TB50

Multimedia Player Specifications

2025

Introduction

The TB50 is a new generation of multimedia player powered by Pensar LED 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, Smark, CQC, FCC, UL, IC, KC, CE, UKCA, CB, MIC, PSE,

If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please contact Pensar LED to confirm or address the problem. Otherwise, the customer shall be responsible for the legal risks caused or Pensar LED has the right to claim compensation.

Features

Outputs

- **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**

All 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 Pensar LED'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 and support for HDMI loop

Inputs

- **1x HDMI 1.3 connector**

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

- **2x sensor connectors**

Connect to the brightness sensor or temperature and humidity sensor

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.

Features

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

- **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**

  - **W-Fi AP**
  User terminal devices can connect to the built-in Wi-Fi hotspot of the multimedia player. 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 multimedia player to a Wi-Fi network and turn on the Wi-Fi hotspot at the same time.

- **Synchronous and asynchronous modes**

  - In asynchronous mode, the internal video source works.
  - In synchronous mode, the HDMI video source 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**
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.) (Not shipped with 4G/5G Module)

Appearance

Front Panel

Name	Description
SWITCH	Switches between synchronous and asynchronous modes. • 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

Appearance

Rear Panel

Name	Description
SENSOR	Sensor connectors Connect to brightness sensors or temperature and humidity sensors.
	Reserved RF antenna connector

HDMI	1x HDMI 1.3 OUT
	
	• 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:
	
	  - Custom pixel width range: 512~4096 (512×512@60Hz~4096×560@60Hz)
	  - Custom pixel height range: 512~3680 (512×512@60Hz~512×3680@60Hz)

Appearance

Rear Panel

Name	Description
HDMI	1x HDMI 1.3 IN • 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: - Custom pixel width range: 512~4096 (512×512@60Hz~4096×560@60Hz) - Custom pixel height range: 512~3680 (512×512@60Hz~512×3680@60Hz) 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 for video input and users can enable fullscreen scaling to make the image to fit the screen automatically. Requirements for full-screen scaling in synchronous mode: - 512 pixels ≤ video source width ≤ 2048 pixels - 512 pixels ≤ video source height ≤ 2048 pixels - Maximum resolution: 1920×1080 - The image 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.

Appearance

Rear Panel

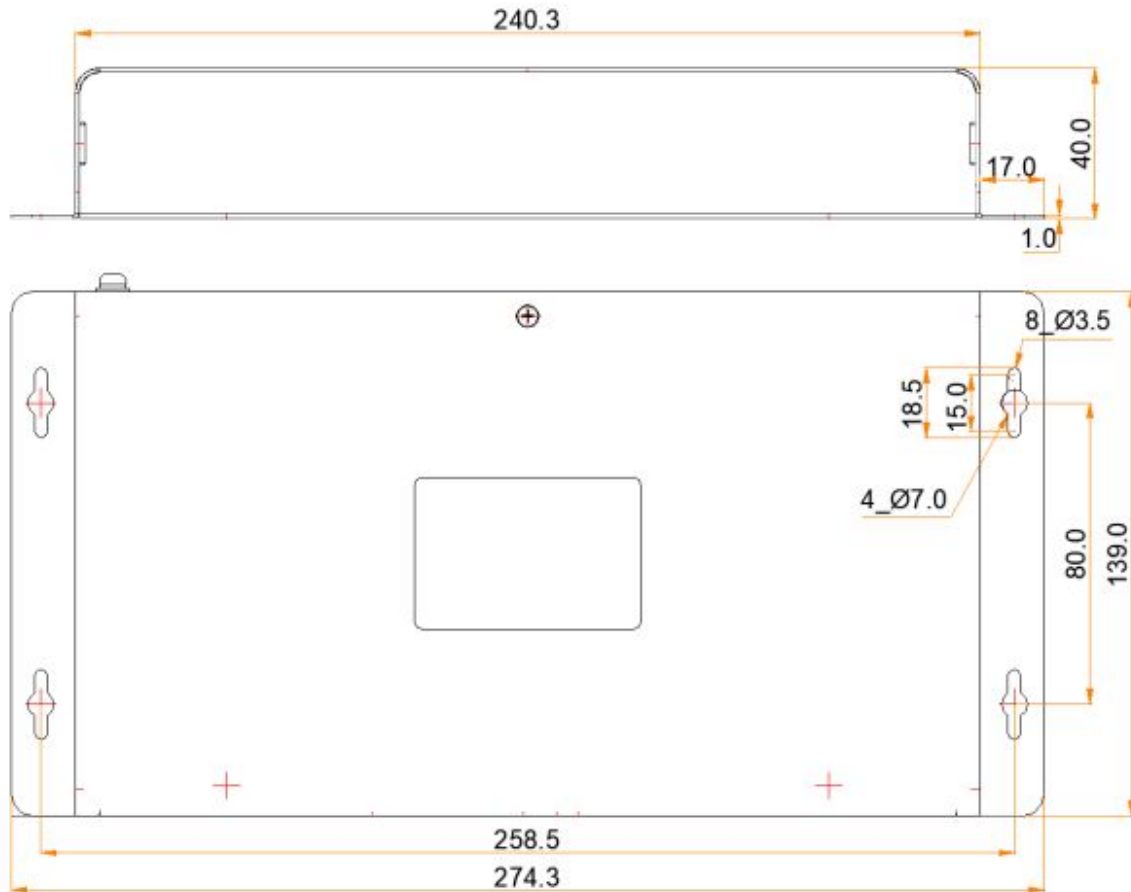| Name	Description
WiFi	Wi-Fi antenna connector (2.4 GHz Wi-Fi supported) Support for switching between Wi-Fi AP and Wi-Fi Sta
ETHERNET	Gigabit Ethernet port Connects to the control computer, a LAN or public network for content publishing and screen control
COM 2	GPS antenna connector
USB 3.0	USB 3.0 (Type A) port Allows for USB playback, firmware upgrade and storage expansion. 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.
COM 1	4G antenna connector
AUDIO OUT	Audio output connector OMTP headphones can be connected.
100-240V~, 50/60Hz, 0.6A	Power input connector
ON/OFF	Power switch

Appearance

Indicator Status

Indicator	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 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 device is upgrading the operating system.
		Flashing once every 0.5s	The device 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	• 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	Android 11.0 operating system software Android terminal application software FPGA program Note: Third-party applications are not supported.	

Media Decoding Specifications

Codec	Max Resolution	Format	Remarks
JFIF file format 1.02		JPG, JPEG	No support for non-interlaced scan Support for SRGB JPEG Support for Adobe RGB JPEG
BMP	4096×2160 pixels	BMP	N/A
GIF		GIF	
PNG		PNG	
WEBP		WEBP	

Media Decoding Specifications

Codec	Resolution	Max Frame Rate	Max Bit Rate	Format
MPEG-1/2	48×48 pixels to 1920×1088 pixels	30fps	80Mbps	DAT, MPG, VOB, TS
MPEG4			38.4Mbps	AVI, MKV, MP4, MOV, 3GP
H.264	16×16 pixels to 4096×2304 pixels	2304p@30fps	80Mbps	AVI, MKV, MP4, MOV, 3GP, TS, FLV
H.264 MVC	16×16 pixels to 4096×2304 pixels		100Mbps	MKV, TS
H.265/HEVC	64×64 pixels to 4096×2304 pixels			MKV, MP4, MOV, TS
VP8	48×48 pixels to 1920×1088 pixels	30fps	38.4Mbps	WEBM, MKV
VP9	64×64 pixels to 4096×2304 pixels	60fps	80Mbps	WEBM, MKV
H.263	SQCIF(128×96) QCIF(176×144) CIF(352×288) 4CIF(704×576)	30fps	38.4Mbps	3GP, MOV, MP4
MJPEG	48×48 pixels to 1920×1088 pixels	60fps	60Mbps	AVI

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.

Cautions

This product can only be placed horizontally. Do not mount vertically or upside-down.

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.

Statement

Thank you for choosing Pensar LED product. This document Is Intended to help you understand and use the product. For accuracy and reliability, Pensar LED 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 suggestions.

This Product is subject to change firmware, hardware, specifications, components, and functionalities without any notice to the end user, we advise you to stay updated on our product line as we continuously make improvements.

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