

# TU40 Pro

## LED Playback Control Processor



Specifications

## Change History

| Document Version | Release Date | Description  |
|------------------|--------------|--|
| V1.1.1           | 2024-12-25   | <ul style="list-style-type: none"> <li>• Updated the features.</li> <li>• Updated the front and rear panel descriptions.</li> </ul>  |
| V1.1.0           | 2024-11-11   | <ul style="list-style-type: none"> <li>• Updated the features.</li> <li>• Updated the front and rear panel descriptions.</li> <li>• Updated the application diagram.</li> <li>• Updated the product specifications.</li> <li>• Updated the media decoding specifications.</li> </ul> |
| V1.0.1           | 2024-09-23   | Updated the application diagram.   |
| V1.0.0           | 2024-09-10   | First release  |

## Introduction

The TU40 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 TU40 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 TU40 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 TU40 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 display screens.

## Certifications

CQC, CE, RoHs, FCC, 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

- 1x HDMI 1.3 input
- 2x HDMI 2.0 inputs
- 2x USB 2.0 inputs
- 1x USB 3.0 input
- 1x HDMI 1.3 output for monitoring
- 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  $\leq$  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 terminals
- 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 (only H.265/HEVC and VP9 encoding formats supported), 3 streams of 4K video, 7 streams of 1080p video, 10 streams of 720p video, 20 streams of 480p video, or 20 streams of 360p video.

Note: 8K refers to the standard 8K resolution (7680×3840@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.

- 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.
- 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

### 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.
- 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.

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.
- Eye comfort mode

## Appearance

### Front Panel

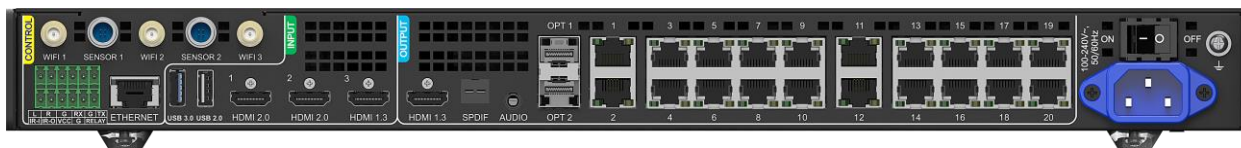


| Name         | Description   |
|--------------|---|
| USB 2.0      | <ul style="list-style-type: none"> <li>Support a mouse, keyboard, camera, speaker and other common USB devices.</li> <li>Can be used for USB playback, firmware update and exporting logs.</li> </ul>   |
| Status LED   | <ul style="list-style-type: none"> <li>Solid red: Powered off</li> <li>Solid green: Functioning normally/Standby</li> <li>Off: No power supply</li> </ul>   |
| Power Button | <ul style="list-style-type: none"> <li>Press the button to start up/shut down the device or put it on standby.</li> <li>Hold down the button to restart the device.</li> </ul>  |
| 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         | <ul style="list-style-type: none"> <li>On the home screen, press the knob to enter the main menu screen.</li> <li>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.</li> <li>Hold down the knob and <b>BACK</b> button simultaneously for 5s or longer to lock or unlock the buttons.</li> </ul> |
| BACK         | Press the button to go back to the previous menu or cancel the current operation.   |

#### Note

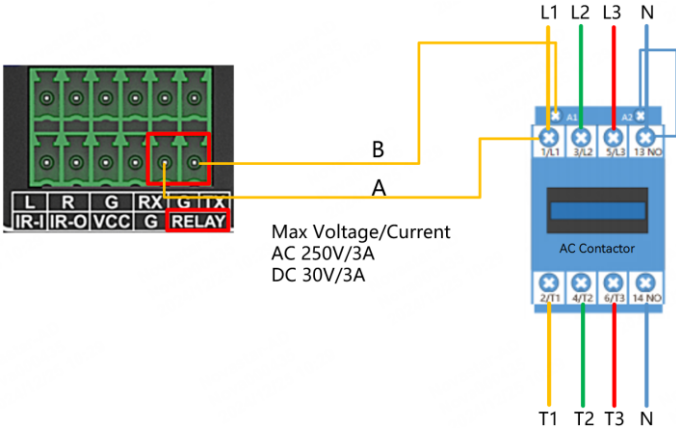
To cancel the shutdown, press the power button or the **BACK** button.

## Rear Panel



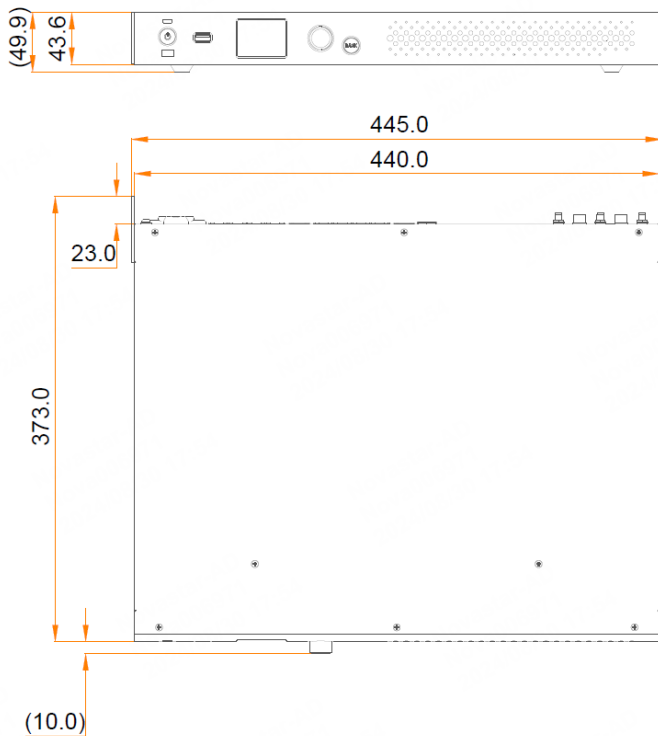
| Input     |     |  |
|-----------|-----|--|
| Connector | Qty | Description  |
| HDMI 1.3  | 1   | <ul style="list-style-type: none"> <li>• Max resolution: 1920×1080@60Hz</li> <li>• Min resolution: 800×600@60Hz</li> <li>• Custom resolutions supported                             <ul style="list-style-type: none"> <li>– Max width: 3840 pixels (3840×600@60Hz).</li> <li>– Max height: 2560 pixels (800×2560@60Hz)</li> </ul> </li> <li>• Accepts 8-bit and 10-bit input sources.</li> <li>• Interlaced signal not supported</li> <li>• HDCP 1.4 compliant</li> <li>• Accompanied audio supported</li> </ul>  |
| HDMI 2.0  | 2   | <ul style="list-style-type: none"> <li>• Max resolution: 4096×2160@60Hz/8192×1080@60Hz (forced)</li> <li>• Min resolution: 800×600@60Hz</li> <li>• Custom resolutions supported                             <ul style="list-style-type: none"> <li>– Max width (forced): 8192 (8192×1080@60Hz)</li> <li>– Max height (forced): 8192 (1080×8192@60Hz)</li> </ul> </li> <li>• Accepts 8-bit and 10-bit input sources.</li> <li>• Interlaced signal not supported</li> <li>• HDCP 1.4 and HDCP 2.2 compliant</li> <li>• Embedded audio supported</li> <li>• eARC audio supported by HDMI 2.0-1</li> </ul> |
| USB 3.0   | 1   | <ul style="list-style-type: none"> <li>• Support a mouse, keyboard, camera, speaker and other common USB devices.</li> </ul>   |
| USB 2.0   | 1   | <ul style="list-style-type: none"> <li>• Can be used for USB playback, firmware update and exporting logs.</li> <li>• Supported image formats: *.jpg, *.jpeg, *.bmp, *.png, *.gif</li> <li>• Supported video formats: *.mp4, *.mkv, *.ts, *.mov, *.avi, *.m4v, *.flv, *.vob, *.webm, *.mpg</li> <li>• File systems supported: FAT32, NTFS, exFAT, FAT16</li> </ul>   |

| Output                      |     |  |
|-----------------------------|-----|--|
| Type                        | Qty | Description  |
| 1-20                        | 20  | RJ45 (1Gps)  |
| OPT 1-2                     | 2   | 10G OPT outputs, for fiber converting applications   |
| AUDIO                       | 1   | 3.5-mm audio output<br>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<br>Connect to an external network or control software.   |
| WIFI 1-2                    | 2   | Connect to Wi-Fi 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.<br><br><b>Note</b><br>It is recommended to use NovaStar's light sensors or temperature and humidity sensors.   |
| Phoenix connector (12 pins) | 1   | <ul style="list-style-type: none"> <li>• 1x L: Left channel of output audio</li> <li>• 1x R: Right channel of output audio</li> <li>• 1x GND: Grounding</li> <li>• 1x RS232 for connecting to the central control device <ul style="list-style-type: none"> <li>- Baud rate: 115200bps</li> <li>- Data bits: 8, stop bits: 1, no parity, no flow control</li> </ul> </li> <li>• 1x IR-I: Infrared input</li> <li>• 1x IR-O: Infrared output</li> <li>• 1x VCC: 3.3 V power supply</li> <li>• 1x GND: Grounding</li> <li>• 1x RELAY <ul style="list-style-type: none"> <li>- Connect to a relay to control external power supply.</li> <li>- Voltage: DC 30V, 3A / AC 250V, 3A</li> </ul> </li> </ul> |

|                                    |     |   |
|------------------------------------|-----|---|
|                                    |     |  <p>Max Voltage/Current<br/>AC 250V/3A<br/>DC 30V/3A</p> <p>A, B: Relay switch signals</p> <p>The above wiring diagram is only for illustration purpose. For actual applications, please refer to the relevant AC contactor manual.</p> |
| Power                              |     |   |
| Connector                          | Qty | Description   |
| 100-240V~,<br>50/60Hz, 2.5A<br>Max | 1   | An AC power input connector and switch  |

## Dimensions

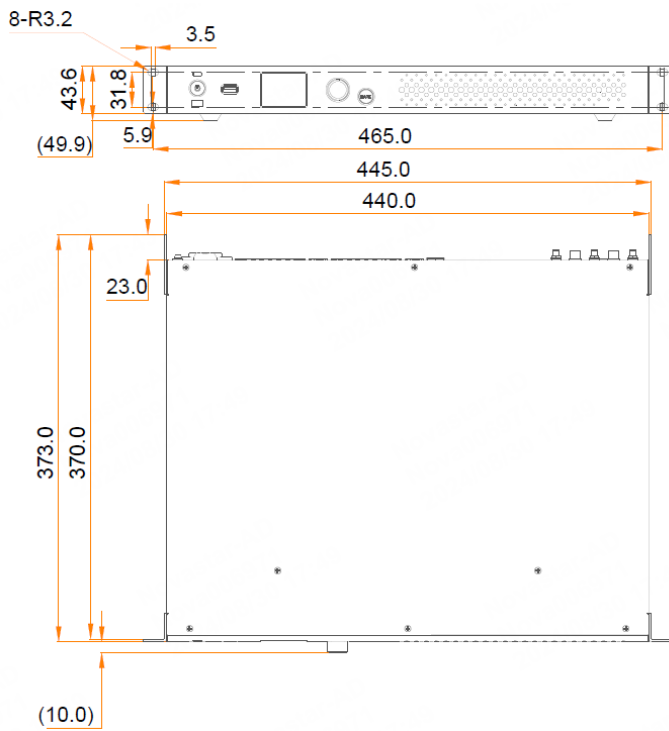
### TU40 Pro



Tolerance: ±0.3 Unit: mm

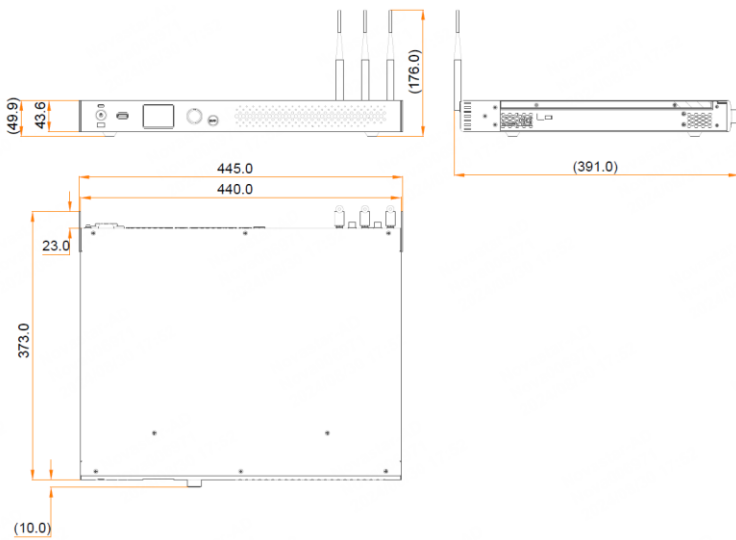


### TU40 Pro with Hanging Brackets (No Antennas)



Tolerance:  $\pm 0.3$  Unit: mm

### TU40 Pro with Antennas (No Hanging Brackets)



Tolerance:  $\pm 0.3$  Unit: mm

# Applications



## Note

The TU40 Pro product package in this diagram is described in the packing list in the specifications table.

The PTB1304 mirroring dongle (Type-C connector) is not included in the TU40 Pro product package and must be purchased separately. To use the PTB1304 dongle with the TU40 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 × 383.0 mm × 49.9 mm  |
|                           | Net weight  | 4.54 Kg  |
|                           | Gross weight  | 7.90 Kg<br>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  | <ul style="list-style-type: none"> <li>• 1x TU40 Pro</li> <li>• 1x Power cord</li> <li>• 1x Bluetooth voice remote</li> <li>• 1x Ethernet cable</li> <li>• 1x HDMI cable</li> <li>• 2x Female Phoenix connectors (6 pins)</li> <li>• 3x Antennas</li> <li>• 2x Hanging brackets</li> <li>• 1x Certificate of Approval</li> </ul> |
| IP Rating                 | IP20<br><br>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  |
|-----------|---|---|
| 710010073 | Wireless mirroring activation code – 9-split screen | To use the 9-split screen feature, please purchase this item separately.  |
| 710010027 | Whiteboard activation code                          | To use the whiteboard feature, please purchase this item separately.  |
| W01010277 | MEECUS_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 included). |

### Note

The TU40 Pro comes with 4-split screen mirroring. If you want 9-split screen mirroring, please refer to the above table and purchase the item separately.

## Media Decoding Specifications

### Image

| Codec | Max Resolution   | Format    | Note  |
|-------|------------------|-----------|---|
| JPEG  | 8000×8000 pixels | JPG, JPEG | No support for non-interlaced scan<br>Support for SRGB JPEG<br>Support for Adobe RGB JPEG |
| BMP   | 8000×8000 pixels | BMP       | N/A   |
| GIF   | 6000×4500 pixels | GIF       | N/A   |
| PNG   | 8000×8000 pixels | PNG       | N/A   |

### Video

| Codec  | Resolution                          | Frame Rate | Bit Rate (Ideal Case) | Format  |
|--------|-------------------------------------|------------|-----------------------|---------|
| MPEG-1 | 48×48 pixels to<br>1920×1088 pixels | 60fps      | 28.5Kbps~25Mbps       | MPG, TS |

| Codec      | Resolution                          | Frame Rate      | Bit Rate (Ideal Case) | Format                              |
|------------|-------------------------------------|-----------------|-----------------------|-------------------------------------|
| MPEG-2     | 48×48 pixels to<br>1920×1088 pixels | 60fps           | 28.5Kbps~25Mbps       | MPG, TS, VOB                        |
| MPEG4 ASP  | 48×48 pixels to<br>4096×2304 pixels | 60fps           | 28.5Kbps~100Mbps      | MP4, AVI, MOV                       |
| MJPEG      | 48×48 pixels to<br>1920×1088 pixels | 60fps           | 28.5Kbps~25Mbps       | AVI                                 |
| DivX3      | 64×64 pixels to<br>720×480 pixels   | 30fps~60fps     | 50.5Kbps~4.16Mbps     | AVI                                 |
| DivX4      | 64×64 pixels to<br>1920×1088 pixels | 23.976fps~60fps | 50.5Kbps~4.16Mbps     | AVI                                 |
| DivX5      | 64×64 pixels to<br>1920×1088 pixels | 30fps~60fps     | 50.5Kbps~25Mbps       | AVI                                 |
| XviD       | 64×64 pixels to<br>1920×1088 pixels | 30fps~60fps     | 50.5Kbps~25Mbps       | AVI                                 |
| H.264/AVC  | 64×64 pixels to<br>4096×2304 pixels | 30fps           | 50.5Kbps~100Mbps      | AVI, MOV, MP4,<br>MKV, TS, M4V, FLV |
| H.265/HEVC | 64×64 pixels to<br>7680×4320 pixels | 24fps~60fps     | 50.5Kbps~97.7Mbps     | TS, MP4, MKV                        |
| VP9        | 64×64 pixels to<br>7680×4320 pixels | 24fps~60fps     | 50.5Kbps~60Mbps       | WEBM, MKV                           |
| VP8        | 48×48 pixels to<br>1920×1088 pixels | 30fps~60fps     | 28.5Kbps~25Mbps       | WEBM, MKV                           |

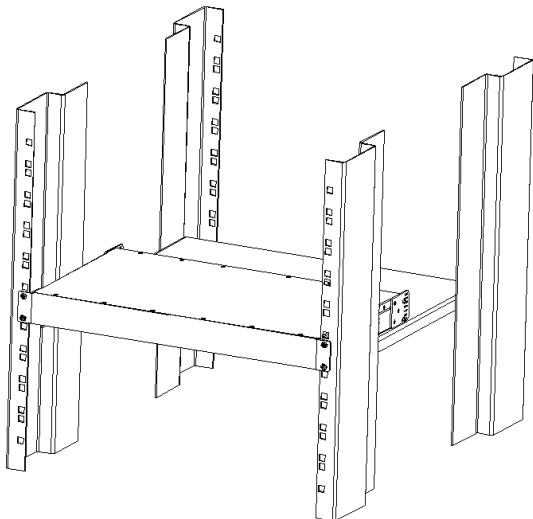
## Notes and Cautions

### 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 (T<sub>ma</sub>) 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).

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 **Note:**

The connecting piece is not included in the TU40 Pro product package. It needs to be purchased separately.

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## 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.

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.



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