Alcorn McBride Inc.

RidePlayer User's Guide

THE ULTIMATE ON-BOARD AUDIO AND SHOW CONTROL SOLUTION

January 6, 2023

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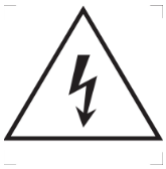
Every effort has been made to assure the accuracy of the information contained in this manual, and the reliability of the Alcorn McBride RidePlayer hardware and software. Errors can sometimes go undetected, however. If you find one, please bring it to our attention so that we can correct it for others. Alcorn McBride welcomes comments and suggestions on the content and layout of its documentation.

Applications described herein are for illustrative purposes only. Alcorn McBride Inc. assumes no responsibility or liability for the use of these products, and makes no representation or warranty that the use of these products for specific applications will be suitable without further testing or modification. Alcorn McBride products are not intended for use in applications where a malfunction can reasonably be expected to result in personal injury. Customers using or selling Alcorn McBride products for use in such applications do so at their own risk, and agree to fully indemnify Alcorn McBride for any damages resulting from such improper use or sale. Alcorn McBride Inc. reserves the right to make changes to these products, without notice, in order to improve their design or performance. The unit requires installation into a suitable fire enclosure in the final assembly.

This unit has been tested and found to comply with the following:

FCC 47 CFR Part 15B:2017, ISED ICES-003: Issue 06 (2016)
EN 55032 Class A Conducted and Radiated Emissions
EN 55035, EN 61000-3-2, and EN61000-3-3 Immunity



Caution, shock hazard, disconnect all power sources before servicing.

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.

WELCOME!

Congratulations on your shiny new Alcorn McBride RidePlayer!

We carefully designed this product to be the perfect solution for the unique challenges of on-board (vehicle-based) audio and show control systems for themed attractions.

Many would agree that the most significant of those challenges is the ability to synchronize on-board audio with off-board audio, video, lighting, animatronics, etc. RidePlayer accomplishes this by incorporating Alcorn McBride SyncCore™ technology, which leverages several methods to ensure extremely precise synchronization with other show system components. These industry-standard methods include PTP (IEEE-1588), NTP, GPS, SMPTE LTC, and Video Genlock. When used in conjunction with other SyncCore™ products like the V16X, it's easy to synchronize even the most complex attractions.

Another important requirement of on-board systems is the ability to trigger and monitor sub-systems like animation controllers, PLCs, RFID scanners, and other miscellaneous equipment. Once again, RidePlayer steps up to the plate by integrating the power of Alcorn McBride's industry-standard show control core into the same hardware platform. This enables it to interface to just about any device including PLCs, animation controllers, sensors, lighting systems, video servers, and our ShowTouch panels. It also empowers the user with full scripting, logic, and timeline capabilities to handle those pesky curveballs that crop up during installation.

Of course, the primary purpose of this device is to provide high-quality audio playback, so it has a wide-range of features to suit that task well. It is capable of sourcing up to 16 outputs of 24-bit 48kHz uncompressed audio. This powerful audio engine provides playback of up to 64 simultaneous tracks with the ability to route, crossfade, and mix those tracks to any of the 16 outputs. This polyphonic capability allows any combination of discrete playback of tracks like background music, vocals, and sound effects all mixed on a single audio output. Each audio output is also equipped with powerful DSP capabilities that enable you to tune audio characteristics on-site.

Audio distribution options are plentiful. This product offers up to 16 individual 25W amplified outputs or up to 8 bridged 50W outputs; which makes it perfectly suited to drive high-range and mid-range speakers as well as some bass transducers (i.e. ButtKickers). The 16 line level outputs can be used to feed high-powered external analog amplifiers to drive larger speakers like subwoofers. For a clean all-digital signal path and intelligent monitoring of amplifiers like our RideAmp companion product, the 16x16 AES67/Dante Network Audio interface is a no-brainer.

Content production and workflow are also critical to building great rides. Using the built-in 16x16 AES67/Dante interface, media designers can patch in their source (i.e. ProTools rig, etc.) to preview content on the actual on-board audio system without having to load a single file. Once satisfied with the mix, WAV files can be easily exported to the product via network for normal operation.

Special care has been taken to ensure that this design is rugged enough to handle on-board applications like tour vehicles, dark ride vehicles, parade floats, and even high-vibration vehicles like coasters.

This product leverages 32 years of experience designing products specifically for themed entertainment applications. In true Alcorn McBride fashion, the solid-state and rugged design will ensure years of 24/7 maintenance free operation which is essential to zero downtime for attractions. At Alcorn McBride, it is our passion to engineer solutions that are uniquely suited for themed entertainment. We hope that you love using this product as much as we enjoyed designing it!

PRODUCT FEATURES

SHOW CONTROL FEATURES

RidePlayer is fully-equipped with the powerful and flexible Alcorn McBride ControlCore™. This technology provides the ability to control and monitor other components commonly deployed on vehicle systems such as PLCs, RFID scanners, GPS antennas, animation controllers, and DSP systems; all without requiring additional components to be added to the vehicle.

The control feature set is as follows:

- **Alcorn McBride Show Control Core**
  - Timeline Programming
  - ShowTouch Integration
  - Advanced Scripting
  - Device Control (PLCs, RFID, Animatronics, AV, etc.)
- **2 x Network Control Ports (Isolated)**
- **8 x CC/Voltage Inputs**
- **4 x CC Outputs /w Self-Healing Polymer Fuse**
- **2 x RS-232/RS-422 Serial Ports**
  - **Serial, GPS, DMX**
- **Power Supply Voltage Monitoring**
- **Analog Voltage Sense Input**

AUDIO FEATURES

This product is equipped with an incredibly powerful audio playback system that includes many advanced features designed to eliminate the need for external components like DSPs, amplifiers, multiple audio players, etc. These features enable high-quality surround sound effects to enhance the guest experience and make integration and content production a breeze.

The audio features are:

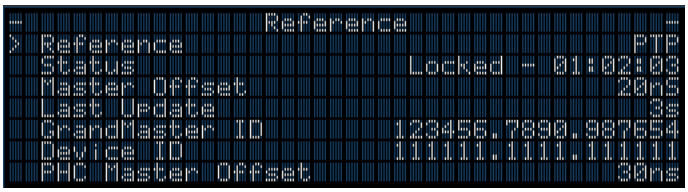
- **24-bit 48kHz WAV files**
- **16 x Audio Outputs**
  - 16 x 25W Amplified Outputs (Bridge to 50W)
  - 16 x Line Outputs
  - DSP with 9-band parametric EQ, high and low pass filters; time delay.
- **16x16 AES67/Dante Network Audio interface**
  - Input audio from a production workstation
  - Output audio to provide clean digital audio to external amplifiers
- **Up to 64 Simultaneous Tracks /w Dynamic Routing, Mixing, and Crossfade**
- **Remote Content Update via Ethernet**

SYNCHRONIZATION FEATURES

RidePlayer is equipped with the Alcorn McBride SyncCore™ system to provide for extremely precise synchronization between the on-board and off-board systems. This technology uses several industry-standard methods to maintain a very precise clock between RidePlayer and other SyncCore™ enabled products like the V16X.

Synchronization features include:

- PTP (IEEE-1588)
- NTP
- GPS /w PPS Clock Input
- SMPTE LTC
- Genlock



PHYSICAL FEATURES

This product's rugged solid-state design enables it to endure the harsh environments of coaster and dark ride applications. It offers flexible mounting options, industrial-grade connectors, DC power input, and a rock-solid chassis design.

Physical features include:

- Vibration/impact resistant design
  - Coasters, Dark Rides, Parade Floats, Parking Trams, etc.
- Rugged Locking Molex connectors
- M12 X-Coded Ethernet Connectors
- Dimensions – 9.5"W x 13.1"L x 3.3"H – Surface Mount
- Weight – 11 Lbs.
- 9-28VDC Power Input /w software monitoring
- 42x8 OLED Character Display /w navigation wheel (top)
- 16 bi-color playback status LEDs (top)
- Removable 128GB M.2 SSD Drive for storage of WAV files (accessible from top)
- Removable SD Card for storage of scripts and panels (accessible from end)

TECHNICAL SUPPORT

Now that we've tantalized you with all of the wonderful things this product can do, I'll bet you're chomping at the bit to flip all the switches and push all the buttons. Not so fast! Before we get to the fun stuff, we just want to take a moment to remind you that we are here to help. Chances are that you're building something really cool and we want you to have access to the resources and support you need to be successful.

To start, you'll find a wealth of information on our website. This includes Application Notes that give you detailed documentation and examples for how this product is used in common types of themed entertainment projects. You'll also find the latest downloads for software, firmware, drawings, 3D models, cutsheets, and other helpful resources on our Support page. The Knowledge Base is especially handy for common questions and helpful troubleshooting tips. And last, but certainly not least, you always have our friendly and mildly entertaining staff available by email or telephone.

Training	https://www.alcorn.com/training
Application Notes	https://www.alcorn.com/applications
Support Resources	https://www.alcorn.com/support
Knowledge Base (FAQ)	https://alcornmcbride.zendesk.com/hc/en-us
Email Support	support@alcorn.com
Telephone Support	(407) 296-5800 (Mon-Fri 9am-6pm EST)

GETTING STARTED

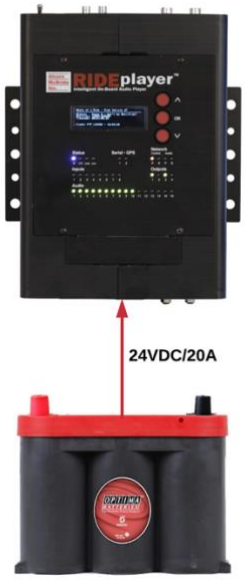
Alright, time to roll up your sleeves and get to work! This section will guide you through basic concepts that will help you get on your way with RidePlayer.

WIRING AND CONNECTIVITY

A few connections are required to experience the core functionality of RidePlayer. If you're the DIY-type that's comfortable with purchasing and crimping your own connectors and pins, you'll be happy to know that this product uses industry-standard connectors which are documented in detail in the **Hardware Information** section of this User's Guide. For those looking for the path of least resistance, we strongly encourage you to order a RidePlayer Development Kit covered in the **Accessories** section of this document. This kit provides a full set of pre-fabricated connectors and a power supply, so you spend less time crimping and get right to bench testing your RidePlayer.

POWER

Our engineers are working around the clock to eliminate the need for those pesky Electrons. However, until they inevitably succeed, RidePlayer needs power to work properly.

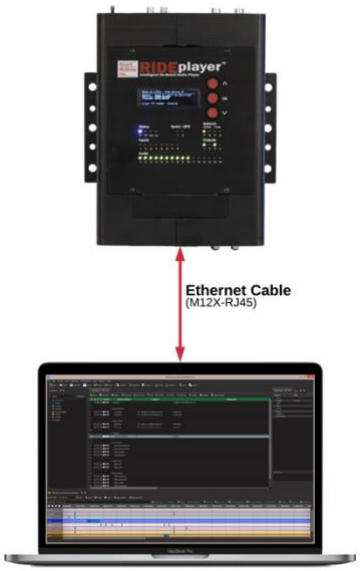


You'll want to start by connecting RidePlayer's power input to a 24VDC power source like a battery, super-capacitor, or bench supply. If you intend to use the built-in amplifiers, we recommend a 24VDC/20A power source. If you plan to only use the line outputs or network audio interface, a 24VDC/3A source will do the job.

Once you have connected the power source, RidePlayer can be powered up by simply flipping the circuit breaker switch UP to the ON position. HEY!!! What are you doing?!? We didn't actually say to power up yet, but you went ahead and did it anyway didn't you?!?! <Head Slap> Alright… clearly you're excited so I guess we'll cut you some slack, but could you at least try to follow instructions next time?

CONTROL NETWORK

While RidePlayer sure looks pretty when you power it up, network connectivity is required to actually make it do magical things. The goal here is to interface RidePlayer to your Windows or macOS computer running our WinScript Live software. This application empowers you to configure, program, and load audio content to the unit over the network connection.

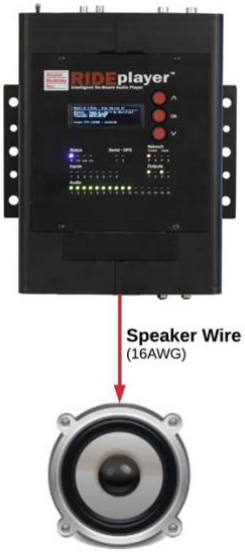


To make this connection, you'll need an Ethernet cable with an M12 X-Code connector on at least one end. The other end can be either RJ45 or M12 depending on your computer or network switch. For convenience, the RidePlayer Development Kit includes several M12→RJ45 adapter cables. These cables are also available for individual purchase from Alcorn McBride.

Using the M12 cable, you'll want to connect the **Primary Control** port of RidePlayer to your network switch or computer. Aside from the vibration-resistant M12 connector, this is no different than connecting to any other network device. When the unit is powered on, you will see a link indicator illuminate on RidePlayer's top panel to indicate a good network connection.

SPEAKER OUTPUT

In order to make great sound, we're going to have to move some air! To do this, we recommend at least one 4Ω or 8Ω unpowered speaker with a 25W (or higher) power rating.



The next step is pretty simple. Connect the positive (+) terminal of Speaker Output 1 to the positive (+) input of the speaker. Connect the negative (-) terminal of Speaker Output 1 to the (-) terminal of the speaker. Rinse and repeat for any other speakers that you wish to connect.

NETWORK CONFIGURATION

Now that we're good to go with connections, we just need to do a little bit of configuration before we can connect your computer to RidePlayer. Before we get started, it's helpful to know that RidePlayer ships with the following default IP address configuration:

RidePlayer Primary Control Port	
Control IP	192.168.0.253
Media IP	192.168.0.254
Subnet Mask	255.255.255.0

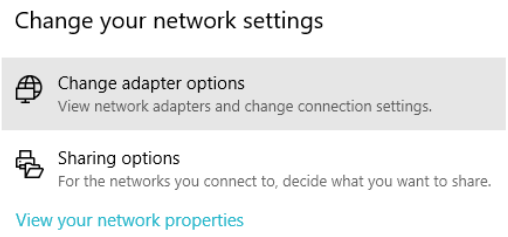
If you're at ease in the world of networking, you can easily adjust these settings for RidePlayer to operate on an existing network. For more information on how to access the network configuration menu, see the **Display and Navigation Buttons** section of this User's Guide.

For those that just wish to connect a computer directly to RidePlayer, the easiest way is to set your computer to a static IP address that is compatible with RidePlayer's default network settings. For example, this configuration would work nicely for your computer:

Computer Ethernet Port	
IP	192.168.0.100
Subnet Mask	255.255.255.0

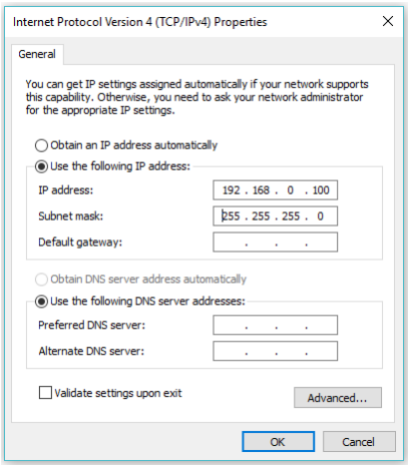
CONFIGURING STATIC IP - WINDOWS 10

1. Right-click on the Windows icon in the bottom-left and select **Network Connections**
2. Select **Change adapter options**



3. Right-click on the network interface that is connected to RidePlayer and select **Properties**
4. Select **Internet Protocol Version 4 (TCP/IPv4)** from the list of items and click the **Properties** button below.

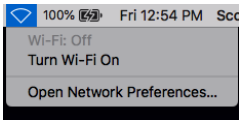
5. Select **Use the following IP address**, enter the IP address as **192.168.0.100**, and enter the Subnet Mask as **255.255.255.0** as indicated in the screenshot below:



6. Click the **Ok** button to apply the static IP address.

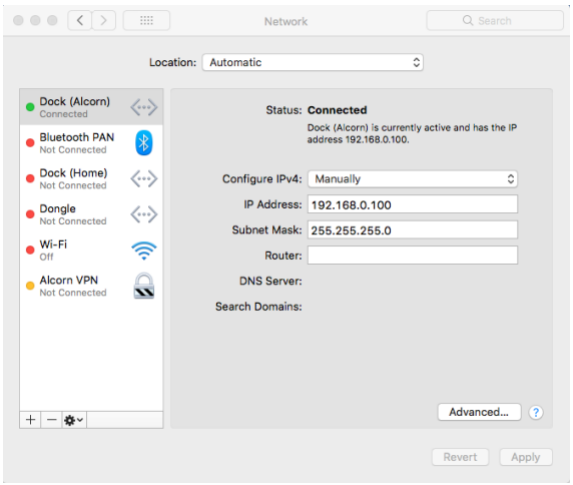
CONFIGURING STATIC IP – OS X

1. Click on the network icon in the OS X menu bar and select **Open Network Preferences**.



2. Select the network interface that is connected to RidePlayer from the available interfaces on the left.

3. Configure the network interface **Manually**, specify an IP address of **192.168.0.100**, and a Subnet Mask of **255.255.255.0** as indicated in the screenshot below.



4. Click **Apply** to enable the new static IP configuration

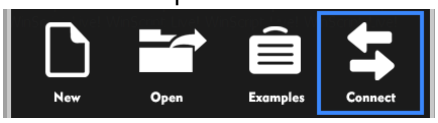
CONTROLLING WITH WINSCRIPT LIVE

At this point, everything should be wired up, configured, and ready to go. The next step is to connect to the RidePlayer using our WinScript Live software. Once connected, you will have access to transfer media content, configure, and control the RidePlayer unit.

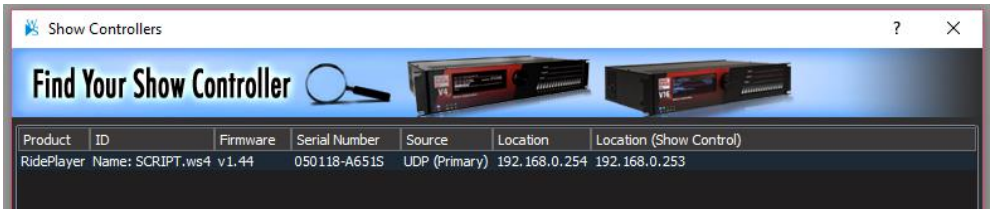
Before we can get started, you'll want to make sure to install the latest version of WinScript Live on your Windows or macOS computer. This software can be downloaded for free from our website at www.alcorn.com.

Once the software is installed, follow these instructions to play a test clip from your RidePlayer:

1. Launch WinScript Live and click the **Connect** button on the splash screen



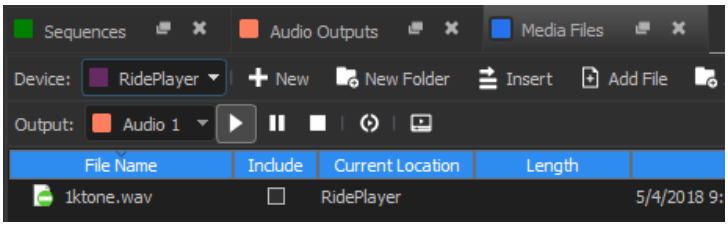
2. Your RidePlayer unit should automatically appear in the connection list. Click it once to select, and then click the **OK** button to connect.



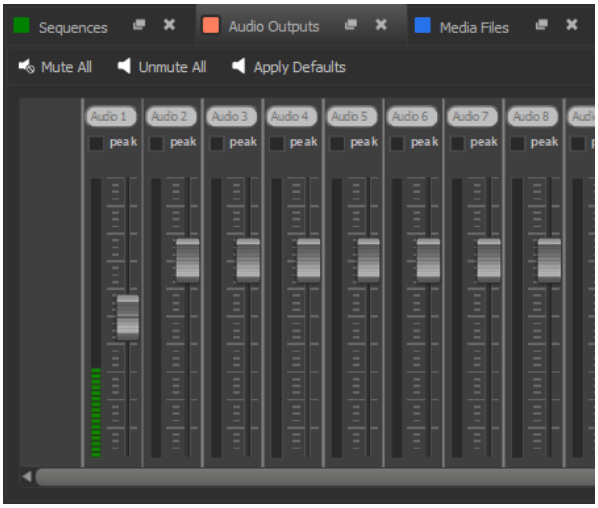
3. Select **Retrieve** and click **OK**. WinScript Live will then load the project currently stored on the RidePlayer.

4. Double-click on the **Media Files** resource listed on the left-hand side of WinScript Live. This will display the audio files currently loaded on the RidePlayer. By default, RidePlayer includes a single test clip named **1KTONE.WAV**.

5. Click on the **1KTONE.WAV** entry to select, select **Audio 1** as the current output, and then click the **Play** icon. The test clip will start playing a 1kHz sine wave on Audio Output 1. Notice how the top-panel status indicator for the audio output illuminates green to indicate playback is in progress.



6. Double-click on the **Audio Outputs** resource listed on the left-hand side of WinScript Live. In this screen, you can adjust the gain level of the audio outputs using the on-screen controls. You can also see level indicators for each channel when playback is in progress.



7. Congratulations! You are in control of your RidePlayer unit. There are many places you can go from here, but here are some helpful suggestions:

    - Feel free to load your own WAV files by simply dragging-and-dropping them to the Media Files screen. Once they have been added to the list, you can click on the **Sync** button to transfer them to the unit. You can also right-click on the file and click **Send Media File**.

    - Much of RidePlayer's capabilities require the use of its powerful show control engine. This includes advanced scripting capability, timeline features, and device control. To learn more, the detailed documentation of our show control platform is built right into the WinScript Live software. If you are new to Alcorn McBride show control, we also strongly encourage you to access the training content included with WinScript Live using the **Examples** screen and/or sign up for our next training class.

    - Visit our Applications page at www.alcorn.com to access more detailed examples on application-specific topics.

HARDWARE INFORMATION

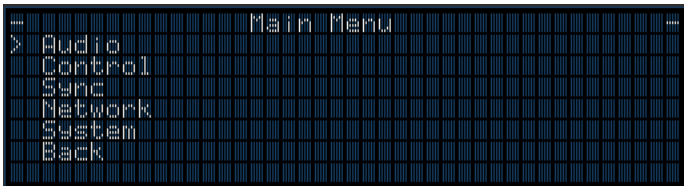
OVERVIEW

RidePlayer has quite an assortment of dedicated hardware for the purpose of configuration, status monitoring, and interfacing to other hardware. This section covers these features in more detail.

DISPLAY AND NAVIGATION BUTTONS

The top panel of RidePlayer features an 8-line by 42-character OLED status display. This display is primarily used to share application-specific information (i.e. "Location: Scene 2") from the show control script. However, this display also offers a full menu system that can be accessed using the navigation buttons located adjacent to the display.

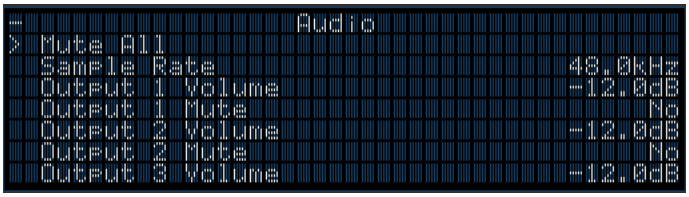
MAIN MENU



This menu provides access to the following sub-menus:

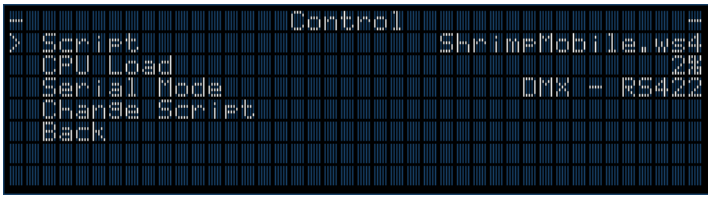
- **Audio** – View Audio settings and control Gain and Mute
- **Control** – Monitor show control performance and script status
- **Sync** – View sync configuration and monitor sync status
- **Network** – Configure control and audio network interfaces
- **System** – Configure and monitor generic system status

AUDIO MENU



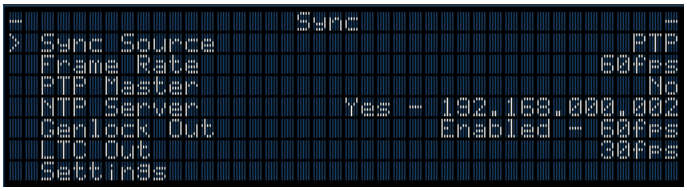
- **Mute All** – Mute/Unmute all audio outputs
- **Sample Rate** – View current audio sample rate (44.1KHz or 48.0KHz)
- **Output Volume** – Set volume level of individual output (-128dB→0dB)
- **Output Mute** – Mute/Unmute individual output

SHOW CONTROL MENU



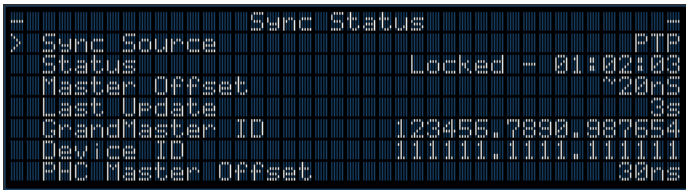
- **Script** – View currently active show control script
- **CPU Load** – View current load of show control processor
- **Serial Mode** – View mode of operation for multi-purpose serial port
- **Change Script** – Select a new active script file

SYNC MENU



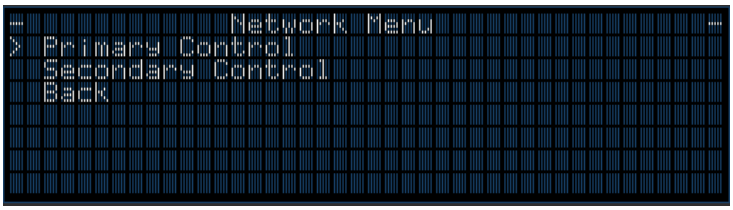
- **Sync Source** – View sync clock reference (Internal, PTP, NTP, GPS, SMPTE LTC, Genlock)
- **Frame Rate** – View operating frame rate of show control core
- **PTP Master** – View state of PTP clock distribution (No/Yes)
- **NTP Master Address** – View state of NTP Server clock distribution (No/Yes – IP)
- **Genlock Out** – View sync format of Genlock output (Enabled – Format)
- **LTC Out** – View operating frame rate of SMPTE LTC interface
- **PTP Info** – View detailed information about PTP status
- **Sync Status** – Access screen with detailed status information about the sync system

SYNC STATUS



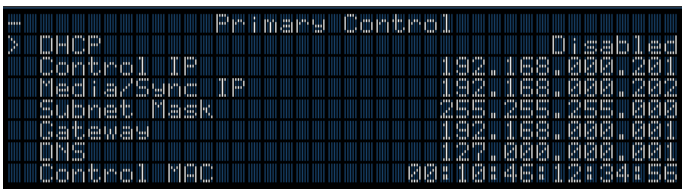
- **Reference** – View clock reference (Internal, PTP, NTP, GPS, SMPTE LTC, Genlock)
- **Status** – View lock status (Locked/Not Locked – HH:MM:SS)
- **Master Offset** – View estimated offset (in nS) from Clock Reference
- **Last Update** – View how long it has been since the last update with the Clock Reference (Seconds)
- **Detailed Info** – The screen items that follow will depend on which reference is being used:
    - **Internal** – No additional information
    - **PTP**
        - **GrandMaster ID –** None, or XXXXXX.XXXX.XXXXXX
        - **Device ID** - XXXXXX.XXXX.XXXXXX
        - **PHC Master Offset** – In nS
        - **Mean Path Delay** – In nS
    - **NTP**
        - **Server Address**
    - **GPS**
        - **PPS –** Active (1Hz, 5Hz, etc.)
    - **SMPTE LTC** – No additional information
    - **Genlock**
        - **Genlock Input –** Format of Genlock input signal (i.e.1080p60Hz)

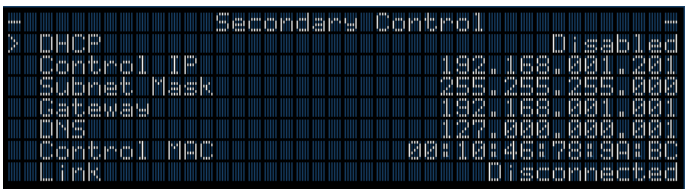
NETWORK MENU



- **Primary Control** – View Status and Configure the 'Primary Control' port
- **Secondary Control** – View Status and Configure the 'Secondary Control' port

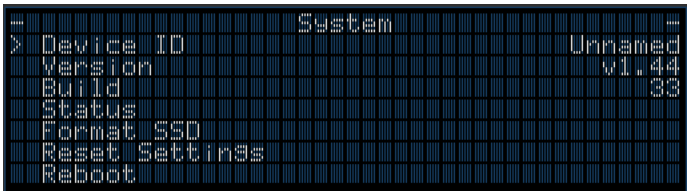
CONTROL NETWORK MENU





- **DHCP** – Enable/Disable DHCP network configuration
- **Control IP** – View/Configure Show Control IP address
- **Media/Sync IP** – Media/Sync IP address (Primary Only - Used for NTP/PTP sync and media file transfer)
- **Subnet Mask** – View/Configure subnet mask
- **Gateway** – View/Configure gateway IP address
- **DNS** – View/Configure DNS address
- **Control MAC** – View MAC address for Show Control Ethernet interface
- **Media/Sync MAC** – View MAC address for Media/Sync Ethernet interface
- **Link** – Current link status of network port

SYSTEM MENU

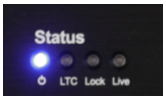


- **Device ID** – Shows the user-assigned name of the RidePlayer unit (i.e. “RV[1]”)
- **Version** – Firmware version of unit
- **Build** – Build revision of firmware
- **Status** – View status info such as temperature, fan speed, input voltage, etc.
- **Format SSD** – Erase and Format internal SSD media
- **Reset Settings** – Reset all configuration data (i.e. network, device name, etc.) to factory defaults
- **Reboot** – Reboot RidePlayer and re-launch script

INDICATOR LEDS

The top-panel of RidePlayer has a full set of indicator LEDs to provide an overall status of different features of the device.

STATUS



Power – ON whenever power is applied to the unit and the circuit breaker is switched on
LTC – ON whenever SMPTE LTC is being actively generated or read
Lock – ON whenever the sync system is locked to the configured reference
Live – ON whenever WinScript Live is connected to the unit

SERIAL - GPS

These indicators blink to indicate activity on either the GPS serial port, or the multi-purpose serial port.

NETWORK

These indicators display both network link and activity for all of the Control and Network Audio ethernet ports.

LED State	Description
OFF	No network link
SOLID ORANGE	Network link active – No network activity detected
BLINKING ORANGE	Network link active – Network activity detected

INPUTS

These indicators display the activation state of the 8 digital inputs.

LED State	Description
OFF	Inactive – No contact closure detected or voltage input is <9VDC
GREEN	Active – Contact closure detected or voltage input is 9-24VDC

OUTPUTS

These indicators display the activation state of the 4 dry-contact relay outputs. Keep in mind that these are normally-open (NO) relays, so the contacts are closed when the output is in an 'Active' state.

LED State	Description
OFF	Inactive – Relay contact is OPEN
GREEN	Active – Relay contact is CLOSED

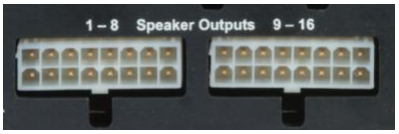
AUDIO

These indicators display the status of all 16 audio outputs. This includes playback activity and audio mute status.

LED State	Description
OFF	No audio playback
GREEN	Audio playback in progress
RED	Audio output is MUTED

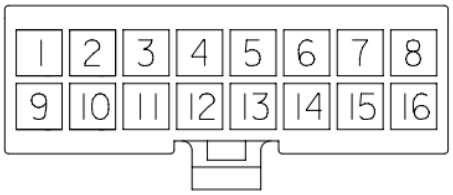
SPEAKER OUTPUTS

This is where you connect speakers being driven from the built-in amplifier outputs. These connectors provide access to all 16 of the 25W speaker outputs. Keep in mind that these outputs can be software-configured for bridged operation and wired differently to achieve up to 8 individual 50W speaker outputs.



Connector Information

Connector Type	2x8 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012160
Mating Pins	Molex 39000185
Recommended Wire	16 AWG Stranded



Connector Layout (Wire-Side View)

Pinouts

Speakers 1-8 (Single - 25W)	
SPK 1 (-)	1
SPK 1 (+)	9
SPK 2 (-)	2
SPK 2 (+)	10
SPK 3 (-)	3
SPK 3 (+)	11
SPK 4 (-)	4
SPK 4 (+)	12
SPK 5 (-)	5
SPK 5 (+)	13
SPK 6 (-)	6
SPK 6 (+)	14
SPK 7 (-)	7
SPK 7 (+)	15
SPK 8 (-)	8
SPK 8 (+)	16

Speakers 9-16 (Single – 25W)	
SPK 9 (-)	1
SPK 9 (+)	9
SPK 10 (-)	2
SPK 10 (+)	10
SPK 11 (-)	3
SPK 11 (+)	11
SPK 12 (-)	4
SPK 12 (+)	12
SPK 13 (-)	5
SPK 13 (+)	13
SPK 14 (-)	6
SPK 14 (+)	14
SPK 15 (-)	7
SPK 15 (+)	15
SPK 16 (-)	8
SPK 16 (+)	16

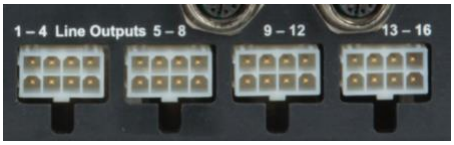
Speakers 1-8 (Bridged – 50W)	
SPK 2 (-)	1 & 9
SPK 2 (+)	2 & 10
SPK 4 (-)	3 & 11
SPK 4 (+)	4 & 12
SPK 6 (-)	5 & 13
SPK 6 (+)	6 & 14
SPK 8 (-)	7 & 15
SPK 8 (+)	8 & 16

Speakers 9-16 (Bridged – 50W)	
SPK 10 (-)	1 & 9
SPK 10 (+)	2 & 10
SPK 12 (-)	3 & 11
SPK 12 (+)	4 & 12
SPK 14 (-)	5 & 13
SPK 14 (+)	6 & 14
SPK 16 (-)	7 & 15
SPK 16 (+)	8 & 16

NOTE: The Speaker and Line Outputs can be inverted within the WinScipt project to compensate for mis-wired speakers or external amplifiers with inverted outputs.

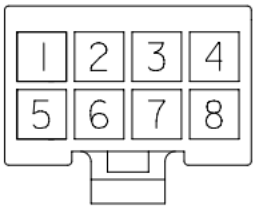
LINE OUTPUTS

These connectors provide unbalanced line-level analog audio outputs that are designed to feed external amplifiers or audio processing equipment.



Connector Information

Connector Type	2x4 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012080
Mating Pins	Molex 39000073
Recommended Wire	18 AWG Stranded



Connector Layout (Wire-Side View)

Pinouts

Line Outputs 1-4	
LINE OUT 1	1
SHIELD	5
LINE OUT 2	2
SHIELD	6
LINE OUT 3	3
SHIELD	7
LINE OUT 4	4
SHIELD	8

Line Outputs 5-8	
LINE OUT 5	1
SHIELD	5
LINE OUT 6	2
SHIELD	6
LINE OUT 7	3
SHIELD	7
LINE OUT 8	4
SHIELD	8

Line Outputs 9-12	
LINE OUT 9	1
SHIELD	5
LINE OUT 10	2
SHIELD	6
LINE OUT 11	3
SHIELD	7
LINE OUT 12	4
SHIELD	8

Line Outputs 13-16	
LINE OUT 13	1
SHIELD	5
LINE OUT 14	2
SHIELD	6
LINE OUT 15	3
SHIELD	7
LINE OUT 16	4
SHIELD	8

NOTE: The Speaker and Line Outputs can be inverted within the WinScipt project to compensate for mis-wired speakers or external amplifiers with inverted outputs.

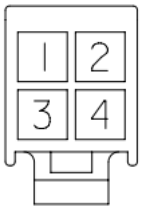
ANALOG IN

This input can be used to monitor analog voltage levels between 0-10V. Example applications include monitoring a secondary power rail (i.e. 48VDC power rail for external amplifiers).

NOTE: When monitoring voltages higher than 10V, a voltage-divider circuit can be used to scale down the input to the 0-10V range.

Connector Information

Connector Type	2x2 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012040
Mating Pins	Molex 39000073
Recommended Wire	18 AWG Stranded



Connector Layout (Wire-Side View)

Pinouts

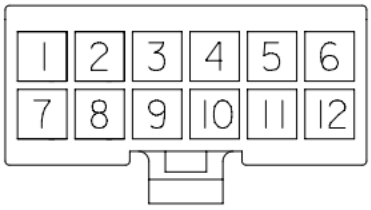
Analog In	
Analog In (+)	1
Analog In (-)	2
Analog In (+)	3
Analog In (-)	4

SERIAL/GPS/DMX

This connector provides access to the Serial Control, GPS, and DMX features. This includes two serial ports that can be configured to operate in either RS232 or RS422 modes. One of these ports is a dedicated GPS interface used for highly accurate clock synchronization and triggering based upon geographic location. The second port is multi-purpose and can be configured for DMX lighting control or for generic serial control of RS232/RS422 devices.

Connector Information

Connector Type	2x6 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012120
Mating Pins	Molex 39000073
Recommended Wire	18 AWG Stranded



Connector Layout (Wire-Side View)

Pinouts

GPS Port	
GPS PPS	6
GPS RS232 TX GPS RS422 TX(-)	12
GPS RS422 TX(+)	5
GPS RS422 RX(-)	11
GPS RS232 RX GPS RS422 RX(+)	4
GPS Power	10
Ground	3

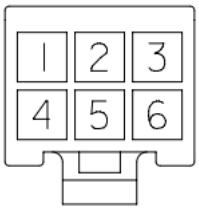
Serial/DMX Port	
Serial RS232 TX Serial RS422 TX(-) DMX Out (-)	9
Serial RS422 TX(+) DMX Out (+)	2
Serial RS422 RX(-) DMX In (-)	8
Serial RS232 RX Serial RS422 RX(+) DMX In (+)	1
Ground	7

SMPTE LTC

This connector provides access to the SMPTE Timecode (LTC) input and output.

Connector Information

Connector Type	2x3 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012060
Mating Pins	Molex 39000073
Recommended Wire	18 AWG Stranded



Connector Layout (Wire-Side View)

Pinouts

SMPTE LTC	
LTC IN (-)	3
LTC IN (+)	6
GND	2
GND	5
LTC OUT (-)	1
LTC OUT (+)	4

GENLOCK

These are standard BNC connectors that provide access to the genlock interface of the RidePlayer. The input will accept a Blackburst, Composite Sync, or Tri-level video sync source. The output will provide a Composite Sync signal that can be fed into other genlock-capable devices. Two DIP switches are provided to configure sync termination and sync input mode.

Sync Mode Switch	
OFF (UP)	C-Sync
ON (DOWN)	Blackburst/Tri-level

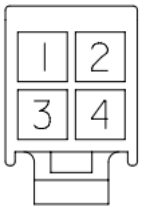
Termination Switch	
OFF (UP)	No Termination
ON (DOWN)	75Ω Termination

POWER INPUT

This connector is used to power the RidePlayer. While this unit will operate with a power source between 9-28VDC, we recommend 24VDC to achieve maximum output power for the built-in amplifiers. This input includes a built-in 25A circuit breaker switch.

Connector Information

Connector Type	2x4 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012040
Mating Pins	Molex 39000185
Recommended Wire	16 AWG Stranded



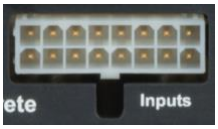
Connector Layout (Wire-Side View)

Pinouts

Power Input	
PWR	1
GND	2
PWR	3
GND	4

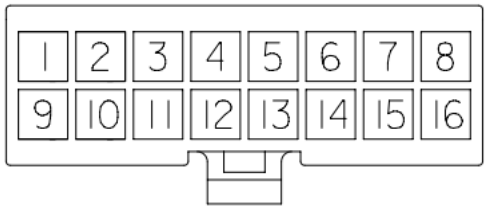
DIGITAL INPUTS

This connector provides access to 8 discrete digital inputs that can be used as show control triggers. Each input has two contacts and can be software-configured for two modes of operation; contact closure or voltage.



Connector Information

Connector Type	2x8 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012160
Mating Pins	Molex 39000073
Recommended Wire	18 AWG Stranded



Connector Layout (Wire-Side View)

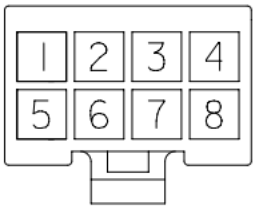
Digital Inputs	
IN1(+)	1
IN1(-)	9
IN2(+)	2
IN2(-)	10
IN3(+)	3
IN3(-)	11
IN4(+)	4
IN4(-)	12
IN5(+)	5
IN5(-)	13
IN6(+)	6
IN6(-)	14
IN7(+)	7
IN7(-)	15
IN8(+)	8
IN8(-)	16

DIGITAL OUTPUTS

This connector has 4 discrete dry-contact relay outputs that are utilized by the show control core. These contacts are normally-open (NO) and include inline self-healing polymer fuses that are rated to 900mA.

Connector Information

Connector Type	2x4 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012080
Mating Pins	Molex 39000073
Recommended Wire	18 AWG Stranded



Connector Layout (Wire-Side View)

Digital Outputs	
OUT1(A)	1
OUT1(B)	5
OUT2(A)	2
OUT2(B)	6
OUT3(A)	3
OUT3(B)	7
OUT4(A)	4
OUT4(B)	8

NETWORK CONTROL

RidePlayer has two Ethernet ports dedicated for control activities. The Primary port provides access to load a configuration and content from WinScript. The Primary port occupies two IP addresses; one for network synchronization (PTP and NTP) and media transfer, and another for device monitoring and control. The Secondary port only has a single IP address and can only be used for device monitoring and control.

Connector Information

Connector Type	M12 X-Coded Female
Mating Connector	M12 X-Coded Male

Some portions of the network interface, such as FTP access, are protected with a configurable username and password. By default, these credentials are configured to:

User Name	admin
Password	password

NETWORK AUDIO

These connectors are standard M12 X-Coded Ethernet connectors. They provide access to the 16x16 network audio interface that supports the AES67 and Dante standards. There are two connectors ("Primary" and "Secondary") to support redundant networks for enhanced reliability.

Connector Information

Connector Type	M12 X-Coded Female
Mating Connector	M12 X-Coded Male

SYNCHRONIZATION

Precise synchronization between show systems, especially those involving ride vehicles, is one of the biggest challenges faced in themed entertainment applications. Doing this properly involves achieving two critical conditions:

1. **Phase-locked Clocks** – All clocks must operate at the same rate to avoid 'drifting' from one another
2. **Precise Triggering** - All systems must start playback simultaneously with extreme precision

The unique design of the SyncCore™ technology integrated into RidePlayer, V16X, and BinloopX enables these products to easily achieve both conditions and ensure precise synchronization between all on-board and off-board show systems throughout the entire attraction.

PHASE-LOCKED CLOCKS

Let's say you and a friend buy identical wristwatches and set both to the exact same time. When you meet up again a week later, you might be surprised to see that the watches are likely many seconds off from one another. Why? Well, there are many contributing factors such as crystal frequency precision, temperature, mechanical tolerance, etc. Bottom line… the watches run at slightly different rates and this difference compounds over time. The same concept also holds true with the audio and video clocks used as the basis for AV playback. Without a shared reference clock, all AV components will play at slightly different rates and drift from one another over time.

The solution to this problem is to phase-lock these clocks with each other. This generally involves one piece of equipment serving as the clock 'master' and distributing its clock to other 'slave' devices. The 'slave' devices then speed up or slow down their clocks to stay in perfect time with the 'master' device.

SyncCore™ allows AV clocks to be phase-locked by any of the following methods:

- **PTP (IEEE-1588)**
- **NTP**
- **GPS**
- **SMPTE LTC**
- **Genlock**

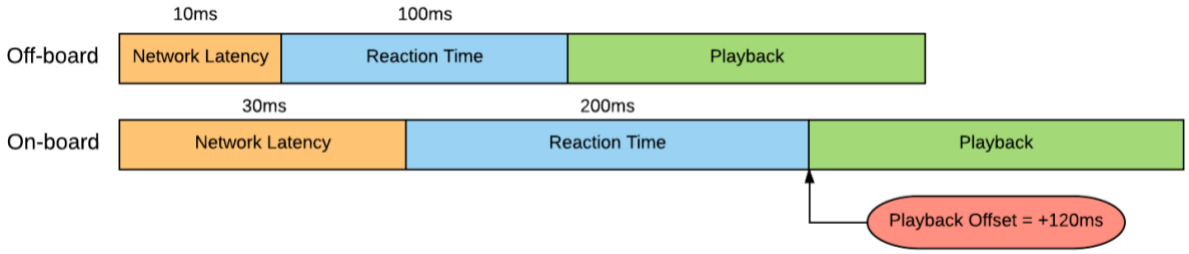
PRECISE TRIGGERING

No matter how perfectly locked clocks may be, it doesn't do much good if you can't start playback at the same time. To illustrate by example, let's walk through a typical dark ride system that requires synchronized on-board audio and off-board audio. If the on-board audio starts playing 300ms late, it's going to be off consistently for 300ms the entire time. There are several common factors that make this a challenging problem to contend with.

PLAYBACK LATENCY

First, most AV playback equipment is not capable of triggering consistently upon command. This is especially true for PC-based hardware running operating systems that are often busy running unpredictable tasks. Let's say you send a command to play audio and playback begins about 100ms after the command is issued. Repeat this same process, and next time it might take 200ms. It is simply impossible to ensure synchronization between two (or more) devices when playback reaction time is not consistent.

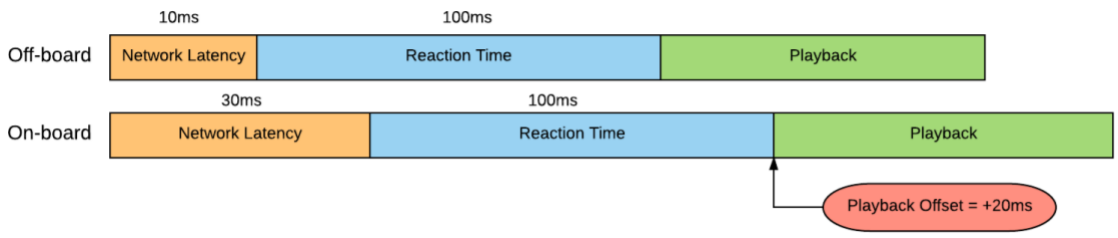
Network Latency + Inconsistent Playback Device



NETWORK LATENCY

Specialized AV playback equipment can greatly improve this situation by offering consistent reaction time. Let's say that this equipment guarantees that playback will begin exactly 100ms after a command is received. The idea is that you send the same command to two different devices and they both start after exactly 100ms. Viola! They are synchronized! The catch is that those commands must be received by both devices at exactly the same time for this concept to work. This is quite challenging, especially via wireless networks where packet latency can sometimes exceed 300ms.

Network Latency + Consistent Playback Device

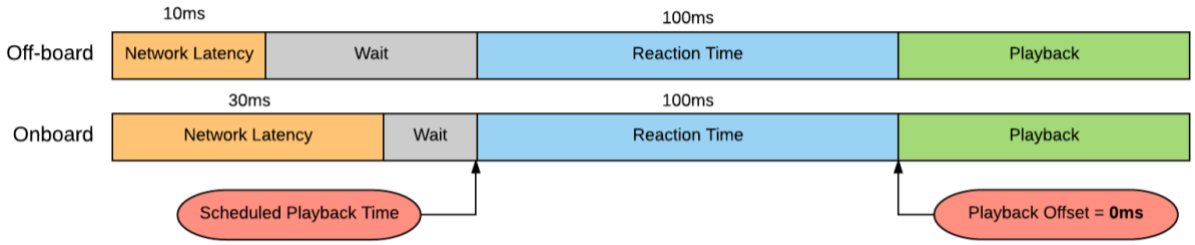


SCHEDULED PLAYBACK

To overcome these common problems, SyncCore™ enabled products take a unique approach. The same clock references that are used to maintain phase-lock between on-board and off-board devices are also used to maintain a very precise master clock. In other words, all devices keep track of the current hour, minute, second, and millisecond with a precision as tight as a few nanoseconds.

With this approach, playback times are scheduled based upon this shared master clock. This greatly reduces the impact of network latency because the time that the command arrives is irrelevant as long as it arrives before the scheduled playback time.

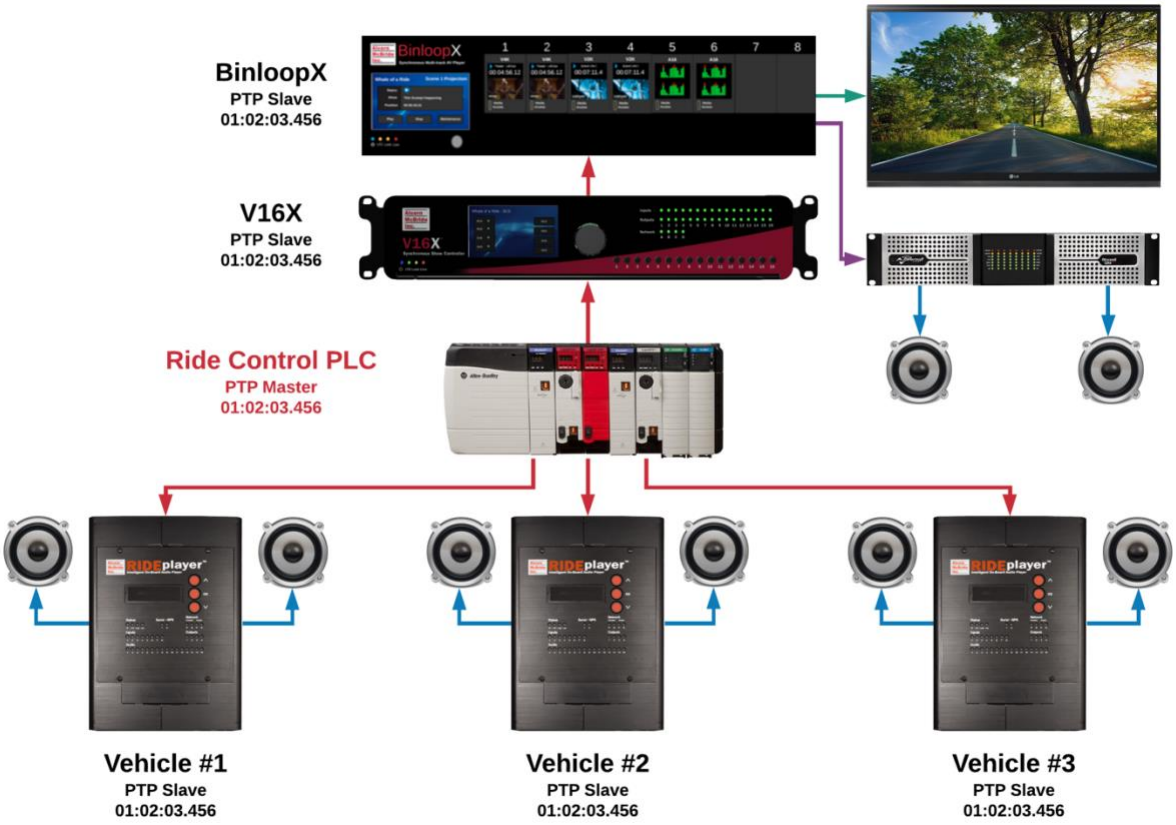
Scheduled Playback Time



SYSTEM ARCHITECTURE

Sounds great! But how do we actually use it in a real application?

To answer that question with a pretty picture, here is a representation of a typical dark ride system that uses the Ride Control PLC as the PTP clock master for the entire attraction. In this example, the V16X, BinloopX, and RidePlayer would all be configured to lock directly to the PLC's master PTP clock to ensure perfect synchronization for all show systems throughout the attraction.

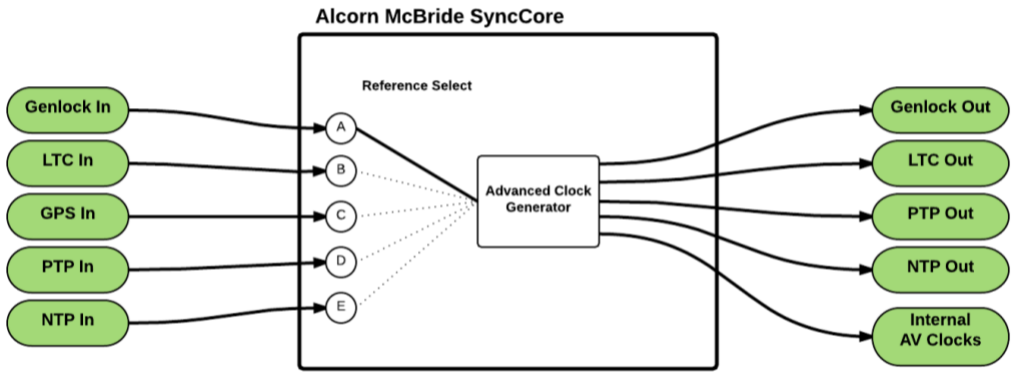


SYNC CONFIGURATION

The SyncCore™ system is able to achieve precise synchronization from any of the following reference clocks:

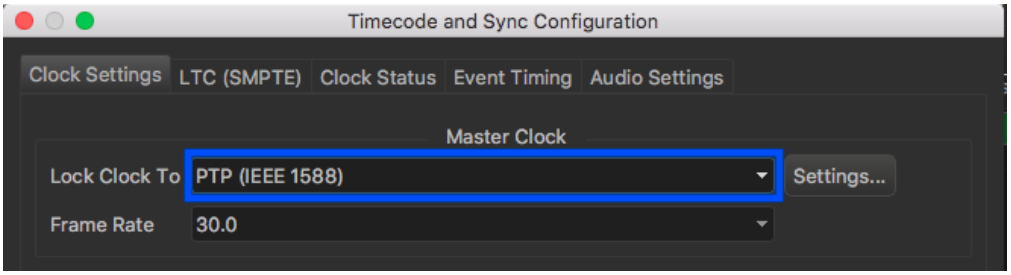
- **PTP (IEEE-1588)**
- **NTP**
- **GPS**
- **SMPTE LTC**
- **Genlock**

Here's a simple diagram to illustrate these synchronization methods, how they can be selected, and the resulting outputs that can be used to synchronize the entire system:



LOCKING TO A SYNC REFERENCE

Within your WinScript Live project, you can configure an external sync reference by accessing the **Configuration→Sync** menu option. Here, you can choose the reference source you want this unit to synchronize with and specify a master Frame Rate for the show control system.

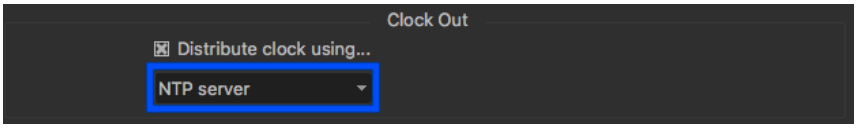


If your application does not require the use of an external reference clock, you can leave this selection at its default value of **Internal**. In this mode, the product will generate its own clocks internally.

DISTRIBUTING A SYNC REFERENCE

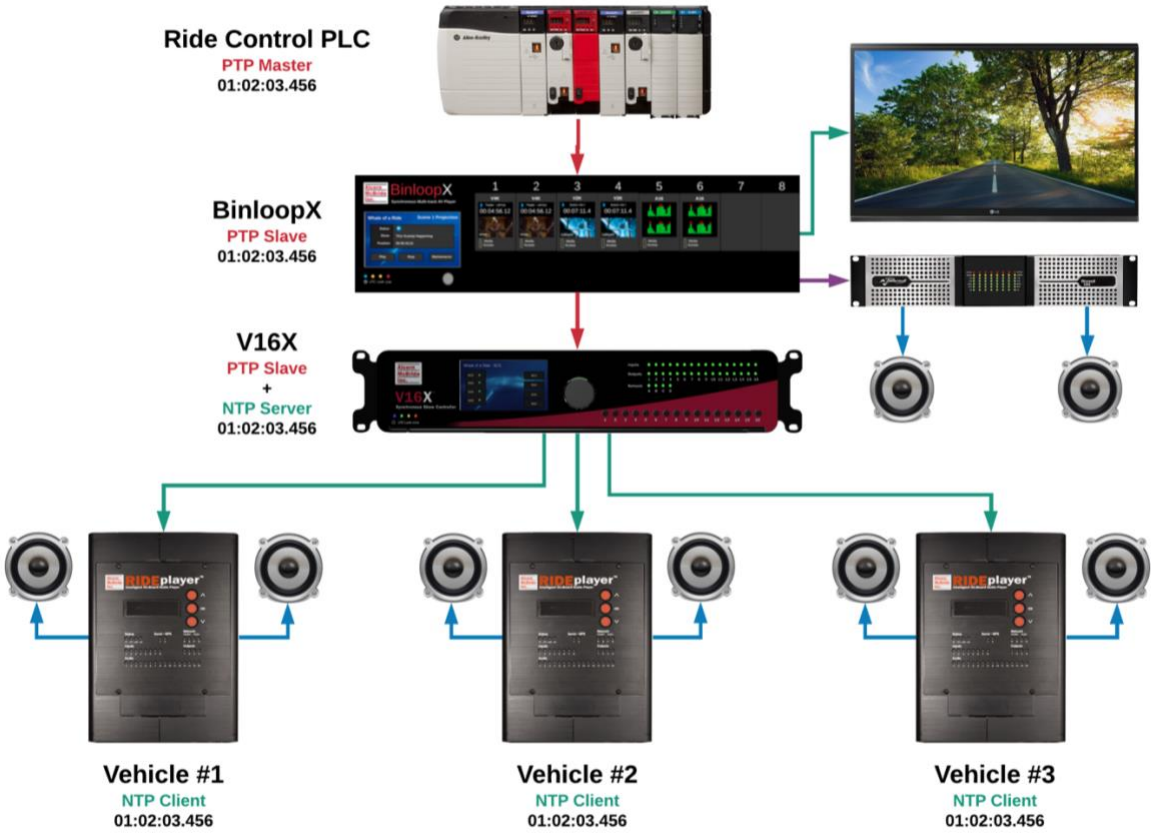
Not only can this product lock to an external sync reference, it is also capable of distributing sync references as well.

Genlock is always distributed automatically based upon the master Frame Rate you have selected. There's also the option to distribute a clock via network using NTP or PTP as well. This option is also configured from the Sync Configuration screen which is accessed using the **Configuration→Sync** menu.



One important thing to note is that it is possible for SyncCore™ products to lock to an external reference and simultaneously distribute another type of reference. A common example of this would be configuring a V16X to lock to an external PTP Master (i.e. Ride Control PLC). This V16X may then need to synchronize precisely with RidePlayers over a wireless network which may not support PTP distribution. To overcome the limitations of the wireless network, the V16X could be configured to distribute a sync reference as an NTP Server. We would then configure the RidePlayer units to lock to the V16X via NTP.

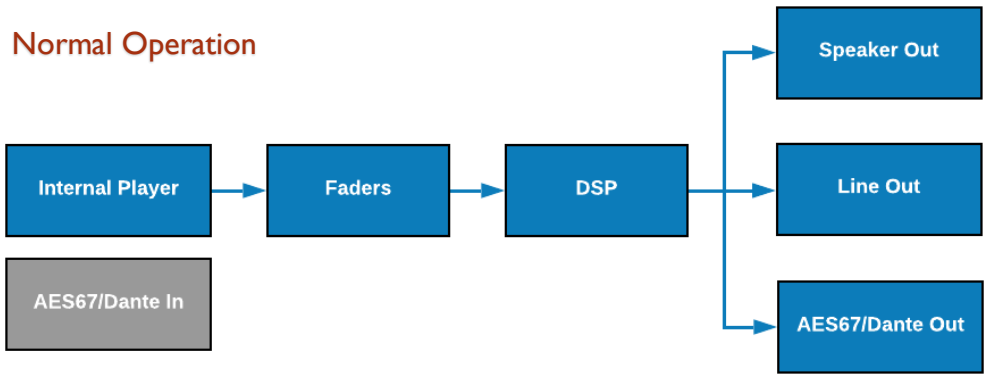
The hybrid system architecture would look like this:



NETWORK AUDIO PASS-THROUGH

RidePlayer has the ability to accept a 16x16 AES67 or Dante network audio input and route the incoming channels directly to the line-level, amplifier, and network audio outputs. We call this mode of operation Network Audio Pass-Through because it effectively bypasses RidePlayer's internal playback system. This mode empowers media designers to feed the output of their editing suite directly to RidePlayer's outputs to effectively preview their content without having to load audio files to the unit.

To explain how this mode affects RidePlayer, let's first look at the audio signal path during normal operation:

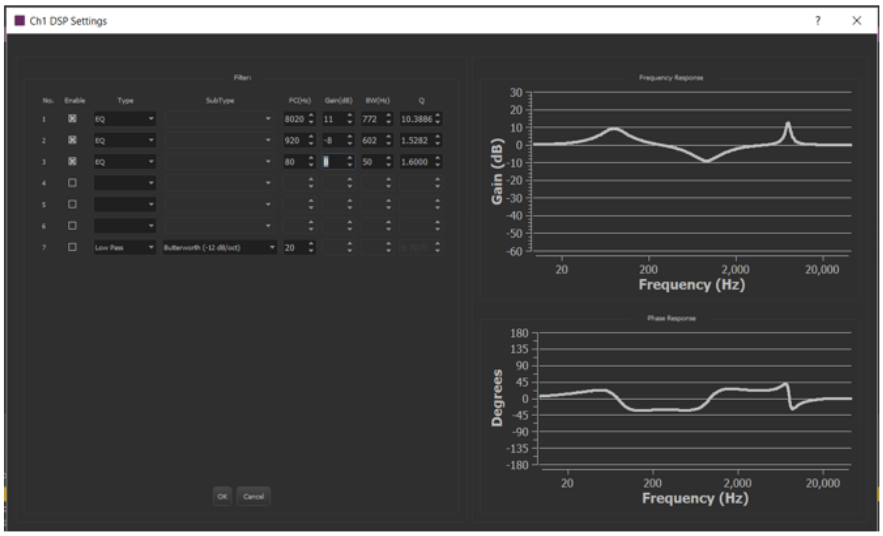


As you can see, during normal operation the internal audio player outputs are fed into the audio faders. This enables you to control the levels for each output channel.

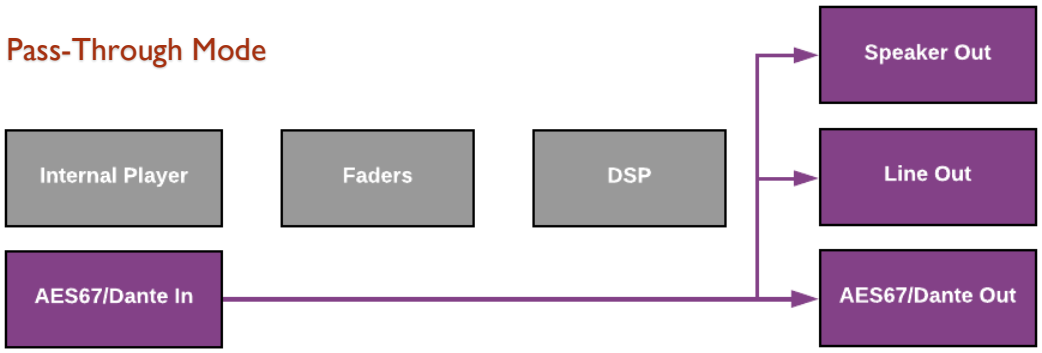
Faders

The DSP section is where the user can manipulate the audio signal as needed. Once the audio signal is processed, the signal is passed on to the speaker outputs, line outputs, and AES67/Dante outputs.

DSP



When the Pass-Through feature is engaged, the signal path changes to the following:



As you can see, the faders and DSP will not take effect when the RidePlayer is in this mode. The Internal Player and Faders are effectively disconnected from the signal path. This means that all levels of adjustment and DSP processing must be done prior to feeding the audio signal to the RidePlayer.

PATCHING INTO AES67/DANTE INPUTS

The 16x16 network audio input interface of RidePlayer will automatically show up on the AES67/Dante network. This enables the Dante Controller software can patch any stream into these inputs.

To illustrate a common example, this is what a computer running Dante Virtual Sound Card might look like within Dante Controller:

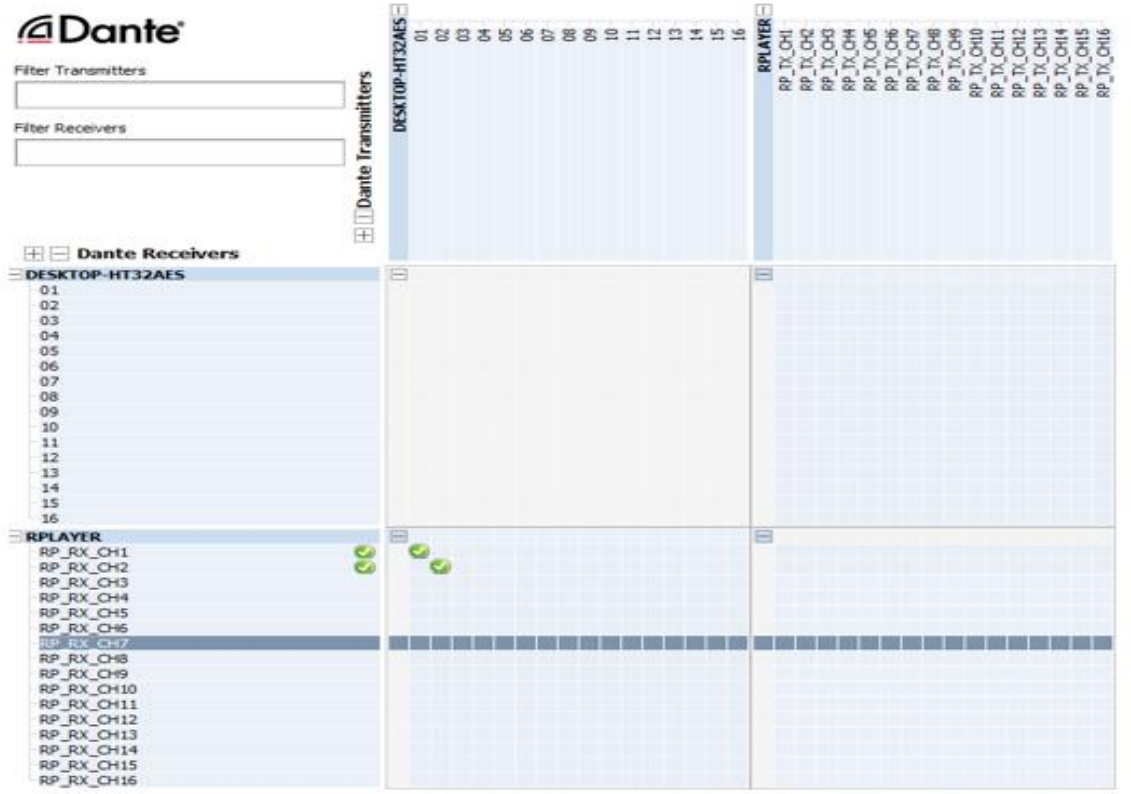
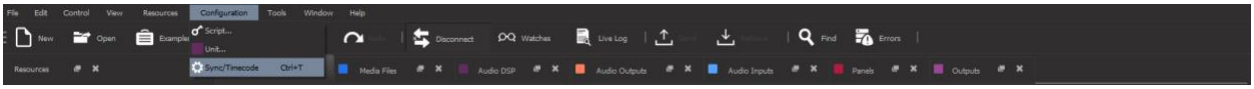


Fig 5

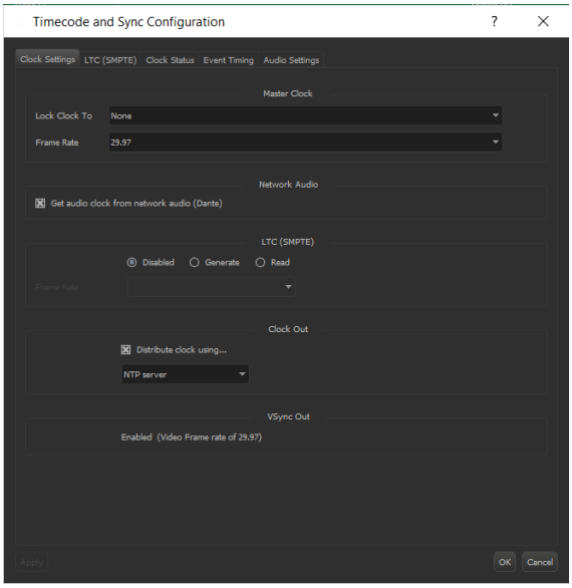
Routing the outputs of the Dante Virtual Sound Card is simply a matter of patching them to RidePlayer's inputs.

ENABLING AUDIO PASS-THROUGH VIA WINSCRIPT LIVE 4

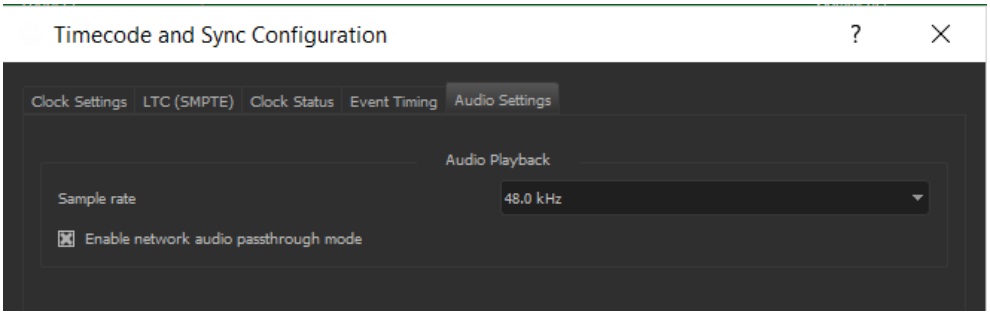
Click on Configuration and choose Sync/Timecode (Ctrl+T)



Under Clock Setting Tab check "Get audio clock from network audio".



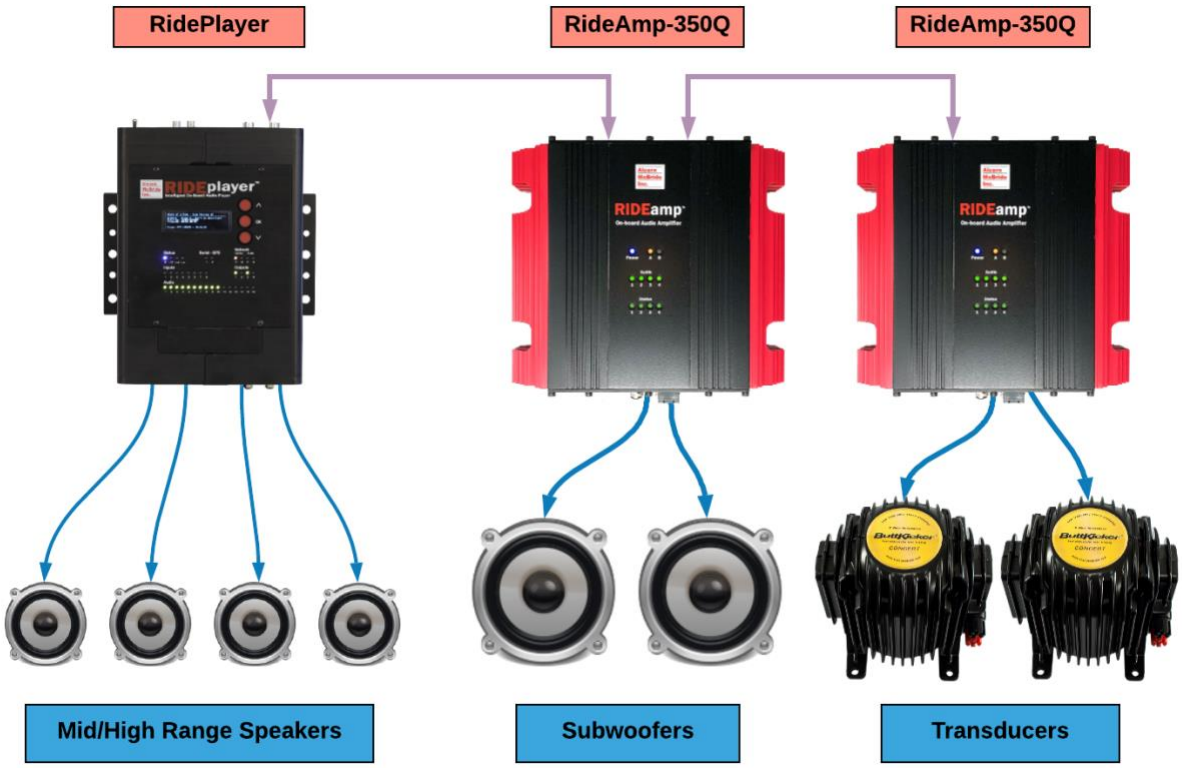
Click the Audio Settings tab and check "Enable network audio passthrough mode".



Click OK to accept the changes and voila! The AES67/Dante input is now being routed directly to RidePlayer's outputs. Once the mix is complete, the media designer can export WAV files to be loaded onto RidePlayer and the Network Audio Bypass Mode can be disabled to resume normal operation.

RIDEAMP INTEGRATION

The Alcorn McBride RideAmp serves as a natural extension to the RidePlayer. RidePlayer easily handles the complexities of precisely synchronized on-board audio playback while RideAmp units greatly enhance its amplification capabilities. The AES67/Dante network audio interfaces allow you to daisy-chain up to 8 RideAmp units while maintaining an all-digital signal path with rugged M12 connections. These network connections also allow you to remotely control and monitor the RideAmp units via RidePlayer.

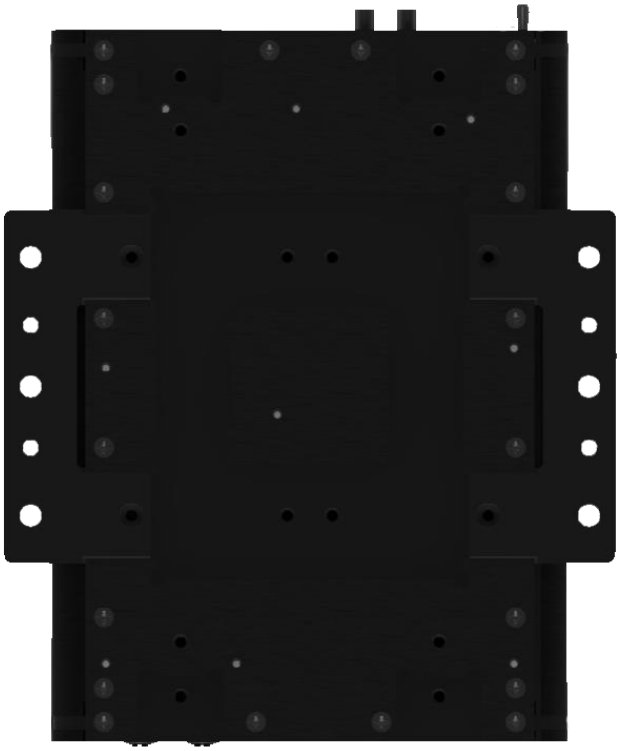


For more information about RideAmp, please visit our website at www.alcorn.com.

MOUNTING

RidePlayer is designed to be flush-mounted to a flat surface. It has two removable brackets that can be relocated to mount the unit in two different configurations; side mounted and end mounted. This allows for the conservation of vertical or horizontal space on the ride panel as needed.

Side Mounted



End Mounted

For exact measurements and mounting hole locations, drawings and models are available in the Downloads section of the RidePlayer web page at www.alcorn.com.

SPECIFICATIONS

CONTROL

Show Control	Advanced Scripted Control Timeline Programming ShowTouch Touch Panel Integration Tightly-integrated Device Control (PLC, DSP, Animation, AV, Projection, etc.)
Display	42x8 character user-programmable OLED /w navigation buttons
LED Indicators	Power, LTC, Sync, Live Mode, Serial, Ethernet, Inputs, Outputs, Audio Output Status
Ethernet	Primary - 10/100/1000BT (M12 X-Coded) Secondary - 10/100BT (M12 X-Coded)
Serial	2 x RS232/RS422 (12-pin Molex)
Digital Inputs	8 x Contact/Voltage (5-24VDC) Inputs (16-pin Molex)
Digital Outputs	4 x Dry-contact Relay Output /w 900mA self-healing fuses (8-pin Molex)
Analog Inputs	1 x Power Supply Voltage-Sense 0-28VDC (Internal) 1 x General Purpose 0-10VDC (4-pin Molex)
Show Memory	Removable SD Card /w Captive Socket
GPS	NMEA-0183 waypoint triggering

AUDIO

Playback	64 sources – 16 output channels x 4-layers of polyphony per channel 16-bit or 24-bit WAV 44.1kHz, 48kHz Sample-accurate
DSP	9-band Parametric EQ High-Pass, Low-Pass, Notch Filters Phase Shift Treble Shelf, Bass Shelf Delay
Line Outputs	16 x unbalanced outputs (4 x 8-pin Molex) -17dBV (with 24VDC Power)
Amplifier	16 x 25W (bridgeable to 50W) (2 x 16-pin Molex)
Network Audio	16x16 AES67/Dante Interface – (2x M12 X-Coded for Primary & Secondary)
Mic Input	Dynamic Mic or 48V Phantom Power Mic /w PTT (6-pin Molex)
Media	128GB M.2 SSD (Internal)

* *Network audio only*

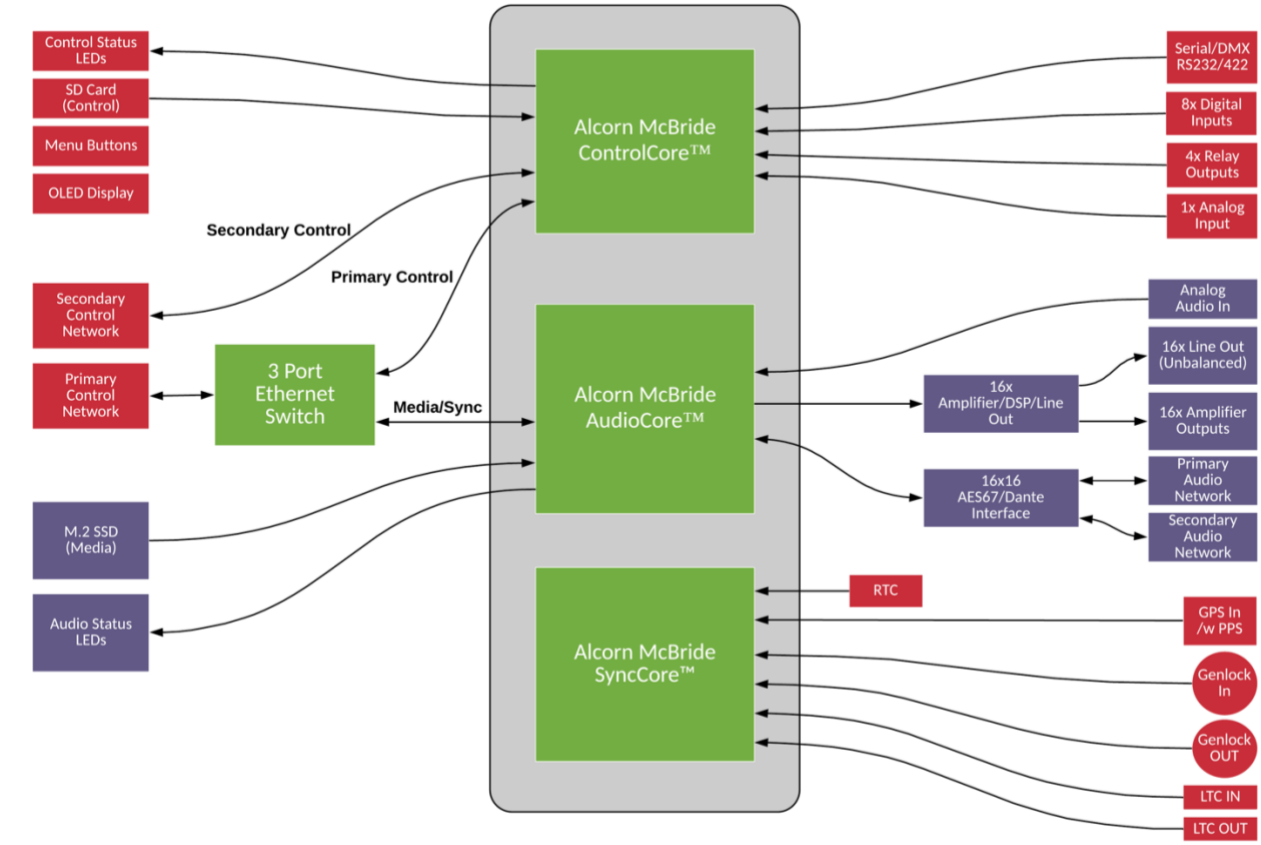
SYNCHRONIZATION

Sync Inputs	GPS In (Serial Port – 12-pin Molex) PTP In – IEEE-1588 (Primary Control Port - M12 X-Coded) NTP In (Primary Control Port - M12 X-Coded) Genlock In - Blackburst, C-Sync, Tri-level (BNC) SMPTE LTC In (6-Pin Molex)
Sync Outputs	PTP Out – IEEE-1588 (Primary Control Port - M12 X-Coded) NTP Out (Primary Control Port - M12 X-Coded) Genlock Out - C-Sync (BNC) SMPTE LTC Out (6-Pin Molex)
Frame Rates	23.976, 24, 25, 29.97, 30, 47.952, 48, 50, 59.94, 60
GPS Type	NMEA-0183 /w PPS Clock Input
Clock Accuracy	GPS - <1uS /w <1ppB Free-run accuracy PTP - <1uS /w <1ppB Free-run accuracy Genlock + NTP - <1mS /w <10ppB Free-run accuracy

PHYSICAL

Size	9.5”W x 13.1”L x 3.3”H
Weight	11 lbs.
Power	9-28VDC 24VDC @ 3A without Speakers 24VDC @ 20A with Speakers
Circuit Breaker	25A
Operating Temperature	0C (32F) to 38C (100F) 0-90% Relative Humidity
Mounting	Configurable surface-mount brackets (Top or Side)
Configuration Switches	Genlock Type, Genlock Termination, Phantom Power, PTT Mode

BLOCK DIAGRAM



ACCESSORIES

DEVELOPMENT KIT

Part Number: DEVKIT-RIDEPLAYER

We offer this kit to enable users to quickly bench test or build mockups with RidePlayer units. This kit includes prefabricated cables for each of the connectors on the unit. It also includes a 24V/20A DIN Rail power supply to power up the unit.

We recommend that new users order at least one of these kits to get started with RidePlayer development. Since most on-board audio applications use highly customized cabling, this kit is probably not practical for wiring up an entire fleet of ride vehicles.

CONNECTOR KIT

Part Number: CONKIT-RIDEPLAYER

This kit provides a full set of blank Molex connectors and pins for the majority of RidePlayer's connectors. We offer this kit as a convenience to fabricators so that the individual parts don't have to be researched and ordered. Unlike the Development Kit, the Connector Kit is intended to be used for fleet deployments. We recommend ordering a Connector Kit for each RidePlayer in the ride vehicle fleet.

M12 X-CODED ETHERNET CABLE

Part Number: CM12X-2M

This is an M12 X-Coded patch cable that allows RidePlayer to connect to an M12 X-Coded Ethernet switch. Our stock cable is 2 Meters (6.5ft) in length. For fleet deployments, we have the capability to manufacture cables to custom lengths to suit your application. Please contact us for quotes for custom length M12 X-Coded cables.

M12→RJ45 ETHERNET ADAPTER

Part Number: CM12X-RJ45F

This is an adapter that converts from the M12 X-Coded connectors of RidePlayer to a standard RJ45F Ethernet connector.

POWER SUPPLY

Part Number: PSD24V20A

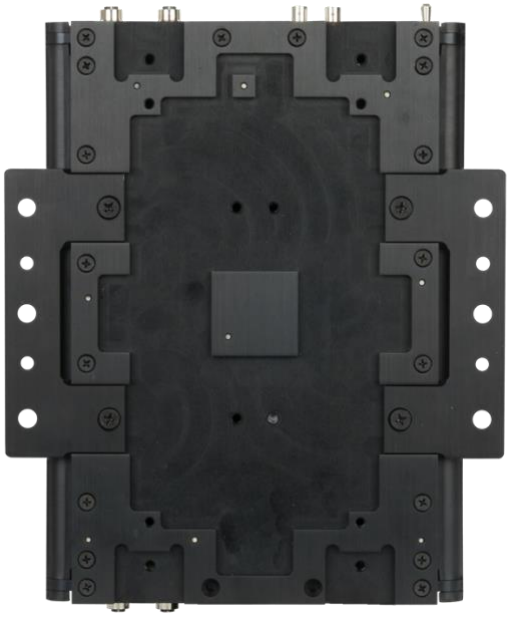
This supply is capable of providing RidePlayer with the recommended 24VDC/20A power source. It accepts an input between 100-240VAC and is designed to mount on a DIN Rail alongside the RidePlayer.

PRODUCT PHOTOS

Top

Side

Bottom



Control Connectors

Audio Connectors