

TB50

Multimedia Player



Specifications

Change History

| Document Version | Release Date | Description |
|------------------|--------------|---|
| V1.2.0 | 2024-07-24 | <ul style="list-style-type: none"> • Updated the feature description. • Updated the RUN indicator description. • Added the recommended supply power. • Updated the packing information. • Updated the media decoding specifications. |
| V1.1.0 | 2024-05-30 | <ul style="list-style-type: none"> • Updated the introduction. • Updated the feature description. • Updated the connector description. • Updated the media decoding specifications. |
| V1.0.8 | 2023-09-28 | <ul style="list-style-type: none"> • Changed the description of the default Wi-Fi AP password. • Changed the internal storage capacity from 16 GB to 32 GB. |
| V1.0.7 | 2023-07-20 | Updated the appearance picture of the product. |
| V1.0.6 | 2023-06-14 | Updated the connector descriptions. |
| V1.0.5 | 2022-11-18 | Updated the certification information. |
| V1.0.4 | 2022-06-10 | <ul style="list-style-type: none"> • Added a description of RF synchronization. • Added notes and cautions. • Updated the certification information. • Updated the indicator descriptions. • Updated the accessory descriptions. |
| V1.0.2 | 2021-12-17 | <ul style="list-style-type: none"> • Updated the descriptions of the USB (Type B) port and Gigabit Ethernet port. • Added the gross weight of the product. • Added a note for the power consumption. |
| V1.0.1 | 2021-09-30 | <ul style="list-style-type: none"> • Added certification information. • Updated the description of the playback performance. • Updated net weight. |
| V1.0.0 | 2021-07-30 | First release |

Introduction

The TB50 is a new generation of multimedia player created by NovaStar for full-color LED displays. This multimedia player integrates playback and sending capabilities, allowing users to publish content and control LED displays with a computer, mobile phone, or tablet. Working with our superior cloud-based publishing and monitoring platforms, the TB50 enables users to manage LED displays from an Internet-connected device anywhere, anytime.

Support for multi-screen synchronous playback and synchronous and asynchronous modes makes this multimedia player a perfect fit for a wide range of applications.

Thanks to its reliability, ease of use, and intelligent control, the TB50 becomes a winning choice for commercial LED displays and smart city applications such as fixed displays, lamp-post displays, chain store displays, advertisement players, retail store displays, door head displays, shelf displays, and much more.

Certifications

NBTC, IMDA, PSB, FAC DoC, ENACOM, ICASA, SRRC, EAC DoC, EAC RoHS, RCM, UL Smark, CQC, FCC, UL, IC, KC, CE, UKCA, CB, MIC, PSE, NOM

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

Output

- Loading capacity up to 1,300,000 pixels
 - Maximum width: 4096 pixels
Maximum height: 4096 pixels
 - Non-standard resolutions can be customized in both asynchronous and synchronous modes and the pixel clock of the custom resolutions cannot exceed 153 MHz.
- 2x Gigabit Ethernet ports

These two ports serve as primary by default. Users can also set one as primary and the other as backup.
- 1x Stereo audio connector

The audio sample rate is fixed at 48 kHz. If NovaStar's multifunction card is used for audio output, audio with a sample rate of 48 kHz is required.
- 1x HDMI 1.3 connector
 - Maximum output: 1920×1200@60Hz
 - Support for HDMI loop

Input

- 1x HDMI 1.3 connector

In synchronous mode, video sources input from this connector can be scaled to fit the entire screen automatically.

- 2x sensor connectors

Connect to brightness sensors or temperature and humidity sensors.

Control

- 1x USB 3.0 (Type A) port

Allows for USB playback, firmware upgrade and storage expansion.

- 1x USB (Type B) port

Connects to the control computer for content publishing and screen control.

- 1x Gigabit Ethernet port

Connects to the control computer, a LAN or public network for content publishing and screen control.

Performance

- Powerful processing capacity
 - Quad-core ARM A55 processor @1.8 GHz
 - Support for H.264/H.265 4K@60Hz video decoding
 - 1 GB of onboard RAM
 - 32 GB of internal storage

- Flawless playback

Support for playback of 1x 4K, 2x 1080p, 4x 720p, 4x 480p or 6x 360p videos

Functionality

- All-round control plans
 - Enables users to publish content and control screens from a computer, mobile phone, or tablet.
 - Allows users to publish content and control screens from anywhere, anytime.
 - Allows users to monitor screens from anywhere, anytime.
- Switching between Wi-Fi AP and Wi-Fi STA
 - In Wi-Fi AP mode, the user terminal is connected to the built-in Wi-Fi hotspot of the TB50. The default SSID is “AP+ *Last 8 digits of SN*” and the default password is printed on the SSID label of the product.
 - In Wi-Fi STA mode, the user terminal and the TB50 are connected to the Wi-Fi hotspot of a router.
- Synchronous and asynchronous modes
 - In asynchronous mode, the internal video source works.
 - In synchronous mode, the video source input from the HDMI connector works.

- Synchronous playback across multiple screens

Enabling synchronous playback halves the number of videos that can be played simultaneously within the decoding capability of the device.

- NTP time synchronization
- GPS time synchronization (The specified 4G module must be installed.)
- RF time synchronization (The specified RF module must be installed.)

- Support for 4G/5G modules

The TB50 ships without a 4G/5G module. Users have to purchase 4G/5G modules separately if needed.

Network connection priority: Wired network > Wi-Fi network > 4G/5G network (This order of priority is followed when the firmware is earlier than V4.5.0. The networks coexist when the firmware is V4.5.0 or later.)

Appearance


Front Panel



| Name | Description |
|----------|---|
| SWITCH | Switches between synchronous and asynchronous modes. <ul style="list-style-type: none"> • Staying on: Synchronous mode • Off: Asynchronous mode |
| SIM CARD | SIM card slot Capable of preventing users from inserting a SIM card in the wrong orientation. |
| RESET | Factory reset button Press and hold this button for 5 seconds to reset the product to its factory settings. |
| USB | USB (Type B) port Connects to the control computer for content publishing and screen control. |
| LED OUT | Gigabit Ethernet outputs |

Rear Panel



| Name | Description |
|---|--|
| SENSOR | <p>Sensor connectors</p> <p>Connect to brightness sensors or temperature and humidity sensors.</p> |
|  | RF antenna connector (to be available in future updates) |
| HDMI | <p>1x HDMI 1.3 OUT</p> <ul style="list-style-type: none"> • Support for HDMI loop • Maximum output resolution: The pixel clock cannot exceed 153 MHz. • Maximum output: 1920×1200@60Hz • HDCP 1.4 compliant • No support for interlaced signal output • In asynchronous mode, output resolutions support 400×4096@60Hz and 480×4096@60Hz. • Support for custom resolutions: <ul style="list-style-type: none"> – Custom pixel width range: 512~4096 (512×512@60Hz~4096×560@60Hz) – Custom pixel height range: 512~3680 (512×512@60Hz~512×3680@60Hz) <p>1x HDMI 1.3 IN</p> <ul style="list-style-type: none"> • Maximum input resolution: The pixel clock cannot exceed 153 MHz. • Maximum input: 1920×1200@60Hz • HDCP 1.4 compliant • No support for interlaced signal input • Support for custom resolutions: <ul style="list-style-type: none"> – Custom pixel width range: 512~4096 (512×512@60Hz~4096×560@60Hz) – Custom pixel height range: 512~3680 (512×512@60Hz~512×3680@60Hz) <p>Note: The resolution of HDMI IN can be customized by changing the preset EDID, so the external source must support custom resolutions.</p> <ul style="list-style-type: none"> • In synchronous mode, HDMI is used for video input and users can enable full-screen scaling to make the image to fit the screen automatically. <p>Requirements for full-screen scaling in synchronous mode:</p> <ul style="list-style-type: none"> – 512 pixels ≤ video source width ≤ 2048 pixels |

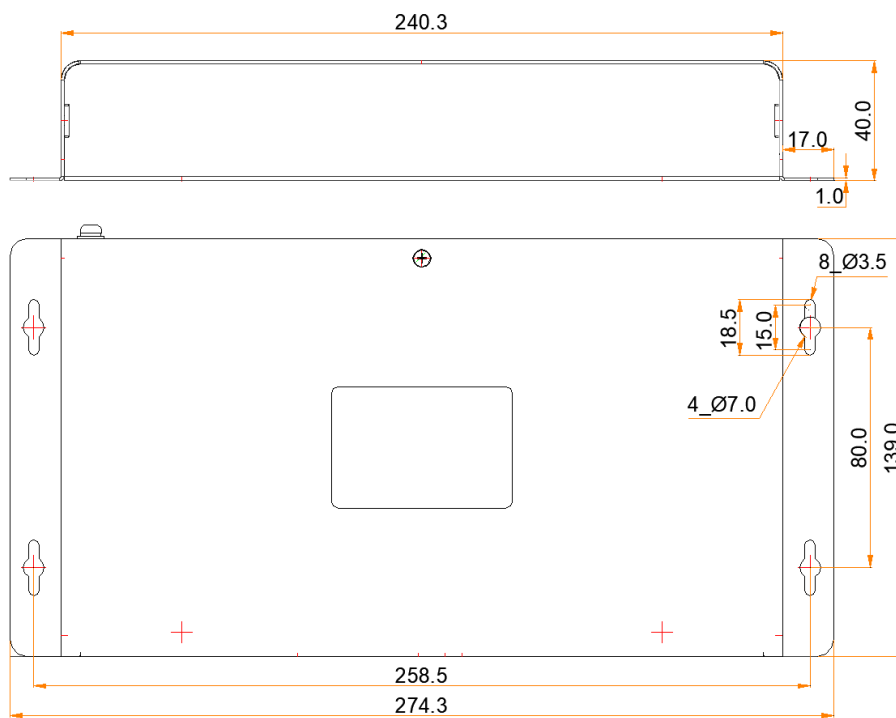
| Name | Description |
|--------------------------|--|
| | <ul style="list-style-type: none"> - 512 pixels ≤ video source height ≤ 2048 pixels - Maximum resolution: 1920×1080 - The image can only be scaled down and cannot be scaled up. <p>Note: The pixel width and height of the video source must be greater than or equal to the pixel width and height of the screen, respectively.</p> |
| WiFi | <p>Wi-Fi antenna connector (2.4 GHz Wi-Fi supported)</p> <p>Support for switching between Wi-Fi AP and Wi-Fi Sta</p> |
| ETHERNET | <p>Gigabit Ethernet port</p> <p>Connects to the control computer, a LAN or public network for content publishing and screen control.</p> |
| COM 2 | GPS antenna connector |
| USB 3.0 | <p>USB 3.0 (Type A) port</p> <p>Allows for USB playback, firmware upgrade and storage expansion.</p> <p>The Ext4 and FAT32 file systems are supported. The maximum size of a single file supported by FAT32 is 4 GB. The exFAT and FAT16 file systems are not supported.</p> |
| COM 1 | 4G antenna connector |
| AUDIO OUT | <p>Audio output connector</p> <p>OMTP headphones can be connected.</p> |
| 100-240V~, 50/60Hz, 0.6A | Power input connector |
| ON/OFF | Power switch |

Indicators

| Name | Color | Status | Description |
|-------|-------|------------------------|--|
| PWR | Red | Staying on | The power supply is working properly. |
| SYS | Green | Flashing once every 2s | The operating system is functioning normally. |
| | | Staying on/off | The operating system is malfunctioning. |
| CLOUD | Green | Staying on | The TB50 is connected to the Internet and the connection is available. |
| | | Flashing once every 2s | The TB50 is connected to VNNOX and the connection is |

| Name | Color | Status | Description |
|------|-------|----------------------------|---|
| | | | available. |
| | | Flashing once every second | The TB50 is upgrading the operating system. |
| | | Flashing once every 0.5s | The TB50 is copying the upgrade package. |
| RUN | Green | Flashing once every 2s | The FPGA has no video source. |
| | | Flashing once every 0.5s | The FPGA is functioning normally. |
| | | Staying on/off | The FPGA loading is abnormal. |

Dimensions



Tolerance: ± 0.3 Unit: mm

Specifications

| | | |
|-----------------------|---------------------------|--------------------------|
| Electrical Parameters | Input power | 100-240V~, 50/60Hz, 0.6A |
| | Maximum power consumption | 18 W |
| | Recommended supply power | 25 W |
| Storage Capacity | RAM | 1 GB |

| | | |
|-------------------------|---|--|
| | Internal storage | 32 GB |
| Operating Environment | Temperature | -20°C to +60°C |
| | Humidity | 0% RH to 80% RH, non-condensing |
| Storage Environment | Temperature | -40°C to +80°C |
| | Humidity | 0% RH to 80% RH, non-condensing |
| Physical Specifications | Dimensions | 274.3 mm × 139.0 mm × 40.0 mm |
| | Net weight | 1234.0 g |
| | Gross weight | 1653.6 g Note: It is the total weight of the product, accessories and packing materials packed according to the packing specifications. |
| Packing Information | Dimensions | 385.0 mm × 280.0 mm × 75.0 mm |
| | Accessories | <ul style="list-style-type: none"> • 1x Wi-Fi omnidirectional antenna • 1x AC power cord • 1x Quick Start Guide • 1x Certificate of Approval |
| IP Rating | IP20 Please prevent the product from water intrusion and do not wet or wash the product. | |
| System Software | <ul style="list-style-type: none"> • Android 11.0 operating system software • Android terminal application software • FPGA program Note: Third-party applications are not supported. | |

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

Media Decoding Specifications

Image

| Codec | Max Resolution | Format | Remarks |
|-----------------------|------------------|-----------|-------------------------------|
| JFIF file format 1.02 | 4096×2160 pixels | JPG, JPEG | No support for non-interlaced |

| Codec | Max Resolution | Format | Remarks |
|-------|------------------|--------|---|
| | | | scan Support for SRGB JPEG Support for Adobe RGB JPEG |
| BMP | 4096×2160 pixels | BMP | N/A |
| GIF | 4096×2160 pixels | GIF | N/A |
| PNG | 4096×2160 pixels | PNG | N/A |
| WEBP | 4096×2160 pixels | WEBP | N/A |

Video

| Codec | Resolution | Max Frame Rate | Max Bit Rate (Ideal Case) | Format | Remarks |
|------------|----------------------------------|----------------|---------------------------|----------------------------------|---|
| MPEG-1/2 | 48×48 pixels to 1920×1088 pixels | 30fps | 80Mbps | DAT, MPG, VOB, TS | Support for field coding |
| MPEG4 | 48×48 pixels to 1920×1088 pixels | 30fps | 38.4Mbps | AVI, MKV, MP4, MOV, 3GP | No support for MS MPEG4 v1/v2/v3, GMC |
| H.264 | 16×16 pixels to 4096×2304 pixels | 2304p@30fps | 80Mbps | AVI, MKV, MP4, MOV, 3GP, TS, FLV | Support for field coding, MBAFF, High & High 10 Profile |
| H.264 MVC | 16×16 pixels to 4096×2304 pixels | 2304p@30fps | 100Mbps | MKV, TS | Support for Stereo High Profile only |
| H.265/HEVC | 64×64 pixels to 4096×2304 pixels | 2304p@60fps | 100Mbps | MKV, MP4, MOV, TS | Support for Main & Main 10 Profile, Tile & Slice |
| VP8 | 48×48 pixels to 1920×1088 pixels | 30fps | 38.4Mbps | WEBM, MKV | N/A |
| VP9 | 64×64 pixels to 4096×2304 pixels | 60fps | 80Mbps | WEBM, MKV | N/A |
| H.263 | SQCIF (128×96) QCIF (176×144) | 30fps | 38.4Mbps | 3GP, MOV, MP4 | No support for H.263+ |

| Codec | Resolution | Max Frame Rate | Max Bit Rate (Ideal Case) | Format | Remarks |
|-------|-------------------------------------|----------------|------------------------------|--------|---------|
| | CIF (352×288) 4CIF (704×576) | | | | |
| MJPEG | 48×48 pixels to 1920×1088 pixels | 60fps | 60Mbps | AVI | N/A |

Notes and cautions

FCC Caution

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 B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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 Caution

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-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.

Others

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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