LS425, LS445

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The BrightSign LS425 and LS445 media players can be used to decode images, audio, and video for digital-signage and kiosk applications. In addition to driving audio/video devices, these players can be controlled with various networked and built-in interfaces. Both models include a Real Time Clock (RTC) with supercapacitor that backs up the clock settings when it is power cycled.

These pages specify the hardware interfaces and operational theory of the LS425 and LS445.

Interfaces

LS425

Front	Back
WiFi antenna connector (1 of 2)	Ethernet 10/100
IR via USB-C	HDMI® out (Full HD)
MicroSD card slot	Service button (SVC)
Audio out (3.5mm analog and SPDIF)	Reset button (Reset)
12V@1.5A power connector	
WiFi antenna connector (2 of 2)	

LS445

Front	Back
WiFi antenna connector (1 of 2)	LAN/Ethernet 10/100
IR via USB-C	HDMI® out (Full HD)
MicroSD card slot	Service button (SVC)
Audio out (3.5mm analog and SPDIF)	Reset button (Reset)
12V@1.5A power connector	
WiFi antenna connector (2 of 2)	

LS5 Hardware Interfaces

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This section describes the characteristics and operation of all connectors on the LS425 and LS445.

Ethernet

This connection is used to connect an ethernet cable for internet access. The LS425 and LS445 wired ethernet connection is capable of 10/100 Base-T Mbps.

Power Connector

The power connector for the LS425 and LS445, which connects the power cord to the device, is rated for 12V@1.5A. The connector is used for power input only—it does not transfer data.

HDMI Output

The LS425 has full HD HDMI® output and the LS445 has a UHD/4K HDMI output. The LS425 is capable of outputting HD video (up to a maximum video resolution of 2048x1048x60p), while the LS445 can output 4K video resolutions (including 1920x1200x60p, and up to 3840x2160x60p).

IR Input/Output

The 3.5mm IR in/output is via USB-C.

Audio Connector

The LS425 and LS445 have a dedicated 3.5mm combination analog/optical audio port. To transmit a digital audio signal, use a TOSLINK optical audio cable with a 3.5mm connector. Analog and digital audio cannot be transmitted simultaneously.

The full-scale voltage output of the analog audio is 2V RMS. The minimum load impedance is 32Ω.

The analog audio connector has the following pinout:

- **Tip**: Left audio
- **Ring**: Right audio
- **Sleeve**: Ground for audio signal

USB-C

A USB-C 3.0 port connects to USB-compatible devices. The USB-C port supports both device and host mode, and supports custom cable solutions such as USB-C to GPIO cable, USB-C to USB-A and 3.5 serial cable, and USB-C to IR.

WiFi & Antennas

The LS425 and LS445 models come equipped with an M.2 connector slot and two SMT-mounted SMA connectors. The M.2 slot supports M.2 PCIe cards for WiFi and Bluetooth connectivity (sold separately), while the SMA connectors facilitate the connection of external antennas.

LS5 Environmental and Power Usage

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The LS245 and LS445 are designed for sustained ambient temperatures between 0°C and 50°C, with transients up to 50°C (at 90% maximum relative humidity, non-condensing). Non-operational (transportation or storage) temperatures can range from -20°C to 85°C. Units should be allowed time to acclimate before being powered up.

Operating the players above 50°C ambient for prolonged periods may reduce the operational life of the product and result in intermittent resetting of the device.

> ⚠ **Important**
>
> Exposing a cold player to warm air at high relative humidity may cause water to condense inside the player, leading to component failure. Damage due to such internal condensation is not covered by warranty. If a player is cold, allow several hours for it to acclimatize to ambient conditions before applying power.

Power Adaptor

The LS245 and LS445 are supplied with 12V@1.5A power supply.

This section describes how specific components operate on the LS425 and LS445.

On-Board LED

The single on-board LED acts as a power-on light (similar to the green LED on other players) and will illuminate when power is applied to the player and will remain in a solid state. The LED will flash to indicate an error as described in the chart below, or flash during the firmware update process (it will cease flashing when the update is complete).

Number of flashes	Code
The light will remain illuminated if power is on unless one of the following errors is present, or unless a firmware update is happening.	
2	Unspecified error
3	Network recovery script is preparing to run on a device configured for network recovery.
4	No upgrade file found
5	Failed to load kernel module
6	Board is not capable of running the current firmware version
7	A piece of on-board hardware is not working correctly.
8	Problem related to the storage device (either the USB drive or microSD card)
9	Problem related to the registry/NAND
10	The autorun script encountered a load/run error.
11	WiFi-related error
12	Unable to find a bootable image

On-Board Switch / SVC Button

The on-board switch is connected to the GPIO02, which is pulled low when the service (SVC) button is pressed. Conversely, a pull-up on the button normally sets the GPIO02 to be pulled high.

Reset Switch / GPIO Button

The Reset button is connected to the reset circuit. Pressing the reset button will send an initial signal to the system software and holding the reset button low for approximately four seconds will cause a hard reset.
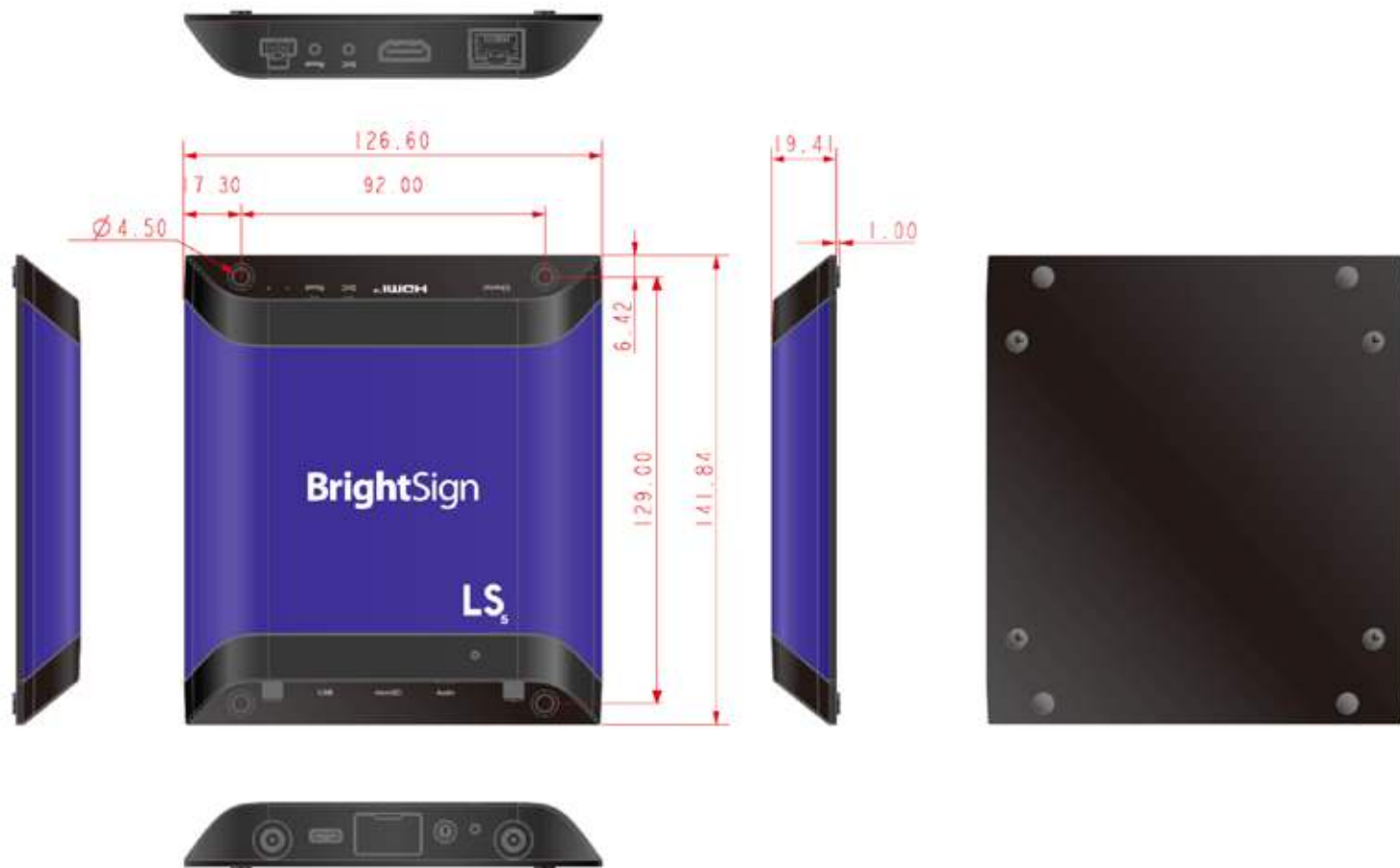
MicroSD Slot

The LS425 and LS445 have one MicroSD slot, which supports transfer modes up to UHS-1 DDR50 (50MB/s). There is a 2TB limit on the storage capacity of microSD cards used with the player.

Wireless Module

The optional WiFi module also has Bluetooth functionality.

LS5 Dimensions

Last updated 24 May, 2023

LS5 Mounting Procedure

Last updated 24 May, 2023

The LS425 and LS445 can be mounted on a wall using the sealed mounting holes on the front and back. It is recommended that you mount the device using four screws (one for each hole). The screws should have a major diameter between 3.5mm and 4.2mm.

> ⚠ **Important**
>
> Nails should not be used to mount the device.