TU4K Pro

LED Playback Control Processor

Specifications

Change History

Document Version	Release Date	Description
V1.0.4	2025-05-08	• Updated the playback performance. • Updated the media decoding specifications.
V1.0.3	2025-03-31	Updated the product specifications.
V1.0.2	2025-03-10	Updated the media decoding specifications.
V1.0.1	2025-02-25	• Updated the features. • Updated the sensor description.
V1.0.0	2025-02-07	First release

Introduction

The TU4K Pro is an LED playback control processor specially designed by Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar) for LED screen applications. It integrates the Android system, sending card and video processing functions into one unit, and allows third-party apps to run on it, featuring powerful interaction, display and playback control capabilities.

The TU4K Pro supports a maximum load capacity of 13 million pixels and offers convenient LED screen control via the front panel LCD or a remote control. It also supports wireless screen mirroring across multiple platforms including Windows, macOS, iOS, and Android. To cater to different application scenarios, the TU4K Pro features advanced image processing capabilities and provides 4 modes to let the document presentation, video playback and remote meetings have the optimal display effect.

The TU4K Pro has no requirements of redesigning or changing the screen structure and can be mounted on the wall or placed on a surface or into a cabinet, allowing for quick environment setup and use. It is highly versatile and suitable for a broad range of applications such as corporate showrooms, conference rooms, auditoriums, and outdoor standalone LED displays.

Certifications

CE, FCC, RoHs, IC

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

- 2x HDMI 2.0 inputs
- 1x HDMI 1.3 input
- 1x USB 3.0 input
- 2x USB 2.0 inputs
- 1x HDMI 1.3 output for monitoring and debugging
- 20x Gigabit Ethernet outputs
- 2x OPT outputs
- 4x audio outputs
  - 1x SPDIF digital audio output
  - 1x 3.5-mm audio output
  - 1x HDMI eARC audio output
  - 1x Phoenix audio output
- Output image scaling
  - Width range: 64 to 16384 pixels
  - Height range: 64 to 8192 pixels
  - Total device load capacity ≤ 13 million pixels

  Note: When using the scaling function, the maximum load capacity is 13 million pixels, while the maximum pixel load for pixel-to-pixel display is 8.8 million. For any questions, please contact NovaStar technical support.

System Functions

- Android 13.0-based desktop UI system, supporting third-party apps
- Screen drawing and commenting (To use this feature, please purchase a whiteboard activation code separately.)
- Wireless screen mirroring from multiple platforms
  - Max resolution: 3840×2160@30Hz
  - Mirror from Windows, macOS, iOS and Android
- Working with ViPlex Handy to achieve reverse control

  The speaker can reversely control the LED screen via the terminal.
- Powerful processing performance
  - Quad-core A73 + quad-core A53 ARM processor @ 2.2 GHz
  - Support high-definition video decoding of H.264 4K@30Hz and H.265 4K@60Hz.
  - 8 GB of onboard RAM
  - 128 GB of storage space
- Excellent playback performance

  Supports playback of 1 stream of 8K video, 2 streams of 4K video, 4 streams of 1080p video, 9 streams of 720p video, 16 streams of 480p video, or 20 streams of 360p video.

  Notes:
  - 8K refers to the standard 8K resolution (7680×4320@24Hz). Only H.265/HEVC and VP9 encoding formats are supported. Decoding and playback of videos with resolutions between 4K and 8K are not supported.
  - The H.265/HEVC and VP9 encoding formats support 2 streams of 4K video.
  - Videos between 2K and 4K will be processed into 4K format.
- Playback control via different terminals
  - Intelligent playback control via mobile app: Install ViPlex Handy on

your smartphone for program editing and publishing and screen control. The HDMI 1 can also be used as program content.
  - Convenient playback control via remote: Perform playback control of local programs and simple program editing on the screen.
  - USB playback: Support standalone playback, plug and play, copy and play.
- Eye comfort mode
- Dual Wi-Fi modes

  Allow for Wi-Fi and wireless hotspot connections at the same time.
- Dynamic Engine
  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.
  Note: This feature is available when the A10s Pro receiving card is used and Gamma is manually adjusted to 2.8 in NovaLCT in advance.
- AI image enhancement

  Enable intelligent recognition of playing content, fine tuning of colors in each frame, and comprehensive optimization of color saturation, brightness, sharpness and dynamic motion compensation.

  Note: This feature is available for the internal source and HDMI 1 only.
- Decoding and playback of HDR videos
- Effect adjustment

  Offer 4 display modes including standard, meeting, vivid and skin, and allow you to adjust the brightness, color temperature, saturation, contrast, etc.

Device Controls

- Gigabit Ethernet control port with TCP/IP protocol support
- Low-power (less than 0.5 W) mode during standby, and wakeup from standby via infrared remote
- A relay can be connected for convenient power management of LED display
- Intelligent control via mobile app

  Download and install VNNOX Care on your smartphone to easily configure the LED screen within just 10 minutes. The app also allows you to scan QR codes to set up screens, connect and adjust the topology by taking photos, and monitor the status of your devices.
- Control the LED screen with a remote
- Bluetooth 5.1

  Can connect to the Bluetooth voice remote, Bluetooth mouse, Bluetooth keyboard, Bluetooth sound system and other common peripherals. Up to 7 peripheral devices can be connected.
- Control via front panel LCD (touch control not supported)
- Support peripherals such as camera, sound system and infrared touch frame.

  Please contact NovaStar technical support for information on supported peripheral device models.

Appearance

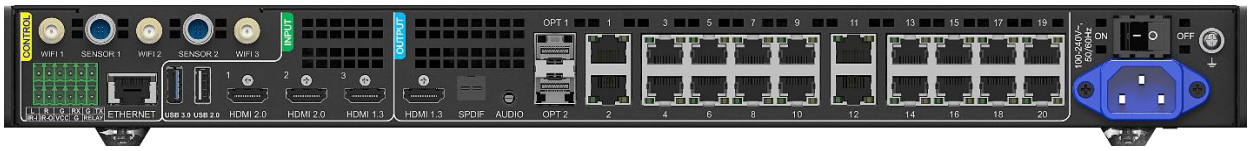
Front Panel

Name	Description
USB 2.0	• Support a mouse, keyboard, camera, speaker and other common USB devices. • Can be used for USB playback, firmware update and exporting logs.
Status LED	• Solid red: Powered off • Solid green: Functioning normally/Standby • Off: No power supply
Power Button	• Press the button to start up/shut down the device or put it on standby. • Hold down the button to restart the device.
IR Receiver	Receive the infrared signal from the remote.
LCD Screen	A 2.0-inch screen with a resolution of 320×240 pixels 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. • 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	Press the button to go back to the previous menu or cancel the current operation.

Note

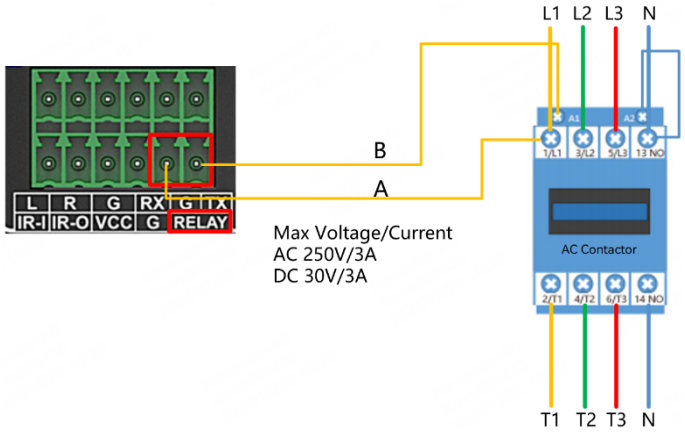
To cancel the shutdown, press the power button or the **BACK** button.

Rear Panel



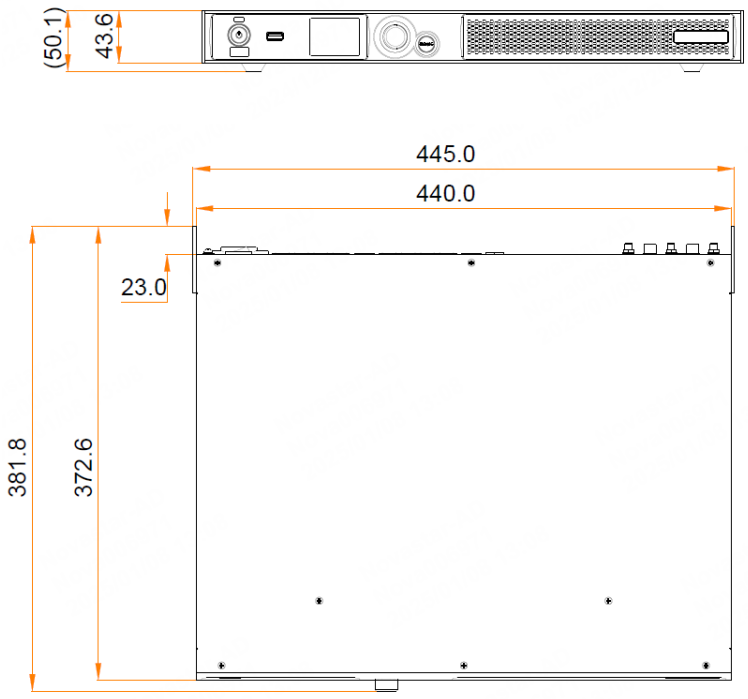
Input		
Connector	Qty	Description
HDMI 1.3	1	• Max resolution: 1920×1200@60Hz • Min resolution: 800×600@60Hz • Custom resolutions supported – Max width: 3840 pixels (3840×600@60Hz). – Max height: 2560 pixels (800×2560@60Hz) • Accepts 8-bit and 10-bit input sources. • YCbCr and RGB color space settings supported • Interlaced signal not supported • HDCP 1.4 compliant • Embedded audio supported
HDMI 2.0	2	• Max resolution: 4096×2160@60Hz/8192×1080@60Hz (forced) • Min resolution: 800×600@60Hz • Custom resolutions supported – Max width (forced): 8192 (8192×1080@60Hz) – Max height (forced): 8192 (1080×8192@60Hz) • Accepts 8-bit and 10-bit input sources. • YCbCr and RGB color space settings supported • Interlaced signal not supported • HDCP 1.4 and HDCP 2.2 compliant • Embedded audio supported • eARC audio supported by HDMI 2.0-1
USB 3.0	1	• Support a mouse, keyboard, camera, speaker and other common USB devices. • Can be used for USB playback, firmware update and exporting logs. • Supported image formats: *.jpg, *.jepg, *.bmp, *.png, *.gif • Supported video formats: *.mp4, *.mkv, *.ts, *.mov, *.avi, *.m4v, *.flv, *.vob, *.webm, *.mpg
USB 2.0	1	

		• Supported file systems: FAT32, NTFS, exFAT, FAT16
Output		
Type	Qty	Description
1–20	20	RJ45 (1Gps)
OPT 1–2	2	10G OPT outputs • Both OPT ports work as primary outputs and cannot be used for loop backup of the Ethernet ports. • OPT 1 outputs the data of Ethernet ports 1 to 10 and OPT 2 outputs the data of Ethernet ports 11 to 20. • Supports both single-mode and multi-mode fiber cables and can work with fiber converters.
AUDIO	1	3.5-mm audio output Note: 3-conductor audio connectors are supported.
SPDIF	1	For digital fiber optic audio output
HDMI 1.3	1	Output monitoring for device debugging
Controls (CONTROL area)		
Type	Qty	Description
ETHERNET	1	Max bandwidth: 1 Gbps Connect to an external network or control software (ViPlex Express/ViPlex Handy/VNNOX).
WIFI 1–2	2	Connect to Wi-Fi AP and Bluetooth antennas.
WIFI 3	1	Connect to a Wi-Fi Sta antenna.
SENSOR 1–2	2	Connect to light sensors or temperature and humidity sensors.
Phoenix connector (12 pins)	1	• 1x L: Left channel of output audio • 1x R: Right channel of output audio • 1x GND: Grounding • 1x RS232 for connecting to the central control device – Baud rate: 115200bps – Data bits: 8, stop bits: 1, no parity, no flow control • 1x IR-I: Infrared input • 1x IR-O: Infrared output • 1x VCC: 3.3 V power supply

		• 1x GND: Grounding • 1x RELAY – Connect to a relay to control external power supply. – Voltage: DC 30 V, 3 A / AC 250 V, 3 A  A, B: Relay switch signals The above wiring diagram is only for illustration purpose. For actual applications, please refer to the relevant AC contactor manual.
Power		
Connector	Qty	Description
100–240V~, 50/60Hz, 2.5A Max	1	An AC power input connector and switch

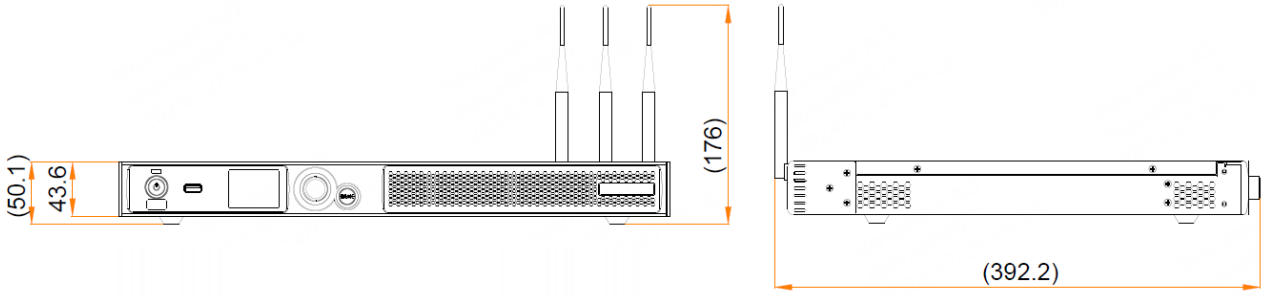
Dimensions

TU4K Pro



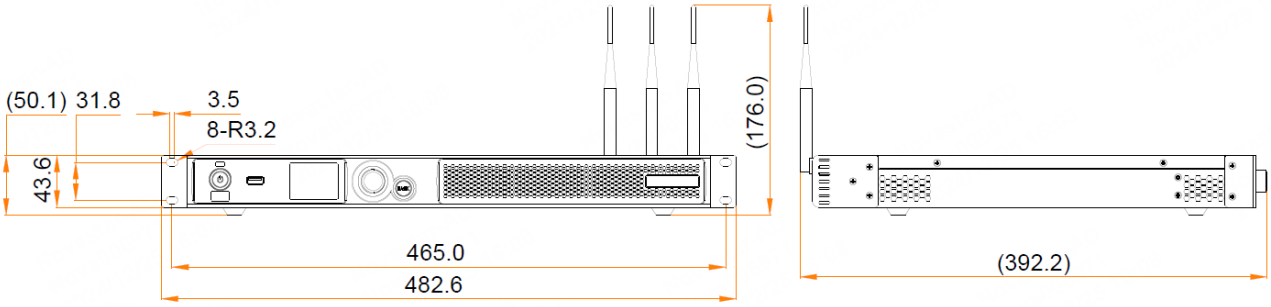
Tolerance: ±0.3 Unit: mm

TU4K Pro with Antennas (No Hanging Brackets)



Tolerance: ±0.3 Unit: mm

TU4K Pro with Antennas and Hanging Brackets



Tolerance: ±0.3 Unit: mm

Applications

Note

The PTB1304 mirroring dongle (Type-C connector) is not included in the TU4K Pro product package and must be purchased separately. To use the PTB1304 dongle with the TU4K Pro, you will need to connect it using a Type-C to USB adapter (provided with the PTB1304).

Specifications

Electrical Specifications	Input voltage	100-240V~, 50/60Hz, 2.5A Max
	Rated power consumption	53.9 W
Storage Space	RAM	8 GB
	Internal storage	128 GB
Operating Environment	Temperature	-20°C to +50°C
	Humidity	5% RH to 85% RH, non-condensing
Storage Environment	Temperature	-20°C to +70°C
	Humidity	5% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	445.0 mm × 381.8 mm × 50.1 mm
	Net weight	4.60 kg
	Gross weight	8.00 kg Note: It is the total weight of the product, accessories, and packing materials packed according to the packing specifications.
Packing Information	Packing box	590.0 mm × 520.0 mm × 180.0 mm, kraft paper box
	Accessory box	408.0 mm × 294.0 mm × 51.0 mm, white cardboard box
	List	• 1x TU4K Pro • 1x Power cord • 1x Bluetooth voice remote • 1x Ethernet cable • 1x HDMI cable • 2x Female Phoenix connectors (6 pins) • 3x Antennas • 2x Hanging brackets • 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.

Optional Accessories

Item Code	Description	Note
710010027	Whiteboard activation code	To use the whiteboard feature, please purchase this item separately.
W01010277	MEEXUS_Dongle_TB1304	To use the mirroring dongle, please purchase this item separately (it has a Type-C connector but can also be used with a USB port and comes with a Type-C to USB adapter).

Note

The TU4K Pro supports 9-split screen mirroring by default.

Video Source Features

Input	Common Resolution		Color Space	Sampling	Bit Depth	Integer frame rate
HDMI 2.0 (HDMI 1)	4K	4096×2160	RGB/YCbCr	4:4:4	10bit	24/25/30/48Hz
					8bit	24/25/30/48/50/60Hz
			YCbCr	4:2:2	8/10bit	
		3840×2160	RGB/YCbCr	4:4:4	10bit	24/25/30/48Hz
					8bit	24/25/30/48/50/60Hz
			YCbCr	4:2:2	8/10bit	
	2K1K	2560×1600	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
		2560×1440	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
		1920×1080	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	

Input	Common Resolution		Color Space	Sampling	Bit Depth	Integer frame rate
			YCbCr	4:2:2	8/10bit	
HDMI 2.0 (HDMI 2)	4K	4096×2160	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
		3840×2160	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
	2K1K	2560×1600	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
		2560×1440	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
		1920×1080	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
HDMI 1.3 (HDMI 3)	2K1K	1920×1080	RGB/YCbCr	4:4:4	10bit	24/25/30/48/50/60Hz
					8bit	
			YCbCr	4:2:2	8/10bit	
		3840x2160				50/60Hz
	2K1K	1920×1080				24/25/30/50/60Hz

Note

The above table only displays some common resolutions and integer frame rates. Decimal frame rates are also supported, allowing for automatic frame rate adaptation to 23.98/29.97/47.95/59.94 Hz for the maximum frame rates at various resolutions.

Media Decoding Specifications

Image

Codec	Resolution	Format	Note
JPEG	64×64 pixels to 8000×8000 pixels	JPG, JPEG	No support for non-interlaced scan Support for SRGB JPEG Support for Adobe RGB JPEG
BMP	64×64 pixels to 8000×8000 pixels	BMP	N/A
GIF	64×64 pixels to 480×360 pixels	GIF	Supported frame rate range: 5fps to 20fps
PNG	64×64 pixels to 8000×8000 pixels	PNG	N/A

Video

Codec	Resolution	Max Frame Rate	Max Bit Rate (Ideal Case)	Format
MPEG-1	48×48 pixels to 1920×1088 pixels	60fps	25Mbps	MPG, TS
MPEG-2	48×48 pixels to 1920×1088 pixels	60fps	25Mbps	MPG, TS, VOB
MPEG-4	48×48 pixels to 4096×2304 pixels	60fps	100Mbps	MP4, AVI、MOV, 3GP
MPEG-4 ASP	48×48 pixels to 4096×2304 pixels	60fps	100Mbps	MP4, AVI, MOV
MJPEG	48×48 pixels to 1920×1088 pixels	50fps	25Mbps	AVI
DivX4	48×48 pixels to 1280×720 pixels	30fps	11Mbps	AVI

Codec	Resolution	Max Frame Rate	Max Bit Rate (Ideal Case)	Format
DivX5	48×48 pixels to 1920×1088 pixels	30fps	25Mbps	AVI
XviD	48×48 pixels to 1920×1088 pixels	30fps	25Mbps	AVI
H.264/AVC	48×48 pixels to 4096×2304 pixels	30fps	100Mbps	AVI, MOV, MP4, MKV, TS, M2TS, MTS, M4V, FLV, F4V, PMP
H.265/HEVC	48×48 pixels to 7680×4320 pixels	60fps	100Mbps	TS, MP4, MKV
VP9	48×48 pixels to 7680×4320 pixels	60fps	60Mbps	WEBM, MP4, MKV
VP8	48×48 pixels to 1920×1088 pixels	60fps	25Mbps	WEBM, MP4, MKV

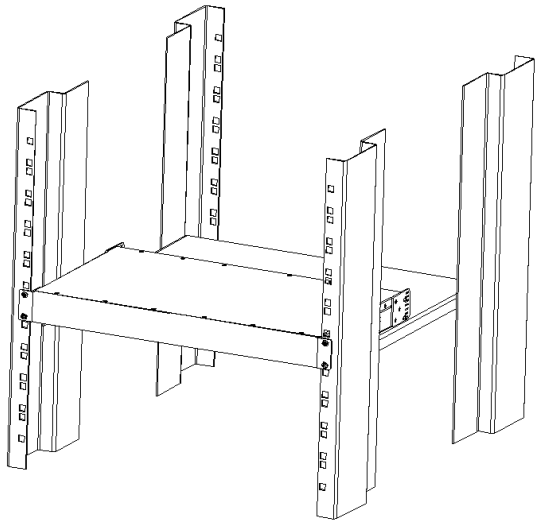
Notes and Cautions

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 19kg weight.



A) 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.

B) 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.

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

D) 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.

E) 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).

Note:

The connecting piece is not included in the TU4K Pro product package. It needs to be purchased separately.

Cautions

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.

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.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L’émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d’Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes : 1) L’appareil ne doit pas produire de brouillage; 2) L’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

This equipment complies with Industry Canada radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme à l'exposition aux rayonnements Industry Canada limites établies pour un environnement non contrôlé.

Radiation Exposure Statement

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cetéquipementestconforme Canada limitesd'exposition aux radiations dans un environnement non contrôlé. Cetéquipementdoitêtreinstallé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

Trademark

NOVASTAR is a trademark of Xi'an NovaStar Tech Co., Ltd.

Statement

Thank you for choosing NovaStar's product. This document is intended to help you understand and use the product. For accuracy and reliability, NovaStar may make improvements and/or changes to this document at any time and without notice. If you experience any problems in use or have any suggestions, please contact us via the contact information given in this document. We will do our best to solve any issues, as well as evaluate and implement any suggestions.

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