

MX40 Pro

LED Display Controller



Specifications

Change History

Document Version	Release Date	Description
V1.0.1	2022-07-09	<ul style="list-style-type: none"> • Updated the product introduction. • Updated the certification information and cautions. • Updated the feature description • Updated the appearance diagrams. • Updated the maximum resolution and power consumption.
V1.0.0	2022-03-01	First release

Introduction

The MX40 Pro is a flagship all-in-one LED display controller with 20 Ethernet ports in the brand-new control system COEX series of Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). This controller integrates video processing and video control into one box and offers rich video input connectors (HDMI 2.0, DP 1.2 and 12G-SDI), 20x Ethernet output ports and 4x 10G optical ports. It can also work with the brand-new software VMP (Vision Management Platform) to provide a better operation and control experience.

Certifications

CCC, RoHS, CE, FCC, IC, UKCA, UL, CB

If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please contact NovaStar to confirm or address the problem. Otherwise, the customer shall be responsible for the legal risks caused or NovaStar has the right to claim compensation.

Features

Inputs and Outputs

- Inputs
 - 3x HDMI 2.0 (with loop through)
 - 1x DP 1.2
 - 1x 12G-SDI (with loop through)
- 12-bit, 10-bit and 8-bit video inputs
- Genlock signal input (with loop through)
- Ethernet outputs
20 Ethernet ports, up to 9 million pixels supported
- Optical outputs
Four 10G optical ports are provided. Two ports work as the primary ports and the other two work as the backup ports.

Advanced Features

- Four independent layers
Support up to 4x 4K layers and layer priority adjustment in Z order.
- Personalized image scaling
Support 3 image scaling modes: custom, pixel to pixel, and snap to canvas.
- Color Replacement
Support free replacement of any color on the image without affecting the performance of other colors.
- 14Ch Color Correction
Support precise adjustment to hue, saturation and brightness of the black, white and the 12 derived standard colors of the red, green and blue primary colors.
- Curves
Support adjustment to the video source curves.
- 3D LUT
Support adjustment to the video source colors through 3D LUT files.

- **Dynamic Booster**
Real-time analysis and dynamic adjustment are made to each frame to significantly improve the display contrast and image details for better visual experience, and effectively control and lower the display power consumption, extending the service life of the LED screen.
- **Full Grayscale Calibration**
Work with NovaStar's high-precision calibration system to generate unique calibration coefficients for each grayscale, ensuring uniformity of each grayscale and improving the screen's image quality.
- **HDR**
 - Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards.
 - Support HLG and comply with the BT.2100 standard.
- **Latency**
 - Support low latency. The latency at the controller is 0 frame (less than 1 ms) and the loading capacity is not reduced.
- Support additional frame latency. Zero to two frames of latency can be added at the controller.
- **3D**
Work with the specified receiving cards, 3D emitter and 3D glasses to bring a fascinating and immersive 3D viewing experience.
- **Adaptive input frame rate**
The controller can be adaptive to various video input frame rates, including decimal frame rates. Custom frame rates are also supported and the frame rate can be adjusted in 0.01 Hz.
- **Two working modes**
Support the All-In-One Controller and Send-Only Controller working modes. In the Send-Only Controller mode, the latency can be reduced by one frame.
- **Display system monitoring**
Support monitoring of 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.
- **Cascading control via Ethernet**
The Gigabit Ethernet control ports support TCP/IP protocol and star topology. No switch is needed to cascade control of multiple devices as a network switch is already built in.

Video Sources

Input	Bit Depth	Sampling Format	Max Input Resolution
HDMI 2.0-1	8bit	RGB 4:4:4	4096x2160@60Hz
		YCbCr 4:4:4	8192x1080@60Hz
		YCbCr 4:2:2	
	10bit	RGB 4:4:4	4096x2160@30Hz
		YCbCr 4:4:4	4096x1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz
	12bit	RGB 4:4:4	4096x2160@30Hz
		YCbCr 4:4:4	4096x1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz
HDMI 2.0-2	8bit	RGB 4:4:4	4096x2160@60Hz
		YCbCr 4:4:4	8192x1080@60Hz

Input	Bit Depth	Sampling Format	Max Input Resolution
	10bit	YCbCr 4:2:2	
		RGB 4:4:4	4096x2160@30Hz
		YCbCr 4:4:4	4096x1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz
HDMI 2.0-3	8bit	RGB 4:4:4	4096x2160@60Hz
		YCbCr 4:4:4	8192x1080@60Hz
		YCbCr 4:2:2	
	10bit	RGB 4:4:4	4096x2160@30Hz
		YCbCr 4:4:4	4096x1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz
DP 1.2	8bit	RGB 4:4:4	4096x2160@60Hz
		YCbCr 4:4:4	8192x1080@60Hz
		YCbCr 4:2:2	
	10bit	RGB 4:4:4	4096x2160@30Hz
		YCbCr 4:4:4	4096x1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz
	12bit	RGB 4:4:4	4096x2160@30Hz
		YCbCr 4:4:4	4096x1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz
12G-SDI	10bit	YCbCr 4:2:2	4096x2160@60Hz

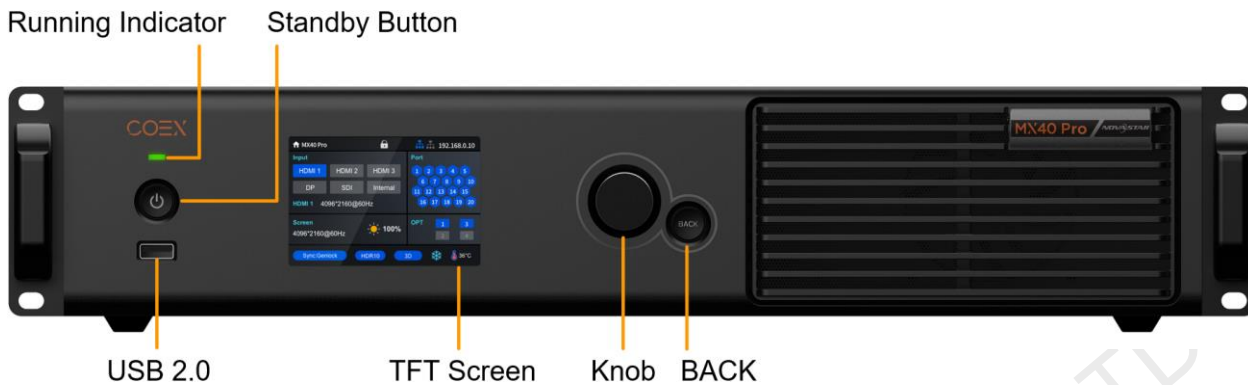
Note

The controller must work with the A10s Pro to realize the function of adaptive input frame rate. Currently supported driver ICs include MBI5264, ICND2055, ICND2065, ICND2059 and ICND2069.

The maximum resolution of HDMI and DP input sources in the table must be obtained by setting the graphics card.

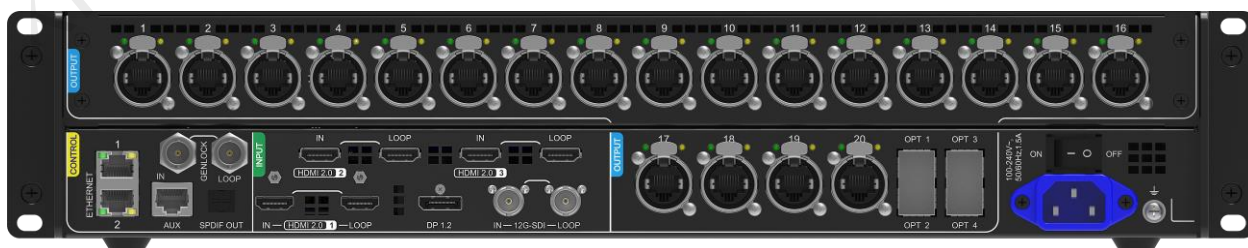
Appearance

Front Panel



Name	Description
Running Indicator	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Press the button to power on or power off the device. • Hold down the button for 5s or longer to restart the device.
USB 2.0	Used to send cabinet configuration files and export the diagnostic result
TFT Screen	A 3.5-inch screen that displays the device status, menus, submenus and messages for parameter settings
Knob	<ul style="list-style-type: none"> • On the home screen, press the knob to enter the main menu screen. • 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

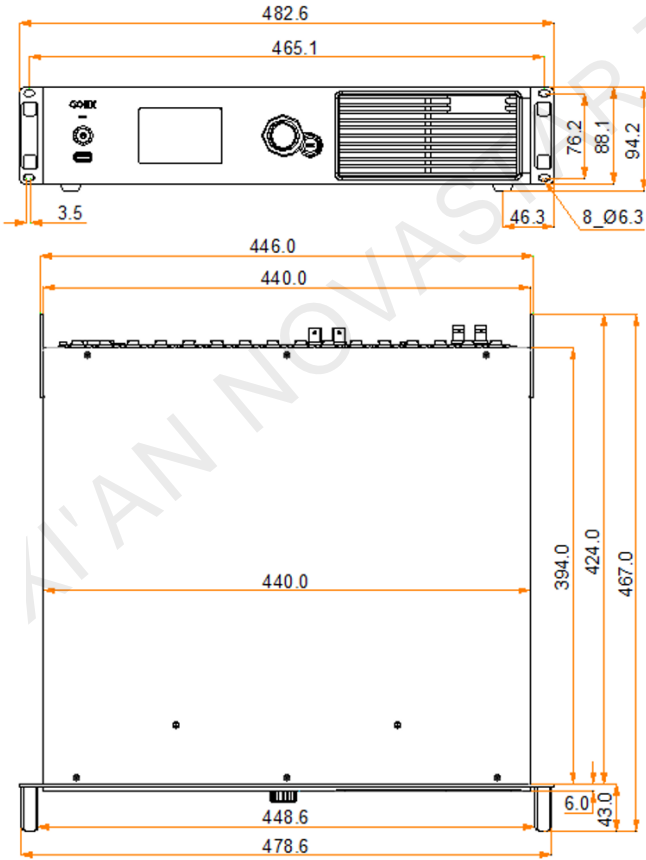


Inputs (INPUT area)			
Type	Qty	Description	
HDMI 2.0-1 IN	1	Resolutions	Max resolution: 4096x2160@60Hz or 8192x1080@60Hz Min resolution: 800x600@60Hz
		Max width/height	Max width: 8192 pixels (8192x1080@60Hz) Max height: 8192 pixels (1080x8192@60Hz)
		Frame rates	23.98/24/25/29.97/30/47.95/48/50/59.94/60/71.93/72/75/100/119.88/120/143.86/144/240 Hz
		HDR	Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards. Support HLG and comply with the BT.2100 standard.
		EDID management	Support standard resolutions, up to 3840x2160@60Hz. Support custom input resolutions.
		HDCP	HDCP 2.2 compliant, backwards compatible
		Interlaced signal inputs	Not supported
HDMI 2.0-2 IN	1	Resolutions	Max resolution: 4096x2160@60Hz or 8192x1080@60Hz Min resolution: 800x600@60Hz
		Max width/height	Max width: 8192 pixels (8192x1080@60Hz) Max height: 7680 pixels (1080x7680@60Hz)
		Frame rates	23.98/24/25/29.97/30/47.95/48/50/59.94/60/71.93/72/75/100/119.88/120/143.86/144/240 Hz
		HDR	Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards. Support HLG and comply with the BT.2100 standard.
		EDID management	Support standard resolutions, up to 3840x2160@60Hz. Support custom input resolutions.
		HDCP	HDCP 2.2 compliant, backwards compatible
		Interlaced signal inputs	Not supported
HDMI 2.0-3 IN	1	Resolutions	Max resolution: 4096x2160@60Hz or 8192x1080@60Hz Min resolution: 800x600@60Hz
		Max width/height	Max width: 8192 pixels (8192x1080@60Hz) Max height: 7680 pixels (1080x7680@60Hz)
		Frame rates	23.98/24/25/29.97/30/47.95/48/50/59.94/60/71.93/72/75/100/119.88/120/143.86/144/240 Hz
		HDR	Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards. Support HLG and comply with the BT.2100 standard.

		EDID management	Support standard resolutions, up to 3840×2160@60Hz. Support custom input resolutions.
		HDCP	HDCP 2.2 compliant, backwards compatible
		Interlaced signal inputs	Not supported
DP 1.2	1	Resolutions	Max resolution: 4096×2160@60Hz or 8192×1080@60Hz Min resolution: 800×600@60Hz
		Max width/height	Max width: 8192 pixels (8192×1080@60Hz) Max height: 8192 pixels (1080×8192@60Hz)
		Frame rates	23.98/24/25/29.97/30/47.95/48/50/59.94/60/71.93/72/75/100/119.88/120/143.86/144/240 Hz
		EDID management	Support standard resolutions, up to 3840×2160@60Hz. Support custom input resolutions.
		HDCP	HDCP 1.3 compliant
		Interlaced signal inputs	Not supported
12G-SDI IN	1	Standards	Support ST-2082 (12G), ST-2081 (6G), ST-424 (3G) and ST-292 (HD) standard video inputs. Support 3G-Level A/Level B (DS mode).
		Resolutions	Max resolution: 4096×2160@60Hz
		Frame rates	Support frame rates up to 60 Hz.
Outputs (OUTPUT area)			
Type	Qty	Description	
1–20	20	Gigabit Ethernet output ports. Support hot backup between Ethernet ports. Max loading capacity per port: <ul style="list-style-type: none"> • 8bit@60Hz: 650,000 pixels • 10bit@60Hz: 480,000 pixels (available only with the A10s Pro receiving card) • 10/12bit@60Hz: 325,000 pixels 	
OPT 1–4	4	10G optical output ports <ul style="list-style-type: none"> • OPT 1 transmits the data of Ethernet ports 1 to 10. OPT 3 is the copy channel of OPT 1. • OPT 2 transmits the data of Ethernet ports 11 to 20. OPT 4 is the copy channel of OPT 2. 	
HDMI 2.0-1 LOOP	1	HDMI loop through	
HDMI 2.0-2 LOOP	1		
HDMI 2.0-3 LOOP	1		
12G-SDI LOOP	1	SDI loop through	

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 topology. They have the same functions without priority and order, and can be connected to VMP software. No switch is needed to cascade control of multiple devices as a network switch is already built in.
GENLOCK	1	A pair of Genlock signal connectors. Support Bi-Level and Tri-Level. <ul style="list-style-type: none"> • IN: Accept the sync signal. • LOOP: Loop the sync signal. For standard Genlock signal generators, up to 20 MX40 Pro devices 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



Tolerance: ±0.3 Unit: mm

Specifications

Electrical Specifications	Power input	100-240V~, 50/60Hz, 1.5A
	Max power consumption	95 W
Operating Environment	Temperature	-20°C to +50°C
	Humidity	0% RH to 80% RH, non-condensing
Storage Environment	Temperature	-30°C to +80°C
	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	482.6 mm × 94.2 mm × 467.0 mm
	Net weight	7.5 kg
	Gross weight	10.5 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	<ul style="list-style-type: none"> • 1x Power cord • 1x Ethernet cable • 1x HDMI cable • 1x DP 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.

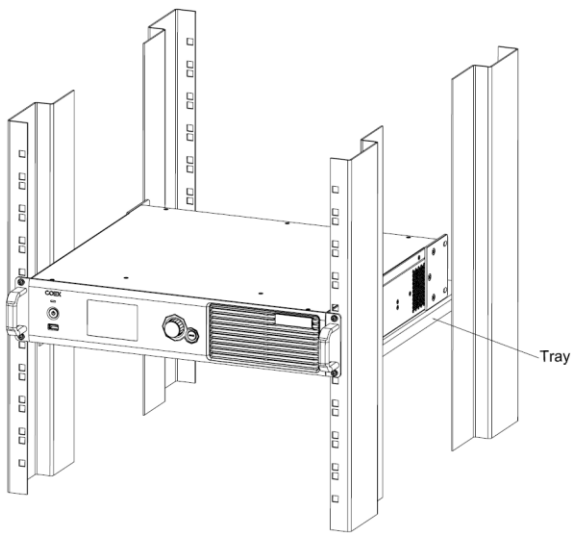
Notes and Cautions

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 32kg weight.



- 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 (T_{ma}) 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).

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 A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Others

This product can only be placed horizontally. Do not mount vertically or upside-down.

This is Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

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Statement

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Official website
www.novastar.tech

Technical support
support@novastar.tech