TB20 Plus

Multimedia Player

Specifications

Change History

Document Version	Release Date	Description
V1.0.0	2025-05-27	First release

Introduction

The TB20 Plus is a new generation of multimedia player designed 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 the superior cloud-based publishing and monitoring platforms, the TB20 Plus enables users to manage LED displays from an Internet-connected device anywhere, anytime.

The TB20 Plus supports synchronous and asynchronous modes and can play content from a USB drive, satisfying various playback demands. Multiple protection measures such as terminal authentication and player verification are taken to keep the playback secure.

Thanks to its reliability, ease of use, and intelligent control, the TB20 Plus 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

CE, FCC, IC, CQC

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

Input and Output

- Loading capacity up to 650,000 pixels

  Maximum width: 2048 pixels, maximum height: 2048 pixels

- Maximum width of an ultra-long screen: 8192 pixels, maximum height of an ultra-long screen: 2048 pixels (maximum loading capacity per Ethernet port: 650,000 pixels)

- 1x Gigabit Ethernet output port

- 1x Stereo audio output 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 input connector

In synchronous mode, this connector is used as the video source which can be scaled to fit the entire screen automatically.

Control

- 1x USB 2.0 (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 Fast Ethernet port

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

Performance

- Powerful processing capacity
  - Quad-core ARM A53 processor @1.4GHz
  - Support for hardware decoding of 4K videos
  - 2 GB of RAM
  - 32 GB of internal storage
- Flawless playback

Support for playback of 1x 4K, 3x 1080p, 8x 720p, 16x 480p, or 20x 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.
- Wi-Fi AP and Wi-Fi Sta can be turned on at the same time
  - Wi-Fi AP

    User terminal devices can be connected to the built-in Wi-Fi hotspot of the TB20 Plus. The default SSID is "AP+*Last 8 digits of SN*" and the default password is printed on the SSID label.
  - Wi-Fi AP+Wi-Fi Sta

    Users can connect the TB20 Plus to a Wi-Fi network and turn on the Wi-Fi hotspot at the same time.
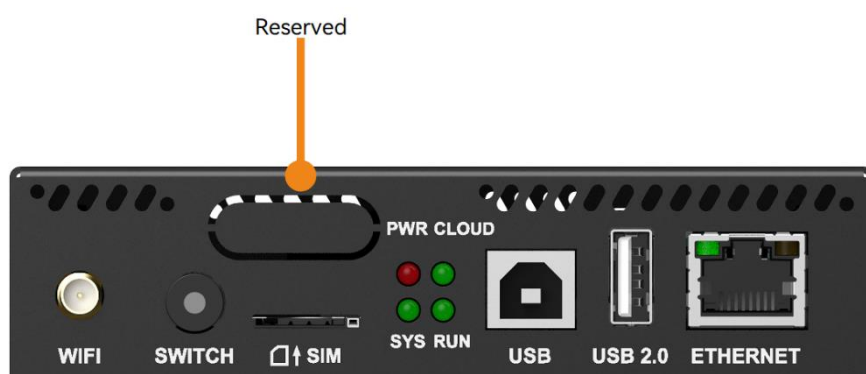- Ultra-long-screen solution playback

- Synchronous and asynchronous modes
  - In asynchronous mode, the internal video source is used.
  - In asynchronous mode, HDMI is used as the video source.
- Synchronous playback across multiple screens

  Enabling synchronous playback halves 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 modules
  - The TB20 Plus ships without a 4G module. Users have to purchase 4G modules separately if needed.
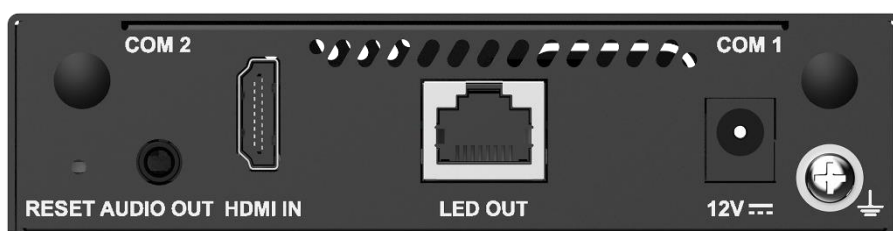 - Network connection priority: Wired network > Wi-Fi network > 4G network

Appearance

Front Panel

Name	Description
WIFI	Wi-Fi antenna connector (2.4GHz Wi-Fi supported)
Reserved	Sensor connector Connects to a light sensor or temperature and humidity sensor.
SWITCH	Press the button to switch between synchronous and asynchronous mode. • Solid green: Synchronous mode • Off: Asynchronous mode
SIM	SIM card slot Capable of preventing users from inserting a SIM card in the wrong orientation.

Name	Description
USB	USB (Type B) port Connects to the control computer for content publishing and screen control.
USB 2.0	USB 2.0 (Type A) port Allows for USB playback, firmware upgrade and storage expansion (up to 128 GB). Ext4 and FAT32 file systems are supported, with FAT32 allowing a maximum file size of 4 GB. exFAT and FAT16 are not supported.
ETHERNET	Fast Ethernet port Standard RJ45 connector (with built-in LEDs) connecting to the control computer or connecting to a LAN or public network for content publishing and screen control.

Rear Panel

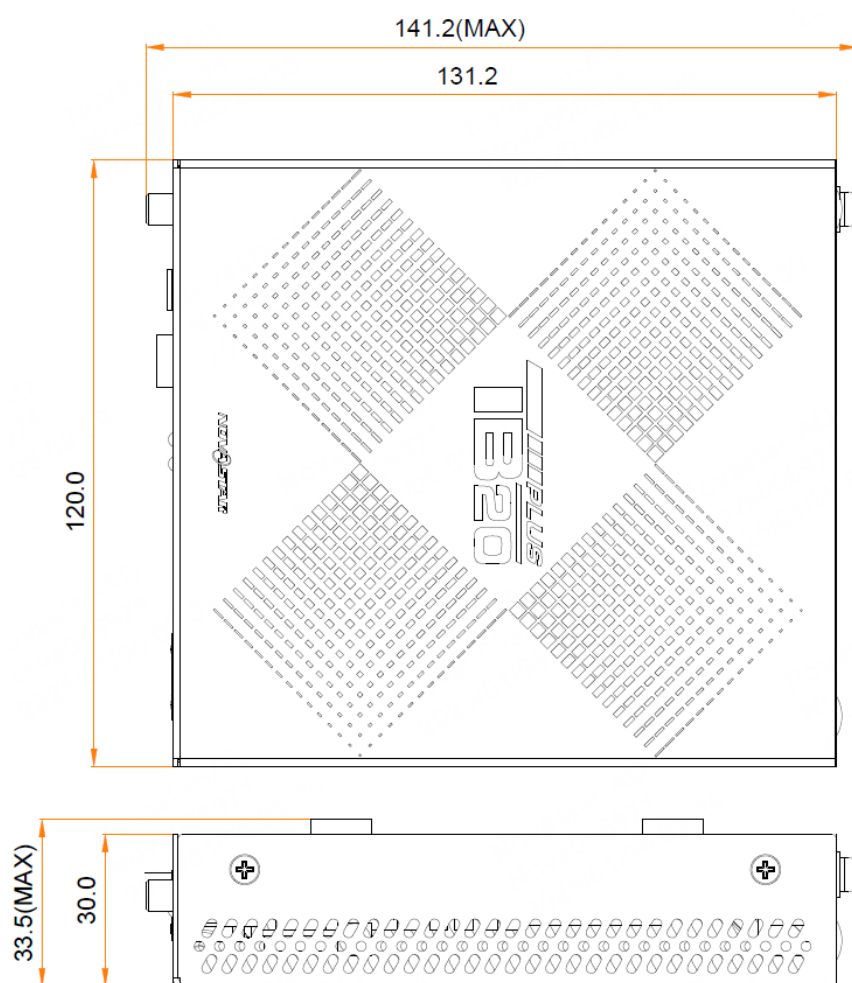| Name	Description
COM 2	GPS antenna connector
RESET	Factory reset button Press and hold this button for 5s to reset the product to its factory settings.
AUDIO OUT	3.5mm audio output connector Note: 3-pole audio connectors are supported.
HDMI IN	1x HDMI 1.3 input connector • Maximum input resolution: The pixel clock cannot exceed 164 MHz. • Maximum input: 2048×1024@60Hz • HDCP 1.4 compliant, backwards compatible with HDCP 1.3 • No support for interlaced signal input • Support for custom resolutions: − Custom width range: 64~2048 pixels (64×64@60Hz~2048×1024@60Hz) − Custom height range: 64~2048 pixels (64×64@60Hz~1024×2048@60Hz)

Name	Description
	Note: The resolution of HDMI IN can be customized by changing the preset EDID, so the external source must support custom resolutions. • In synchronous mode, HDMI is used as the video source and users can enable full-screen scaling to make the image fit the screen automatically. Requirements for full-screen scaling in synchronous mode: − 64 pixels ≤ video source width ≤ 2048 pixels − 64 pixels ≤ video source height ≤ 2048 pixels − Maximum resolution: 2048×1024@60Hz − Images can only be scaled down and cannot be scaled up. 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.
LED OUT	Gigabit Ethernet output Standard RJ45 connector (with no built-in LEDs)
12V—	Power input connector
COM 1	4G antenna connector

Indicators

Name	Color	Status	Description
PWR	Red	Staying on	The power supply is working properly.
SYS	Green	Staying on/off	The operating system is malfunctioning.
		Flashing once every 2s	The operating system is functioning normally.
		Flashing once every second	Failed to reset the USB drive.
		Flashing once every 0.5s	The USB drive is reset successfully.
CLOUD	Green	Staying on	The device is connected to the Internet and the connection is available.
		Flashing once every 2s	The device is connected to VNNOX and the connection is available.
		Flashing once every second	The operating system is being upgraded.
		Flashing once every 0.5s	The device is copying the upgrade package or files from a USB drive.

Name	Color	Status	Description
RUN	Green	Flashing once every 4s	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 voltage	DC 5 V to 12 V
	Maximum power consumption	15 W
Storage Capacity	RAM	2 GB

	Internal storage	32 GB
Storage Environment	Temperature	−40℃ to +80℃
	Humidity	5% RH to 95% RH, non-condensing
Operating Environment	Temperature	−20℃ to +60℃
	Humidity	5% RH to 85% RH, non-condensing
	Dimensions (L×W×H)	141.2 mm × 120.0 mm × 33.5 mm
	Net weight	470.3 g
	Gross weight	776.1 g
Packing Information	Dimensions (L×W×H)	333.0 mm × 196.0 mm × 70.0 mm
	Accessories	• 1x Wi-Fi omnidirectional antenna • 1x Power adapter • 2x Racks • 4x Phillips countersunk head screws • 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	• Android 10.0 operating system software • Android terminal application software • FPGA program	

Media Decoding Specifications

Image

Codec	Max Resolution	Format	Remarks
BMP	4096×2304 pixels	BMP	N/A
GIF	4096×2304 pixels	GIF	N/A

Codec	Max Resolution	Format	Remarks
JPG	4096×2304 pixels	JPG	N/A
JPEG	4096×2304 pixels	JPEG	N/A
PNG	4096×2304 pixels	PNG	N/A

Video

Codec	Max Resolution	Max Frame Rate	Max Bit Rate (Ideal Case)	Format
H.265	64×64 pixels to 4096×2304 pixels	60fps	100Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
H.264	64×64 pixels to 4096×2304 pixels	30fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
MPEG-4	64×64 pixels to 1920×1088 pixels	60fps	29Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
VP9	64×64 pixels to 4096×2304 pixels	30fps	49Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
MJPEG	64×64 pixels to 1920×1088 pixels	22fps	6Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
AVS2	64×64 pixels to 3840×2160 pixels	25fps	20Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
H.263	64×64 pixels to 1920×1088 pixels	60fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
VP8	64×64 pixels to 1920×1088 pixels	60fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
MPEG-2	64×64 pixels to 1920×1088 pixels	60fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
MPEG-1	64×64 pixels to 1920×1088 pixels	60fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
VC-1	64×64 pixels to 1920×1088 pixels	60fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV

Codec	Max Resolution	Max Frame Rate	Max Bit Rate (Ideal Case)	Format
Sorenson Spark	64×64 pixels to 1920×1088 pixels	60fps	60Mbps	MP4, AVI, RMVB, FLV, MKV, MOV
CAVS	64×64 pixels to 1920×1088 pixels	60fps	30Mbps	MP4, AVI, RMVB, FLV, MKV, MOV

Notes and Cautions

Notes for Installation

When the product needs to be installed on the rack, four M3*5 Phillips countersunk head screws with a torque of 3N·m should be used to fix it. The rack for installation shall bear at least 1.9kg weight.

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.

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 & your body.

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

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.

Copyright

Official website
www.novastar.tech

Technical support
support@novastar.tech