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MCTRL4K

LED Display Controller



Specifications

1 Overview

The MCTRL4K is an LED display controller with ultra-large loading capacity developed by NovaStar. A single unit features a loading capacity of up to 4096×2160@60Hz. It supports any custom resolutions with the maximum width or height up to 7680 pixels, meeting the on-site configuration requirements of ultra-long or ultra-wide LED displays.

The MCTRL4K has many industry-leading advanced technologies:

- Supports HDR function, both in HDR10 and HLG standards, which can greatly enhance the image quality of the display, presenting more clear and vivid images.
- Supports individual Gamma adjustment for RGB when the bit depth of input source is 10-bit or 12-bit, which effectively controls image non-uniformity under low grayscale and white balance offset to improve image quality.
- Low latency: Less than 1 ms (when the start position of image is 0.)
- Supports 3D function when working with the 3D emitter EMT200 and 3D glasses, allowing you to experience 3D display effects.
- In multi-card mode, the MCTRL4K can be used as two controllers, allowing the images of two input sources to be displayed on the screen at the same time.

The MCTRL4K is stable, reliable and powerful, dedicated to providing a best visual experience. It can be mainly used for the fixed and rental applications, such as concerts, live events, security monitoring, Olympic Games and various sports centers.

2 Features

- 1 × DP 1.2 input and 1 × HDMI 2.0 input, resolutions up to 8.8 million pixels per input
- 2 × D-DVI inputs, total resolutions up to 8.3 million pixels
- 16 × Neutrik Gigabit Ethernet ports and 4 × 10G optical ports for output
- Supported video bit depths: 8-bit, 10-bit and 12-bit
- Supports both mosaic and multi-card working modes for dual-link DVI inputs.
- Supports HDR function, both in HDR10 and HLG standards.
- Supports individual Gamma adjustment for RGB when the bit depth of input source is 10-bit or 12-bit.
- Supports 3D function when working with the 3D emitter EMT200 and 3D glasses.
- Low latency: Less than 1 ms (when the start position of image is 0.)
- Supports ultra-high resolution settings with NVIDIA graphics card.
- Adaptive to inputs with decimal frame frequencies, including 23.98 / 29.97 / 47.95 / 59.94 / 71.93 / 119.88 Hz
- Supports the new generation of pixel level calibration technology of NovaStar.
- Supports screen configuration via Web interface.
- Multiple MCTRL4K units can be cascaded together for uniform control.
- Supports a variety of video formats, as shown in Table 2-1.

Table 2-1 Video formats

Input Connector	Features		
	Bit Depth	Sampling Format	Maximum Input Resolution
HDMI 2.0	8 bit	RGB 4:4:4 YCbCr 4:4:4 YCbCr 4:2:2 YCbCr 4:2:0	4096x2160@60Hz (Setting via NVIDIA graphics card)
	10 bit/12 bit	RGB 4:4:4 YCbCr 4:4:4	3840×1080@60Hz
		YCbCr 4:2:2 YCbCr 4:2:0	4096x2160@60Hz (Setting via NVIDIA graphics card)

Input Connector	Features		
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	10 bit/12 bit	RGB 4:4:4 YCbCr 4:4:4	3840×1080@60Hz
		YCbCr 4:2:2	4096x2160@60Hz (Setting via NVIDIA graphics card)
Dual-link DVI	8 bit	RGB 4:4:4 YCbCr 4:4:4 YCbCr 4:2:2	3840×1080@60Hz

Table 2-2 Limitations on functions

Function	Limitations	Mutually Exclusive Function
HDR	• Supports 10-bit HDMI input sources only. • The loading capacity of each Ethernet port is reduced by half. • Supports A8s and A10s Plus receiving cards only.	N/A
3D	• When the input source is DVI, DVI1 loads the images for left eye, and DVI2 loads the images for right eye. • When the advanced screen configuration is enabled, 3D function is not supported. • The loading capacity of each Ethernet port is reduced by half.	Low latency, calibration
Low Latency	• Supports HDMI and DP input sources only. • Each Ethernet port must load cabinets vertically.	3D, Genlock
Calibration	N/A	10bit/12bit, HDR, 3D, image settings
Genlock	N/A	Low latency

Note:

- When the input source bit depth is 10-bit/12-bit, you must set the bit depth correspondingly in NovaLCT.
- For detailed limitations on the functions, see *MCTRL4K LED Display Controller User Manual*.

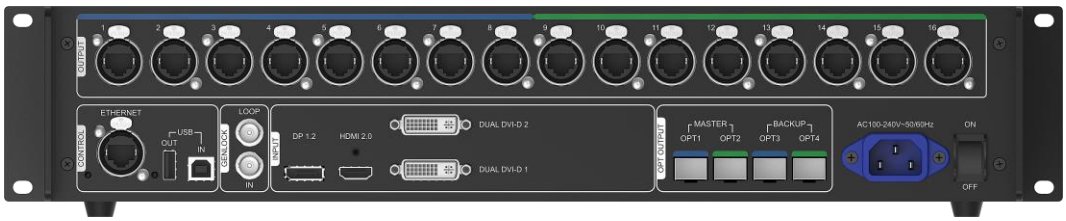
3 Appearance

Front Panel



No.	Name	Description
1	Power button	Press to power on the device and hold down for 4–5 seconds to power off the device.
2	USB	Insert a USB drive only.
3	LCD screen	Display the menu.
4	Knob	• On the home screen, press the knob to enter the operation menu screen. • On the operation menu screen, press the knob to select the current menu item or enter the submenu. Rotate the knob to select a menu item or adjust the parameter. • Hold down the knob and **BACK** button at the same time for 5 seconds or longer to lock or unlock the buttons.
5	BACK	Exit the current menu or operation.

Rear Panel



Input	
DP 1.2	• DP 1.2 input, with a maximum resolution of 4096×2160@60Hz and minimum resolution of 640x480@24Hz • Pixel capacity: 8,800,000 pixels • Custom resolutions supported: Resolution limit with maximum width: 7680×1080@60Hz Resolution limit with maximum height: 1080×7680@60Hz • Supports HDCP 1.3. • Supported standard resolutions: 1280×1024@(24/25/30/48/50/60/72/75/85/100/120)Hz 1366×768@(24/25/30/48/50/60/72/75/85/100/120)Hz 1440×900@(24/25/30/48/50/60/72/75/85/100/120)Hz 1600×1200@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×1080@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×1200@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×2160@(24/25/30/48/50/60/72/75/85/100/120)Hz 2560×1600@(24/25/30/48/50/60/72/75/85/100/120)Hz 3840×1080@(24/25/30/48/50/60/72/75/85/100/120)Hz 3840×2160@(24/25/30/48/50/60)Hz
HDMI 2.0	• HDMI 2.0 input, with a maximum resolution of 4096×2160@60Hz and minimum resolution of 800×600@30Hz • Pixel capacity: 8,800,000 pixels • Custom resolutions supported: Resolution limit with maximum width: 7680×1080@60Hz Resolution limit with maximum height: 1080×7680@60Hz • Supports HDCP 1.4 and HDCP 2.2. • Supported standard resolutions: 1280×1024@(24/25/30/48/50/60/72/75/85/100/120)Hz 1440×900@(24/25/30/48/50/60/72/75/85/100/120)Hz 1600×1200@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×1080@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×1200@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×2160@(24/25/30/48/50/60/72/75/85/100/120)Hz 2048×1536@(24/25/30/48/50/60/72/75/85/100/120)Hz

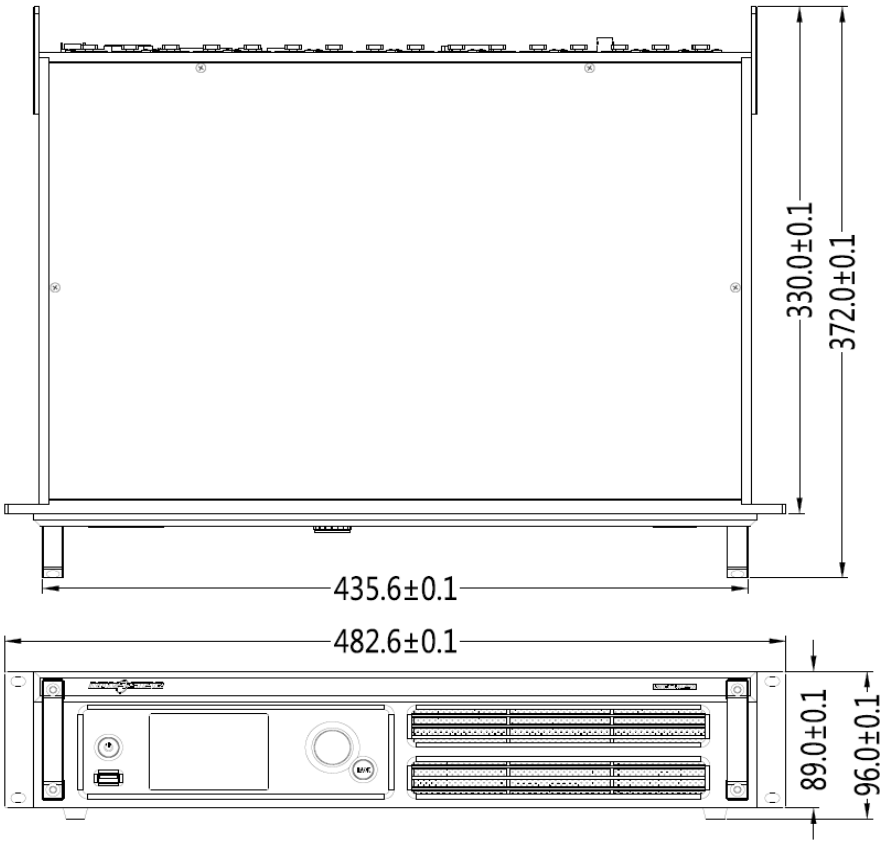
	2560×1600@(24/25/30/48/50/60/72/75/85/100/120)Hz 3840×1080@(24/25/30/48/50/60/72/75/85/100/120)Hz 3840×2160@(24/25/30/48/50/60)Hz
DUAL DVI-D1 DUAL DVI-D2	• 2 × DVI inputs, each with a maximum resolution of 3840×1080@60Hz and minimum resolution of 800×600@30Hz • Pixel capacity: 8,300,000 pixels • Custom resolutions supported: Resolution limit with maximum width: 3840×2160@60Hz Resolution limit with maximum height: 2160×3840@60Hz • Supported standard resolutions: 1280×1024@(24/25/30/48/50/60/72/75/85/100/120)Hz 1366×768@(24/25/30/48/50/60/72/75/85/100/120)Hz 1440×900@(24/25/30/48/50/60/72/75/85/100/120)Hz 1600×1200@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×1080@(24/25/30/48/50/60/72/75/85/100/120)Hz 1920×1200@(24/25/30/48/50/60/72/75/85/100)Hz 1920×2160@(24/25/30/48/50/60)Hz 2560×1600@(24/25/30/48/50/60)Hz 3840×1080@(24/25/30/48/50/60)Hz 3840×2160@(24/25/30)Hz
Output	
1–16	• 16 Neutrik (NE8FBH) Gigabit Ethernet ports • Maximum loading capacity of a single Ethernet port: – For 8-bit input sources: 650,000 pixels – For 10-bit/12-bit input sources: 320,000 pixels • Do not support audio output. • Support redundancy between Ethernet ports.
OPT1–OPT4	• 10G optical ports – Single-mode twin-core fiber: Support LC optical connectors; wavelength: 1310 nm; transmission distance: 10 km; OS1/OS2 recommended. – Dual-mode twin-core fiber: Support LC optical connectors; wavelength: 850 nm; transmission distance: 300 m; OM3/OM4 recommended. • The maximum loading capacity of a single optical port equals to that of all the 8 Ethernet ports. • 4 OPT inputs/outputs – OPT1 and OPT2 are main input/output ports. OPT1 corresponds to Ethernet ports 1–8 and OPT2 corresponds to Ethernet ports 9–16. – OPT3 and OPT4 are backup input/output ports. OPT3 is a duplicate channel of OPT1, and OPT4 is a duplicate channel of OPT2.

Control	
ETHERNET	For PC connection
USB IN	Input port for cascading devices, or connecting to PC
USB OUT	Output port for cascading devices
GENLOCK	
IN	Genlock input connector • Genlock type: Blackburst • Input Genlock sync signal to ensure synchronization and same refresh rate between the output signals of cascaded MCTRL4K units and the external Genlock signal.
LOOP	Genlock loop output connector Up to 10 MCTRL4K units can be cascaded.
Power	
AC 100 V–240 V, 50/60Hz	AC power input

Note:

Type-A USB port is prohibited from being connected to the control computer directly.

4 Dimensions



Unit: mm

5 Specifications

Electrical Parameters	Input voltage	AC 100 V–240 V, 50/60 Hz
	Rated power consumption	30 W
Operating Environment	Temperature	-20°C–60°C
	Humidity	10% RH–90% RH, non-condensing
Storage Environment	Temperature	-20°C–70°C
Dimensions	482.6 mm × 372.0 mm × 96.0 mm	
Weight	4.6 kg	
Certifications	FCC, EMC, LVD, RoHS, UL&CUL, EAC, CB, IC, KC, RCM	
Packing Information	Each MCTRL4K unit is shipped with a carrying case, accessory box and packing box. Packing rules: The product and accessory box (containing related cables) packed in the carrying case and the carrying case packed in the packing box	
	Carrying case	530 mm × 420 mm × 193 mm White cardboard box printed with **NOVASTAR** One unit in each case
	Accessory box	405 mm × 290 mm × 48 mm White cardboard box printed with **Accessory Box** Accessories: 1 × power cord, 1 × Ethernet cable, 1 × USB cable, 1 × HDMI cable and 1 × DP cable
	Packing box	550 mm × 440 mm × 210 mm Craft paper box printed with **NOVASTAR**

6 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.