SP60 Pro

LED Display Controller

Specifications

Change History

Document Version	Release Date	Description
V1.0.0	2023-07-27	First release

Introduction

The SP60 Pro is an LED display controller created by Xi'an NovaStar Tech Co., Ltd. (referred to as NovaStar). It is specifically designed for sub-pixel screens and boasts 20 Ethernet ports. This controller combines video processing and control functions and features 2x HDMI 2.0 input ports, 20x Ethernet output ports, and 2x 10G optical ports. It can also work with the brand-new software VMP (Vision Management Platform) to provide a better operation and control experience.

Features

Inputs and Outputs

- HDMI input
  2x HDMI 2.0 inputs (with loop output)
- 10-bit and 8-bit video inputs

- 20x Ethernet outputs
- 2x 10G optical outputs

Sub-pixel Technique

The SP60 Pro supports popular sub-pixel layouts commonly used in LED displays. Utilizing a pixel enhancement algorithm, it effectively maximizes the amount of content displayed on the screen without compromising the physical pixel density. Depending on the specific sub-pixel layout, it can significantly reduce the number of LED chips and driver ICs required, simplifying the module wiring process. This, in turn, improves heat dissipation and enhances the viewing experience from side angles. The sub-pixel technique offers support for five modes, each suited for different scenarios:

- Standard: The default mode, designed to be versatile and user-friendly, making it well-suited for most scenarios.
- Video: Ideal for scenarios involving video and image playback. It enhances the visual experience by delivering vibrant and pleasing playback that are especially appealing to the human eye.
- Document: Specifically tailored for scenarios where there is a significant contrast between the foreground and background, such as Word/PDF/PPT document display. It ensures a comfortable viewing experience, minimizing eye strain.
- Conference: Geared towards scenarios that prominently display human faces. This mode guarantees accurate and natural skin tones. It offers slightly higher brightness, ensuring clear images with a standard color temperature.
- Custom: Provides users with the flexibility to adjust the display settings according to the specific content being displayed.

Advanced Features

- 2 independent layers
  Supports up to 2x 4K layers.
- Personalized image scaling
  Supports 4 image scaling modes: custom, pixel to pixel, snap to canvas, and fill screen.
- Multi-layer Calibration
  Works with NovaStar's high-precision calibration system to generate unique calibration coefficients for low-grayscale image parts to ensure their uniformity while supporting the traditional brightness and chroma calibration.

- HDR
  - Supports HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards.
  - Supports HLG.
- Latency
  - Support low latency and the controller load capacity is not reduced. The latency at the controller is 0 frame (less than 1 ms) in Send-Only Controller working mode and 1 frame in All-In-One Controller working mode.

- Support additional latency. Zero to two frames of latency can be added at the controller.

- Crop input source
  Allows for input source cropping, enabling the creation of a new input source without impacting the original input source.

- No rectangle restriction
  No rectangle restriction for irregular screens. This means when calculating resolutions, blank pixels do not count towards the total capacity. The used load capacity of Ethernet ports is the sum of the resolutions of all cabinets with load.

- Two working modes
  - In the Send-Only Controller mode, the latency can be reduced by one frame.
  - In the All-In-One Controller mode, the layer and scaling functions are available.

- Display system monitoring
  Support monitoring of the device status and screen status. Any fault and alarm information can be reported actively.

Device Controls

- VMP software control
  The device can be connected to the VMP software to provide easy and convenient operations and smart device management.

- Supports the SNMP and Art-Net protocols

- Cascading control via Ethernet
  The Gigabit Ethernet control ports support TCP/IP protocol and star topology. With their built-in network switching function, serial cascading control of multiple devices can be realized without a switch.

Note

The SP60 Pro requires the A8s Pro receiving card and the dedicated sub-pixel program.

Appearance

Front Panel
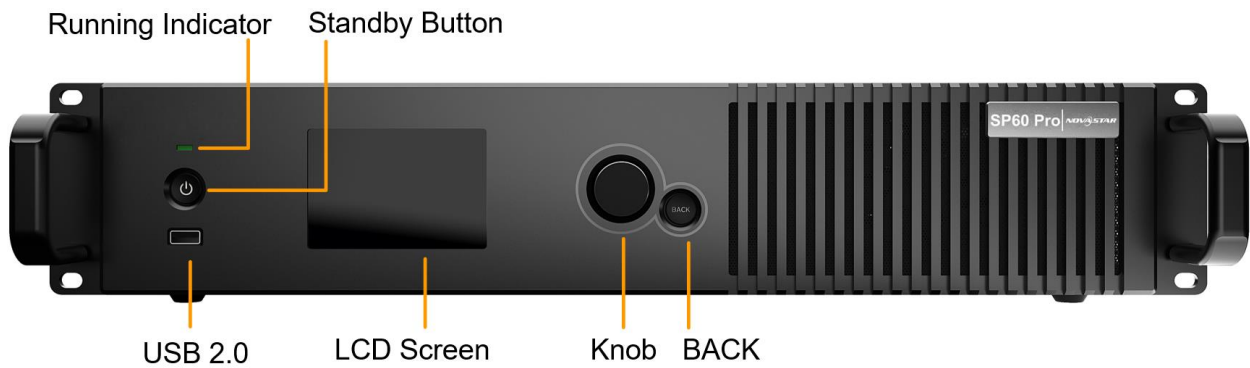
Name	Description
Running indicator	• Solid red: Standby • Solid blue: The device is being powered on. • Solid green: The device is running normally. • Flashing red: The device is running abnormally.
Standby button	• Press the button to power on or power off the device. • Hold down the button for 5s to 10s to restart the device.
LCD screen	A 3.5-inch screen that displays the device status, menus, submenus and messages for parameter settings
Knob	• On the home screen, press the knob to enter the main menu screen.

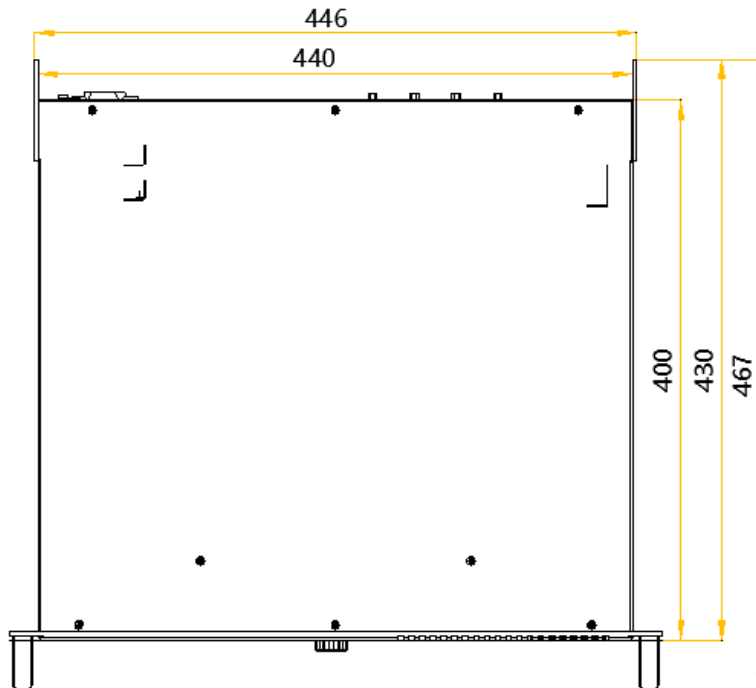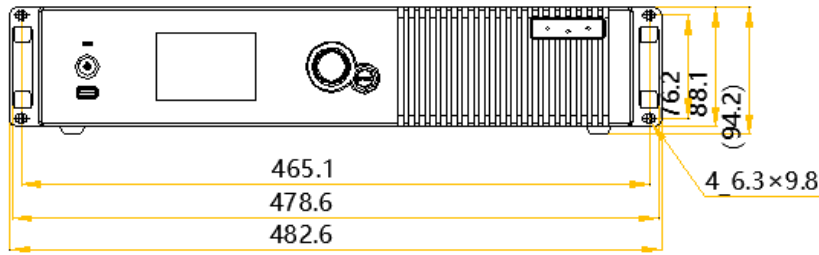| Name	Description
	• On the main menu screen, rotate the knob to select a menu item or adjust the parameter value. Press the knob to confirm the operation. • Hold down the knob and **BACK** button simultaneously for 5s or longer to lock or unlock the buttons.
BACK	Go back to the previous menu or cancel the current operation.

Rear Panel
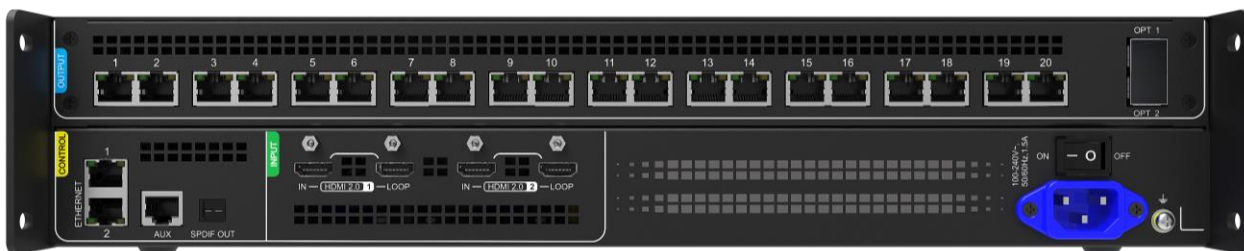
Inputs (INPUT area)			
Type	Qty	Description	
HDMI 2.0-1 IN & HDMI 2.0-2 IN	2	Resolution	Max resolution: 4096×2160@60Hz or 8192×1080@60Hz (Forced) Min resolution: 800×600@60Hz
		Max width/height (Forced)	Max width: 8192 pixels (8192×1080@60Hz) Max height: 7680 pixels (1080×7680@60Hz)
		Frame rates	50 / 59.94 / 60 / 71.93 / 72 / 75 / 100 / 119.88 / 120 / 143.86 / 144 / 240 Hz
		HDR	Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards. Support HLG.
		EDID management	Support standard resolutions, up to 3840×2160@60Hz. Support custom input resolutions.
		HDCP	Support HDCP 2.2, backwards compatible with HDCP1.4 / 1.3.
		Interlaced signal inputs	No support

Outputs (OUTPUT area)		
Type	Qty	Description

1–20	20	Gigabit Ethernet output ports. Support hot backup between Ethernet ports.
		
		In sub-pixel mode, the maximum load for a single Ethernet port is as follows:
		  – Triad delta arrangement, 8-bit at 60Hz: 1,300,000 pixels.
		  – Triad delta arrangement, 10-bit at 60Hz: 975,000 pixels.
		  – Triad delta arrangement, 8-bit at 120Hz: 650,000 pixels.
		  – Quad RGGB arrangement, 8-bit at 120Hz: 1,960,000 pixels.
		  – Quad RGGB arrangement, 10-bit at 60Hz: 1,568,000 pixels.
		  – Quad RGGB arrangement, 8-bit at 120Hz: 880,000 pixels.

OPT 1–2	2	10G optical output ports ● OPT 1 copies and outputs the data on Ethernet ports 1 to 10. ● OPT 2 copies and outputs the data on Ethernet ports 11 to 20.
HDMI 2.0 LOOP	2	An HDMI loop output connector
SPDIF OUT	1	A digital audio output (Reserved)
Controls (CONTROL area)		
Type	Qty	Description
ETHERNET	2	Gigabit Ethernet control ports. Support TCP/IP protocol and star connection. They have the same functions without priority and order, and can be connected to VMP software. No switch or router is needed to deploy multiple devices on the same LAN via device cascading as the network switching function is already built in. Up to 20 SP60 Pro can be cascaded.
AUX	1	An auxiliary connector that connects to the central control device (RS232) (Reserved)
Power		
100-240V~, 50/60Hz, 1.5A	1	An AC power input connector and switch

Dimensions

465.1
478.6
482.6

76.2
88.1
(94.2)

4_6.3×9.8

446
440

400
430
467

Tolerance: ±0.3   Unit: mm

Specifications

Electrical Specifications	Power input	100-240V~, 50/60Hz, 1.5A
	Max power consumption	82 W
Operating Environment	Temperature	−20ºC to +50ºC
	Humidity	0% RH to 80% RH, non-condensing
Storage Environment	Temperature	−30ºC to +80ºC
	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	482.6mm × 94.2mm × 467.0mm
	Net weight	7.4 kg
	Gross weight	10.2 kg Note: It is the total weight of the product, accessories, and packing materials packed according to the packing specifications.

Packing Information	Packing box	660.0 mm × 570.0 mm × 210.0 mm, kraft paper box
	Accessory box	408.0 mm × 290.0 mm × 50.0 mm, white cardboard box
	Accessories	• 1x Power cord • 1x Ethernet cable • 1x HDMI cable • 1x Certificate of Approval
IP Rating		IP20 Please prevent the product from water intrusion and do not wet or wash the product.

The amount of power consumption may vary depending on various factors such as product settings, usage, and environment.

Video Source Specifications

Input	Bit Depth	Sampling Format	Max Input Resolution
HDMI 2.0-1 & HDMI 2.0-2	8bit	RGB 4:4:4	4096×2160@60Hz 8192×1080@60Hz
		YCbCr 4:4:4	
		YCbCr 4:2:2	
	10bit	RGB 4:4:4	4096×2160@30Hz 4096×1080@60Hz
		YCbCr 4:4:4	
		YCbCr 4:2:2	4096×2160@60Hz

Note

The maximum input resolution in the table can be achieved by setting the graphics card.

Notes and Cautions

Notes for Battery

- The battery is not intended to be replaced.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

Notes for Installation

When the product needs to be installed on the rack, 4 screws at least M5*12 should be used to fix it. The rack for installation shall bear at least 29.6 kg weight.

Tray
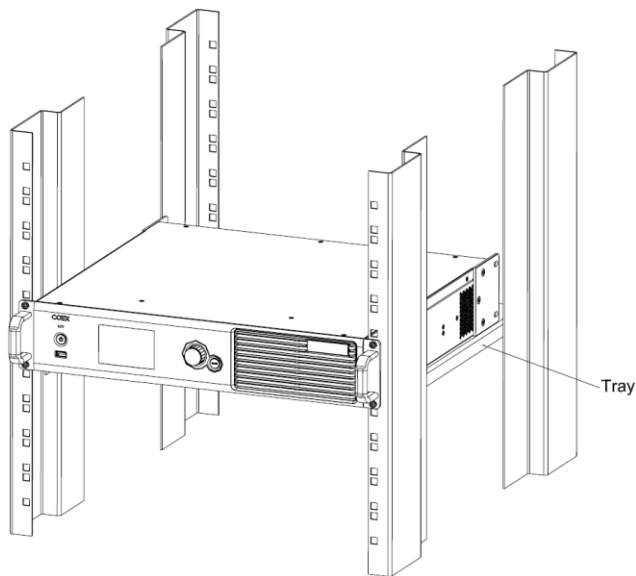
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

- Reduced Air Flow – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

- Mechanical Loading – Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

- Circuit Overloading – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable Earthing – Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Official website
www.novastar.tech

Technical support
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