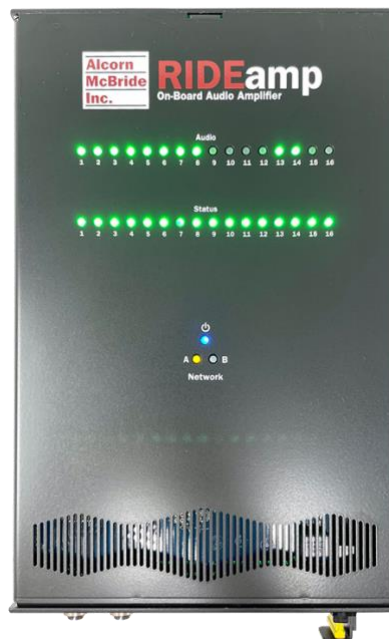


User's Guide

ON-BOARD AUDIO AMPLIFIER



RIDEAMP-25H

August 11, 2022

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WELCOME!

Congratulations on your shiny new Alcorn McBride RideAmp!

Our RideAmp family of products have been designed to provide rugged, flexible, and powerful audio amplifier solutions that are purpose-built for on-board audio applications such as coasters, dark ride vehicles, and parade floats.

For a lack of better options, these applications are often forced to use commercial grade amplifiers that were designed for automotive or marine applications. There are many unfortunate drawbacks to this approach such as:

1. **Consumer-grade Interconnects** - Unbalanced analog RCA inputs.
2. **Vibration-sensitive Design** – No protective coating and no protection for electronic components.
3. **No Intelligence** – No ability to remotely monitor amplifier health, voltage levels, temperature, etc.

RideAmp changes the game by providing a platform that was designed specifically for this niche application. It is a rugged solid-state solution that's designed to endure the high-vibration environments frequently encountered within ride vehicles. We've taken steps like reducing high-mass electronic components, conformal coating circuit boards, and adding protection to larger components to make it an extremely durable design.

All interconnects offer professional inputs and outputs that are better suited for this type of environment. Captive Molex connectors with gold-plated pins provide reliable connections for power and speakers. M12 connectors offer mechanically secure network connections that provide an all-digital signal path for network audio and reliable access to control/status information.

When one or more RideAmp units are paired with an Alcorn McBride RidePlayer, you have a complete solution that offers perfectly synchronized audio, DSP, high-power audio amplification, and comprehensive status monitoring of the entire on-board audio system.

These products leverage our 30 years of experience in designing products specifically for themed entertainment applications. In true Alcorn McBride fashion, the solid-state and rugged design of these products will ensure years of 24/7 maintenance free operation which is essential to zero downtime for attractions. It is our mission to provide solutions that are suited for the unique demands of themed entertainment applications like theme park attractions, amusement parks, and museums.

PRODUCT FEATURES

AUDIO FEATURES

This product features a flexible 16-channel audio amplifier system with professional network audio input and monitoring.

The audio features are:

- **16-channel Audio Amplification**

Mode	12VDC	24VDC
Single (8Ω)	8W	30W
Bridged (8Ω)	12W	55W
Single (4Ω)	15W	25W
Bridged (4Ω)	20W	60W

- **16x16 AES67/Dante Network Audio Input**
- **Remote monitoring via Network Audio link (Requires RidePlayer)**

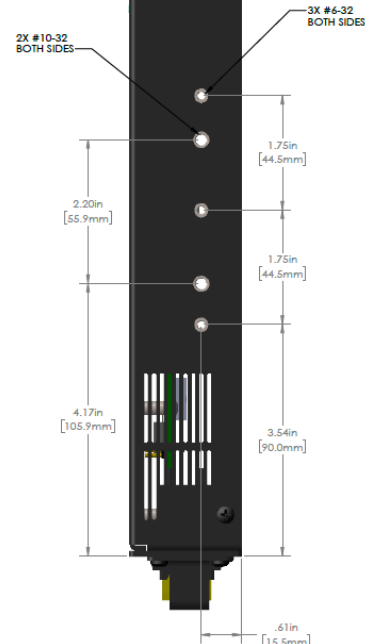
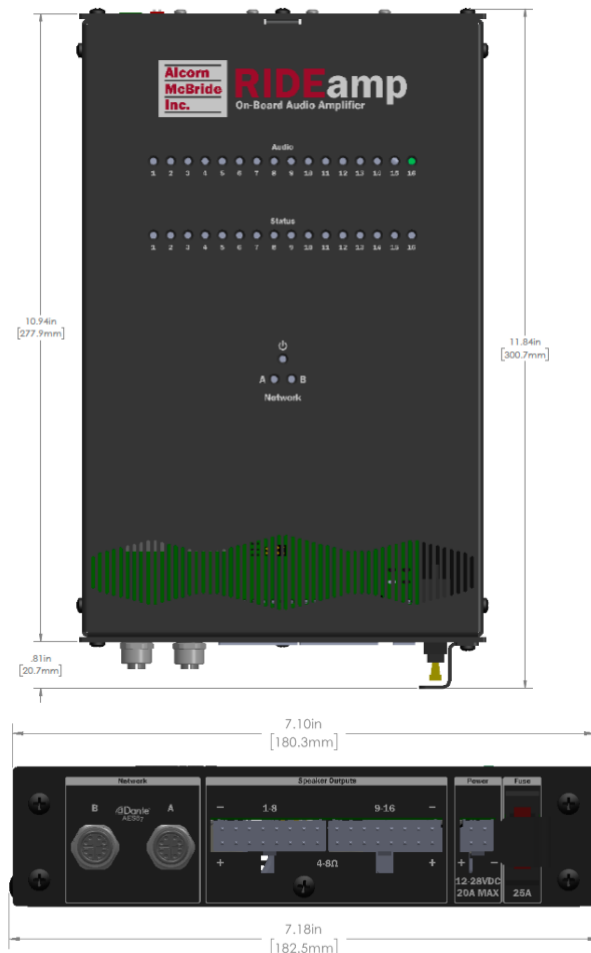


PHYSICAL FEATURES

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 Resistant Design**
 - Coasters, Dark Rides, Parade Floats, Parking Trams, etc.
- **9-26VDC Power Input /w software monitoring**
- **Rugged Locking Molex connectors**
 - Power
 - Speakers
- **M12 X-Coded Ethernet Connectors**
 - AES67/Dante Network Audio
 - Control and Status Monitoring
- **Dimensions – 11.9”L x 7.2”W x 1.7”H (302mm x 183mm x 44mm)**
- **Weight – 2.35 lbs (1.1kg)**



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.

Application Notes	http://www.alcorn.com/applications
Support Resources	http://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 RideAmp.

WIRING AND CONNECTIVITY

A few connections are required to experience the core functionality of RideAmp. 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 RIDEAMP-25H Development Kit covered in the **Accessories** section of this document. This kit provides a full set of prefabricated 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 Electronics. However, until they inevitably succeed, RideAmp needs power to work properly.

You'll want to start by connecting RideAmp's power input to a 24VDC or 12VDC power source like a battery, super-capacitor, or bench supply. To get the most power out of this product, we recommend a 24VDC/20A power source.



SPEAKER OUTPUTS

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.

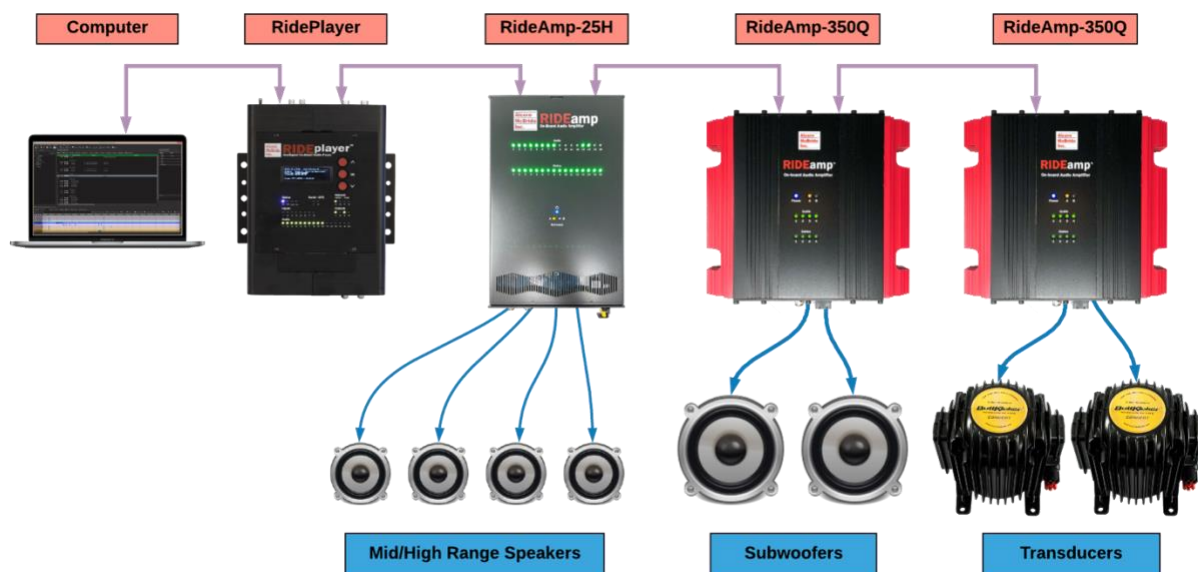
The next step is pretty simple. Connect the positive (+) terminal of Speaker Output 1 to the positive (+) input of the speaker. Connect the negative (-) terminal of Speaker Output 1 to the (-) terminal of the speaker. Rinse and repeat for any other speakers that you wish to connect.



AUDIO INPUTS

Audio inputs are provided on the Dante/AES67 Network Audio interface. The first step in properly configuring this interface is wiring your source device (i.e. RidePlayer) and your RideAmp products to the same network. This can be done using an Ethernet switch, or by leveraging the dual network interfaces of these devices to daisy-chain up to 8 units.

During the configuration phase, you'll also need to temporarily connect a computer running Audinate's Dante Controller software (www.audinate.com). This computer can be connected to a switch on the same network, or into either end of the daisy-chain as illustrated below:



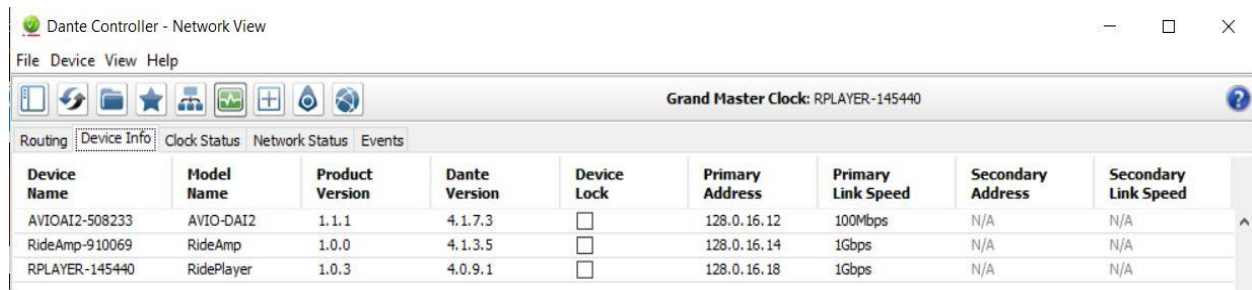
NETWORK AUDIO CONFIGURATION

RideAmp-25H supports the industry-standard Dante and AES67 protocols for audio distribution. If you've used other devices based on these standards, setting up the audio inputs of this amplifier will be a piece of cake.

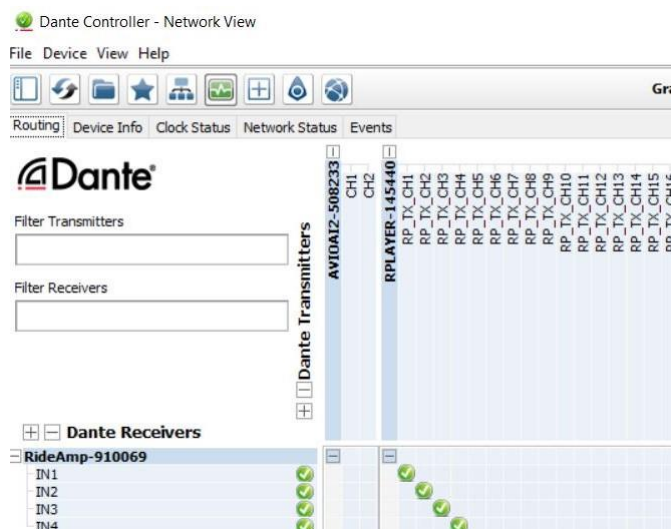
All Alcorn McBride devices that support Dante are shipped with DHCP mode enabled by default. However, it's strongly recommended to assign a static IP address to each device to prevent to avoid addressing issues the next time the amplifier is powered up.

Whether you use DHCP or static IP addresses, the goal is to get all devices on the same subnet so that they can interface to one another. Once this is taken care of, you can follow these steps to patch RidePlayer (or another network audio transmitter) to the RideAmp-25H.

1. Launch the Dante Controller application on your Windows or OS X computer.
2. Click on Device Info to view the current IP address, firmware version, and link speed. If their IP addresses are configured properly, you should see both the RidePlayer and RideAmp in this list.



3. Click on Routing tab to make your first audio patch or subscription. Remember the Rideamp-25H is capable of receiving 16 audio inputs. Let's go ahead and patch the first 4 audio inputs of RideAmp to the first 4 audio outputs of RidePlayer by clicking the grid intersection of these items.



4. You're good to go! Both the RidePlayer and RideAmp will retain these settings from now on.

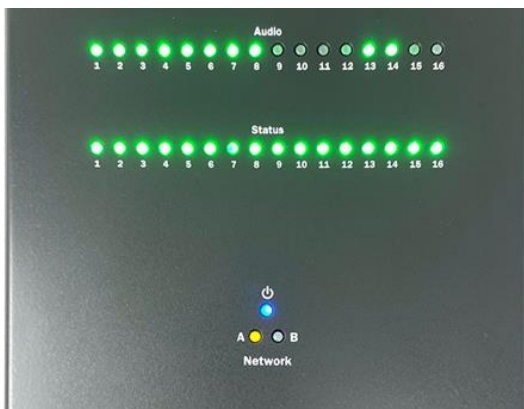
HARDWARE INFORMATION

OVERVIEW

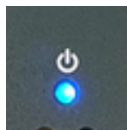
RideAmp has quite an assortment of dedicated hardware for the purpose of configuration, status monitoring, and interfacing to other hardware. This section covers these features in more detail.

INDICATOR LEDS

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



POWER



LED State	Description
OFF	No Power
BLUE	DC Power Applied

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

AUDIO

These indicators display the signal status of the each audio input.



LED State	Description
OFF	OK - No audio signal detected
GREEN	OK - Active audio signal
ORANGE	Not Ready - Initializing
RED	Audio output is MUTED

STATUS

These indicators display the operational status of each amplifier channel.

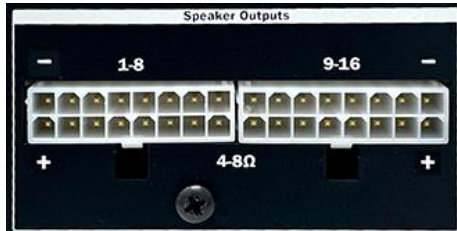


LED State	Description
OFF	Amplifier not ready - Initializing
GREEN	Amplifier OK
ORANGE	Amplifier WARNING <ul style="list-style-type: none">• High Temperature• Single Fan Failure Bootloader Mode ENABLED (DIP Switch #2)
RED	Amplifier FAULT <ul style="list-style-type: none">• Critical Temperature• Dual Fan Failure• Shorted Speaker Output (Protect)• Low Power Voltage• Audio Clock Lost Factory Test Mode ENABLED (DIP Switch #1)

CONNECTORS

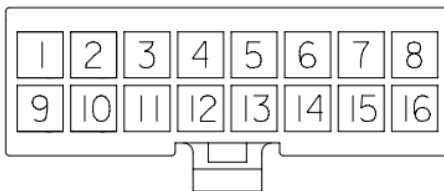
SPEAKER OUTPUTS

This is where you connect speakers to the RideAmp. You can wire up to 16 discrete channels of speakers at up to 30W each, or you can bridge each channel pair to achieve up to 60W.



Connector Information

Connector Type	2x8 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012160
Mating Pins	Molex 0039000185
Recommended Wire	16 AWG Stranded



Connector Layout (Wire-Side View)

Pinouts

Speakers 1-8 (Single - 30W)	
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 - 30W)	
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 - 60W)	
SPK 1 (-)	1 & 9
SPK 1 (+)	2 & 10
SPK 3 (-)	3 & 11
SPK 3 (+)	4 & 12
SPK 5 (-)	5 & 13
SPK 5 (+)	6 & 14
SPK 7 (-)	7 & 15
SPK 7 (+)	8 & 16

Speakers 9-16 (Bridged - 60W)	
SPK 9 (-)	1 & 9
SPK 9 (+)	2 & 10
SPK 11 (-)	3 & 11
SPK 11 (+)	4 & 12
SPK 13 (-)	5 & 13
SPK 13 (+)	6 & 14
SPK 15 (-)	7 & 15
SPK 15 (+)	8 & 16

NETWORK

The RideAmp provides a total of two M12 X-Coded network ports. These ports are devoted to a 16 input (16x0) network audio interface that supports the AES67 and Dante standards. These ports also pass back important status information via the Dante/AES67 link to RidePlayer for monitoring amplifier health.

Two connectors are provided for each of these network connections to allow up to eight RideAmp units to be daisy-chained without the need for an external M12 Ethernet switch.



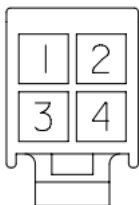
POWER



RideAmp is designed to accept either a 12VDC or 24VDC power source. An inline automotive blade fuse (25A/80V) is accessible on the RideAmp side panel. Voltage levels are electronically monitored, and low voltage conditions can be reported back via the network audio connection to RidePlayer.

Connector Information

Connector Type	2x2 Molex Mini-Fit Jr.
Mating Connector	Molex 0039012040
Mating Pins	Molex 0039000185
Recommended Wire	16 AWG Stranded



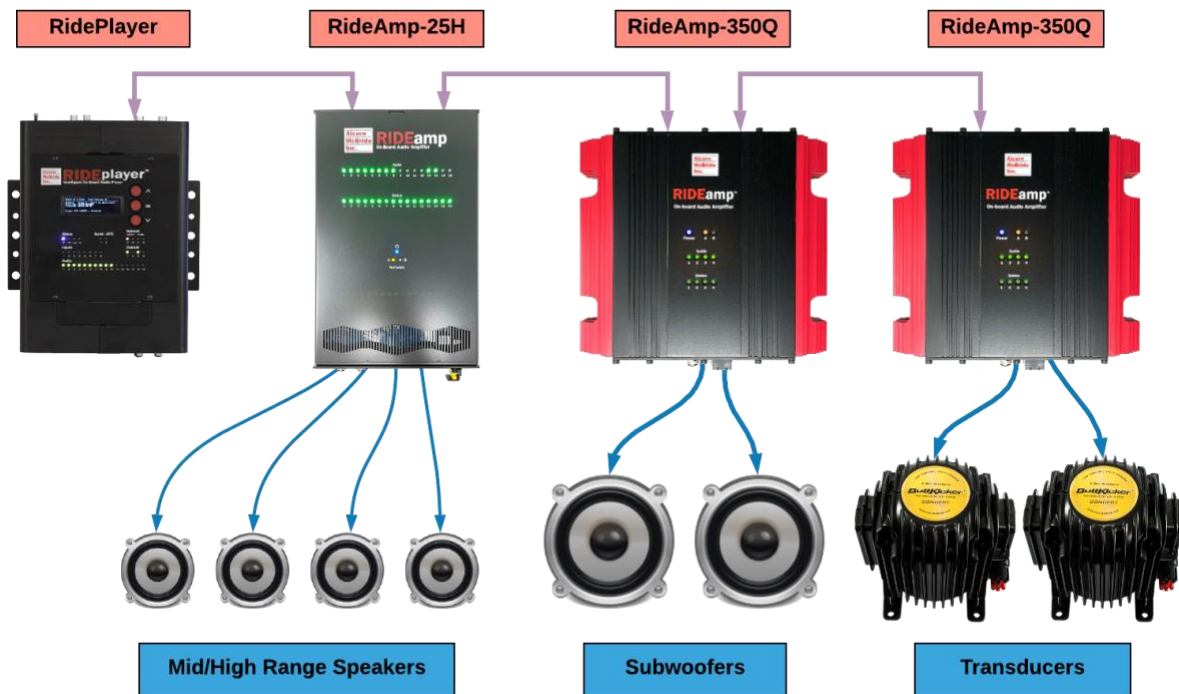
Connector Layout (Wire-Side View)

Pinouts

Power Input	
DC(+)	1
DC(-)	2
DC(+)	3
DC(-)	4

RIDEPLAYER INTEGRATION

The RideAmp family of products are designed to serve as a natural extension to the Alcorn McBride 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.



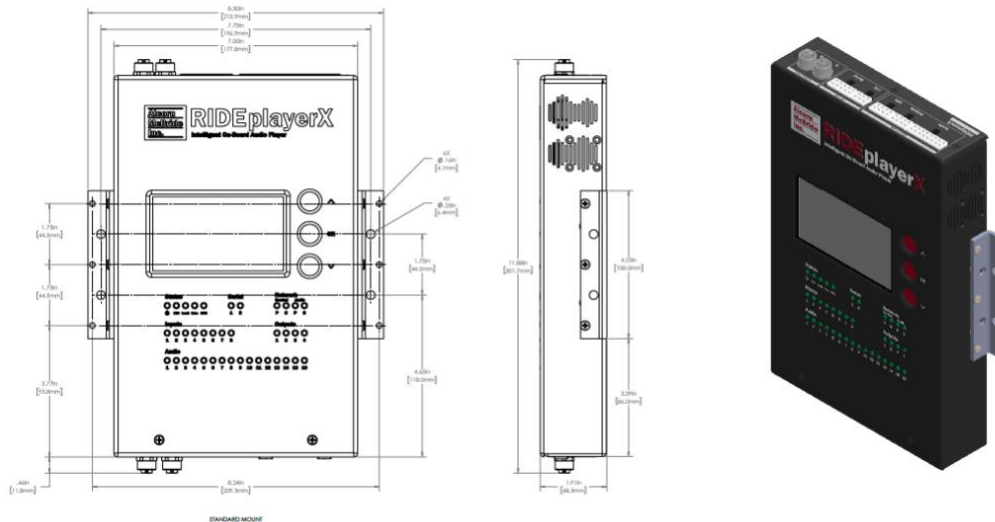
For more information about RidePlayer or RideAmp, please visit our website at www.alcorn.com.

MOUNTING

RideAmp-25H is compatible with a variety of mounting solutions that we offer for many Alcorn McBride products.

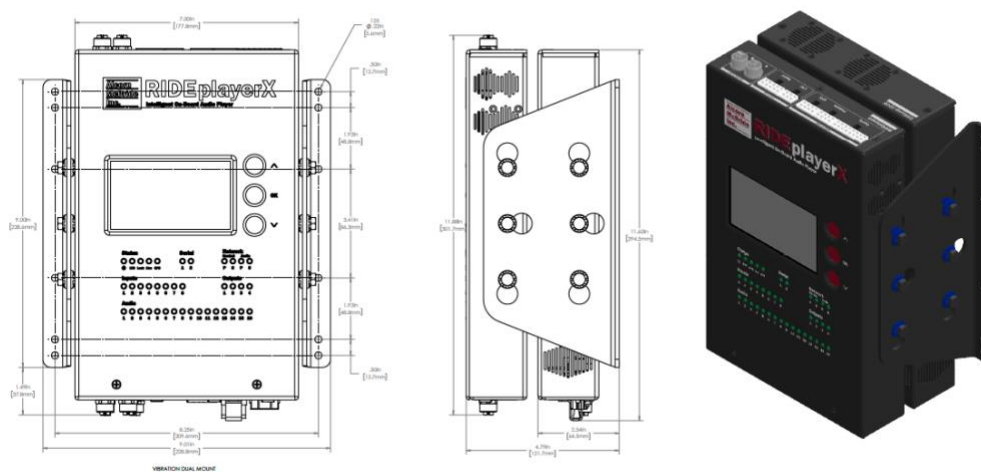
SMK-1

This is our single unit surface mounting kit, which allows RideAmp-25H to be flush mounted to a flat surface.



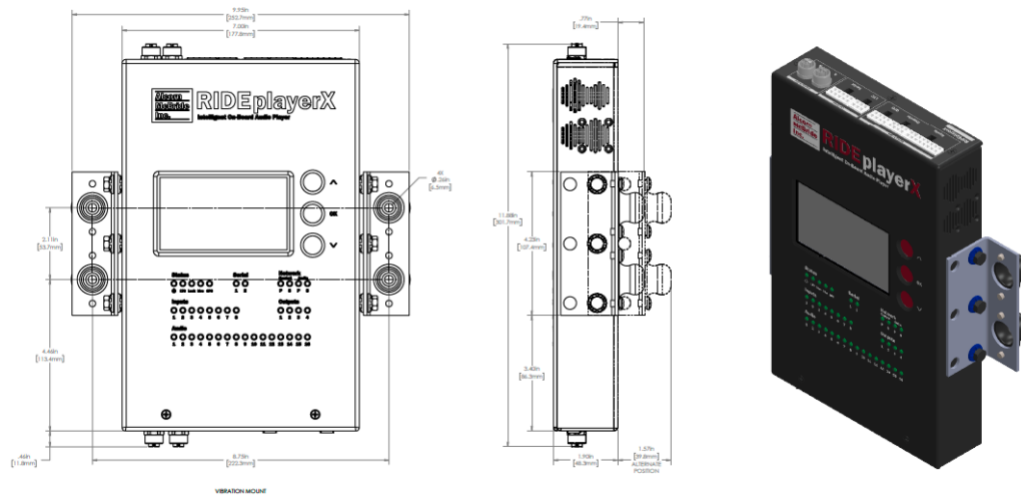
SMK-2

This is a dual-unit surface mounting kit. With this, you can stack multiple RideAmp-25H units to conserve panel space within your ride vehicle.



VSMK-I

This is a single-unit surface mounting kit designed for high-vibration environments.



SPECIFICATIONS

CONTROL

Indicators	Power Network – Link/Activity Audio – Signal/Mute Status – Amp OK, Protect, High Temp, Clipping
Network Control*	Amp Enable/Disable Mute Enable/Disable
Network Monitoring*	Amp Status Power Status Clipping

**RidePlayer network audio connection is required*

AUDIO

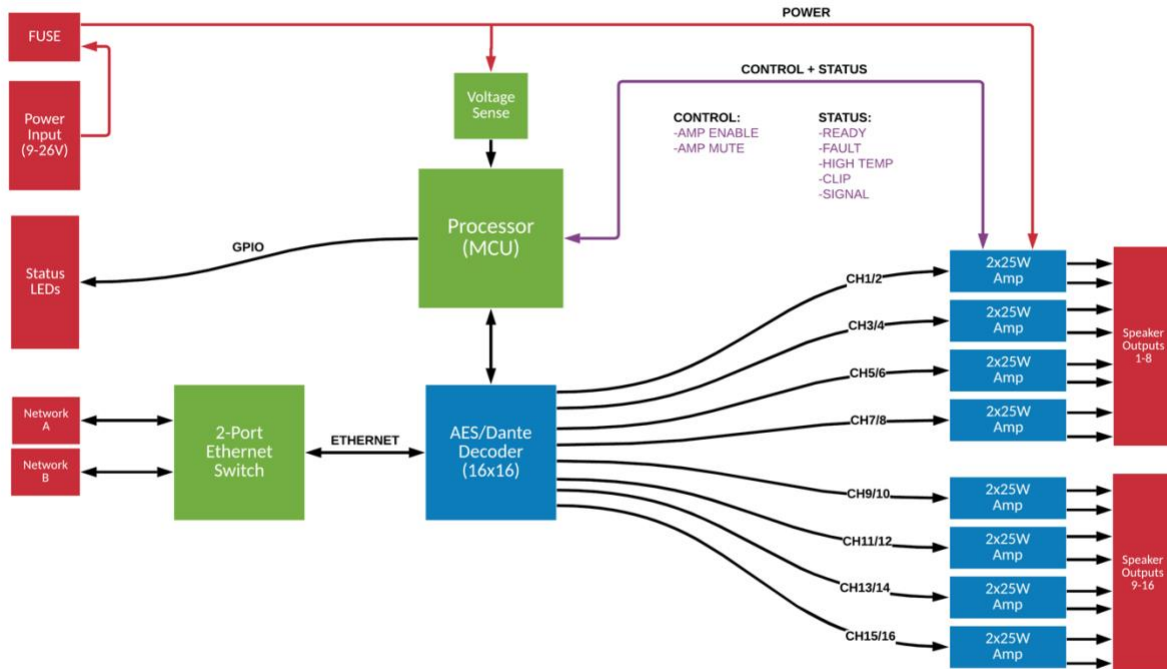
Speaker Outputs	16 x Speaker outputs (2 x 16-pin Molex) 24VDC - 16 x 30W @ 8Ω (bridgeable to 60W @ 8Ω) 12VDC - 16 x 15W @ 4Ω (bridgeable to 20W @ 4Ω)
Minimum Load	Standard - 2 Ohms Bridged - 4 Ohms
Network Audio	16 Input AES67/Dante Interface (16x0) 100/1000 BaseT (2 x M12 X-Coded) Internal Switch to support daisy-chaining RideAmp units
Frequency Response	3Hz - 45kHz
S/N Ratio	>113dB
THD+N	<0.005%

PHYSICAL

Size	11.9"L x 7.2"W x 1.7"H (302mm x 183mm x 44mm)
Weight	2.35 lbs (1.1 kg)
Power	9-26VDC @ 20A Max
Fuse	25A/80V ATO-FKH Blade Fuse
Operating Temperature	0C (32F) to 38C (100F) 0-90% Relative Humidity
Mounting	Surface Mount (SMK-1) Dual-Stacked Surface Mount (SMK-2) Vibration-Resistant Surface Mount (VSMK-1)

BLOCK DIAGRAM

RIDEAMP-25H Block Diagram



ACCESSORIES

DEVELOPMENT KIT

Part Number: DEVKIT-RIDEAMP25H

We offer this kit to enable users to quickly bench test or build mockups with RideAmp 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 RideAmp 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-RIDEAMP25H

This kit provides a full set of blank Molex connectors and pins for RideAmp'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 RideAmp to connect to an M12 X-Coded Ethernet switch or other device like RidePlayer. 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-TO-RJ45 ETHERNET ADAPTER

Part Number: CM12X-RJ45F

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

POWER SUPPLY

Part Number: PSD24V20A

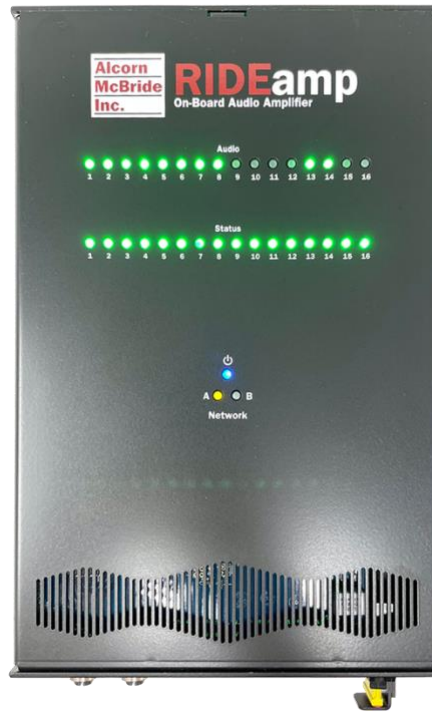
This supply is capable of providing RideAmp with a 24VDC/20A power source. It accepts an input between 100-240VAC and is designed to mount on a DIN Rail alongside the RideAmp.

PRODUCT PHOTOS

Left



Top



Right



Connector Side



Fan Side

