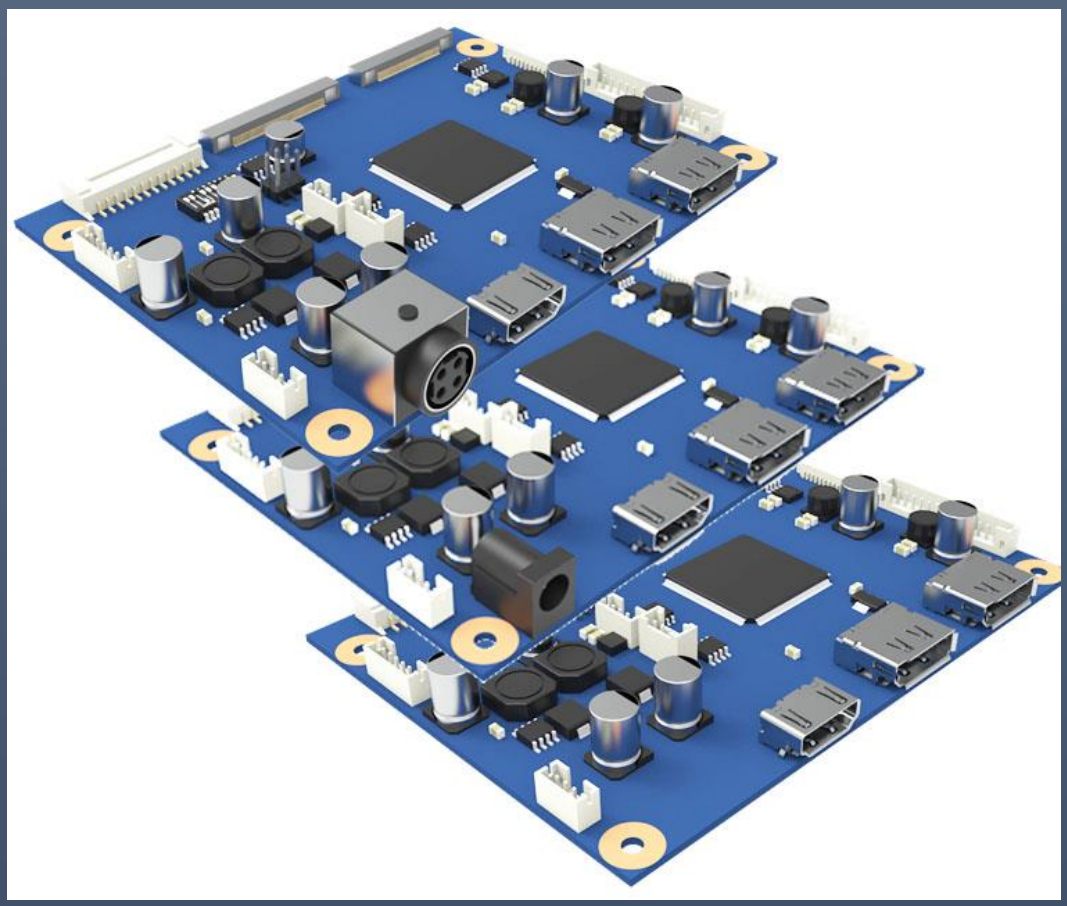
2021

# Data Sheet



## *Model Name : Galaxy 6*

***Part No.:*** ***GLX6 - xxx....xxx***

*(xxx...xxx : Target LCD Part No.)*

# Contents

# Revision History

| PCB Version | Rev. date | Revision Details |
|---|---|---|
| 0.0 | Jan 2021 | Engineering Sample |
| 1.0 | Sep 2021 | Issued the Mass Production version |
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## 1. General Description

- **Up to UXGA (2560x1600, 2560x1440) resolution display format.**
  Up scaling from VGA, SVGA, XGA, SXGA, FHD, WUXGA to QHD VESA Standard Mode.
- Provides up to 30-bit color Interface
- HDCP 2.2 support
- OSD/Display Rotation Function
- Overdrive / Over scan Function
- 6 Color control
- PCM(Precise Color management)
- Sharpness/Hue/Color Support
- Gamma Control
- Color Effect Function
- Response time Control
- Remote Control
- 9 Pin D-Sub for RS232 Control
- 1 x HDMI in connector (ver. 1.4)
- 1 x DP in connector (ver. 1.2) and 1 x DP out connector

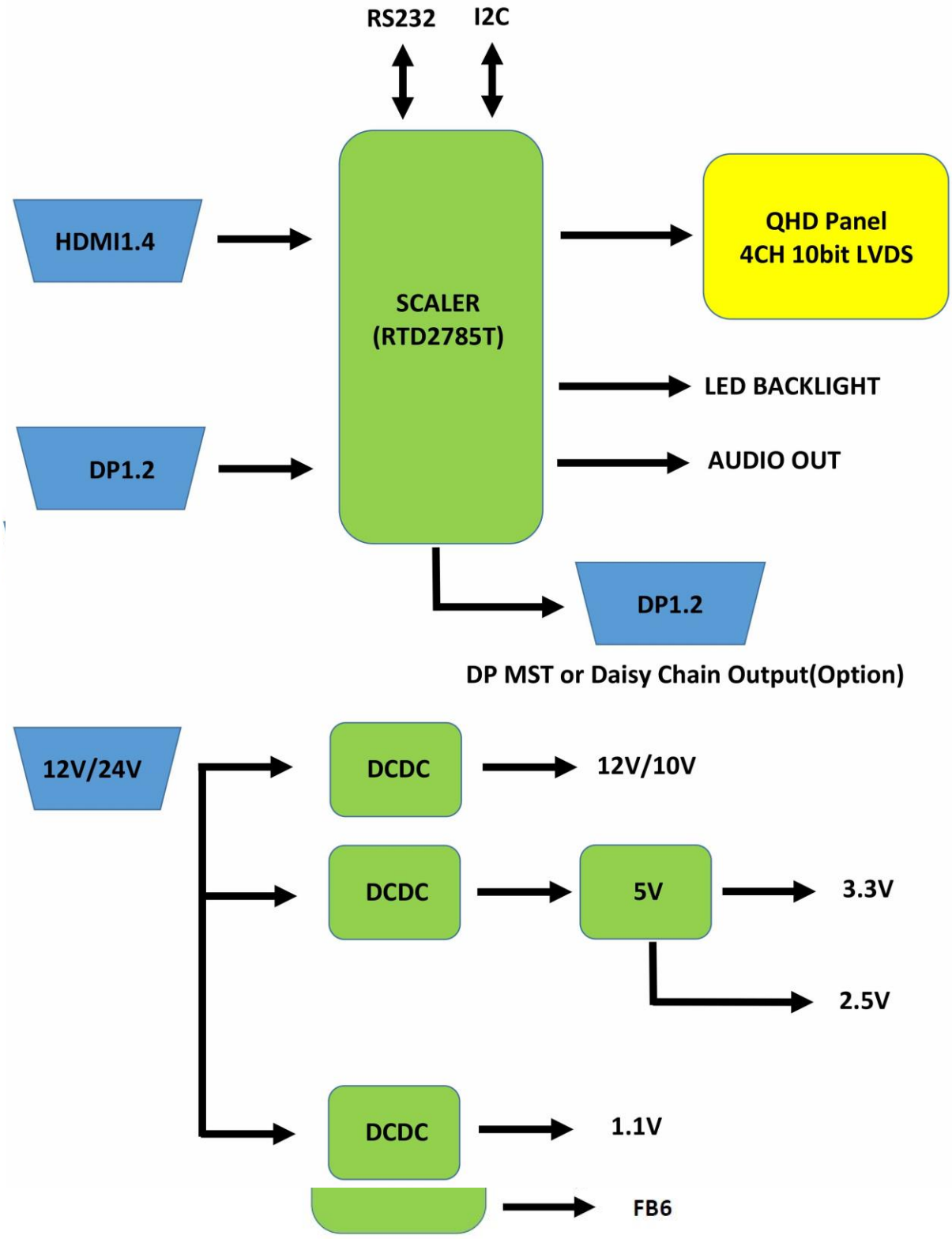
- **Special Feature**

➢ **Fashion Designed GUI (Graphic User Interface)**
Titan perform the fashionable designed OSD Menu (GUI).

➢ **Extended panel power support range**
The power circuit of Vcc has been sufficiently adopted for wide range up to 4A level by enlarged pattern design on the PCB.

➢ **Various Languages**
Max.9 kinds of languages can be provided depending on customer's choice

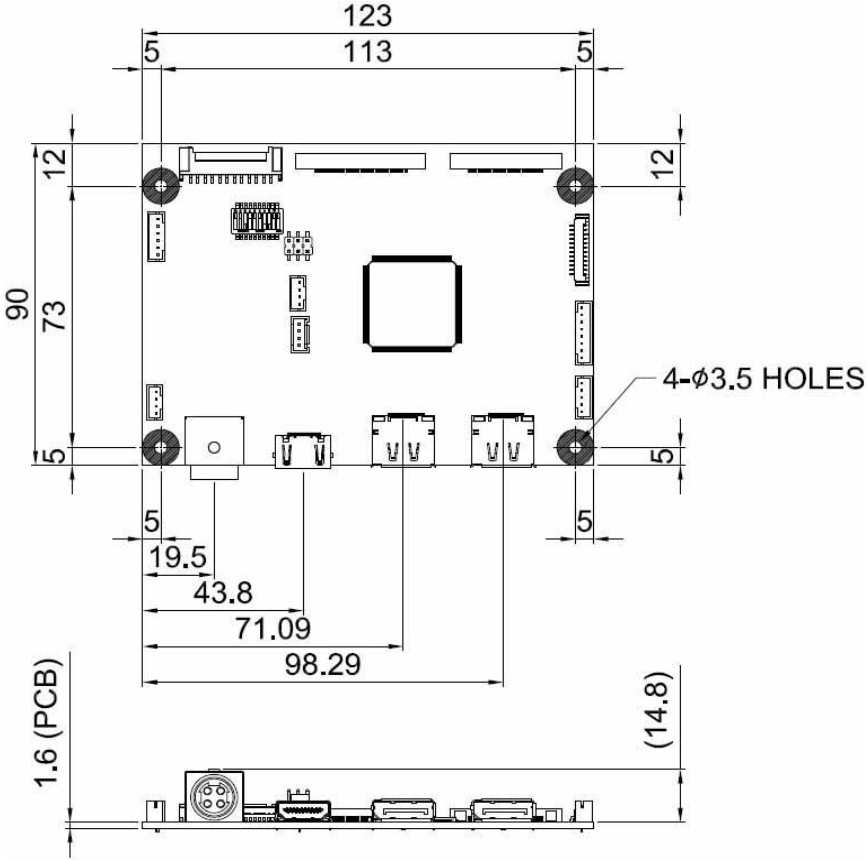
## 2. Block Diagram



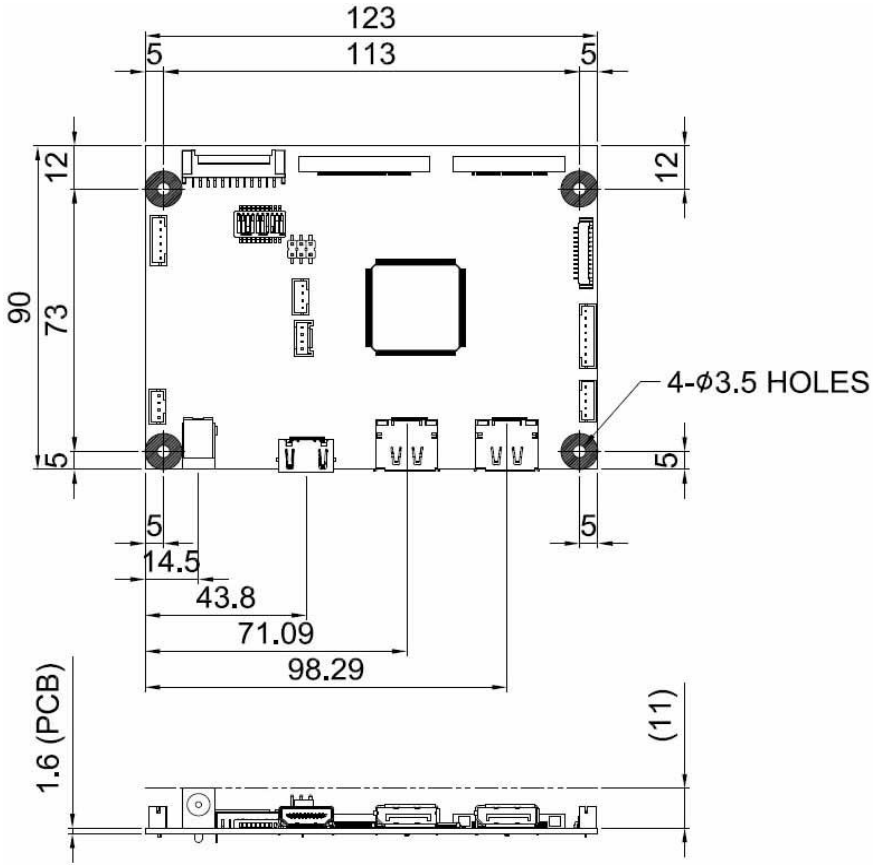
## 3. Board Dimensional Drawing

### 3.1 Main Board Dimensional Drawing

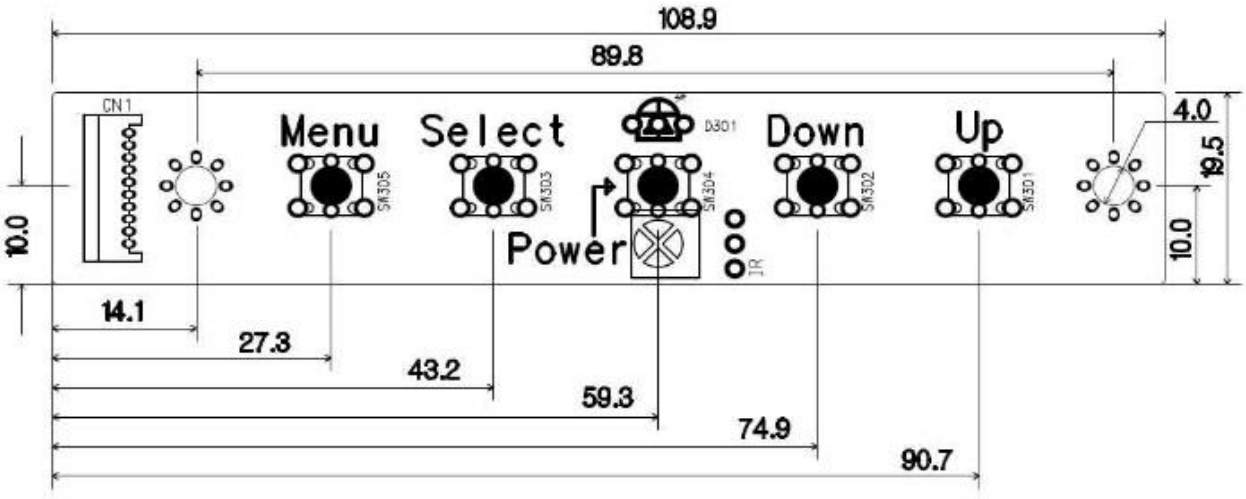
● **DC 24V Jack type (123 x 90 x 15mm)**




● **DC 12V Jack type (123 x 90 x 11mm)**

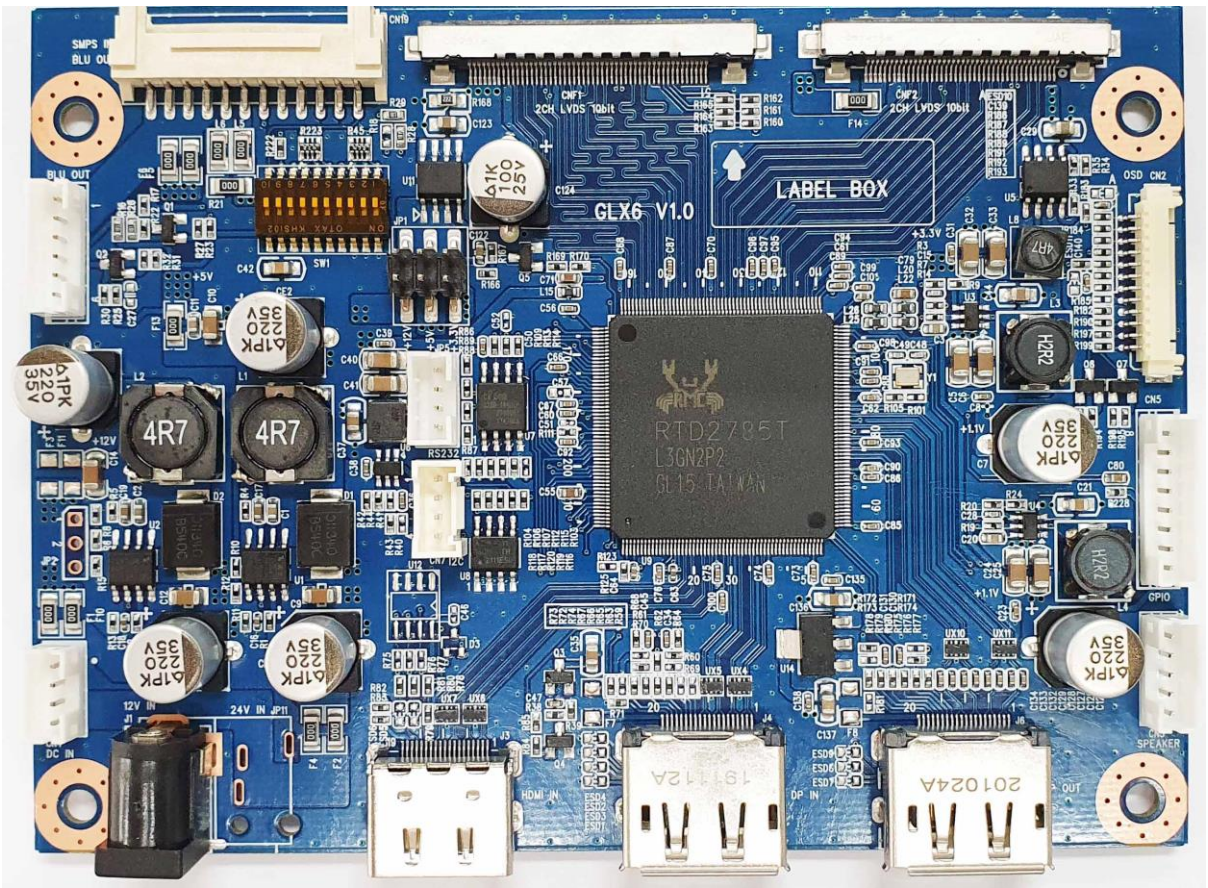


### 3.2 OSD Board Dimensional Drawing (unit : mm, 108.9 x 19.5 x 9.1)

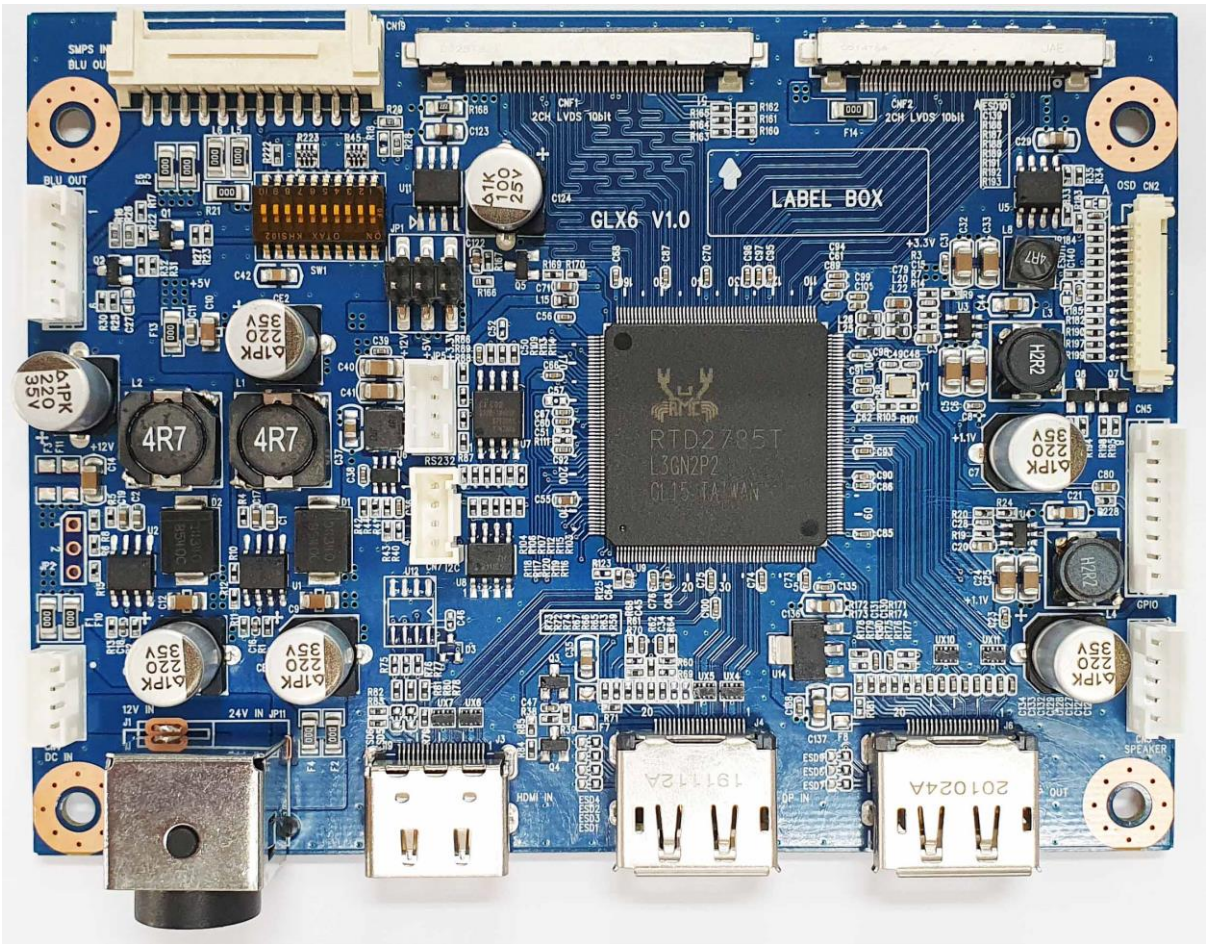



### 3.3 Pictures

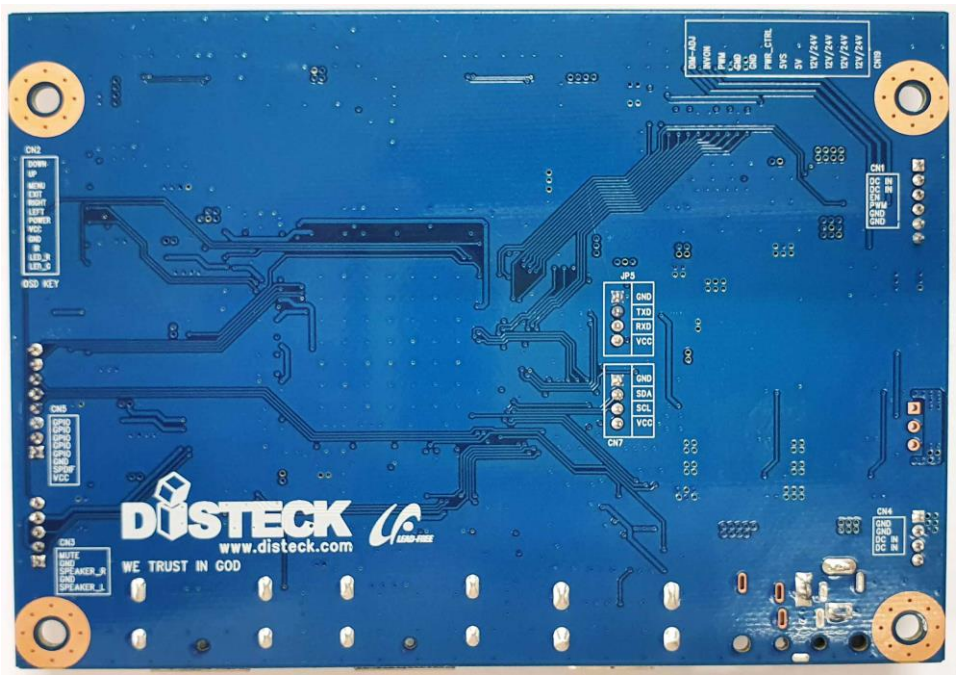
- **12V Adaptor type (Barrel Jack)**



- **24V Adaptor or SMPS Type**

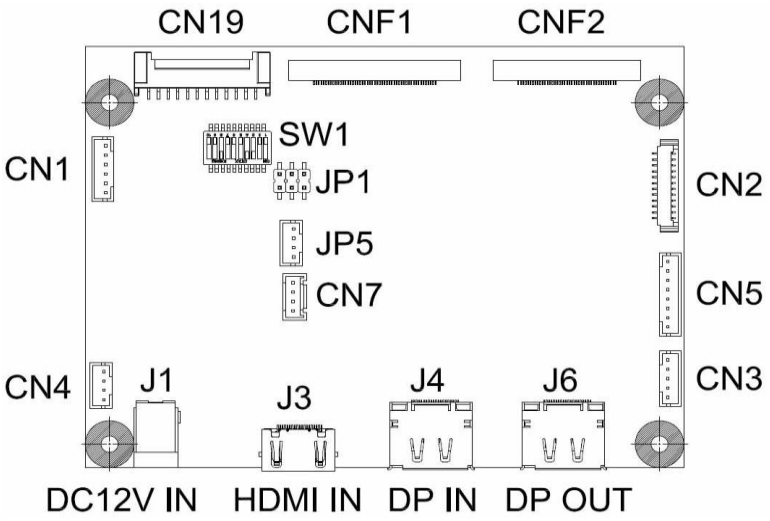



- **Rear View of Board**

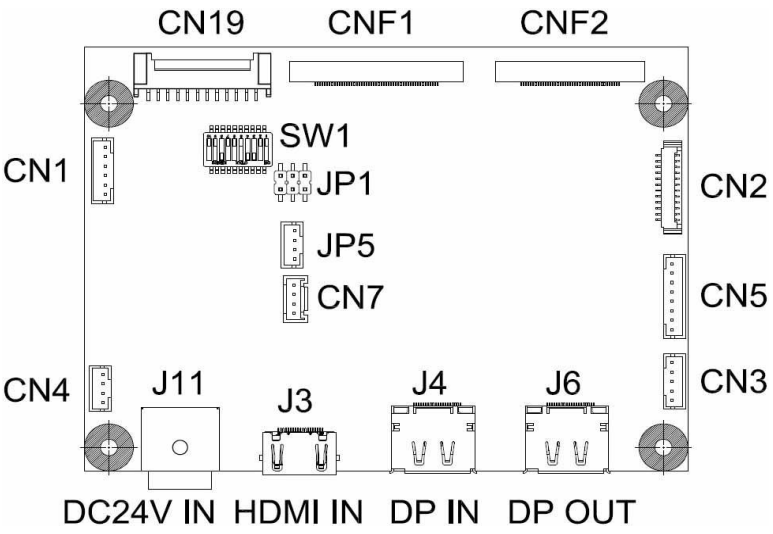


## 4. Connectors and Pin Information

- All Connector Numbers on the **12V** type




- All Connector Numbers on the **24V** type



### 4.1 Connector Summary

| Reference | Item | Description | Type | Manufacture |
|---|---|---|---|---|
| CNF1 | Wafer | For LVDS Output(51P) | FI-RE51S-HF | JAE or equivalent |
| CNF2 | Wafer | For LVDS Output (41P) | FI-RE41S-HF | JAE or equivalent |
| CN19 | Wafer | For Inverter or SMPS | 20037WR-12P | Yeon-Ho or equivalent |
| CN1 | Wafer | For Inverter or SMPS | 20010WS-06 | Yeon-Ho or equivalent |
| CN4 | Wafer | For 12V/24V DC Power | 20010WS-04 | Yeon-Ho or equivalent |
| J1 | DC Power Jack | For 12V DC Power | DC-005(2.5Ø) | Chang-Chun or equivalent |
| JP11 | DC Power Jack | For 24V DC Power | KPJX-4S-S | Chang-Chun or equivalent |
| J3 | HDMI Jack | For HDMI 2.0 Input | 51L019S-36DN-A | Freeport or equivalent |
| J4 | DP Jack | For DP1.2 Input | SD-47272-001 | Molex or equivalent |
| J6 | DP Jack | For DP Output, Daisy Chain | SD-47272-001 | Molex or equivalent |
| CN3 | Wafer | For Speaker Out | 20010WS-05 | Yeon-Ho or equivalent |
| CN5 | Wafer | For SPDIF, GPIO | 20010WS-08 | Yeon-Ho or equivalent |
| CN2 | Wafer | For OSD Key Pad | 12505WR-12P | Yeon-Ho or equivalent |
| CN7 | Wafer | For I2C Control | SMW200-04 | Yeon-Ho or equivalent |
| JP5 | Wafer | For RS232 Control | 20010WS-04 | Yeon-Ho or equivalent |
| SW1 | Dip Switch | For Panel Selection Switch | KHS-10 | Otax or equivalent |

## 4.2 Pin Map Detail

### 4.2.1 CNF1 : LVDS Output : FI-RE51S-HF / 0.5mm, 51P, Right Angle / JAE

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1~7 | LCD_VDD | VDD For LCD Module | |
| 8 | N.C | No Connection | |
| 9 | GND | Ground | |
| 10 | CH1_0- | LVDS Channel 1, Signal 0- | |
| 11 | CH1_0+ | LVDS Channel 1, Signal 0+ | |
| 12 | CH1_1- | LVDS Channel 1, Signal 1- | |
| 13 | CH1_1+ | LVDS Channel 1, Signal 1+ | |
| 14 | CH1_2- | LVDS Channel 1, Signal 2- | |
| 15 | CH1_2+ | LVDS Channel 1, Signal 2+ | |
| 16 | GND | Ground | |
| 17 | CH1_CLK- | LVDS Channel 1, Clock- | |
| 18 | CH1_CLK+ | LVDS Channel 1, Clock+ | |
| 19 | GND | Ground | |
| 20 | CH1_3- | LVDS Channel 1, Signal 3- | |
| 21 | CH1_3+ | LVDS Channel 1, Signal 3+ | |
| 22 | CH1_4- | LVDS Channel 1, Signal 4- | |
| 23 | CH1_4+ | LVDS Channel 1, Signal 4+ | |
| 24 | GND | Ground | |
| 25 | CH2_0- | LVDS Channel 2, Signal 0- | |
| 26 | CH2_0+ | LVDS Channel 2, Signal 0+ | |
| 27 | CH2_1- | LVDS Channel 2, Signal 1- | |
| 28 | CH2_1+ | LVDS Channel 2, Signal 1+ | |
| 29 | CH2_2- | LVDS Channel 2, Signal 2- | |
| 30 | CH2_2+ | LVDS Channel 2, Signal 2+ | |
| 31 | GND | Ground | |
| 32 | CH2_CLK- | LVDS Channel 2, Clock- | |
| 33 | CH2_CLK+ | LVDS Channel 2, Clock+ | |
| 34 | GND | Ground | |
| 35 | CH2_3- | LVDS Channel 2, Signal 3- | |
| 36 | CH2_3+ | LVDS Channel 2, Signal 3+ | |
| 37 | CH2_4- | LVDS Channel 2, Signal 4- | |
| 38 | CH2_4+ | LVDS Channel 2, Signal 4+ | |
| 39 | GND | Ground | |
| 40~41 | NC | No Connection | |
| 42~44 | RESERVED | OPTION | |
| 45~51 | NC | No Connection | |

### 4.2.2 CNF1 : LVDS Output : FI-RE41S-HF / 0.5mm, 41P, Right Angle / JAE

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1~6 | N.C | No Connection | |
| 7~9 | GND | Ground | |
| 10 | CH3_0- | LVDS Channel 3, Signal 0- | |
| 11 | CH3_0+ | LVDS Channel 3, Signal 0+ | |
| 12 | CH3_1- | LVDS Channel 3, Signal 1- | |
| 13 | CH3_1+ | LVDS Channel 3, Signal 1+ | |
| 14 | CH3_2- | LVDS Channel 3, Signal 2- | |
| 15 | CH3_2+ | LVDS Channel 3, Signal 2+ | |
| 16 | GND | Ground | |
| 17 | CH3_CLK- | LVDS Channel 3, Clock- | |
| 18 | CH3_CLK+ | LVDS Channel 3, Clock+ | |
| 19 | GND | Ground | |
| 20 | CH3_3- | LVDS Channel 3, Signal 3- | |
| 21 | CH3_3+ | LVDS Channel 3, Signal 3+ | |
| 22 | CH3_4- | LVDS Channel 3, Signal 4- | |
| 23 | CH3_4+ | LVDS Channel 3, Signal 4+ | |
| 24 | GND | Ground | |
| 25 | CH4_0- | LVDS Channel 4, Signal 0- | |
| 26 | CH4_0+ | LVDS Channel 4, Signal 0+ | |
| 27 | CH4_1- | LVDS Channel 4, Signal 1- | |
| 28 | CH4_1+ | LVDS Channel 4, Signal 1+ | |
| 29 | CH4_2- | LVDS Channel 4, Signal 2- | |
| 30 | CH4_2+ | LVDS Channel 4, Signal 2+ | |
| 31 | GND | Ground | |
| 32 | CH4_CLK- | LVDS Channel 4, Clock- | |
| 33 | CH4_CLK+ | LVDS Channel 4, Clock+ | |
| 34 | GND | Ground | |
| 35 | CH4_3- | LVDS Channel 4, Signal 3- | |
| 36 | CH4_3+ | LVDS Channel 4, Signal 3+ | |
| 37 | CH4_4- | LVDS Channel 4, Signal 4- | |
| 38 | CH4_4+ | LVDS Channel 4, Signal 4+ | |
| 39 | GND | Ground | |
| 40 | N.C | No Connection | |
| 41 | N.C | No Connection | |

### 4.2.3 CN19 : for Inverter/LED Driver or SMPS. Wafer

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | DIM-ADJ | Dimming Adjustment | |
| 2 | INVON | Invert Power On, Off | 0V (Off), 3.3V(On) |
| 3 | PWM | PWM Dimming Control | |
| 4, 5 | GND | Ground | |
| 6 | PWR_CTRL | Power Control Out (SMPS), NC (Inverter) | 0V (Off), 3.3V(On) |
| 7 | 5VS | 5VS In (SMPS), NC(Inverter) | 5V ± 1% |
| 8 | 5V | 5V In (SMPS), NC(Inverter) | 5V ± 1% |
| 9, 10, 11, 12 | 24V | 24V In or 12V In(SMPS),<br>24V Out(Inverter) | 24V ± 5%<br>12V ± 3% |

### 4.2.4 CN1 : for LED Driver Control Power

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | +24 | +12V/+24V DC Power Supply | |
| 2 | +24 | +12V/+24V DC Power Supply | |
| 3 | EN | Backlight ON/OFF | |
| 4 | ADJ | PWM/Analog Dimming | |
| 5 | GND | Ground | |
| 6 | GND | Ground | |

### 4.2.5 CN4 : for 12V/24V DC Power, Wafer

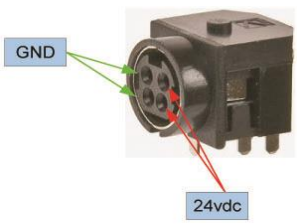
| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1, 2 | GND | Ground | |
| 3, 4 | 12V/24V | 12V/24V Power Input | |

### 4.2.6 J1 : for 12V DC Power, Jack

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | 12V | 12V Power Input | 12V ± 5% |
| 2, 3 | GND | Ground | |

### 4.2.7 JP11 : for 24V DC Power, Jack

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1, 3 | GND | Ground | |
| 2, 4 | 24V | 24V Power Input | 24V ± 5% |



### 4.2.8 J3 : for HDMI Input, HDMI Jack

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | RX2+ | HDMI DATA2 Differential Positive Signal | |
| 2 | GND | Ground | |
| 3 | RX2- | HDMI DATA2 Differential Negative Signal | |
| 4 | RX1+ | HDMI DATA1 Differential Positive Signal | |
| 5 | GND | Ground | |
| 6 | RX1- | HDMI DATA1 Differential Negative Signal | |
| 7 | RX0+ | HDMI DATA0 Differential Positive Signal | |
| 8 | GND | Ground | |
| 9 | RX0- | HDMI DATA0 Differential Negative Signal | |
| 10 | RXC+ | HDMI CLOCK Differential Positive Signal | |
| 11 | H_CABLE_DET_2 | HDMI_CABLE_DETECT_2 | |
| 12 | RXC- | HDMI CLOCK Differential Negative Signal | |
| 13,14 | NC | NO CONNECTION | |
| 15 | HDMI_SCL | HDMI Clock Line | |
| 16 | HDMI_SDA | HDMI Data Line | |
| 17 | GND | Ground | |
| 18 | HDMI_DDC5V | 5V Power Supply | |
| 19 | HDMI_HOT_PLUG | HDMI Hot Plug | |
| 20,21, 22 | GND | Ground | |

### 4.2.9 J4 : for DP Input, DP Jack

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | LANE3- | Negative Signal for Main Link 3 | |
| 3 | LANE3+ | Positive Signal for Main Link 3 | |
| 4 | LANE2- | Negative Signal for Main Link 2 | |
| 6 | LANE2+ | Positive Signal for Main Link 2 | |
| 7 | LANE1- | Negative Signal for Main Link 1 | |
| 9 | LANE1+ | Positive Signal for Main Link 1 | |
| 10 | LANE0- | Negative Signal for Main Link 0 | |
| 12 | LANE0+ | Positive Signal for Main Link 0 | |
| 13 | CONFIG1 | Pull down resister 100KR | |
| 14 | CONFIG2 | Pull down resister 100KR | |
| 15 | AUX CH+ | Positive Signal for Auxiliary Channel | |
| 17 | AUX CH- | Negative Signal for Auxiliary Channel | |
| 18 | HPD | Hot Plug Detection | |
| 19 | RETURN | NO Connection | |
| 20 | PWR OUT | 3.3V | |
| 2, 5, 8, 11, 16, 21, 22, 23, 24 | GND | Ground | |

### 4.2.10 J6 : for DP Output, DP Jack(Daisy Chain : Option)

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | LANE0+ | Positive Signal for Main Link 0 | |
| 3 | LANE0- | Negative Signal for Main Link 0 | |
| 4 | LANE1+ | Positive Signal for Main Link 1 | |
| 6 | LANE1- | Negative Signal for Main Link 1 | |
| 7 | LANE2+ | Positive Signal for Main Link 2 | |
| 9 | LANE2- | Negative Signal for Main Link 2 | |
| 10 | LANE3+ | Positive Signal for Main Link 3 | |
| 12 | LANE3- | Negative Signal for Main Link 3 | |
| 13 | CONFIG1 | Pull down resister 100KR | |
| 14 | CONFIG2 | Pull down resister 100KR | |
| 15 | AUX CH+ | Positive Signal for Auxiliary Channel | |
| 17 | AUX CH- | Negative Signal for Auxiliary Channel | |
| 18 | HPD | Hot Plug Detection | |
| 19 | RETURN | No Connection | |
| 20 | PWR OUT | 3.3V | |
| 2, 5, 8, 11, 16, 21, 22, 23, 24 | GND | Ground | |

### 4.2.11 CN3 : for Speaker, Wafer

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | SP_L | Audio Left Speaker Output | |
| 2 | GND | Ground | |
| 3 | SP_R | Audio Right Speaker Output | |
| 4 | GND | Ground | |
| 5 | MUTE | Audio Mute Output | |

### 4.2.12 CN5 : for SPDIF & GPIO, Wafer

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | VCC | 3.3V | |
| 2 | SPDIF | SPDIF Output | |
| 3 | GND | Ground | |
| 4 | GPIO | General Purpose I/O | |
| 5 | GPIO | General Purpose I/O | |
| 6 | GPIO | General Purpose I/O | |
| 7 | GPIO | General Purpose I/O | |
| 8 | GPIO | General Purpose I/O | |

### 4.2.13 CN2 : for OSD Control Key, Wafer

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | LED Red Key | LED drive for Red Color | |
| 2 | LED Green_Key | LED drive for Green Color | |
| 3 | IR_Key | IR Receiver | |
| 4 | GND | Ground | |
| 5 | 3.3V_Key | 3.3V | |
| 6 | PWR_Key | POWER key | |
| 7 | Left_Key | Left key | |
| 8 | Right_Key | Right key | |
| 9 | Exit_Key | Exit_Key | |
| 10 | Menu_Key | Menu key | |
| 11 | Up_Key | Up key | |
| 12 | Down_Key | Down key | |

### 4.2.14 CN7 : for $I_2C$ Control, Wafer

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | GND | Ground | |
| 2 | SDA | Signal for SDA | |
| 3 | SCL | Signal for SCL | |
| 4 | VCC | 3.3V Power | |

### 4.2.15 JP5 : for RS232 Control, Wafer

| Pin No | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | GND | Ground | |
| 2 | TXD | Signal For TX | |
| 3 | RXD | Signal for RX | |
| 4 | STB_5V | 5V Power | |

## 5. Applicable Graphic Mode

The microprocessor measures the H-sync, V-sync and V-sync/H-sync polarity for RGB inputs, and uses this timing information to control all of the display operation to get the proper image on a screen. This board can detect all VESA standard and MAC Graphic modes shown on the table below and provide more clear and stable image on a screen.
RGB & DIVI Input format

| Resolution | Pixel Freq. | Horizontal Timing | | | | Vertical Timing | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Sync Polar | Freq. | Total | Active | Sync Polar | Freq. | Total | Active |
| | MHz | | KHz | Pixel | Pixel | | Hz | Line | Line |
| 640x350 @70Hz | 25.144 VESA | P | 31.430 | 800 | 640 | N | 70.000 | 449 | 350 |
| 720x400 @70Hz | 28.287 VESA | N | 31.430 | 900 | 720 | P | 70.000 | 449 | 400 |
| 640x480 @60Hz | 25.175 MAC | N | 31.469 | 800 | 640 | N | 59.940 | 525 | 480 |
| 640x480 @60Hz | 25.175 VESA | N | 31.469 | 800 | 640 | N | 59.940 | 525 | 480 |
| 640x480 @67Hz | 30.240 MAC | N | 35.000 | 864 | 640 | N | 66.667 | 525 | 480 |
| 640x480 @72Hz | 31.500 VESA | N | 37.861 | 832 | 640 | N | 72.809 | 520 | 480 |
| 640x480 @75Hz | 31.500 VESA | N | 37.500 | 840 | 640 | N | 75.000 | 500 | 480 |
| 832x624 @75Hz | 57.284 MAC | N | 49.726 | 1152 | 832 | N | 74.551 | 667 | 624 |
| 800x600 @56Hz | 36.000 VESA | P | 35.156 | 1024 | 800 | P | 56.250 | 625 | 600 |
| 800x600 @60Hz | 40.000 VESA | P | 37.879 | 1056 | 800 | P | 60.317 | 628 | 600 |
| 800x600 @72Hz | 50.000 VESA | P | 48.077 | 1040 | 800 | P | 72.188 | 666 | 600 |
| 800x600 @75Hz | 49.500 VESA | P | 46.875 | 1056 | 800 | P | 75.000 | 625 | 600 |
| 1024x768 @60Hz | 65.000 VESA | N | 48.363 | 1344 | 1024 | N | 60.005 | 806 | 768 |
| 1024x768 @60Hz | 64.000 MAC | N | 48.780 | 1312 | 1024 | N | 60.001 | 813 | 768 |
| 1024x768 @70Hz | 75.000 VESA | N | 56.476 | 1328 | 1024 | N | 70.070 | 806 | 768 |
| 1024x768 @75Hz | 80.000 MAC | N | 60.241 | 1328 | 1024 | N | 74.927 | 804 | 768 |
| 1024x768 @75Hz | 78.750 VESA | P | 60.023 | 1312 | 1024 | P | 75.030 | 800 | 768 |
| 1280x768 @60Hz | 79,500 VESA | P | 47,780 | 1664 | 1280 | P | 59,870 | 798 | 768 |
| 1280x1024 @60Hz | 108.000 VESA | P | 63.981 | 1688 | 1280 | P | 60.020 | 1066 | 1024 |
| 1280x1024 @75Hz | 135.000 VESA | P | 79.976 | 1688 | 1280 | P | 75.025 | 1066 | 1024 |
| 1360X768 @60Hz | 85.00 VESA | P | 47.712 | 1792 | 1360 | P | 60.015 | 795 | 768 |
| 1600x1200 @60Hz | 160.875 VESA | N | 74.479 | 2160 | 1600 | P | 59.967 | 1242 | 1200 |
| 1680x1050 @60Hz | 147.000 VESA | N | 65.160 | 2256 | 1680 | P | 59.944 | 1087 | 1050 |
| 1920x1080 @60Hz | 172.750 VESA | N | 67.061 | 2576 | 1920 | P | 59.983 | 1118 | 1080 |
| 1920X1200@60Hz | 193.125 VESA | N | 74.508 | 1292 | 1920 | P | 59,990 | 1242 | 1200 |
| 2560X1440@60Hz | | N | 88.7 | | 2560 | | | | 1440 |
| 2560X1600@60Hz | | N | 98.7 | | 2560 | | | | 1600 |

## 6. OSD Board Menu Tree

The On Screen Display consists of following menu.
These can be activated by selection from Remote Controller or OSD Key pad manually.

### 6.1 Summarized Table

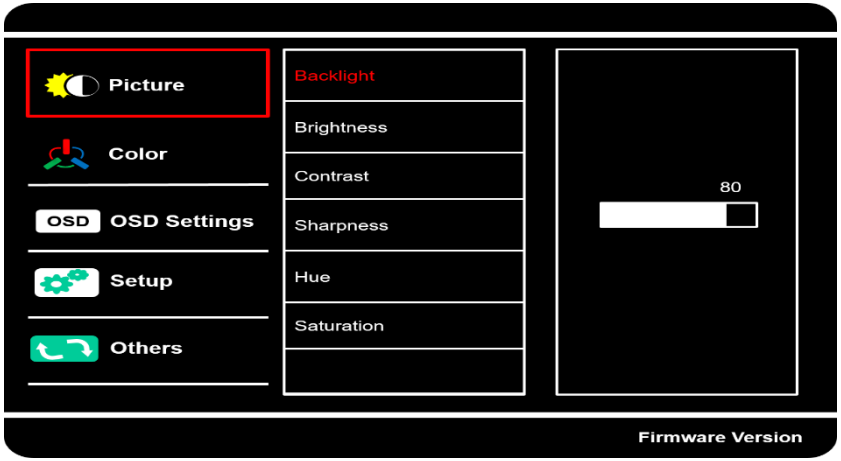
| Main Menu | Sub Menu | Control | |
|---|---|---|---|
| **Picture** | Backlight | 0 ~ 100 | |
| | Brightness | 0 ~ 100 | |
| | Contrast | 0 ~ 100 | |
| | Sharpness | 0 ~ 4 | |
| | Hue | 0 ~ 100 | |
| | Saturation | 0 ~ 100 | |
| **Color** | Color Temp | 9300K, 7500K, 6500K, 5800K, SRGB, User Define | |
| | Red | 0 ~ 100 | |
| | Green | 0 ~ 100 | |
| | Blue | 0 ~ 100 | |
| | Color Effect | Standard, Game, Movie, Photo, Vivid | |
| | Gamma | Off, 1.8, 2.0, 2.2, 2.4 | |
| **OSD Settings** | Language | English, Español, Français, Deutsch, Italiano, Nederlands, Русский | |
| | Horizontal | 0 ~ 100 | |
| | Vertical | 0 ~ 100 | |
| | Transparency | 0 ~ 100 | |
| | OSD Time Out | 0 ~ 100 | |
| | OSD Rotate | 0, 90, 270, 180 | |
| **Setup** | Input | Auto Select, DP, HDMI | |
| | Mute | Off, On | |
| | Volume | 0 ~ 100 | |
| | DP Format | DP 1.1, DP 1.2 | |
| | DP MST | Off, DP1,DP2 | |
| | Clone Mode | Off, On | |
| | Reset | | |
| **Others** | Display Size | Full Screen, AUTO, 4:3, 5:4, 1:1 | |
| | Overdrive | Off, On | |
| | Video Wall Settings | Video Wall | Off, On |
| | | Display Number | 1 ~ 25 |
| | | Horizontal Number | 1 ~ 5 |
| | | Vertical Number | 1 ~ 5 |
| | | RS232 ID | 1 ~ 25 |
| | *Light Sensor | Off, On | |
| | *Fan Controls | Fan Status | Off, On, Auto |
| | | Fan PWM1 | 0 ~ 100 |
| | | Fan PWM2 | 0 ~ 100 |
| | | Fan PWM3 | 0 ~ 100 |
| | | Fan PWM4 | 0 ~ 100 |

| | | | |
|---|---|---|---|
| | | ShutDown | Off, On |
| | | ShutDown Temp | 60 ~ 85 |
| | | Temperature | Temp1 ~ Temp5 |
| | *Self Check | Off, On | |
| **Service** | Backlight >> PWM RES | 8Bit>>256, 12Bit>>4095 | |
| | >> Control | Liner, Curve | |
| | >> Invert | Off, On | |
| | >> Frequency | 120 ~ 50000 | |

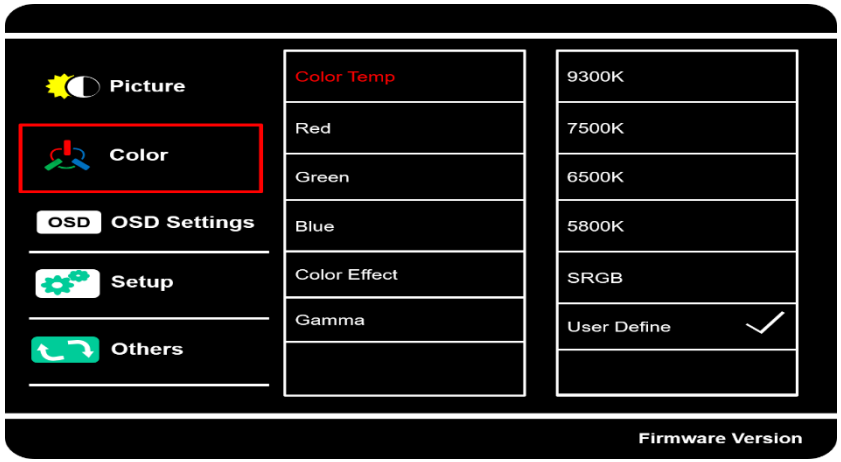
[Note] the " * " is an **Option Sub Menu**

## 6.2 UI Design shape by the orders of Menu Tree

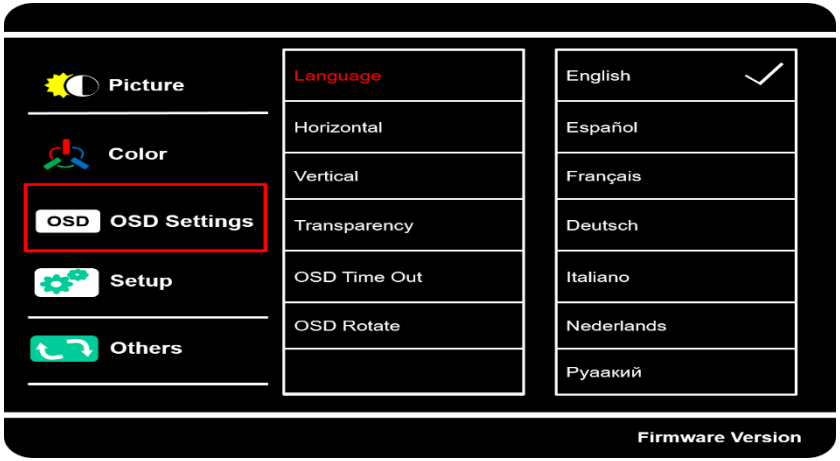
### Main menu – 1 : Picture



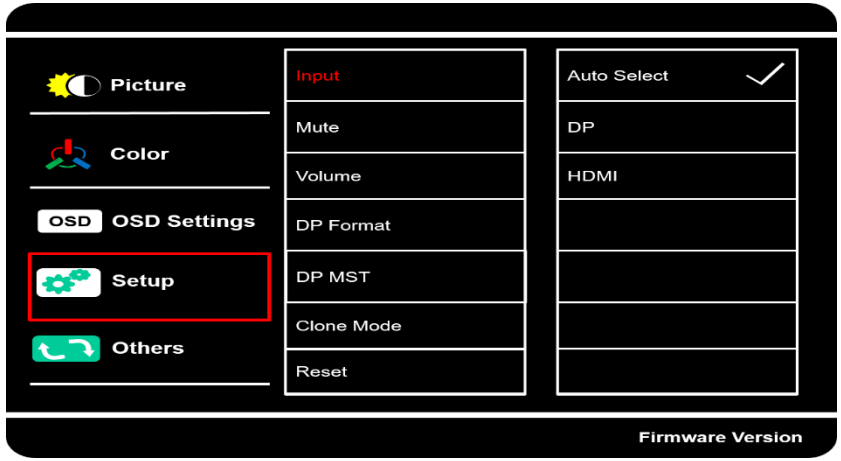

### Main menu – 2 : Color



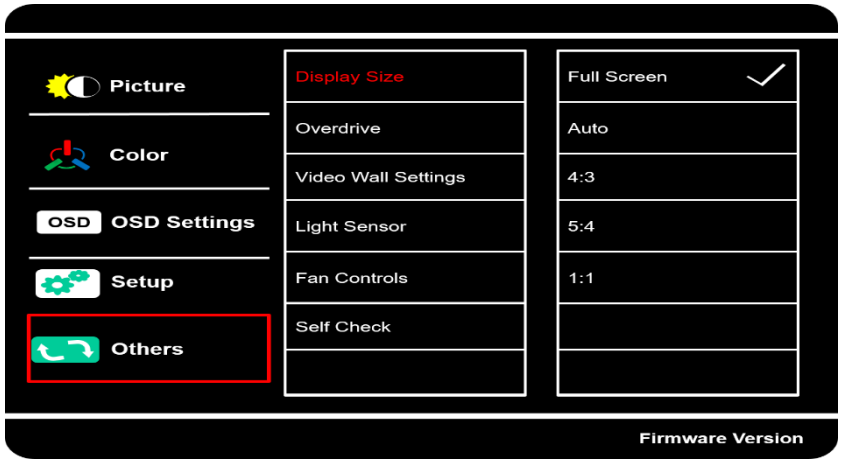

### Main menu – 3 : OSD Settings



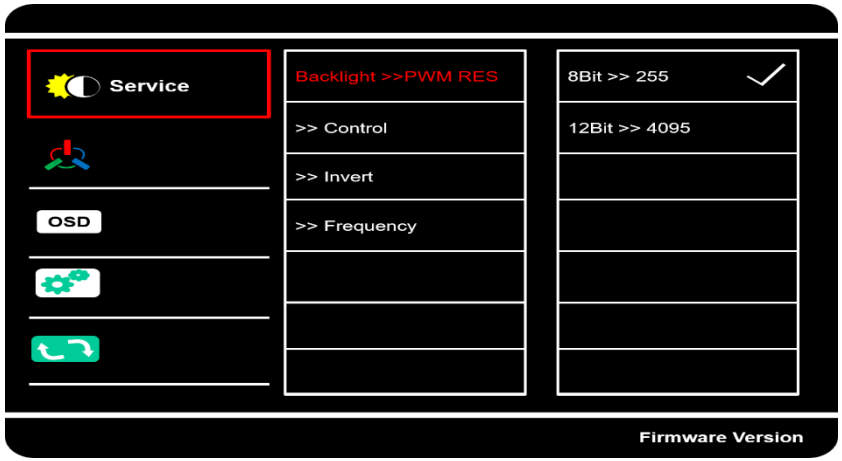

### Main menu – 4 : Setup



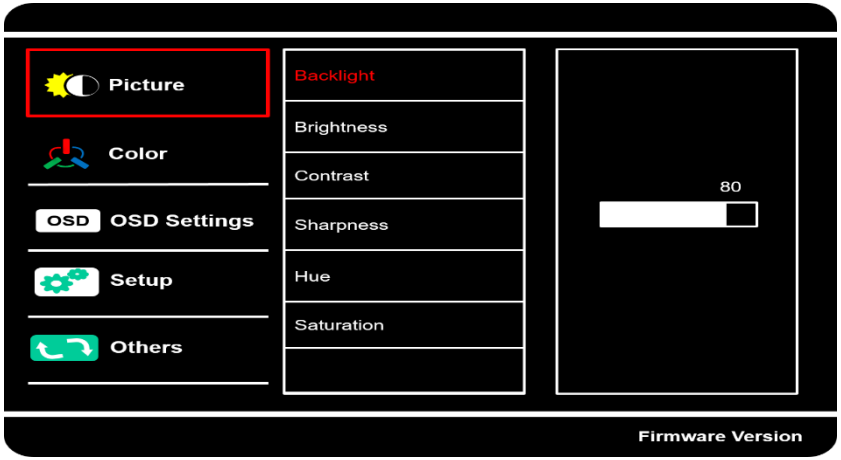
## Main menu – 5 : Others



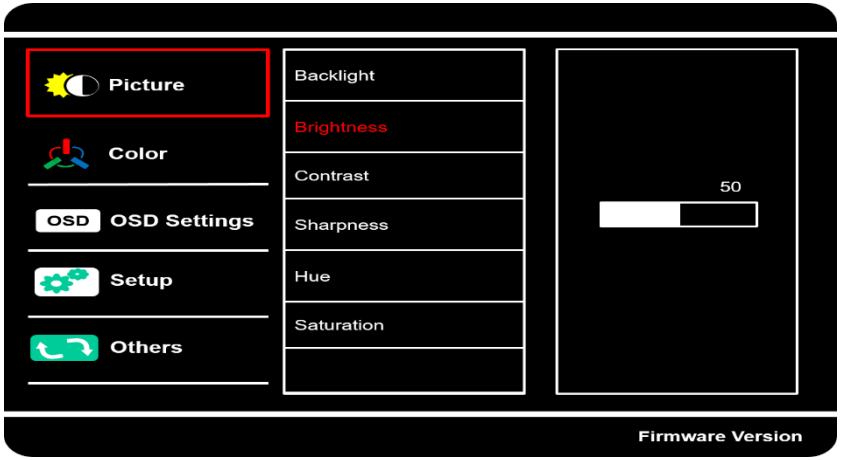

## Service menu – : Service



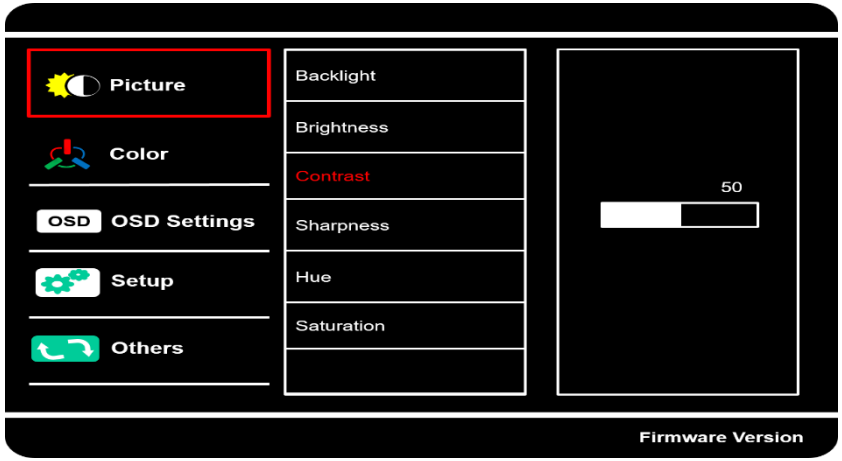

## Submenu – 1-1 : Picture – Backlight



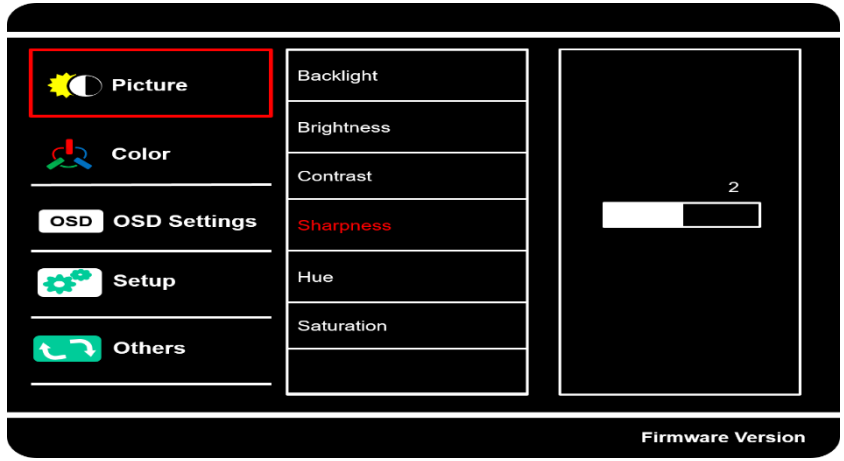

## Submenu – 1-2 : Picture – Brightness



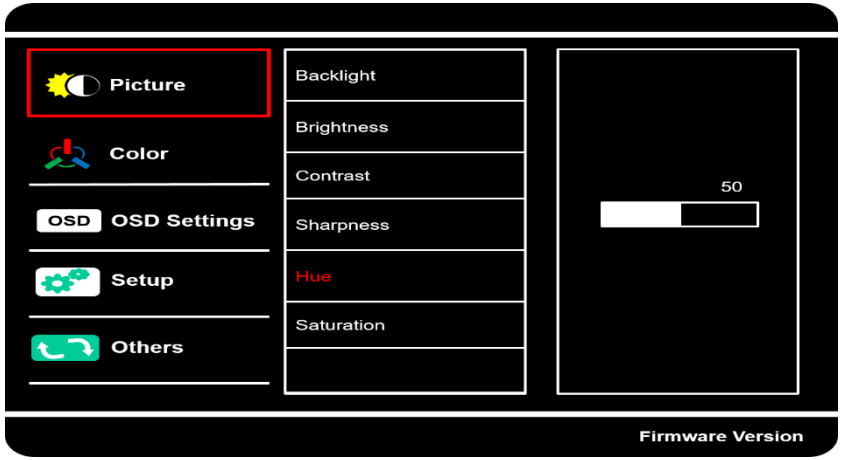
## Submenu – 1-3 : Picture – Contrast



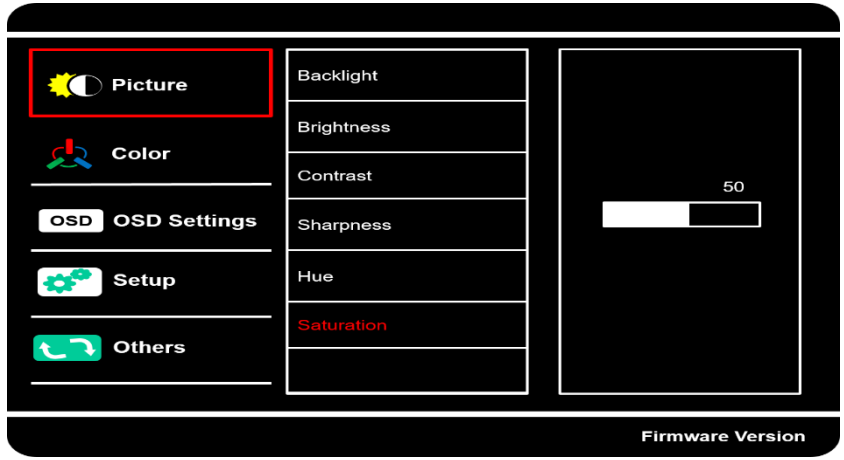

## Submenu – 1-4 : Picture – Sharpness



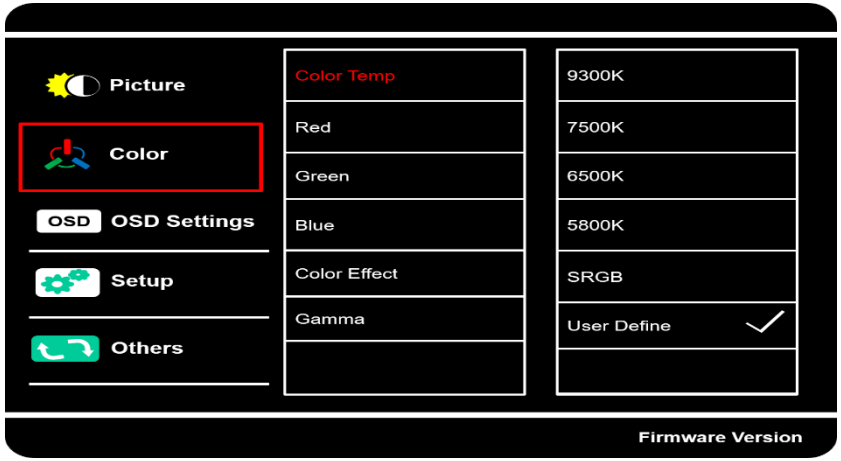

## Submenu – 1-5 : Picture – Hue



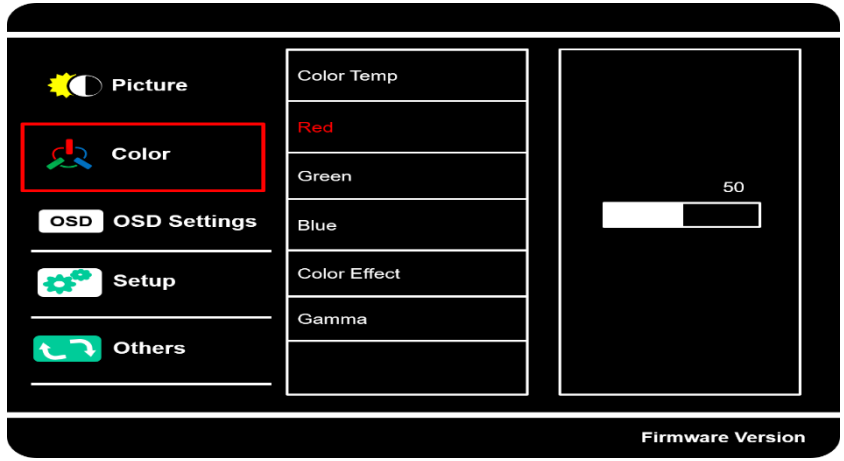

## Submenu – 1-6 : Picture – Saturation



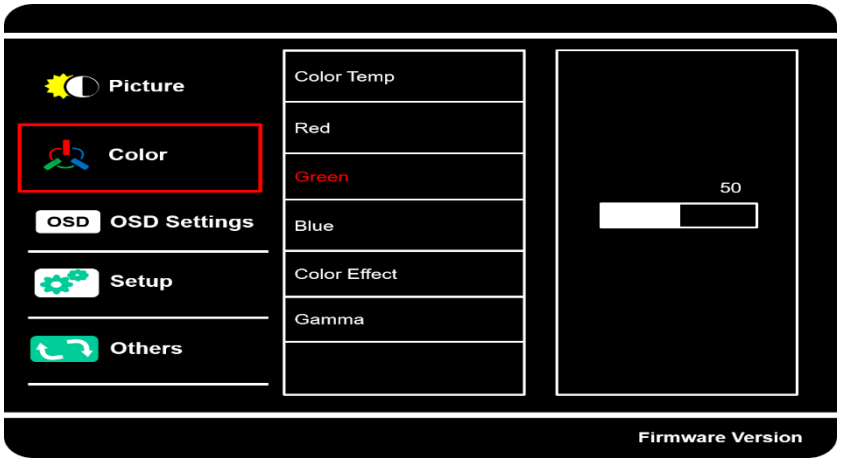
## Submenu – 2-1 : Color – Color Temp



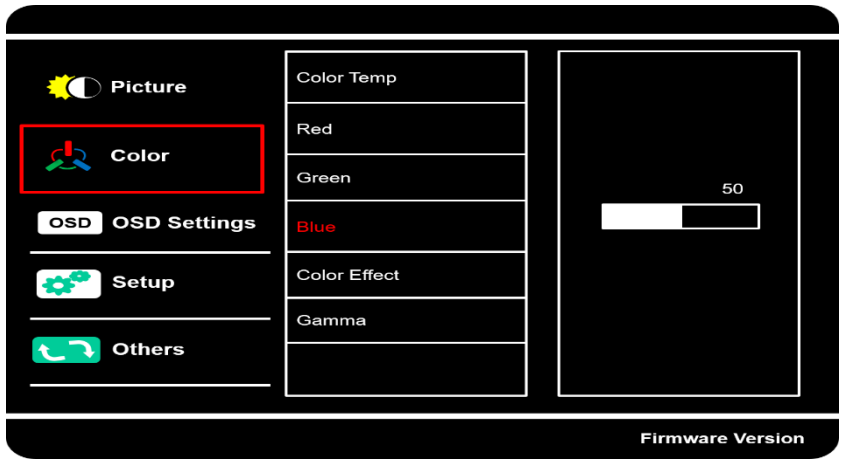

## Submenu – 2-2 : Color – Red



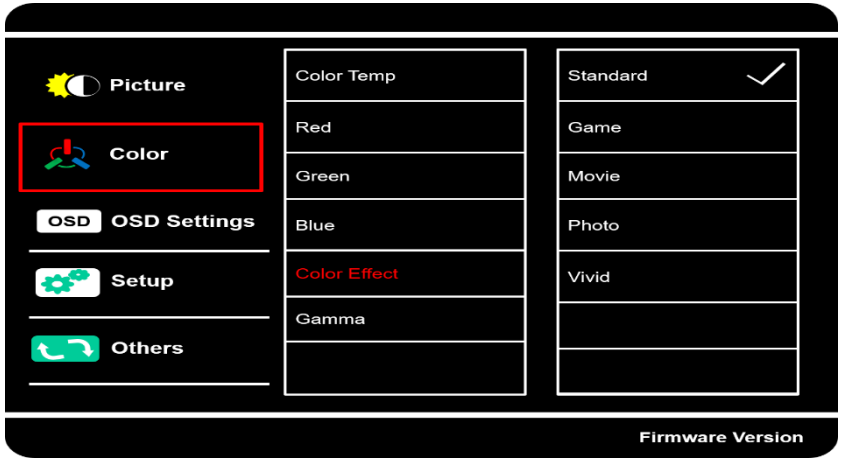

## Submenu – 2-3 : Color – Green



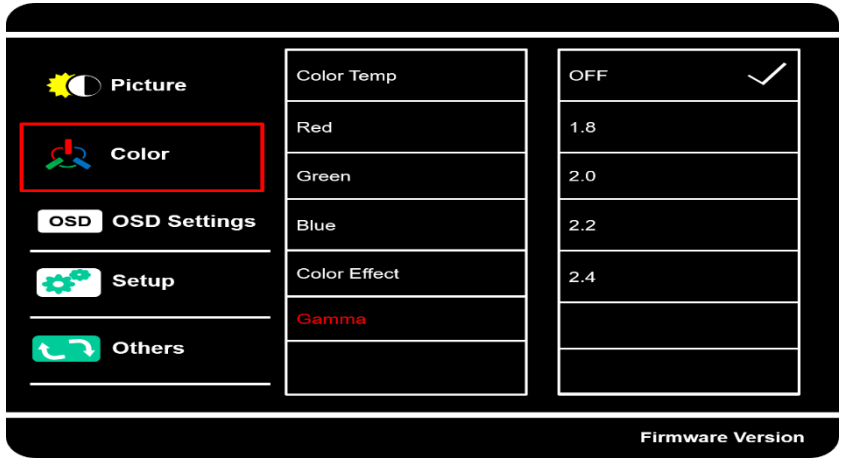

## Submenu – 2-4 : Color – Blue



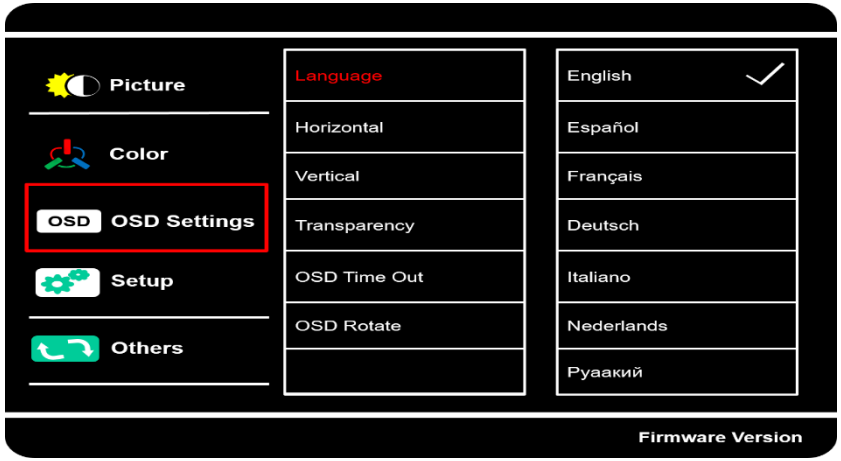
## Submenu – 2-5 : Color – Color Effect



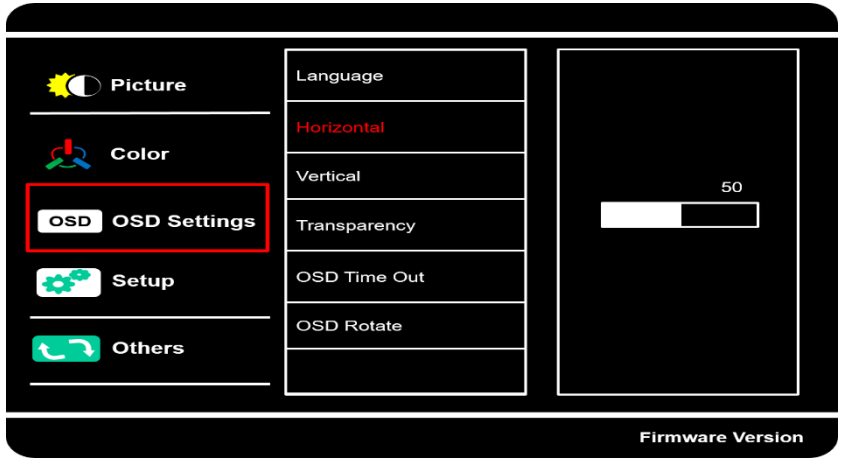

## Submenu – 2-6 : Color – Gamma



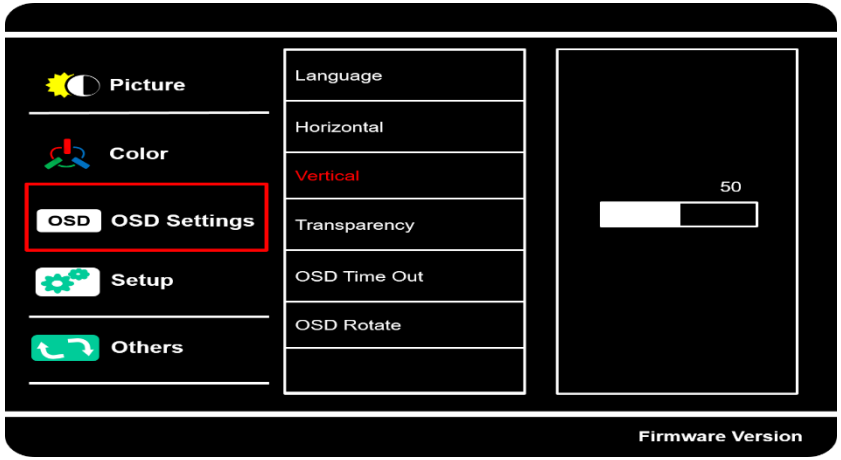

## Submenu – 3-1 : OSD Settings – Language



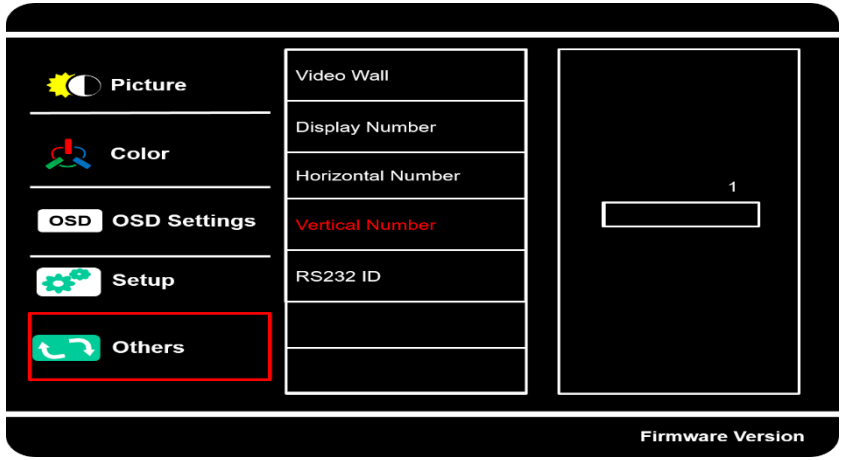

## Submenu – 3-2 : OSD Settings – Horizontal



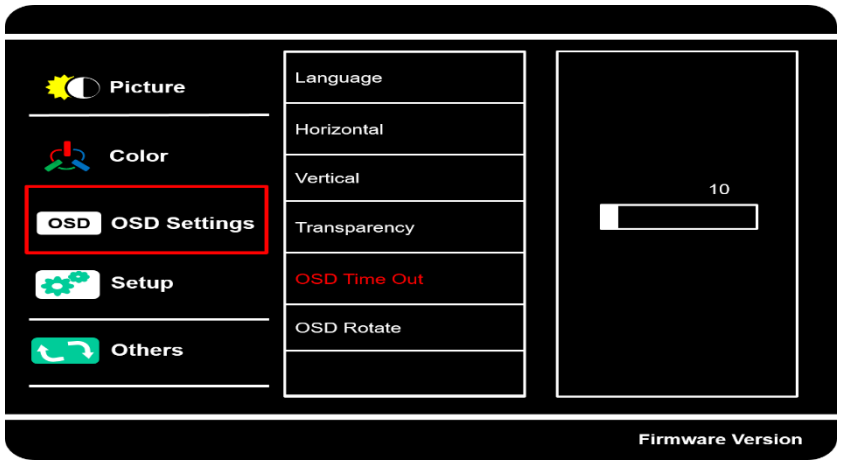
## Submenu – 3-3 : OSD Settings – Vertical



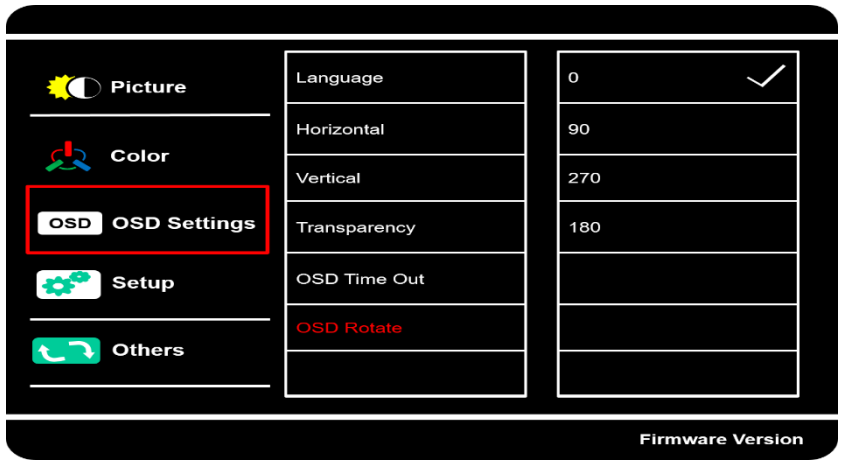

## Submenu – 3-4 : OSD Settings – Transparency



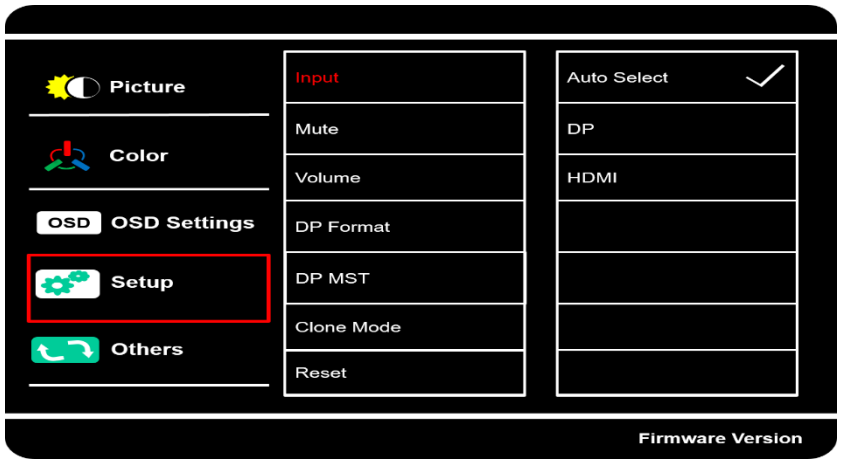

## Submenu – 3-5 : OSD Settings – OSD Time Out



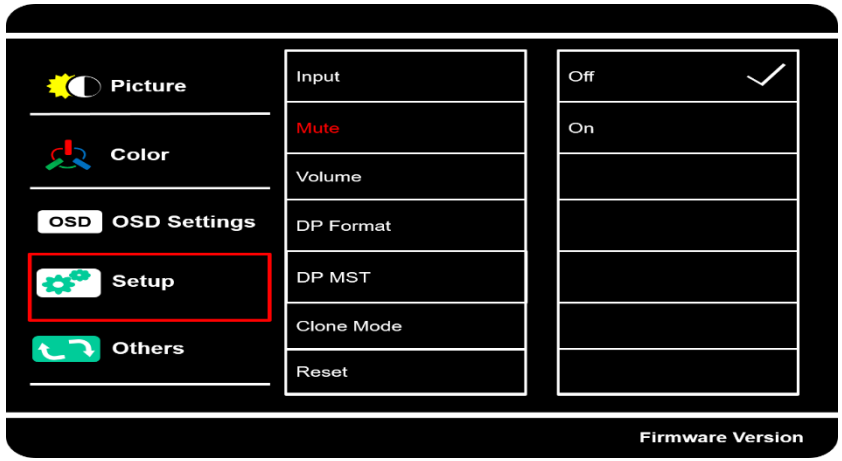

## Submenu – 3-6 : OSD Settings – OSD Rotate



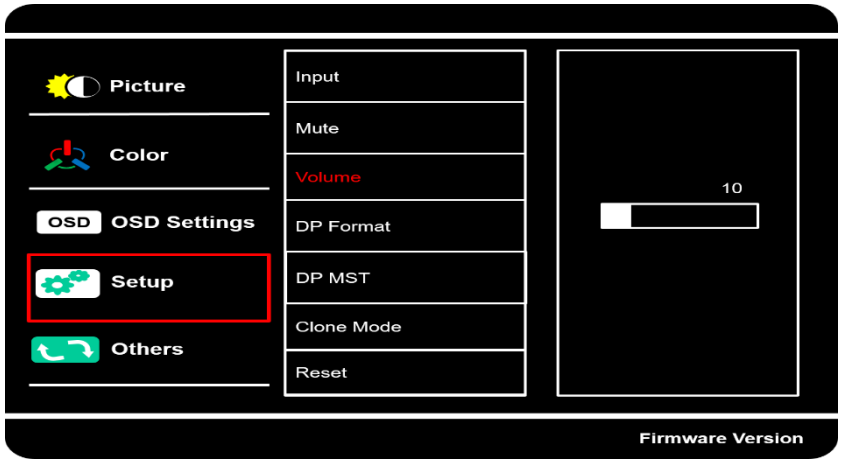
## Submenu – 4-1 : Setup – Input



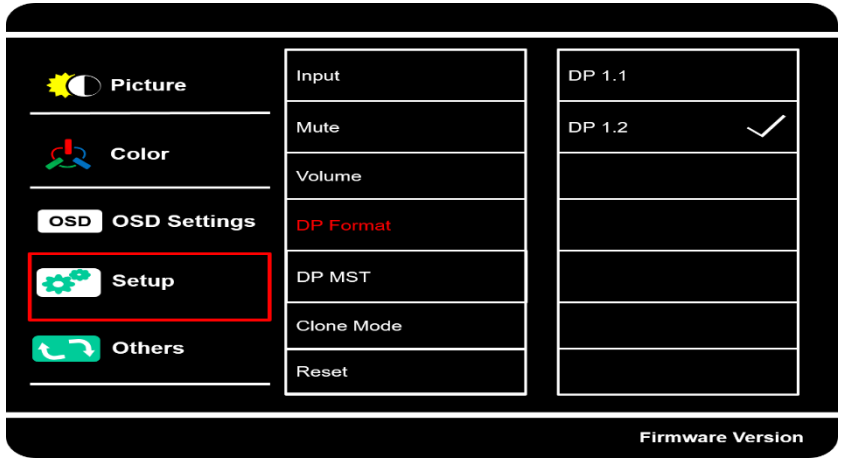

## Submenu – 4-2 : Setup – Mute



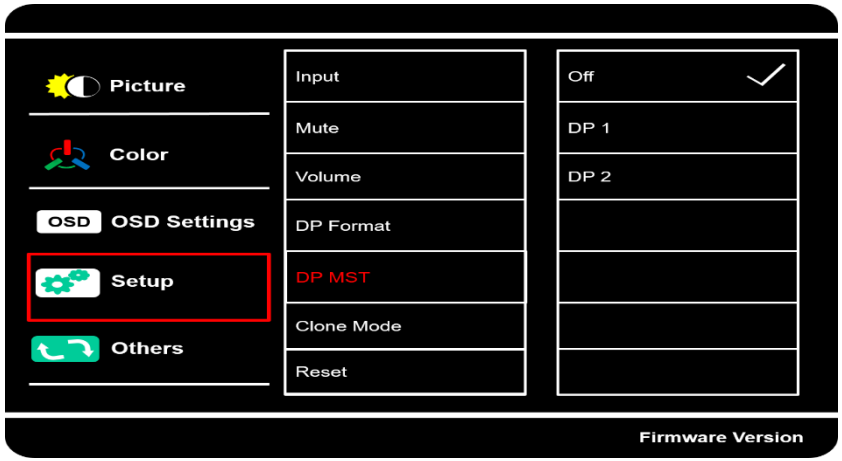

## Submenu – 4-3 : Setup – Volume



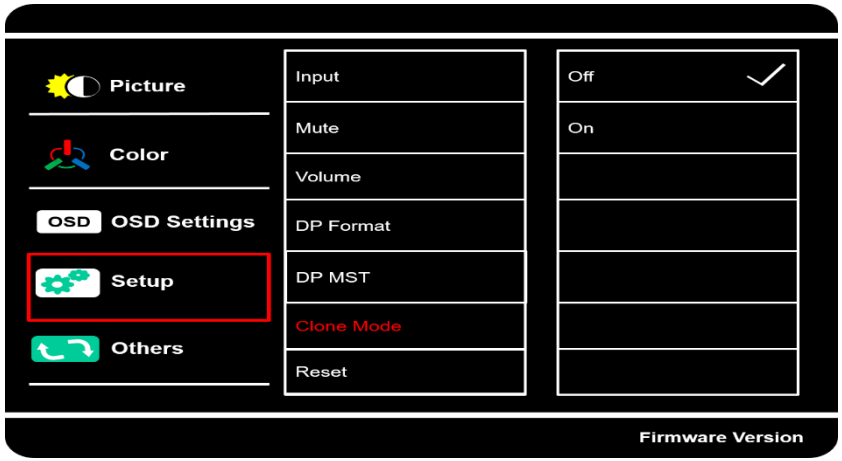

## Submenu – 4-4 : Setup – DP Format



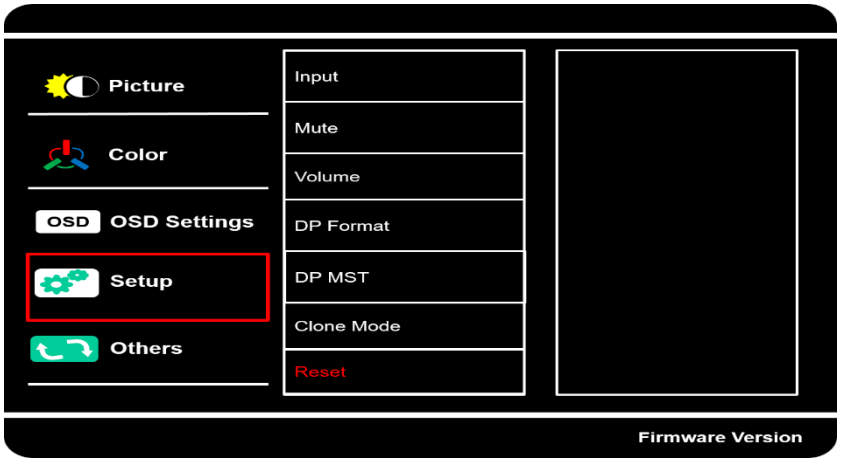
## Submenu – 4-5 : Setup – DP MST



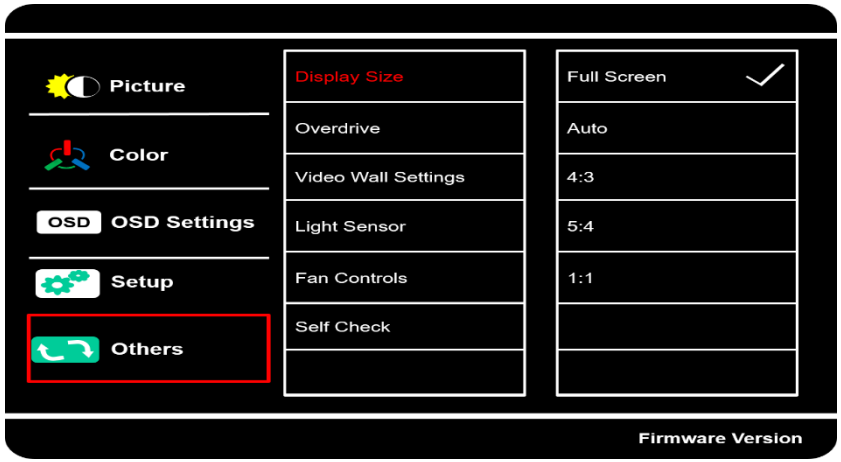

## Submenu – 4-6 : Setup – Clone Mode



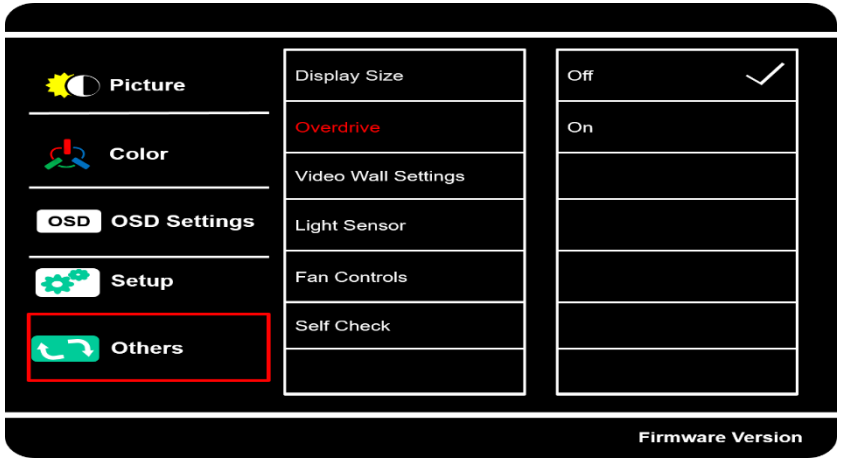

## Submenu – 4-7 : Setup – Reset



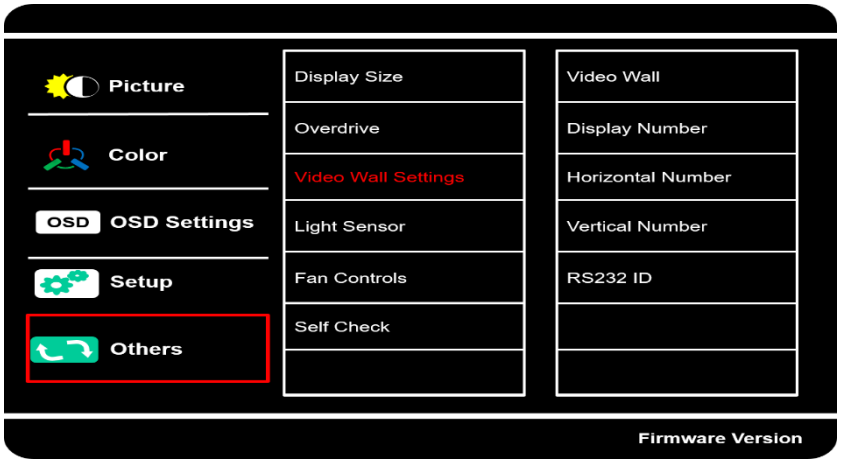
## Submenu – 5-1 : Others – Display Size



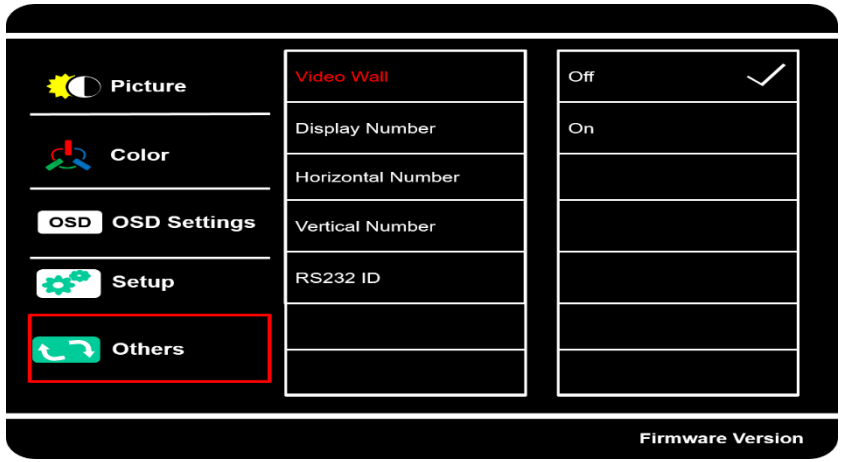

## Submenu – 5-2 : Others – Overdrive



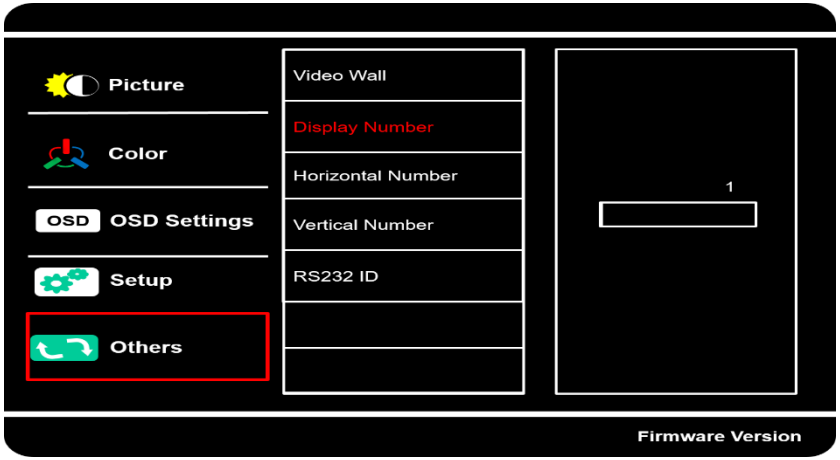

## Submenu – 5-3 : Others – Video Wall Settings



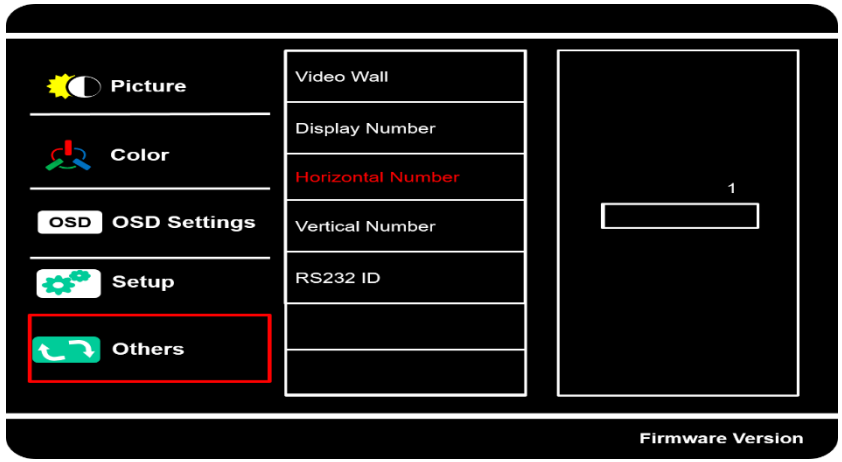

## Submenu – 5-3-1 : Others – Video Wall Settings – Video Wall



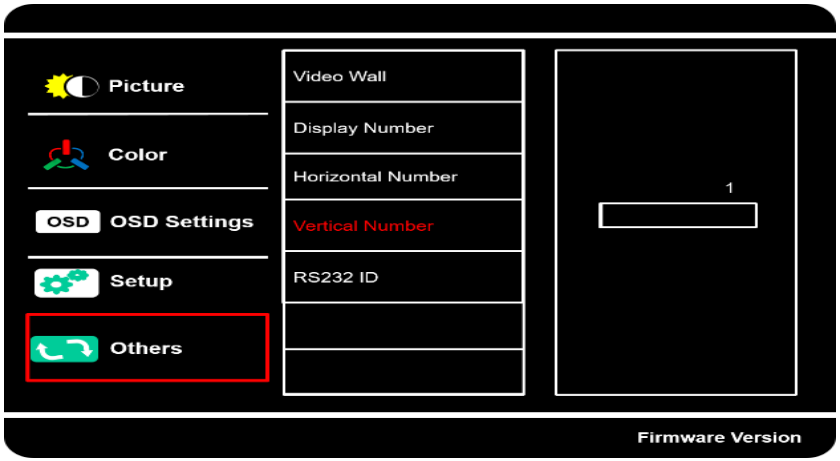
## Submenu – 5-3-2 : Others – Video Wall Settings – Display Number



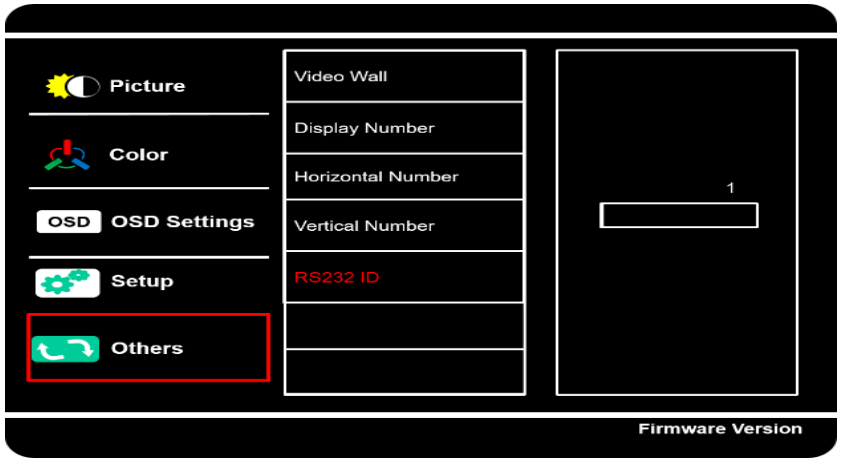

## Submenu – 5-3-3 : Others – Video Wall Settings – Horizontal Number



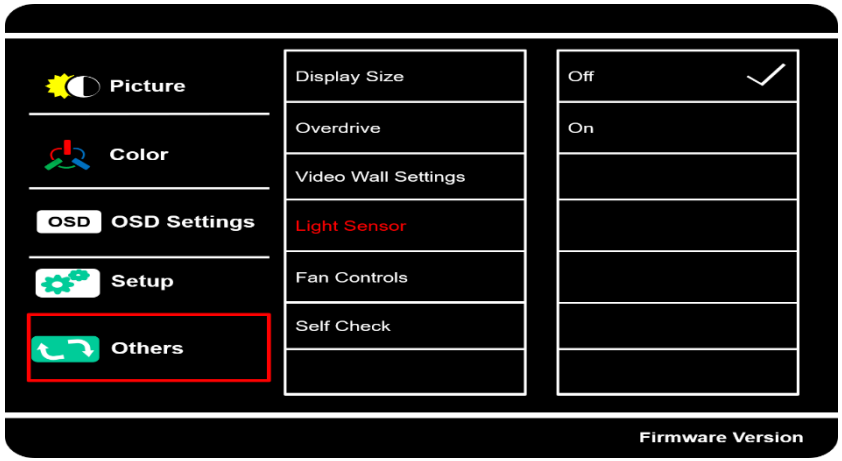

## submenu – 5-3-4 : Others – Video Wall Settings – Vertical Number



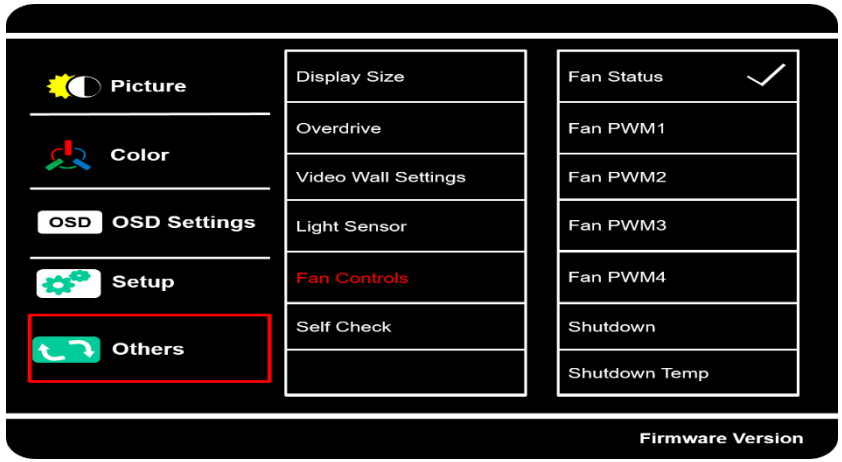

## Submenu – 5-3-5 : Others – Video Wall Settings – RS232 ID



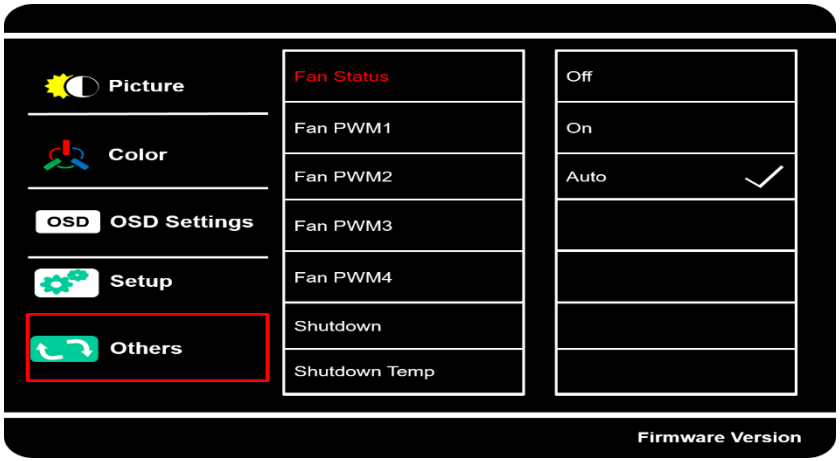
## Submenu – 5-4 : Others – Light Sensor



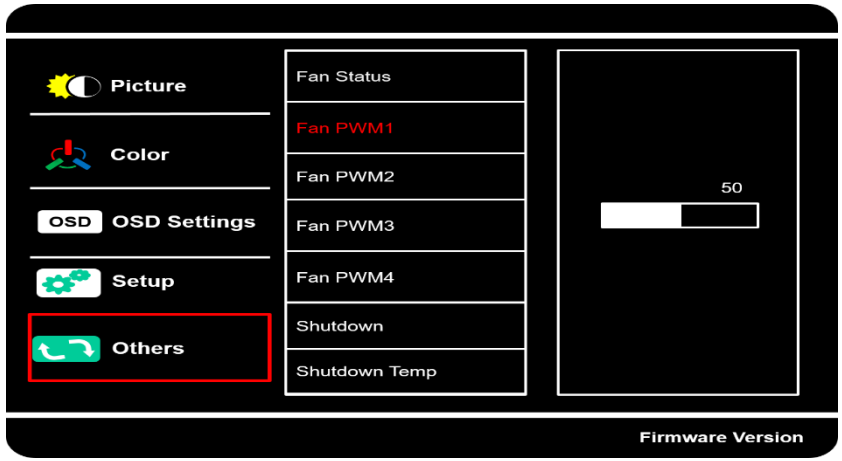

## Submenu – 5-5 : Others – Fan Controls



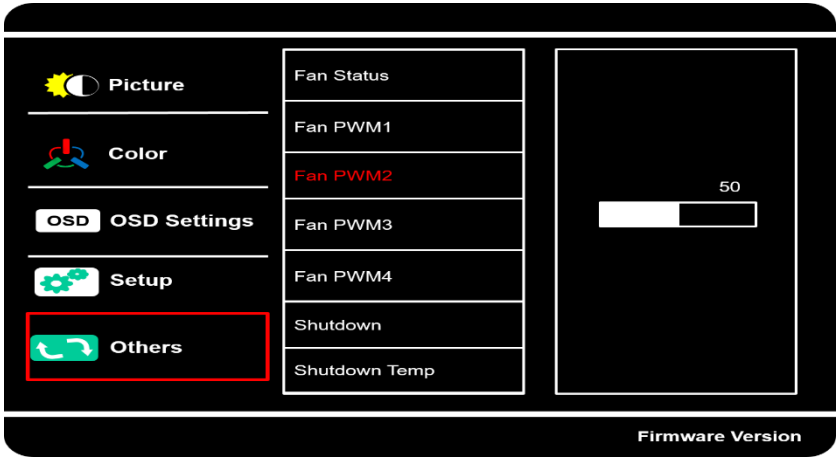

## Submenu – 5-5-1 : Others – Fan Controls – Fan Status



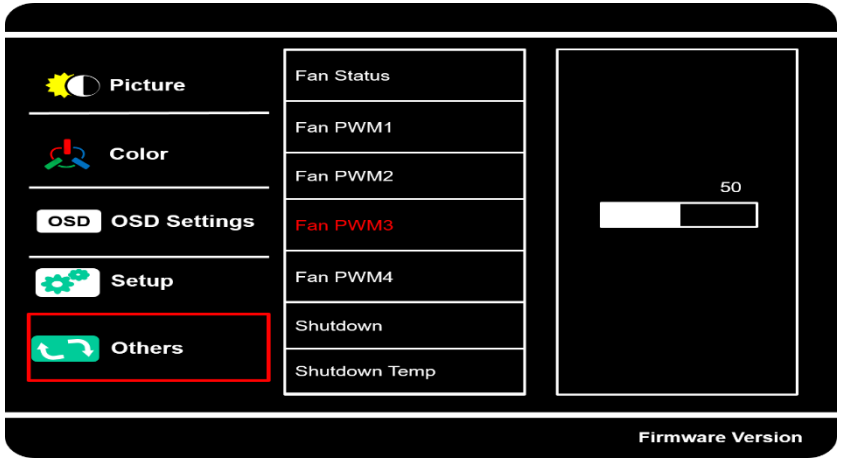

## Submenu – 5-5-2 : Others – Fan Controls – Fan PWM1



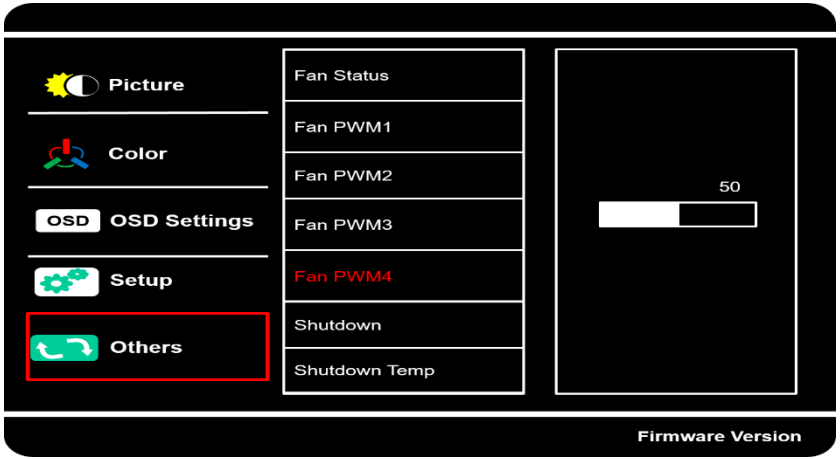
## Submenu – 5-5-3 : Others – Fan Controls – Fan PWM2



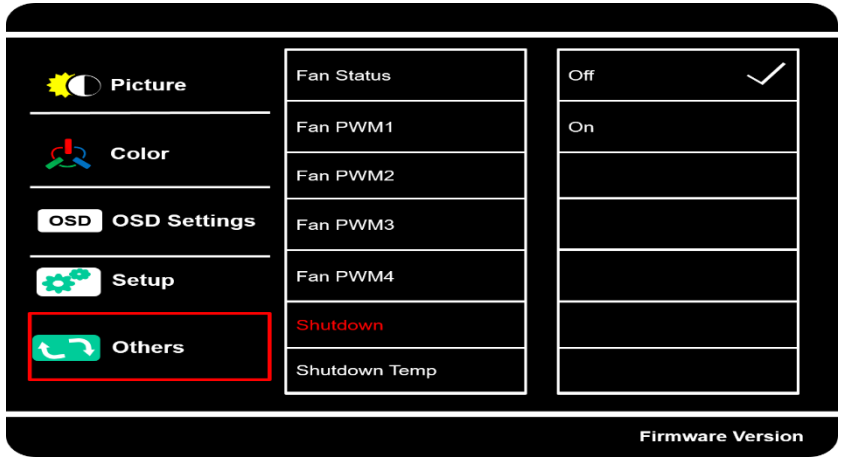

## Submenu – 5-5-4 : Others – Fan Controls – Fan PWM3



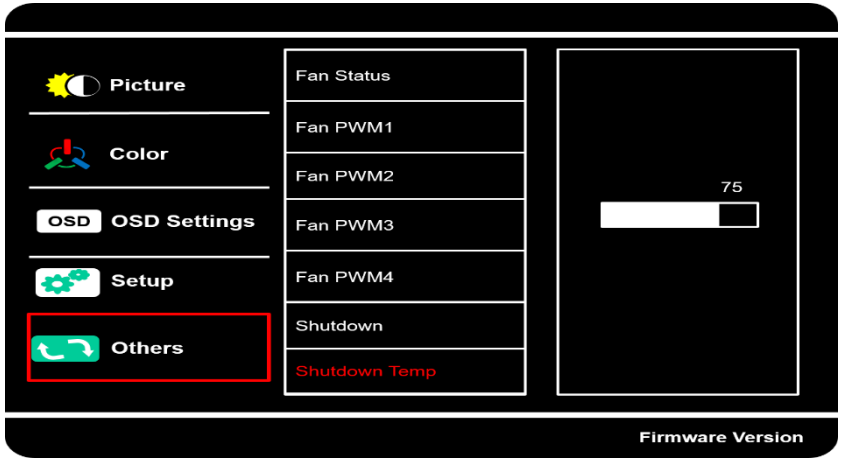

## Submenu – 5-5-5 : Others – Fan Controls – Fan PWM4



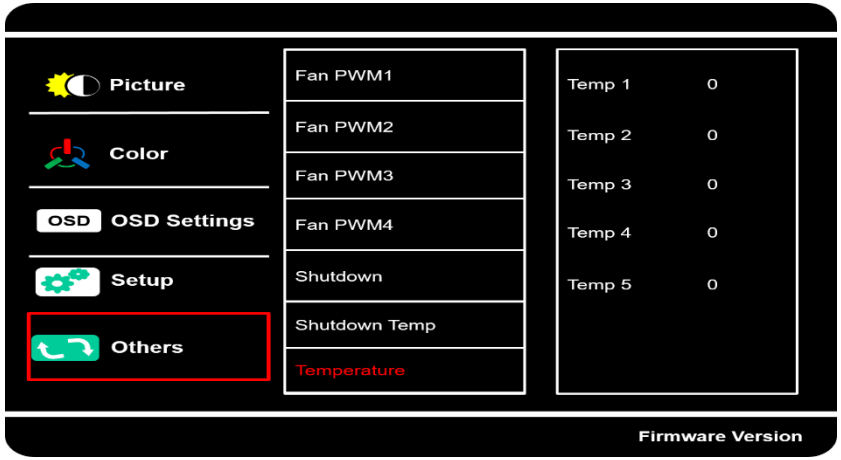

## Submenu – 5-5-6 : Others – Fan Controls – Shutdown



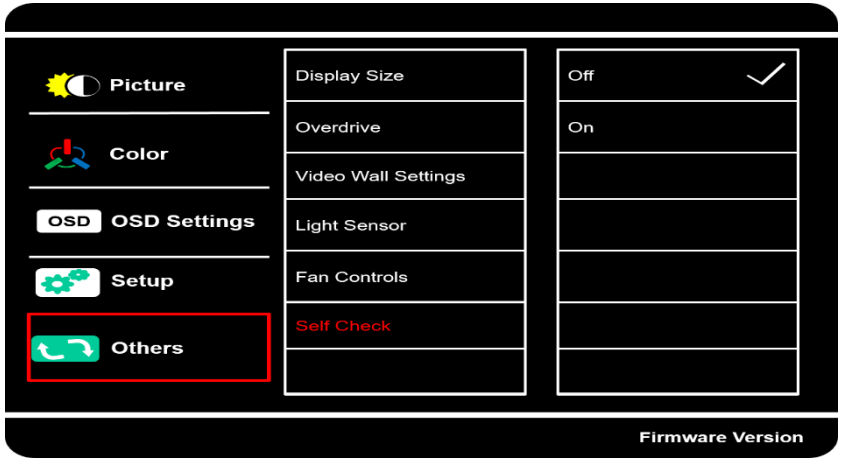
## Submenu – 5-5-7 : Others – Fan Controls – Shutdown Temp



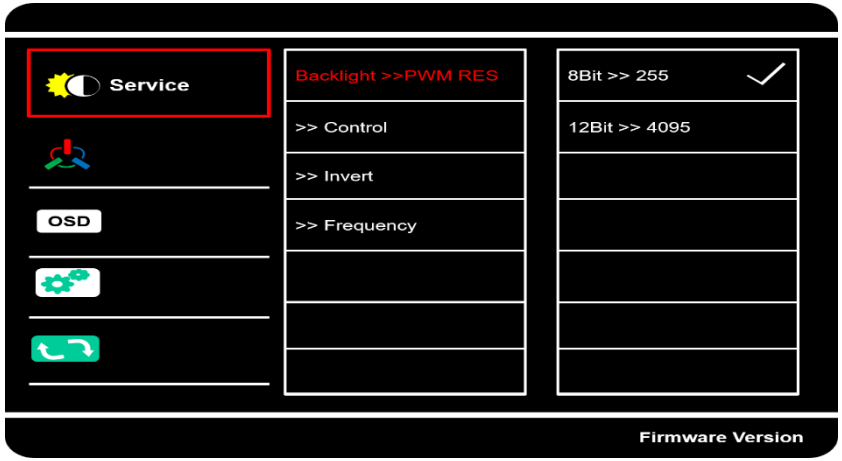

## Submenu – 5-5-8 : Others – Fan Controls – Temperature



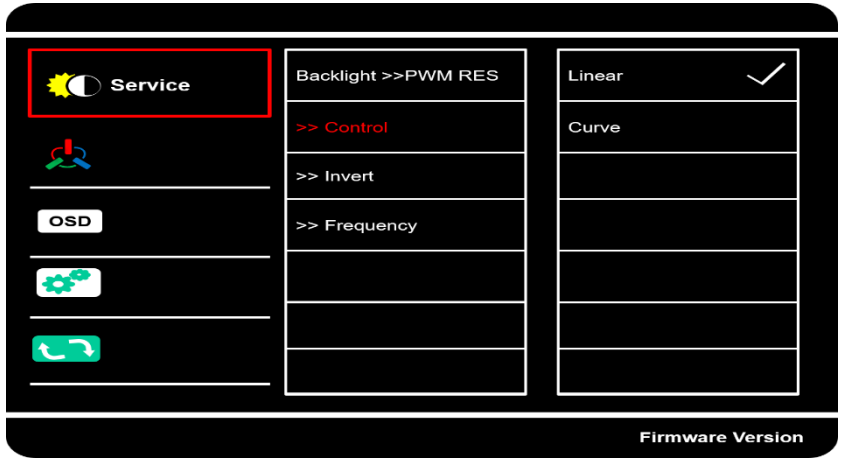

## Submenu – 5-6 : Others – Self Check



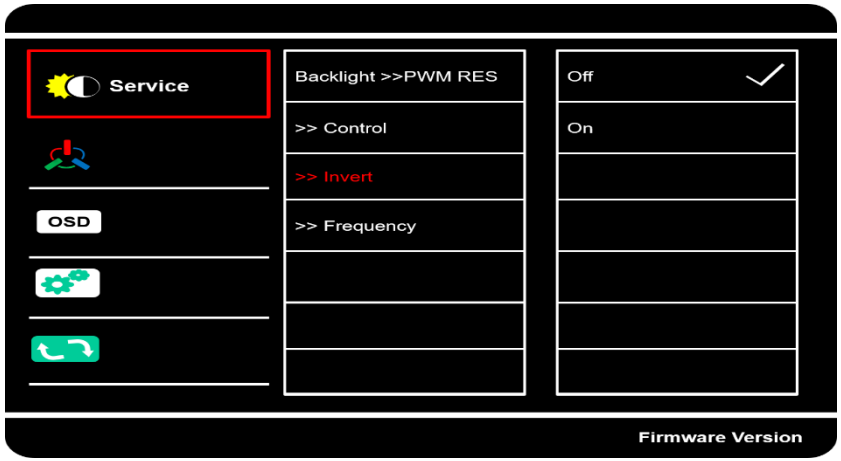
## Service Menu – 1 : Backlight PWM Resolution



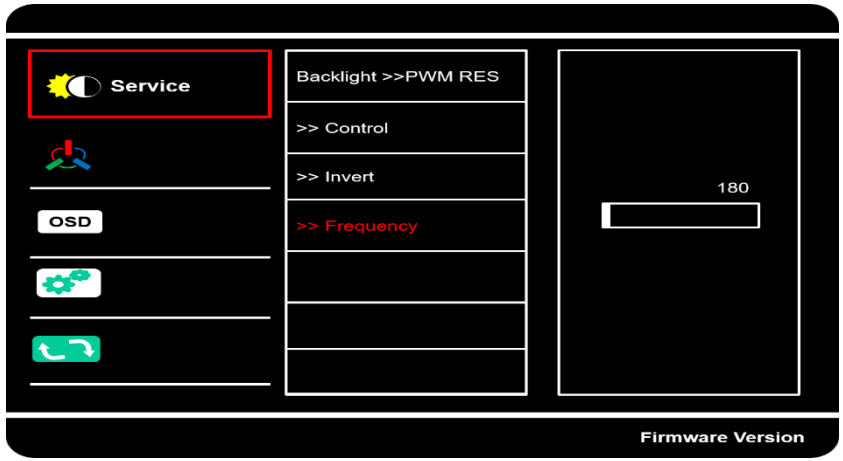

## Service Menu – 2 : Backlight Control




## Service Menu – 3 : Backlight PWM Invert




## Service Menu – 4 : Backlight PWM Frequency



## 7. Remote Controller

Distance at 7 meters max and 30 degree (left/right) max

- Part Number : VRC1340
- Format : NEC
- Custom code : 8479 (Hex)

## 8. RS232 Communication

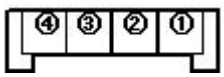
### 8.1 Communication Parameters

- Baud rate :9600 bps
- Data length : 8 bits
- Parity bit : None
- Stop bit : 1 bit
- Communication : ASCII CODE

### 8.2 Physical connection :

Controller side:
Connector interface: CN11
Mating connector: DB9 Female or
20010HS-04, Yeon-Ho

| PIN# | Description |
|---|---|
| 1 | Ground |
| 2 | RS-232 Tx Data |
| 3 | RS-232 Rx Data |
| 4 | Power 5V |




Computer side:
Connector interface: Serial port
Mating connector: DB9 Male

| PIN# | Description |
|---|---|
| 2 | RS-232 Rx Data |
| 3 | RS-232 Tx Data |
| 5 | Ground |


### 8.3 RS-232 Serial Protocols

#### Video Wall Disable (Normal)

Tx Format : [Command1] [Command2] [Space] [0] [0] [Space] [DataH] [DataL] [CR]
; ASCII : [Space] = 0x20 , [CR] = 0x0D, [0] = 0x30, [a] = 0x61, [A] = 0x41
Rx OK Format : [Command2] [Space] [0] [0] [Space] [O] [K] [DataH] [DataL] [x] [CR]
; OK

Rx NG1 Format : [Command2] [Space] [0] [0] [Space] [N] [G] [0] [1] [x] [CR]
; NG01 : illegal command
Rx NG2 Format : [Command2] [Space] [0] [0] [Space] [N] [G] [0] [2] [x] [CR]
; NG02 : unknown command /data

#### Video Wall Enable

Tx Format : [Command1] [Command2] [Space] [0] [0] [Space] [DataH] [DataL] [Space] **[RS232 ID H] [RS232 ID L]** [CR]
; ASCII : [Space] = 0x20 , [CR] = 0x0D, [0] = 0x30, [a] = 0x61, [A] = 0x41
Rx OK Format : [Command2] [Space] [0] [0] [Space] [O] [K] [DataH] [DataL] [Space] **[RS232 ID H] [RS232 ID L]** [x] [CR]
; OK

Rx NG1 Format : [Command2] [Space] [0] [0] [Space] [N] [G] [0] [1] [Space] **[RS232 ID H] [RS232 ID L]** [x] [CR]
; NG01 : illegal command
Rx NG2 Format : [Command2] [Space] [0] [0] [Space] [N] [G] [0] [2] [Space] **[RS232 ID H] [RS232 ID L]** [x] [CR]
; NG02 : unknown command /data

## Serial Command and Protocol

| Command Set | Command | Acknowledgement | Comments |
|---|---|---|---|
| **Power (ka)** | | | |
| Power On | ka 00 01(CR) | a 00 OK01x | 01 |
| Power Off | ka 00 00(CR) | a 00 OK00x | 00 |
| Power Status | ka 00 ff(CR) | a 00 OK01x (On)<br>a 00 OK00x (Off) | read |
| | | | |
| **P1 Input selection (k1)** | | | |
| P1 | k1 00 01(CR)<br>k1 00 02(CR)<br>k1 00 03(CR) | 1 00 OK01x (AUTO)<br>1 00 OK02x (DP)<br>1 00 OK03x (HDMI) | 01 : AUTO (AUTO<br>02 : DP (DP)<br>03 : HDMI (HDMI ) |
| Status | k1 00 ff(CR) | 1 00 OK01x (AUTO)<br>1 00 OK02x (DP)<br>1 00 OK03x (HDMI) | read |
| | | | |
| **Screen Mute (kd)** | | | |
| Screen Mute ON (Picture off) | kd 00 01(CR) | d 00 OK01x (Mute ON) | 01 |
| Screen Mute OFF (Picture on) | kd 00 00(CR) | d 00 OK00x (Mute OFF) | 00 |
| Status | kd 00 ff(CR) | d 00 OK01x (Mute ON)<br>d 00 OK00x (Mute OFF) | read |
| | | | |
| **Audio Mute (ke)** | | | |
| Audio Mute | ke 00 01(CR)<br>ke 00 00(CR) | e 00 OK01x (Mute ON)<br>e 00 OK00x (Mute OFF) | 01 : Mute ON<br>00 : Mute OFF |
| Status | ke 00 ff(CR) | e 00 OK01x (Mute ON)<br>e 00 OK00x (Mute OFF) | read |
| | | | |
| **Audio Volume (kf)** | | | |
| Volume control | kf 00 00(CR) | f 00 OK00x (Volume = 0, Min.) | 00 (Hex , Decimal) |
| (0~100%) (Default = 20%) | kf 00 1A(CR) | f 00 OK1Ax (Volume = 26) | 1A (1Ah = 26) |
| 00h ~ 64h (Default = 32h) | kf 00 32(CR) | f 00 OK32x (Volume = 50) | 32 (32h = 50) |
| | kf 00 64(CR) | f 00 OK64x (Volume = 100, Max.) | 64 (64h = 100) |
| Status | kf 00 ff(CR) | f 00 OK2Fx (Volume = 47) | read |
| | | | |
| **Aspect Ratio (kg)** | | | |
| Aspect Ratio | kg 00 00(CR)<br>kg 00 01(CR)<br>kg 00 02(CR)<br>kg 00 03(CR)<br>kg 00 04(CR) | g 00 OK00x (Full)<br>g 00 OK01x (16:9)<br>g 00 OK02x (4:3)<br>g 00 OK03x (5:4)<br>g 00 OK04x (1:1) | 00 : Full<br>01 : 16:9<br>02 : 4:3<br>03 : 5:4<br>04 : 1:1 |
| Status | kg 00 ff(CR) | g 00 OK00x (Full)<br>g 00 OK01x (16:9)<br>g 00 OK02x (4:3) | read |

| | | | |
|---|---|---|---|
| | | g 00 OK03x (5:4)<br>g 00 OK04x (1:1) | |
| | | | |
| **BackLight (kh)** | | | |
| 0 ~ 100% (Default = 80%) | kh 00 50(CR) | h 00 OK50x (BackLight = 80) | 00h ~ 64h (Default = 50h) |
| Status | kh 00 ff(CR) | h 00 OK50x (BackLight = 80) | read |
| | | | |
| **Contrast (ki)** | | | |
| 0 ~ 100% (Default = 50%) | ki 00 32(CR) | i 00 OK32x (Contrast = 50) | 00h ~ 64h (Default = 32h) |
| Status | ki 00 ff(CR) | i 00 OK32x (Contrast = 50) | read |
| | | | |
| **Brightness (kj)** | | | |
| 0 ~ 100% (Default = 50%) | kj 00 32(CR) | j 00 OK32x (Brightness = 50) | 00h ~ 64h (Default = 32h) |
| Status | kj 00 ff(CR) | j 00 OK32x (Brightness = 50) | read |
| **Sharpness (kk)** | | | |
| 0 ~ 4 (Default = 2) | kk 00 02(CR) | k 00 OK02x (Sharpness = 2) | 00h ~ 04h (Default = 02h) |
| Status | kk 00 ff(CR) | k 00 OK02x (Sharpness = 2) | read |
| | | | |
| | | | |
| **Gamma (kl)** | | | |
| 0 ~ 4 (Default = 0 : OFF) | kl 00 00(CR)<br>kl 00 01(CR)<br>kl 00 02(CR)<br>kl 00 03(CR)<br>kl 00 04(CR) | l 00 OK00x(Gamma=Off)<br>l 00 OK01x(Gamma=1.8)<br>l 00 OK02x(Gamma=2.0)<br>l 00 OK03x(Gamma=2.1)<br>l 00 OK04x(Gamma=2.2) | 00 : Gamma OFF<br>01 : Gamma 1.8<br>02 : Gamma 2.0<br>03 : Gamma 2.2<br>04 : Gamma 2.4 |
| Status | kl 00 ff(CR) | l 00 OK00x(Gamma=Off) | read |
| | | | |
| **Temperature (km)** | | | |
| 0 ~ 4 (Default = 2 : 6500) | km 00 00(CR)<br>km 00 01(CR)<br>km 00 02(CR)<br>km 00 03(CR)<br>km 00 04(CR) | m 00 OK00x (Temperature = 9300)<br>m 00 OK01x (Temperature = 7500)<br>m 00 OK02x (Temperature = 6500)<br>m 00 OK03x (Temperature = 5800)<br>m 00 OK04x (Temperature = sRGB) | 00 : 9300<br>01 : 7500<br>02 : 6500<br>03 : 5800<br>04 : sRGB |
| Status | km 00 ff(CR) | m 00 OK02x (Temperature = 6500) | read |
| | | | |
| **Color Effect (kn)** | | | |
| 0 ~ 4 (Default = 0 : Standard) | kn 00 00(CR)<br>kn 00 01(CR) | n 00 OK00x (Effect = Standard)<br>n 00 OK01x (Effect = Game)<br>n 00 OK02x (Effect = Movie) | 00 : Standard<br>01 : Game |

| | | | |
|---|---|---|---|
| | kn 00 02(CR)<br><br>kn 00 03(CR)<br><br>kn 00 04(CR) | n 00 OK03x (Effect = Photo)<br>n 00 OK04x (Effect = Vivid) | 02 : Movie<br><br>03 : Photo<br><br>04 : Vivid |
| Status | kn 00 ff(CR) | n 00 OK00x (Effect = Standard) | read |
| | | | |
| **Local Key (mk)** | | | |
| POWER KEY | mk 00 00(CR) | k 00 OK00x | 00h |
| MENU KEY (EXIT KEY) | mk 00 01(CR) | k 00 OK01x | 01h |
| DOWN KEY | mk 00 04(CR) | k 00 OK04x | 04h |
| UP KEY | mk 00 05(CR) | k 00 OK05x | 05h |
| SELECT KEY (ENTER KEY) | mk 00 06(CR) | k 00 OK06x | 06h |