

AURORA1600-4K

Multi-image Processor

User Manual

osee

Product Information

Model: AURORA1600-4K Multi-image Processor

Version: V010002

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Company

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About this manual

Important

The following symbols are used in this manual:

Tips

- The further information or know-how for described subjects above which helps user to understand them better.
-

Warning

- The safety matters or operations that user must pay attention to when using this product.
-

Contents

The user manual applies to the following device types:

- ❖ **AURORA1600-4K-16**
- ❖ **AURORA1600-3G-16**

The images of AURORA1600-4K-16 adopted in the following descriptions, and AURORA1600-4K-16 is called AURORA1600-4K for short in the following documentary. The basic features and functionalities for AURORA1600-4K-16 and AURORA1600-3G-16 are almost the same. Any of the different specifications between the device types are elaborated. Before reading the manual, please confirm the device type.

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Chapter 1 Product Overview

This article is mainly about AURORA1600-4K, developed by OSEE with high intelligent, which applied the 1U Multi-image Processor, which performs multi-channels input signals displayed on one screen for surveillance. It attaches, switches and zooms the video sources, and provides ideal visual effect, flexible operation environment and easiness for configuration and maintenance.

The device has the compact module structure, supports up to 16 channels of 12G/6G/3G/HD/SD-SDI inputs, and up to 4 channels of SDI/SFP outputs, two HDMI outputs, the resolution is up to 4K. Signals can be appointed to any output for display freely, and it allows the user easily to set up a display system in 1U frame with 4 inputs, 8 inputs, 12 inputs or 16 inputs.

The device integrates an internal control software to connect to and configure the controller. You can configure multi-walls and multi-scene with the input video sources, and set them at any position and in arbitrary size in the operating interface of the software. Each video window has adequate resolution to show very high-quality frame effects. The software is a WYSIWYG editor and easy to use.

The 1U Multi-image Processor and its inner control software compose the Multi-image system, and it is widely used in studio, transmission control rooms, video conference center, general control center, TV Stations and so on.



Figure 1-1 Module of 1U Multi-image Processor

Module	Input	Output
AURORA1600-4K-16	16 channels SDI video input 16 channels analog audio input	4 channels SDI output 4 channels SFP output 2 channels HDMI output 1-channel audio output
AURORA1600-3G-16	16 channels SDI video input 16 channels analog audio input	4 channels SDI output 4 channels SFP output 2 channels HDMI output 1-channel audio output

The appearance of AURORA1600-3G-16 is exactly as same as AURORA1600-4k-16's. The 12G resolution for SDI inputs (SDI IN1~16) are only available for AURORA1600-4K-16 device. AURORA1600-4K-16 supports 12G/6G/3G/HD/SD-SDI adaptable video input, whilst AURORA1600-3G-16 supports 6G/3G/HD/SD-SDI.

1U Multi-image Processor supports the following features:

Features

- Using professional case for high reliability
- Using 1U compact module structure
- The window of a video source can be moved from one screen to another screen in real time
- Support the general video formats and the inputs are adaptive
- Support up to 4K through one single output interface
- Support up to 16 displays in a single screen
- Support up to 4K resolution through four combined output interfaces per 50/60 frame rate
- All modules are redundant designed, and support online replacement
- Signals can be appointed to any output for display flexibly
- Support dual power supply. It is usually load balanced when the power supply is normal, and once there is a fault in power supply, it will power on the redundant power to keep persistent
- Provide Video/Audio detection and alarming: video loss, video black, and audio loss
- Provide various detections on modules, temperature and power supply

Functionality

- Support dual UMD, dual TALLY, and up to 4 channels of UV audio meter, and support dynamic TSL protocol
- Support several timing methods: LTC timing, native network timing, manual timing
- Support AFD information display and Network control
- Support several types of timers: analog clock timer, digital clock timer, countdown timer, and digital data timer.
- Support various operation methods: web control and computer control

Topology Chart

The topology chart for this unit is shown as in Figure 1-2:

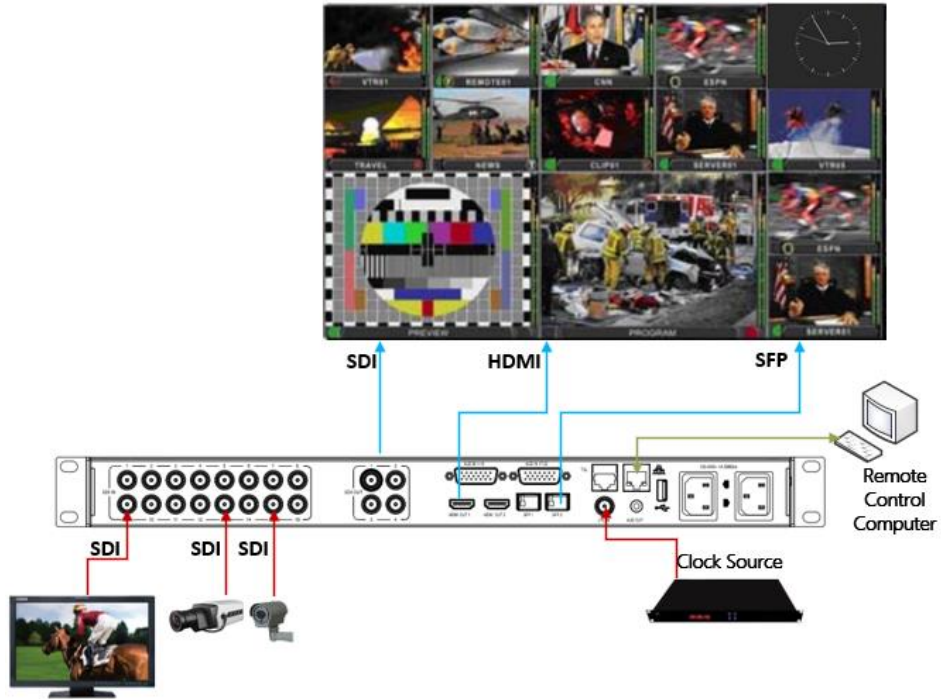


Figure 1-2 Topology of AURORA1600-4K

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Chapter 2 Safety

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Warnings:

Read, keep and follow all of these instructions for your safety. Heed all warnings.

Warning

- **Multi-image Processor**
 - Upgrading of the device is subject to change without notice.
 - Contact your Customer Service representative if parts are missing or damaged.
-

Warning

- **Position**
 - Do not block any ventilation openings.
 - Do not use this unit near water.
 - Do not expose the unit to rain or moisture.
 - Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that product heat.
 - A nameplate indicating operating voltage, etc., is located on the rear panel.
 - The socket-outlet shall be installed near the equipment and shall be easily accessible.
-

Chapter 3 Unpack and Installation

Unpack

When unpacking the components of this switcher, please verify that none of the components listed in Table 3-1 are damaged or lack. If there is any missing, contact your distributors or OSEE for it.

Table 3-1 Packing List

No.	Item	Quantity	Comments
1	Multi-image Processor	1	AURORA1600-4K
2	Power cord	1	
3	Attachments	1	
4	User manual	1	
5	warranty card	1	

Tips

- **About Unpacking and Shipping**
 - This product was carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble-free service. Before you install this unit, do the followings:
 - Check the equipment for any visible damage that may have occurred during transit.
 - Confirm receipt of all items on the packing list.
 - Contact your dealer if any item on the packing list is missing.
 - Contact the carrier if any item is damaged.
 - Remove all packaging material from the product before you install the unit.
 - Retain at least one set of the original packaging materials, in the event that you need to return a product for servicing.

- If the original package is not available, you can supply your own packaging as long as it meets the following criteria:
 - The packaging must be able to withstand the product's weight.
 - The product must be held rigid within the packaging
 - There must be at least 5 cm of space between the product and the container.
 - The corners of the product must be protected.
 - Ship products back to us for servicing prepaid and, if possible, in the original packaging material. If the product is still within the warranty period, we will return the product prepaid after servicing.
-

Installation

1. Prepare for installation

Make sure you have prepared the followings before mount the converter:

- Inspect for any apparent physical damage that may have occurred in transit.
- Make sure you have received all the components listed in packing list.
- if there are any anti-static package or other packages, please take off them.
- Keep the package in case of future usage.

Warning

- The safety matters or operations that user must pay attention to when using this product.
 - Ensure that all handling precautions are taken to avoid electrostatic discharge or other damage to sensitive electronic components. Wear an earth strap and perform all PCB assembly at an appropriate anti-static work station. Follow the instructions carefully to fit the modules.
-

2. Install AURORA1600-4K in your desired location of a standard EIA

equipment rack. Adequate ventilation is required when installed to prevent possible damage to the AURORA1600-4K components.

3. Connect required cables for signal input and output.
4. Connect power source using the included power cord.
5. Connect the power cord to the rear panel.
6. Fasten the power protect accessory.
7. As a final step, power AURORA1600-4K on.

Restore the default IP setting

AURORA1600-4K provides an Ethernet port for connecting with a computer to access the network control page or run the device control tool to modify the network settings. The default IP address of AURORA1600-4K is 192.168.1. 2.

Restore the default IP setting by USB interface at the rear panel.

The instructions are as below:

■ Operations:

Firstly, power down the AURORA1600-4K device, insert the U disk which has the IP restored program.

Secondly, power on AURORA1600-4K and keep it running for at least 60 seconds, thus, the IP address of AURORA1600-4K will be restored to the default one.

At last, power off the AURORA1600-4K again, and pull out the U disk from the USB interface, then power on the AURORA1600-4K, it will run normally.

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Chapter 4 AURORA1600-4K Features

This chapter describes the features of AURORA1600-4K.

4.1 Front Panel Features

There are two indicators in the center of the front panel, as shown in Figure 4.1-1



Figure 4.1-1 AURORA1600-4K - Front Panel

1. Production Information

It shows the basic information of the production: LOGO and model.

2. PS1 Indicator

It is used to indicate the PS1 power on or off.

3. PS2 Indicator

It is used to indicate the PS2 power on or off.

The Multi-image Processor performs the power supply, input, output and control functions through the corresponding interfaces, and you should make sure the cables has been connected to the correct interfaces in the frame.

4.2 Rear Panel Features

It will introduce the arrangement and operations of the interfaces in rear of the panel in the following.

4.2.1 Arrangement of Rear Connectors

As shown in Figure 4.2-1, AURORA1600-4K provides various connectors for power supply, input, output and control, the details are as below:

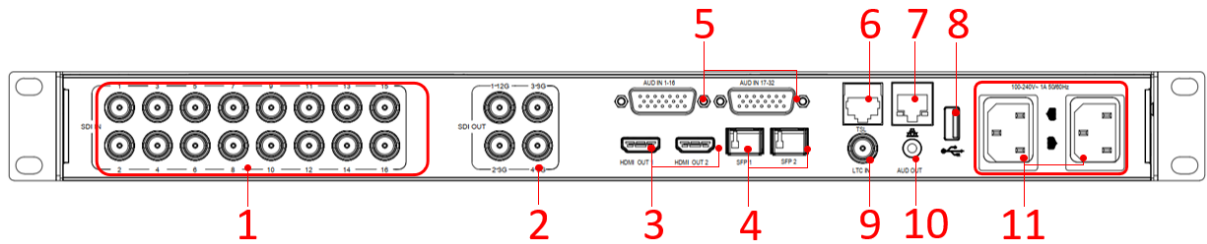


Figure 4.2-1 Rear Connectors of AURORA1600-4K

1. Video Input: SDI IN 1~16
2. Video Output: SDI OUT1-12G, SDI OUT2-3G, SDI OUT3-3G, SDI OUT4-3G
3. HDMI Output: HDMI OUT1~HDMI OUT2
4. SFP Output: SFP1~SFP2
5. Audio Input: AUDIO IN 1~16, AUDIO IN 17~32
6. TSL
7. ETHERNET
8. USB
9. LTC IN
10. Audio Output: AUD OUT
11. Power Input: PS1, PS2

4.2.2 Operations of Rear Panel

The details of these interfaces at the rear panel are described as below:

1. Video Input (BNC)

It provides 16 SDI input interfaces, they are labeled as SDI IN 1~16. The SDI input interfaces are adaptive to 12G/6G/3G/HD/SD-SDI video signals, and supports embedded audio.

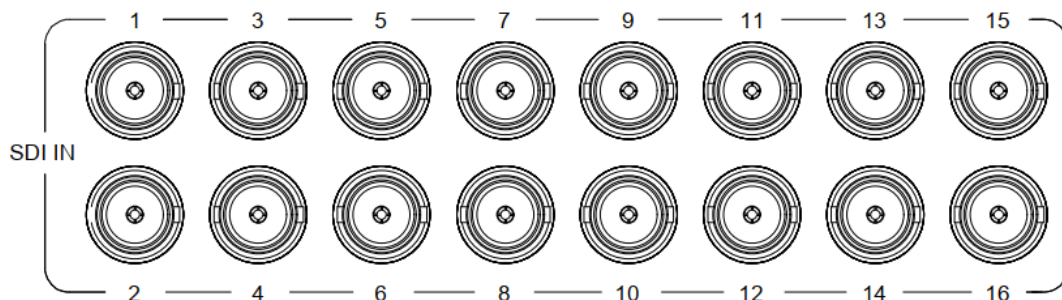


Figure 4.2-2 SDI Video input Connector

The SDI IN interface supports the following resolutions, as shown in Table 4-1:

Table 4-1 Resolutions of the SDI Interfaces

Input Format
3840x2160P(60 / 59.94 / 50 / 30 / 29.97 / 25 / 23.98) (only supported for AURORA1600-3G-16)
1080P (60 / 59.94 / 50) (Level A & B)
1080P (30 / 29.97 / 25 / 23.98)
1080i (60 / 59.94 / 50)
1080PsF (23.98)
720P (60/59.94/50)
480i60
576i50

i Tips

- The 12G resolution for SDI inputs (SDI IN1~16) are only available for AURORA1600-4K-16 device. AURORA1600-4K-16 supports 12G/6G/3G/HD/SD-SDI adaptable video input, whilst AURORA1600-3G-16 supports 6G/3G/HD/SD-SDI adaptable video input, refer to Table 4-1 for details.

2. SDI Video Output (BNC)

It provides four SDI output interfaces, they are labeled as SDI OUT 1-12G, 2-3G, 3-3G, 4-3G.

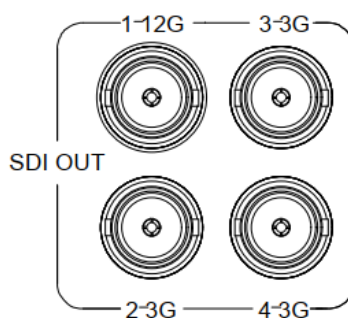


Figure 4.2-3 SDI Video Output Connector

Output Format	SDI OUT1 -12G	SDI OUT2 -3G	SDI OUT3 -3G	SDI OUT4 -3G
3840x2160P (59.94 / 50 / 29.97 /	√	√	√	√

Output Format	SDI OUT1 -12G	SDI OUT2 -3G	SDI OUT3 -3G	SDI OUT4 -3G
25)				
1080P (59.94 / 50) (Level A)	√	√		
1080i (59.94 / 50)	√	√		

Tips

- The four-link outputs (SDI OUT1~4) are available only for 2SI mode.

3. HDMI Video Output (HDMI)

It provides 2 video output interfaces to receive and send HDMI/DVI signals using HDMI-Type A connector. HDMI OUT1, HDMI2.0, supports up to 2160P59.94. HDMI OUT2, HDMI1.4, supports up to 1080P59.94.



Figure 4.2-4 HDMI Output Interface

Output Format	HDMI OUT1	HDMI OUT2
3840x2160P (59.94 / 50 / 29.97 / 25)	√	
1080P (59.94 / 50) (Level A)	√	√
1080i (59.94 / 50)	√	√

4. SFP Video Output (SFP)

It provides 2 SFP output cages, labeled as SFP1, SFP2, supports double optical fiber transmitter module, that is 4-channel SFP outputs.

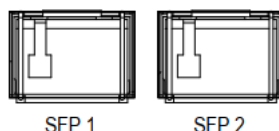


Figure 4.2-5 SFP Output Interface

Output Format	SFP OUT1/2	SFP OUT3/4
1080P (59.94 / 50) (Level A)	√	√

5. Audio Input Interface (DB26)

It provides two audio inputs, labeled as AUD IN 1~16, AUD IN 17~32. It supports 16 channels of analog audio input signals for each AUD IN.

■ AUD IN1~16

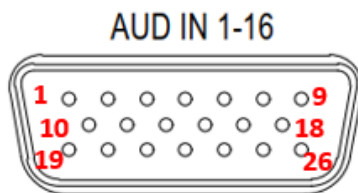


Figure 4.2-6 Audio Input Interface

Table 4-2 Relationship of Pins and Values for AUD IN1~16

Pins	Value	Pins	Value
Pin1	AUDIO IN1	Pin14	GND
Pin2	AUDIO IN2	Pin15	AUDIO IN10
Pin3	GND	Pin16	AUDIO IN11
Pin4	AUDIO IN3	Pin17	GND
Pin5	AUDIO IN4	Pin18	AUDIO IN12
Pin6	GND	Pin19	AUDIO IN13
Pin7	AUDIO IN5	Pin20	AUDIO IN14
Pin8	AUDIO IN6	Pin21	GND
Pin9	GND	Pin22	GND
Pin10	AUDIO IN7	Pin23	GND
Pin11	GND	Pin24	AUDIO IN15
Pin12	AUDIO IN8	Pin25	GND
Pin13	AUDIO IN9	Pin26	AUDIO IN16

■ AUD IN17~32

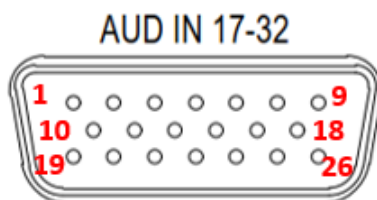


Figure 4.2-7 Audio Input Interface

Table 4-3 Relationship of Pins and Values for AUD IN17~32

Pins	Value	Pins	Value
------	-------	------	-------

Pins	Value	Pins	Value
Pin1	AUDIO IN17	Pin14	GND
Pin2	AUDIO IN18	Pin15	AUDIO IN26
Pin3	GND	Pin16	AUDIO IN27
Pin4	AUDIO IN19	Pin17	GND
Pin5	AUDIO IN20	Pin18	AUDIO IN28
Pin6	GND	Pin19	AUDIO IN29
Pin7	AUDIO IN21	Pin20	AUDIO IN30
Pin8	AUDIO IN22	Pin21	GND
Pin9	GND	Pin22	GND
Pin10	AUDIO IN23	Pin23	GND
Pin11	GND	Pin24	AUDIO IN31
Pin12	AUDIO IN24	Pin25	GND
Pin13	AUDIO IN25	Pin26	AUDIO IN32

6. TSL(RJ-45)

It offers one RS485 interface to set as TSL in AURORA control software. Set it in System Configuration Window→TSL Settings, as shown in Figure 4.2-8:

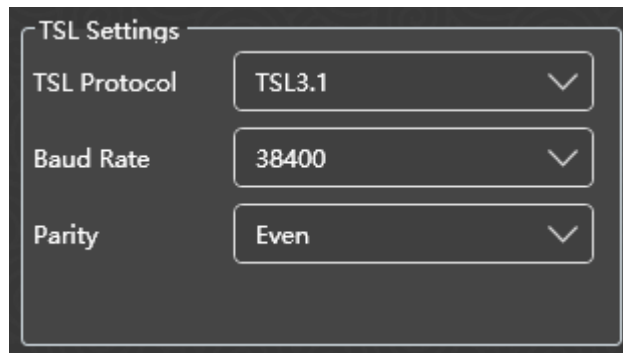


Figure 4.2-8 Application of TSL Connector

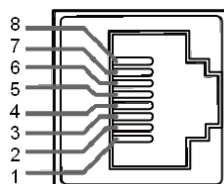


Figure 4.2-9 Pins Sequence of RS485 Connector

Table 4.2-4 Relationship of Pins and Values for TSL

Pins	Value
1,2	GND
4	Rx+
5	Rx-
7,8	GND

7. Ethernet (RJ-45)

It provides one 10/100/1000 Base-T Ethernet interface which is used to connect with a computer to access the network control page or run the device control tool to modify the network settings, and supports TSL5.0.

Tips

- The default IP address of AURORA1600-4K is 192.168.1.2.
-

8. USB

It provides one USB interface to realize the upgrade and IP restore.

9. LTC Input (BNC)

It provides one LTC input interface to connect to a LTC timing device, it is labeled as LTC IN. The LTC timing code is used to time the analog clock timer or digital clock timer.

10. Audio Output (3.5mm jack)

It provides one audio output interface, labeled as AUD OUT. Output a pair of audio signal.

11. Power Input

It is used to supply AC power. There are two power input interfaces, they are redundant, and the specification is 100-240V, 50/60Hz, 100W. They are labeled as PS1, PS2 separately. The corresponding indicators are at the front panel. If the light is green, the device is powered on, and if the light is off, the device is powered off.

Warning

- Only use the adapter and the power cord specified by the manufacture for your safety!
-

4.2.3 Timing

AURORA1600-4K provides the following timing methods: LTC and native timing (administration side).

1. LTC Timing

Use LTC timing through LTC port, the conditions are as below:

- (1) Connect an external LTC timing device through the LTC port. The LTC external device receive a timecode input signal to keep synchronous with the device clock, and the timecode conforms to the SMPTE12M (EBU-3259-E) standard.
- (2) Timing operation: the LTC timing has the top priority. It will display the LTC time in DeviceTime field once AURORA1600-4K detects a LTC timing through the LTC interface, as shown in Figure 4.2-10:



Figure 4.2-10 Selection of Timing Method-LTC

2. PC Timing


Use the local computer connected through the Ethernet port to time with AURORA1600-4K.

- (1) Connect a local computer through the Ethernet port (RJ45), using twisted-pair cables, the IP address of the local computer and the AURORA1600-4K must be in the same network segment.
- (2) Timing operation: It will display the control computer time in DeviceTime field once AURORA1600-4K detects a PC timing through the Ethernet interface.

3. Manual Timing

Use the DeviceTime setting pane to set a time manually in System configuration page.

- (1) Click System tab in Aurora1600-4K system to display the system

configuration page, and click DeviceTime  button in Time box, then it will pop up the Timing dialog box, input your time at the top right field, as shown in Figure 4.2-11:

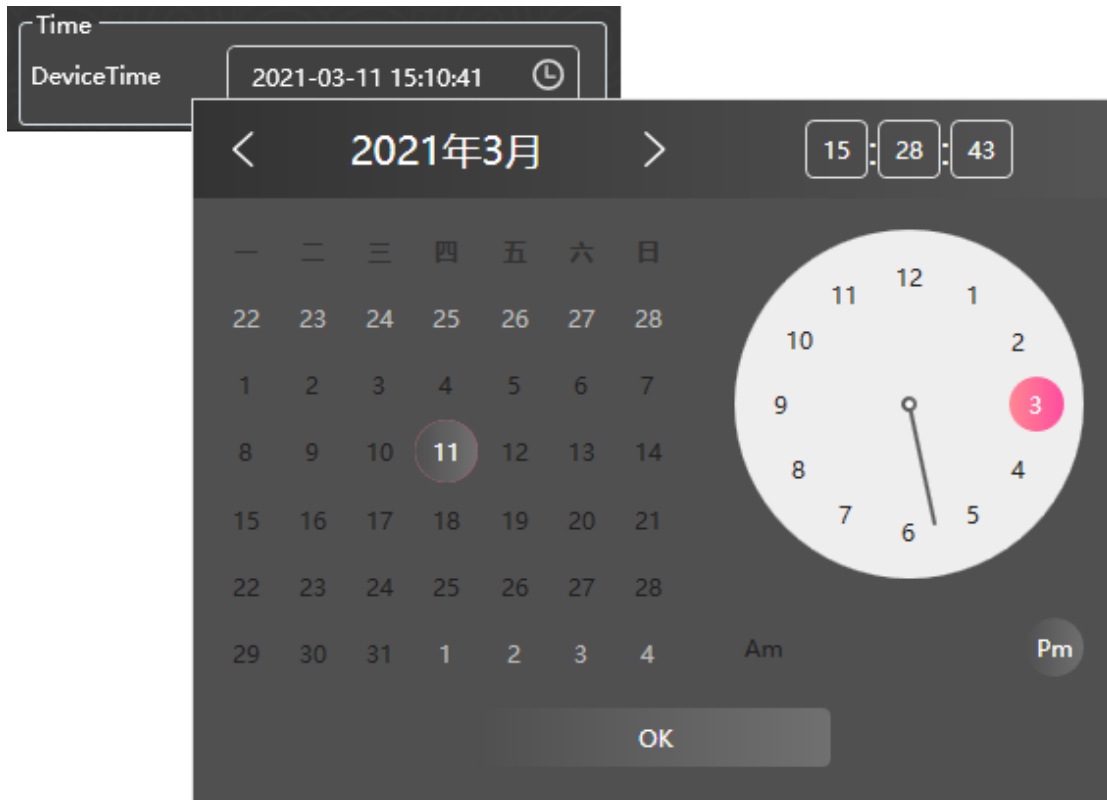


Figure 4.2-11 Timing Operation Window

i Tips

- The LTC timing has the top priority.
- The AURORA1600-4K device must be in online status when using manual timing method.

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Chapter 5 Specifications

1. Product detailed information

Specification	Values			
Model	AURORA1600-4K-16		AURORA1600-3G-16	
Input characteristic	BNC×16	12G/6G/3G/HD/SD-SDI adaptable video input	BNC × 16	6G/3G/HD/SD-SDI adaptable video input
	AUDIO×16	AUDIO input, DB26, 16 pairs		
Output characteristic	BNC×1	12G/3G/HD-SDI		
	BNC×3	3G/HD-SDI		
	SFP×4	12G/3G-SDI (optional double optical fiber transmitter module)		
	HDMI×2	HDMI output		
	AUDIO×1	AUDIO output, 3.5mm Mini Jack		
Control Interface	RS485×1	TSL3.1/4.0 UMD input		
	BNC×1	LTC input		
	RJ45×1	Ethernet		
	USB×1	USB		
Display Units	Up to 16 displays in a single screen			
Control Software	AURORA			
Working Environment	Work Temperature: 0~70°C Work Humidity: 10%~90%(no condense) Height: below 1000 feet (3048 meter) above sea level			
Weight(fully loaded)	1U, 2.9kg	482.6 (L) ×225.2 (W) ×44 (H) mm		
Power Consumption	40W			
Electrical Characteristics	100-240VAC, 50-60Hz, two redundant power modules			
Signal Format	SDI			
Signal Amplitude	1Vp-p+/-3dB			
Impedance	75Ω			
Return Loss	>40 dB to 5 MHz			

Specification	Values
DC Offset	0V±0.05 V
Frequency Response	±0.2 dB to 5 MHz
Differential Gain	<1%
Differential Phase	<1.5°
Video Standard	SMPTE 424M, SMPTE 292M, SMPTE 259M, SMPTE 297M
Connector	BNC per IEC 169-8
Return Loss	>18 dB 5 to 270 MHz >15 dB 270 MHz to 1.5 GHz >10 dB up to 3 GHz
Maximum Signal Level	800 mV pk-pk 10%
Signal Amplitude	800 mV pk-pk 10%
Overshoot	0 V ±0.5 V
Overshoot	<10%
Jitter	<0.2 UI
Rise and Fall Time	<700 ps for SD <270 ps for 1.5 Gb/s HD <135 ps for 3 Gb/s HD
Extinction Ratio	>8
Back Reflection	<-14 dB

2. Product Outline

The outline of AURORA1600-4K is shown as in the following figures:

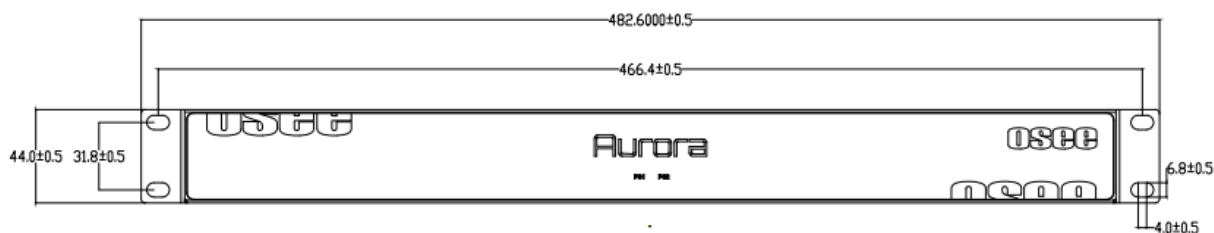


Figure 5-1 Front Panel(Unit: mm)

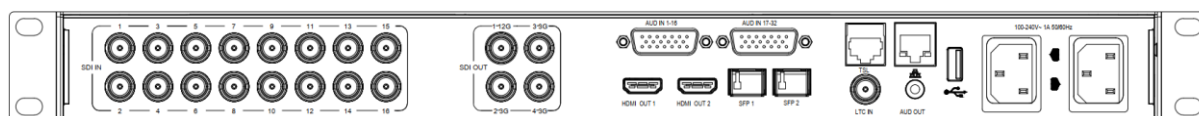


Figure 5-2 Rear Panel(Unit: mm)

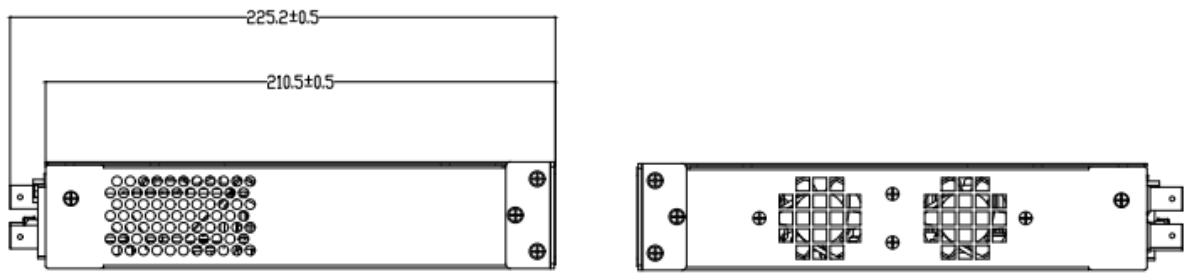


Figure 5-3 Side View(Unit: mm)

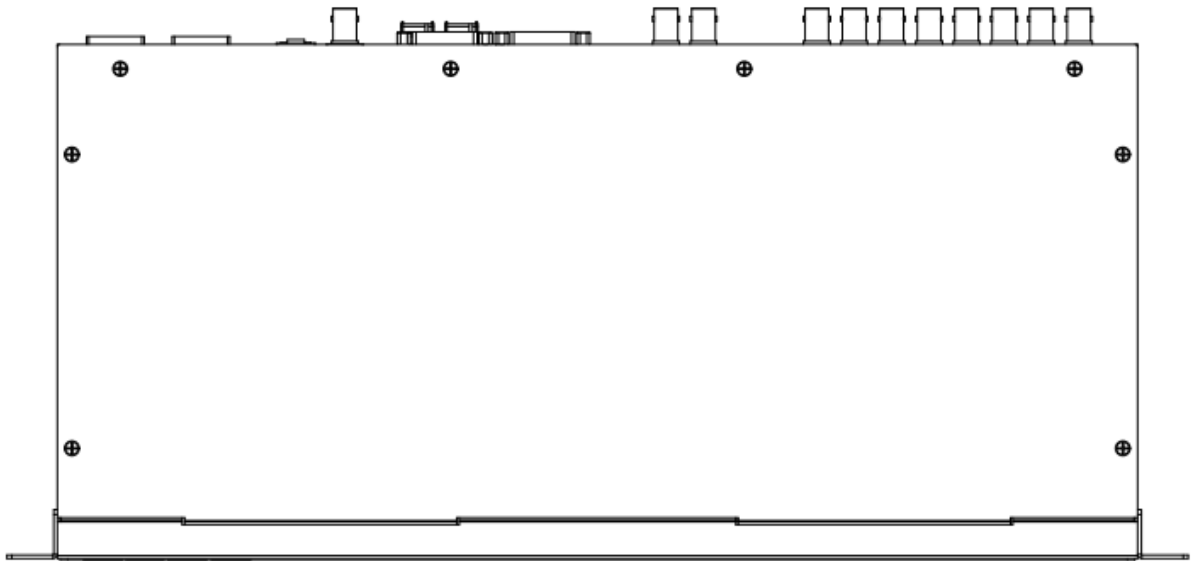


Figure 5-4 Top View(Unit: mm)

i Tips

- Specifications are subject to change without notice.

-----No Text Below-----



FOR MORE INFORMATION PLEASE VISIT: <http://www.osee-dig.com>

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