AURORA1600

1U Multi-image Processor

User Manual

OSEE TECHNOLOGY CO., LTD.

Product Information

Model: AURORA1600 1U Multi-image Processor
Version: V010100
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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**

The images of AURORA1600 adopted in the following descriptions.
Any of the different specifications between the device types are elaborated. Before reading the manual, please confirm the device type.

Contents

Chapter 1 Product Overview

This article is mainly about AURORA1600, 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 3G/HD/SD-SDI inputs, and up to 4 channels of HDMI/SDI outputs, the resolution is up to 1920*1080. 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   The Module of 1U Multi-image Processor

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 1920*1080 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 freeze, video black, audio silence, and audio overload

- Provide various detections on modules, temperature and power supply

- Support SNMP for native and remote users to configure modules

Functionality

- Support dual UMD, dual TALLY, and up to 8 channels of UV audio meter, and support dynamic TSL protocol

- Support 16 channels of GPI input and 4 channels of GPO output

- Support several timing methods: LTC timing, native network timing

- Support UMD edit and display

- Support format display of input signal and AFD information display

- Support Network control

- Support several types of timers: analog clock timer, digital clock timer, countdown timer, and digital data timer.

- Support TC

- Support various operation methods: remote control panel, web control and computer control

- Support models switching, signal sources switching and Full Screen functions

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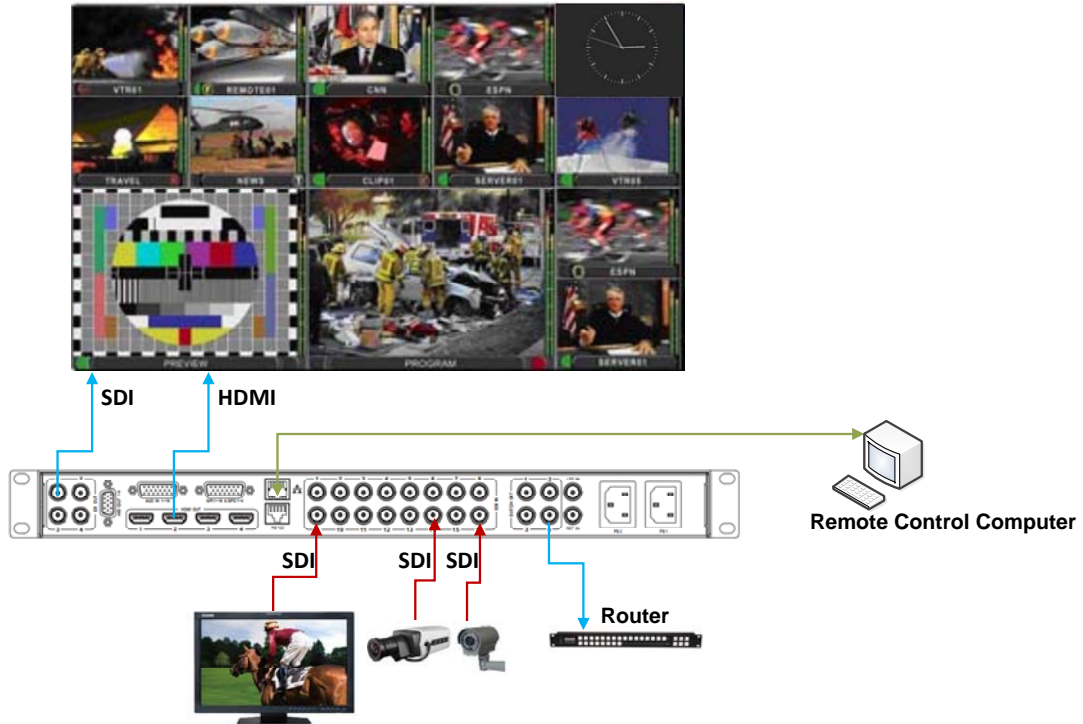
The topology chart for this unit is shown as in Figure 1-:

Figure 1-2   The Topology of AURORA1600

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
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 AURORA1600in your desired location of a standard EIA

equipment rack. Adequate ventilation is required when installed to prevent possible damage to the AURORA1600 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 on.

Restore the default IP setting

AURORA1600 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 is 192.168.1.70.

Restore the default IP setting by short-circuit two pairs of the corresponding pins of RS422 interface at the rear panel.

The instructions are as below:

■ Operations:

Firstly, power down the AURORA1600 device, insert a network cable (called as Restore cable) with a RJ45 plug into the RS422 interface. Short-circuit the two pairs of corresponding pins of RS422 interface: Pin3(Rx-) and Pin5(Tx-), Pin4(Rx+) and Pin6(Tx+) by twisting the corresponding wires of the network cable.

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

At last, power off the AURORA1600 again, and pull out the network cable from the RS422 interface, then power on the AURORA1600, it will run normally.

Refer to "4.2.2-7 Operations of Rear Panel-RS422" for the details about RS422 interface of AURORA1600.

Chapter 4 AURORA1600 Features

This chapter describes the features of AURORA1600.

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   the Buttons in 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 modules, and you should make sure the module has been inserted to the correct slot in the frame. Facing at the direction of the front panel, the arrangement sequence of the modules from left to right is power supply module, input module, control module and output module. Each slot has an attribute, you can see the slots are different after you dismount the front panel.

⚠️Warning

- Make sure the module matches the slot！

4.2 Rear Panel Features

It will introduce the arrangement and the 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 provides the various connectors for power supply, input, output and control, the details are as below:
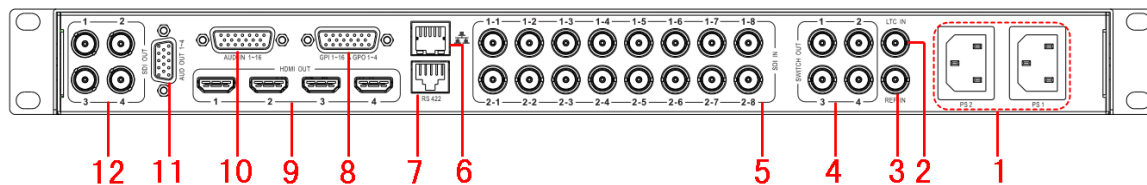

Figure 4.2-1   The Rear Connector of AURORA1600

1. Power Input: PS1, PS2

2. LTC IN

3. REF IN

4. Switch Output: SWITCH OUTPUT1~ SWITCH OUTPUT4

5. Video Input: SDI IN 1~16

6. Ethernet

7. RS422

8. GPI & GPO interface: GPI 1~16 & GPO 1~4

9. HDMI Output: HDMI OUT1~HDMI OUT4

10. Audio Input: AUDIO IN 1~16

11. Audio Output: AUDIO OUT 1~4

12. Video Output: SDI OUT 1~4

4.2.2 Operations of Rear Panel

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

1. 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！

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2. 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.

3. REF Input (BNC)

It provides one reference input interface, it is labeled as REF IN. Connect a synchronous signal to realize gen lock to ensure the coincidence of signals in time at a combining or switching point.

4. Video Output (BNC)

It provides four switch output interfaces, they are labeled as SWITCH OUT1~SWITCH OUT4. Set any one of the input signals as a switch out signal to loop it out by tool software.
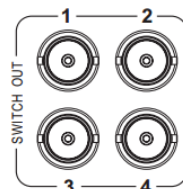
Figure 4.2-2　Video SWITCH Output Connector

5. Video Input (BNC)

It provides 16 SDI input interfaces, they are labeled as SDI IN 1~16. The SDI input interfaces are adaptive to 3G/HD/SD-SDI video signals, and supports embedded audio.
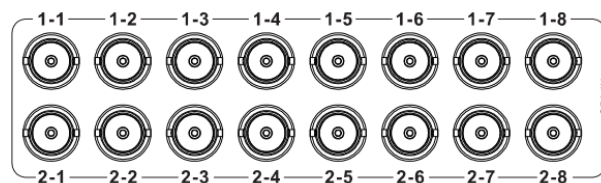
Figure 4.2-3　SDI Video input Connector

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

Table 4-1　The Resolutions of the SDI Interfaces

Name	Resolutions
Input formats	SD-SDI: 525i60, 625i50

Name	Resolutions
	HD-SDI: 720p50/59.94/60, 720p23.98/24/25/29.97/30, 1080i50/59.94/60, 1035i59.94, 1035i60, 1080p23.98/24/25/29.97/30, 1080sf23.98/24
	3G-SDI: 1080p50/60/59.94

6. Ethernet (RJ-45)

It provides one 10/100M 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.

Tips

- The default IP address of AURORA1600 is 192.168.1.70.

- Restore the default IP setting by short-circuit two pairs of the corresponding pins of RS422 interface at the rear panel. Refer to "Chapter 3 Unpack and Installation-- Restore the default IP setting" for the details.

7. RS422(RJ-45)

It offers one RS422 interface to set as TSL in AURORA control software. Set it in Device Configuration Window→Serial Port→Properties window, as shown in Figure 4.2-4:
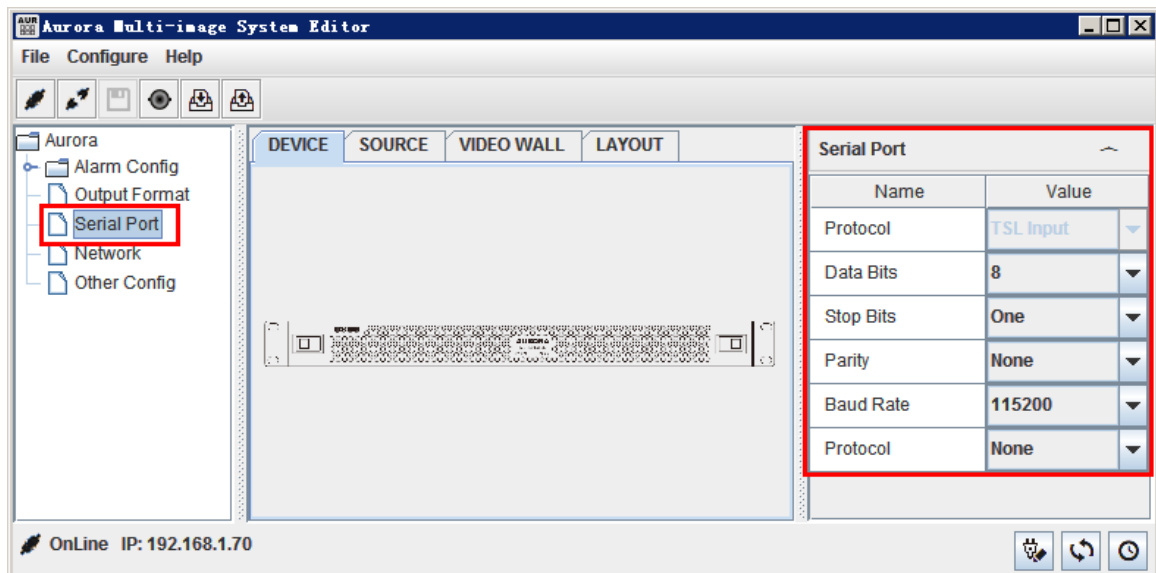
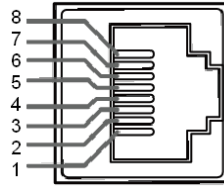*Figure 4.2-4   The Application of RS422 Connector*
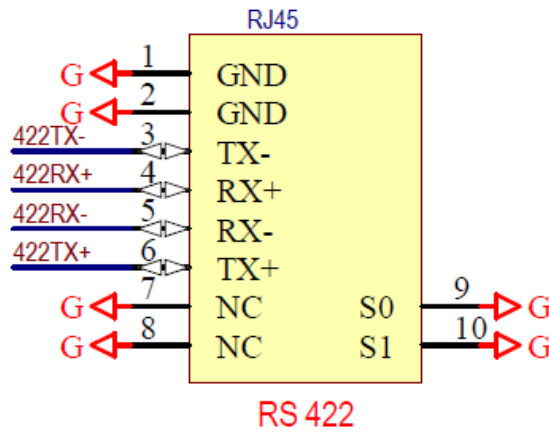
Figure 4.2-5   The Pins Sequence of RS422 Connector

Figure 4.2-6   The Pins Sequence and Functionalities of RS422 Connector

Table 4.2-2   The Relationship of Pins and Values for RS422

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

8. GPIO(DB26)

It provides one GPIO interface to realize the remote control function, and you can set a function value to each appointed pin. The relationship of pins and values for GPIO is as shown in Table 4-3:

GPI 1~16 & GPO 1~4
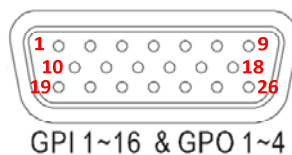
Figure 4.2-7   The Pins Sequence of GPIO Connector

15

Table 4-3 The Relationship of Pins and Values for GPIO

Pins	Value
Pin1~Pin16	GPI1~GPI16
Pin17~Pin22	GND
Pin23	GPO4
Pin24	GPO3
Pin25	GPO2
Pin26	GPO1

9. Video Output Interface (HDMI)

It provides 4 video output interfaces to receive and send HDMI/DVI signals. The signal loops out, and supports embedded audio and HDCP. using HDMI-TypeA connector.
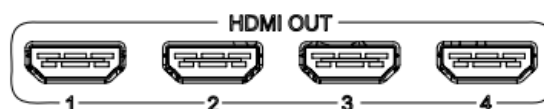

Figure 4.2-8 The HDMI Output Interface

10. Audio Input Interface (DB26)

It provides one audio input interface, it is labeled as AUD IN 1~16. It supports 16 channels of analog audio input signals.
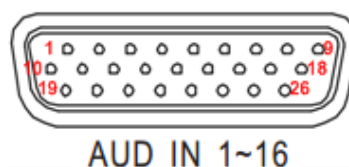

Figure 4.2-9 The Audio Input Interface

Table 4-4 The Relationship of Pins and Values for AUD IN

Pins	Value	Pins	Value
Pin1	AUDIO IN1	Pin14	GND
Pin2	AUDIO IN10	Pin15	AUDIO IN7
Pin3	GND	Pin16	AUDIO IN11
Pin4	AUDIO IN2	Pin17	GND
Pin5	AUDIO IN3	Pin18	AUDIO IN8
Pin6	GND	Pin19	AUDIO IN9

Pins	Value	Pins	Value
Pin7	AUDIO IN15	Pin20	AUDIO IN13
Pin8	AUDIO IN4	Pin21	GND
Pin9	GND	Pin22	GND
Pin10	AUDIO IN5	Pin23	GND
Pin11	GND	Pin24	AUDIO IN16
Pin12	AUDIO IN14	Pin25	GND
Pin13	AUDIO IN6	Pin26	AUDIO IN12

11. Audio Output Interface (DB26)

It provides one audio output interface, it is labeled as AUD OUT 1~4. It supports 4 pairs of audio output signals, as shown in Figure 4.2-10.
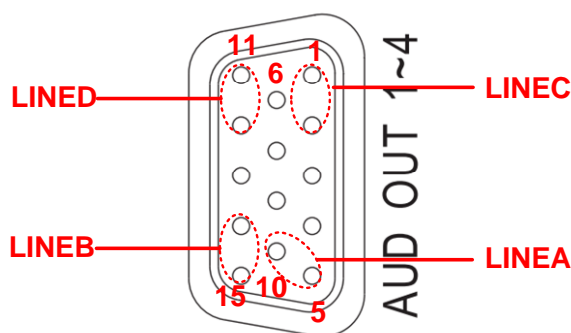
Figure 4.2-10   The Audio Output Interface

The relationship of pins and values for AUD OUT is as shown in Table 4-5:

Table 4-5   The Relationship of Pins and Values for AUD OUT

Pins	Value	Pins	Value
Pin1	LINEC-R	Pin9	GND
Pin2	LINEC-L	Pin10	LINEA-R
Pin3	GND	Pin11	LINED-R
Pin4	GND	Pin12	LINED-L
Pin5	LINEA-L	Pin13	GND
Pin6	GND	Pin14	LINEB-L
Pin7	GND	Pin15	LINEB-R
Pin8	GND		

12. Video Output (BNC)

It provides 4 SDI output interfaces, they are labeled as SDI OUT 1~4. The SDI Output interface supports the following resolutions, as shown in Table 4-6:

Table 4-6   The Resolutions of the SDI Output Interfaces

Name	Resolutions
Input formats	SD-SDI: 525i60, 625i50
	HD-SDI: 720p50/59.94/60, 720p23.98/24/25/29.97/30, 1080i50/59.94/60, 1035i59.94, 1035i60, 1080p23.98/24/25/29.97/30, 1080sf23.98/24
	3G-SDI: 1080p50/60/59.94

4.2.3 Timing

AURORA1600 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 a LTC timing device through the LTC port. The LTC external device receive a timecode input signal to keep synchronous with the system clock, and the timecode conforms to the SMPTE12M (EBU-3259-E) standard.

(2) Timing operation: click the manual timing button [🕐], it will pop up the timing window, select LTC timing in the timing dialog box, as shown in Figure 4.2-11:
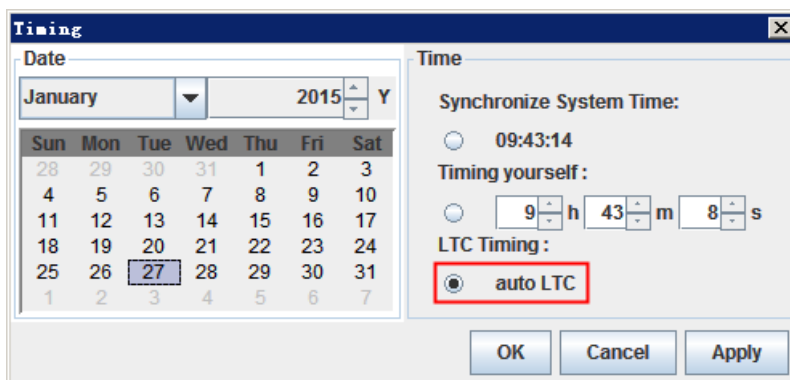

Figure 4.2-11   Selection of Timing Method-LTC

2. Local Timing

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

(1) Connect a local computer through the Ethernet port (RJ45), using twisted-pair cables the IP address of the local computer and the AURORA1600 must be in the same network segment.

(2) Timing operation: click the manual timing button [⏰], it will pop up the timing window, select the Time method as **Synchronize System Time** to use the current time, or select as **Timing yourself** to a customized time, as shown in Figure 4.2-12, click the manual timing button to confirm timing with the local time.
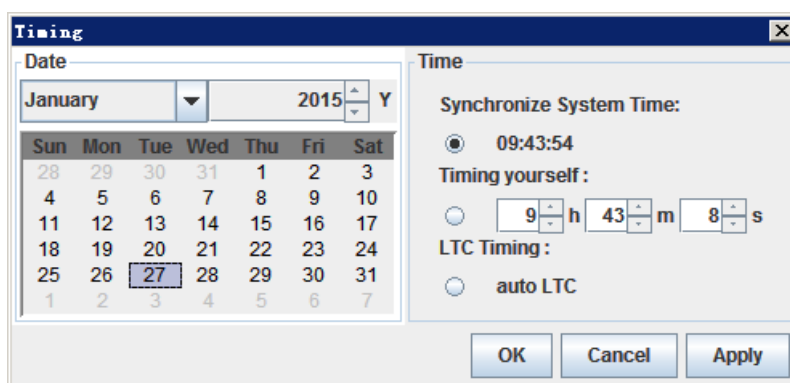

Figure 4.2-12   Timing Operation Window

4.3 Control Access

The AURORA1600 is connected to its remote control computer through the Ethernet interface using the twisted-pair cable. Start up the computer and run the multi-image control software, and the software will load the information of the multi-image after setting up the connection.

Tips

• The multi-image and the remote control computer must be at the same network segment.

Double click the program AURORA.exe in the installation folder of the

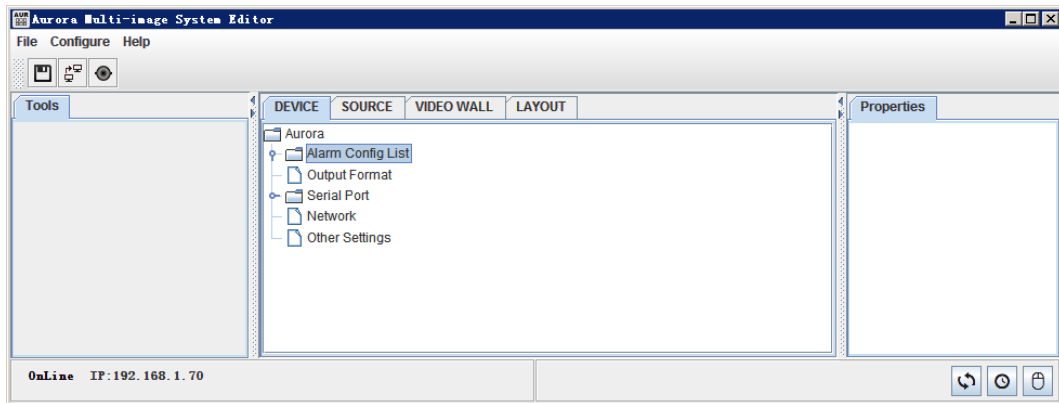multi-image control software, the software interface is shown in Figure 4.3-1:

Figure 4.3-1   The Interface of the Multi-image Control Software

Refer to "The Manual for the Multi-image Controller Software " for details.

Chapter 5 Specifications

1. Product detailed information

Specification	Values	
Input characteristic	16 channels of 3G/HD/SD-SDI input signals	one input module with 16 input channels
Input module	3G/HD/SD-SDI input signal	
Output characteristic	4 channels of SDI/HDMI output signal	one output module with 4 output channels
Output module	SDI/HDMI output signal	
Control Interface	GPI/O, LTC, Ethernet, RS422 (TSL)	
Display Units	Up to 16 displays in a single screen	
Control Software	AURORA	
Working Environment	Work Temperature: 0~70℃ Work Humility: 10%~90%(no condense) Height: below 1000 feet (3048 meter) above sea level	
Weight(fully loaded)	1U,6.1kg	465.5(L)×342(W)×44(H)mm
Power Consumption	100W	
Electrical Characteristics	100-240VAC, 50-60Hz, two redundant power modules	
Signal Format	NTSC, PAL	
Signal Amplitude	1Vp-p+/-3dB	
Impedance	75Ω	
Return Loss	>40 dB to 5 MHz	
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	

Specification	Values
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	<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 is shown as in the following figures:
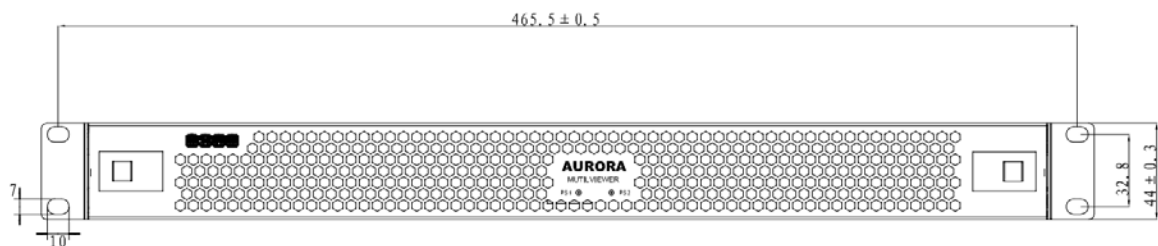
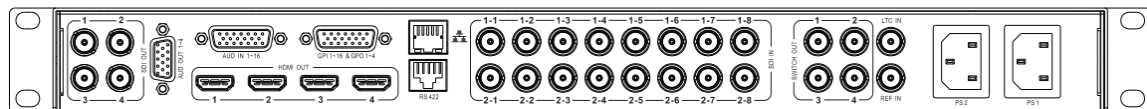*Figure 5-1   Front Panel(Unit: mm)*
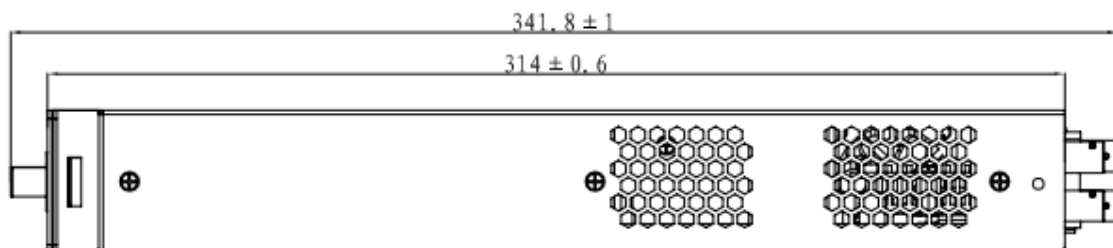

Figure 5-2   Rear Panel(Unit: mm)

Figure 5-3   Side View(Unit: mm)
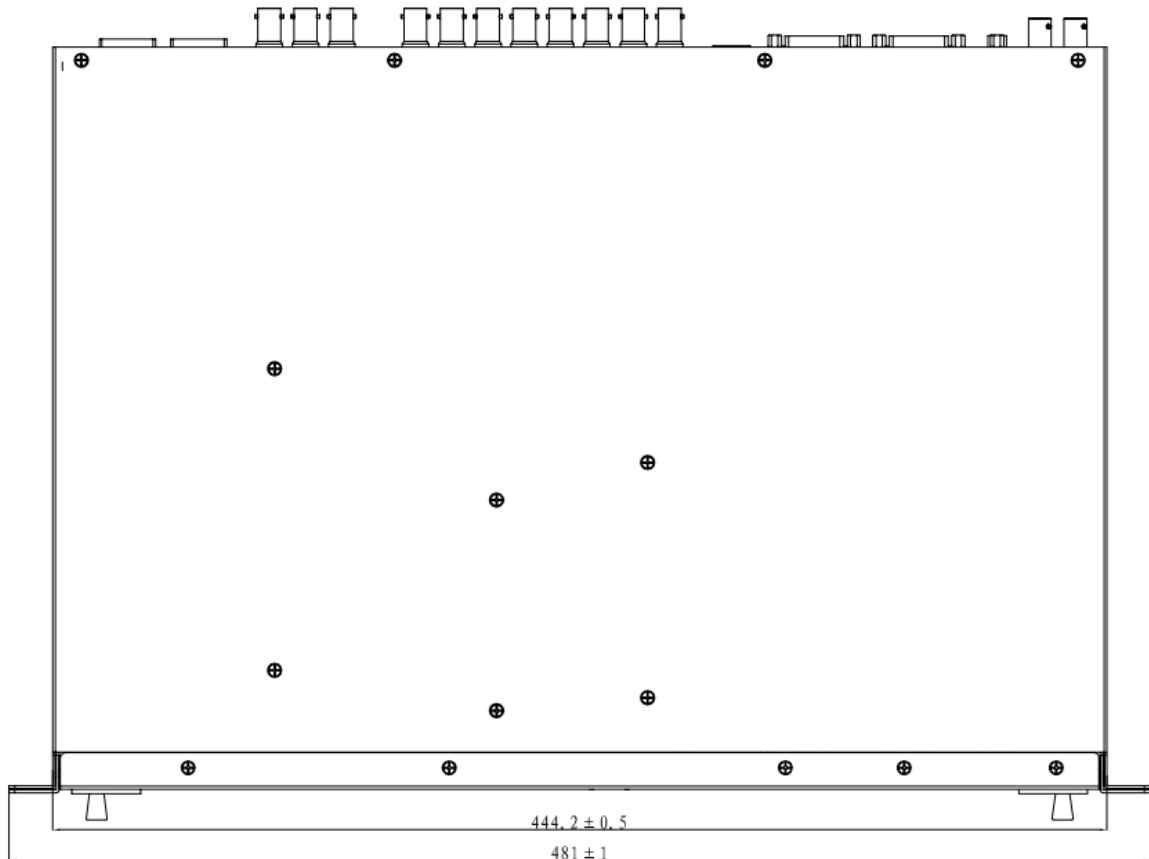
Figure 5-4   Top View(Unit: mm)

![Tips]

• Specifications are subject to change without notice.

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

OSEE

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