zarpli/BSuControl

github.com/zarpli/BSuControl

zarpli

BSuControl

This script is designed to control BrightSign units efficiently using any controller with a serial interface, included arduino.

Supported devices

The following list shows the models that have been tested with this script, but it will surely work on another model in the same series as well.

Model	Serial Port Type	Hardware Level	Firmware
AU320	Onboard DE-09	RS-232	6.1.76
LS422	USB to Serial Adapter	TTL/RS-232	6.2.147.9
LS423	USB C Serial Built-in	TTL	8.4.14
LS424	USB C Serial Built-in	TTL	8.4.14
HD223	GPIO connector AF	TTL	8.4.14
HD224	GPIO connector AF	TTL	8.4.14
HD1023	Onboard 3.5mm Serial	TTL	8.4.14
HD1033	Onboard 3.5mm Serial	TTL	8.4.14
HD1024	Onboard 3.5mm Serial	RS-232	8.4.14
HD1034	Onboard 3.5mm Serial	RS-232	8.4.14
XD233	GPIO connector AF	TTL	8.4.14
XT243	GPIO connector AF	TTL	8.4.14
XT1143	Onboard 3.5mm Serial	TTL	8.4.14

AF: Alternate Function

Please check the technical specifications of the serial port, in particular the tolerated voltages.

Install

Simply add this script and your content to the flash card and you can send the list of commands below to control playback.

Commands Supported

The commands are case sensitive. The unit automatically responds when a command is received.

command (chars)	argument type	response STATUS (hex)
PLAY	File Path	0 : error 1 : ok
STOP	none	0 : error 1 : ok
DISPLAY	File Path	0 : error 1 : ok
VOLUME	INT (%)	0 : error 1 : ok
PAUSE	none	0 : error 1 : ok
RESUME	none	0 : error 1 : ok
LOOP	String	0 : error 1 : ok
REBOOT	none	none

Command Syntax: `<command><argument><cr>`

The path and filename is used in **uppercase** as this is how brightsign handles files internally.

command example	description
`PLAY VIDEO.MOV`	Play video file called "video.mov" in root directory
`PLAY AUDIO/AUDIO.M4A`	Play audio file called "audio.m4a" in "audio" directory
`DISPLAY IMG/TEST.PNG`	Uses the video decoder to display image file called "test.png" in "img" directory
`VOLUME 50`	Set the volume to 50 percent of normal

command example	description
`STOP`	Stop the currently playing media and clears the screen
`LOOP AlwaysLoop`	Enable automatic loop mode

The below table Specifies the looping modes for media playback. Media End events are *only sent if seamless looping is disabled*, or if the mode is set to "SeamlessLoopOrNotAtAll" and the file cannot be looped seamlessly.

LOOP argument	description
NoLoop	Looping is disabled in all cases. This is the default behavior, allowing for playback of multiple files in a playlist—with noticeable gaps between the end and beginning of the file.
AlwaysLoop	The video is looped seamlessly if possible; otherwise, it is looped with seams.
SeamlessLoopOrNotAtAll	The video is looped seamlessly if possible; otherwise, it is not looped at all.
LoopButNotSeamless	The video is looped with seams.

NOTES:

1. When media file is a video, the PLAY command stops on the last frame.
2. cr is carriage return

BS Response

The response start with STX (02h) followed by the status byte and lastly an ETX (03h).

```
<STX><STATUS><ETX>
```

When the unit starts up and has the script installed, the status **online** (02h) is sent.

```
02h 02h 03h
```

Unit responds automatically with **media_ended** (08h) when a file has finished playing:

```
02h 08h 03h
```

When the last command was not executed correctly, the unit responds:

```
02h 00h 03h
```

When the last command was successful, the unit responds:

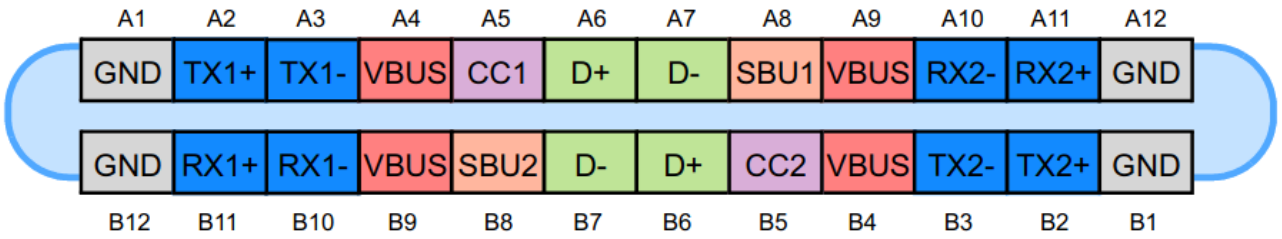
```
02h 01h 03h
```

USB 2.0 Type-C Serial Port

The LS423 and LS424 units has a USB 2.0 Type-C port, this port is configured in *alternate mode* using pins A2/A3 and B2/B3 as a **TTL** serial port.

The following table illustrates the pinout of the USB 2.0 Type-C **host** port:

pin	Signal Name	Description	pin	Signal Name	Description
A1	GND	Ground return	B12	GND	Ground return
A2	**TX1+**	**Serial Transmit**	B11		
A3	**TX1-**	**Serial Receive**	B10		
A4	VBUS	Bus Power	B9	VBUS	Bus Power
A5	CC1	Configuration Channel	B8		
A6	DP1	Positive Half USB 2.0 Position 1	B7	DN2	Negative Half of USB 2.0 Position 2
A7	DN1	Negative Half USB 2.0 Position 1	B6	DP2	Positive Half of USB 2.0 Position 2
A8			B5	CC2	Configuration channel
A9	VBUS	Bus Power	B4	VBUS	Bus Power
A10			**B3**	**TX2-**	**Serial Receive**
A11			**B2**	**TX2+**	**Serial Transmit**
A12	GND	Ground return	B1	GND	Ground return



The serial port is enumerated as port 0.

The USB connector can supply up to 500mA of power for peripherals. The maximum length for a USB cable is 5 meters.

The USB Type-C port will output **analog audio** if the CC1 **and** CC2 signal is shorted to ground via a 1K resistor. Analog output can also be enabled in system software. The D+ signal outputs right audio, and the D- signal outpts left audio.

GPIO - Serial Port

On some BrightSign models that have onboard GPIO connector it is possible to use them with an **alternate function**, including a TTL serial port. This method is currently supported on the XTx44, XTx43, XDx34, XDx33, HDx24, HDx23, and HO523 models.

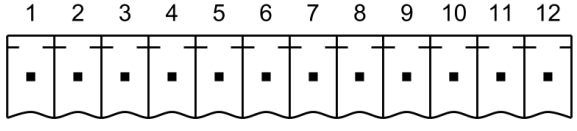
The following table outlines the possible alternate setting for each pin:

GPIO Pin	Native Function	Alternate Function
1	GND	N/A
2	VDD	N/A
3	**Button 0**	**serial1 (Rx)**
4	Button 1	irin1
5	Button 2	irout (HDx23, HO523 only)
6	Button 3	N/A
9	Button 4	serial0 (Rx - console port)*
10	Button 5	serial0 (Tx)*
11	**Button 6**	**serial1 (Tx)**
12	Button 7	N/A

GPIO alternate function serial is **always TTL.**

The GPIO port is a Terminal Block 12 Pin male standard design manufactured by Phoenix Contact.

*Models that do not have a 3.5mm serial port (e.g. HD223, XD233) do not support serial port o.

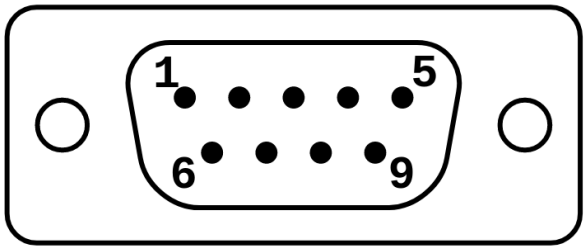


DE-09 RS-232

The RS-232 interface is a male DE-09 connector. The following table illustrates the pinout.

Pin	Description	Pin	Description
1	NC	2	Receive data into the device
3	Transmit data out of the device	4	Available 5V @ 500mA
5	Ground	6	NC
7	RTS	8	CTS
9	NC		

Here is the DE-09 male as viewed from the front of the BrightSign units.



3.5mm Serial Port

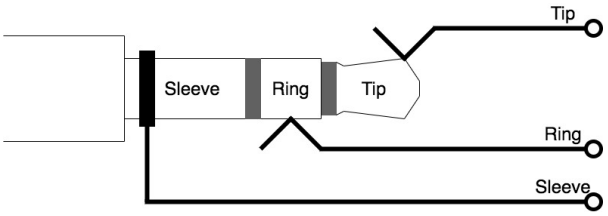
The UART (asynchronous serial) interface is a 3.5mm (1/8") jack for communication. This serial interface supports TX, RX, and ground only.

The 3.5mm serial port has the following configuration (from the perspective of the player):

Pin	Function
Tip	Receive
Ring	Transmit
Sleeve	Ground

There are some models that are compatible with RS-232 voltages, see the following table:

Series with 3.5mm serial	RS-232 Compatible
XT4	YES



Series with 3.5mm serial	RS-232 Compatible
XD4	YES
HD4	YES
XD3 (Revision H and newer)	YES
XT3 (Revision H and newer)	YES
XD3 (Revision G and older)	NO
XT3 (Revision G and older)	NO
HD3	NO
LS424	NO
LS423	NO

USB to Serial Port Adapter

At the moment on **LS422** units, it is only possible to use serial communication using a USB adapter. This script has been tested in conjunction with the following adapters, but it may well work with any other.

Brand
Silicon Laboratories
WinChipHead - CH340
Future Technology Devices International
Prolific Technology Inc

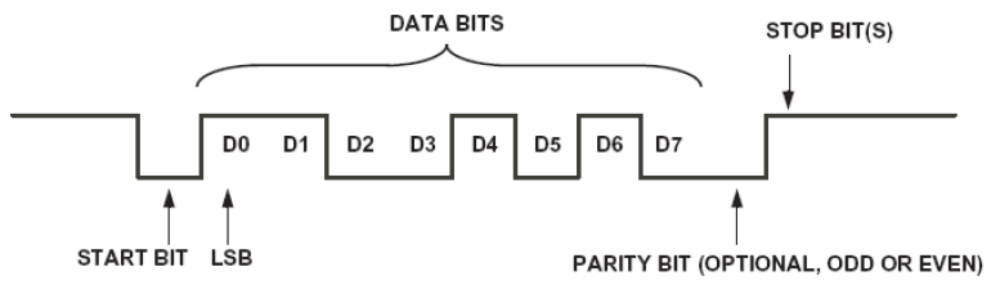
Signaling Settings

The following are the default serial settings for a BrightSign player. They can be changed in the script.

Default serial settings

Default serial settings
Baud rate: 115200
Data: 8 bit
Parity: None
Stop: 1 bit

The following diagram illustrates the behavior of the TX and RX signal:

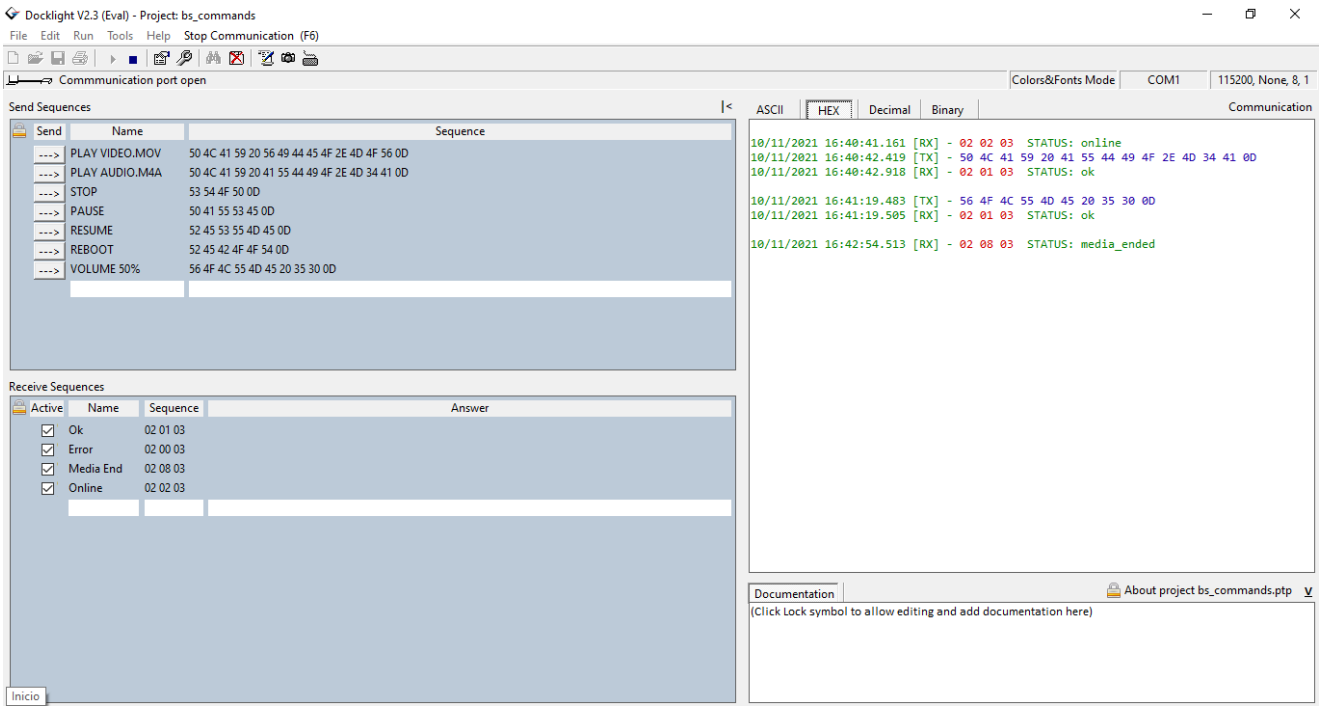


Use with Docklight

Docklight is a testing, analysis and simulation tool for serial communication protocols.

Use the following project to use BrightSign unit connected to a PC running Windows OS.

BSuControl.ptp



Use with Arduino

BrightSign is a library for Arduino.

Power Cycle

LS424 need a power cycle

Media Files for Testing

Media

YouTube