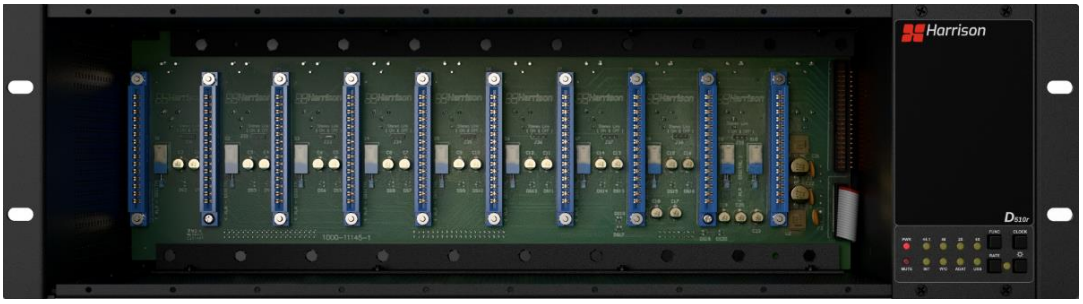
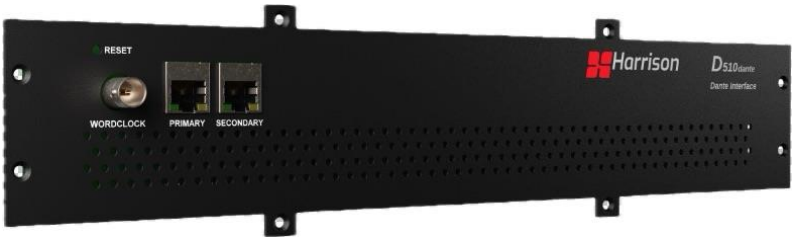
# D510r - D510dante - D510mx

## User Guide





www.harrisonaudio.com

Nashville - Music City USA

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Harrison Audio LLC



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PLEASE READ ALL INSTRUCTIONS, PAY SPEICAL HEED TO SAFETY WARNINGS.

March 2025

Version v3.0

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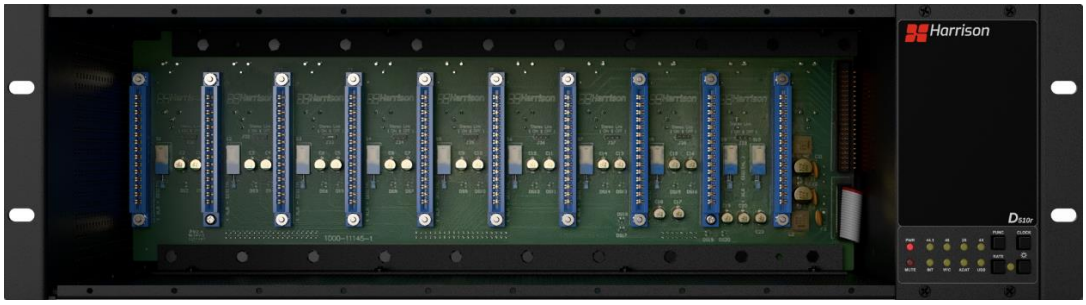
# Overview D510r




### D510r Introduction

The D510r is a 19” 3 RU rack unit designed to house up to 10 standard 500 series modules. The D510r is designed to house the most power-hungry modules and ensure the full performance of those modules. The D510r includes a built-in power supply with sufficient current to handle any complement of 500 series modules. The D510r is a part of a series of products from Harrison that provide analog mixing, digital interfacing in a variety of formats including Dante along with a range of Harrison individual 500 series modules. Please see information in this manual regarding the following optional products offered by Harrison to compliment the D510r system.

D510mx (analog mixer module)
D510dante (Dante interface module)

# Features

- Rugged construction
- 10 standard 500 series slots
- Built in PSU
- Link switch between odd and even slots
- Standard XLR inputs and outputs

# Installation

### Unpacking

The unit has been carefully packed and inside the box you will find the following items.

- D510r
- IEC power cord for your country
- Safety Sheet

It is always a good idea to save the original box and packing just on case you ever need to send the unit in for service.

### Rack Mounting, Heat and Ventilation

The D510r is a 1U, 19” rackmount piece of equipment designed to sit in the racking of a producer’s desk or similar. It is recommended that ventilation space is left above and below the unit so any heat generated by the D510r or other equipment mounted above or below the D510r can naturally disperse. Always allow the unit to cool down before handling.

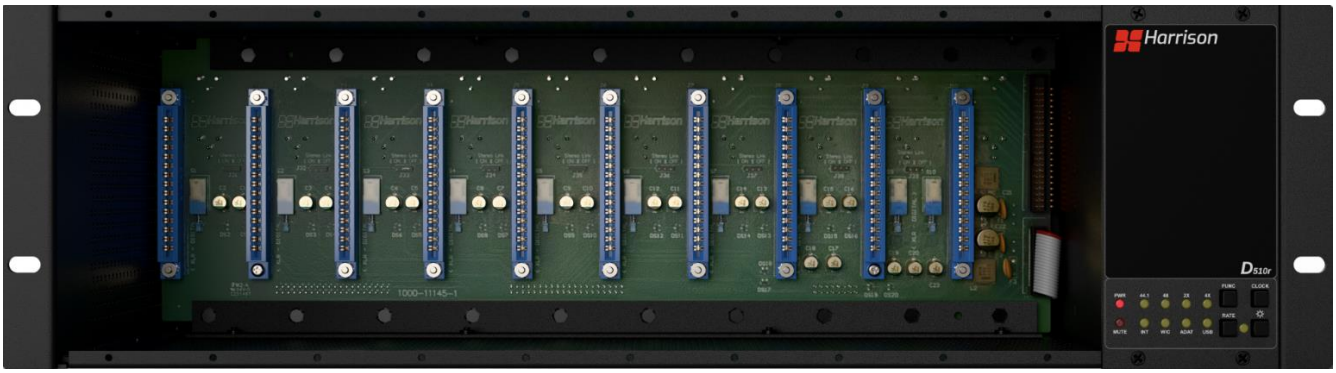
### Safety Notices

Please read the safety notice information included on the Safety Sheet inside the box before using the D510r. This information is also available in Appendices section of this User Guide.

# Hardware Overview

This section provides an overview of the D510r hardware. The tutorial section covers each control in more detail.

### Front View



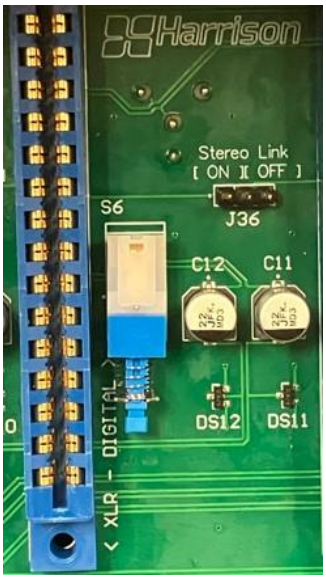

### Rear View

# Tutorial

## Power On

Power on the unit by toggling the power switch (far right end of the D510r) to the up (I) position. Pqwer off the unit by toggling the power switch down to the (O) position.

## Front Slot Controls




## < XLR – DIGITAL> Switch

The XLR – DIGITAL switch provided for each slot selected the audio source for the associated 500 slot. When the switch is depressed (up position) the source for the associated 500 slot will be the associated DA converter from the D510dante unit. When the switch is not depressed (down position) the source for the associated 500 slot is the rear XLR input connector.

## Stereo Link Jumper

A Stereo Link jumper is provided to allows that allows the input source of an odd number slot to be “linked” to the input of the adjacent even slot. The ON jumper position links the input sources, the OFF position leaves them independent.

## Status Panel LEDs


### PWR LED

The PWR LED illuminates when the D510r is powered on.

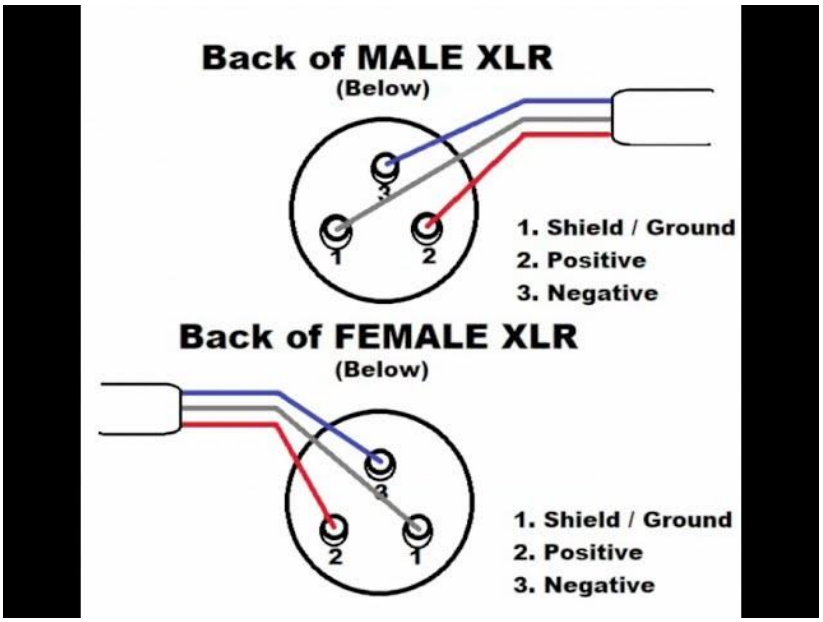
### MUTE LED

The MUTE LED illuminates when the optional D510dante interface is not connected to a network.

## Rear Connectors


### Input / Output XLR Connectors

Each 500 slot has a corresponding female XLR input and male XLR output connector associated with the slot.




**XLR Pinout Diagram**

# Specifications

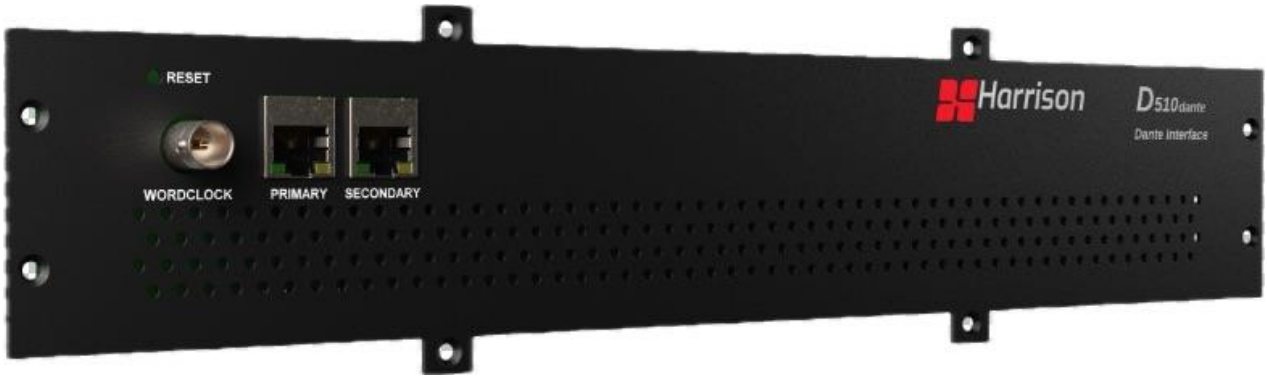
**Dimensions: L = Standard (19”) x H = 3RU (5.25”) x D = (7.2”)**

**Power Input: 50/60Hz / 80-246VAC / 1.8 -0.55A**

**Power Per Slot: 170ma**

**Weight: 10.4 LBS (4.72kg)**

# Overview D510dante




### D510dante Introduction

One of the advanced and unique features of the Harrison D510r 500 rack unit is ability to add a D510dante interface card which includes A/D and D/A converters via a Dante interface providing a direct Ethernet interface to a DAW or other Dante network such as for live performance applications.

The D510dante interfaces can carry up to 10 input by 14 output channels at 44.1/48 KHz sampling rate up to 88.2/96 KHz sampling rate. Because the D510r can be fitted with up to ten 500 series modules the D510dante interface is laid out with 10 AD converters and DA converters one pair for each of the ten 500 slots.

There are an additional four DA converters provided for future use.

These inputs and outputs are combined by an integrated Ethernet switch to result in a single Ethernet interface to a DAW or other Dante network such as in a live performance infrastructure. The D510r with a D510di installed will appear as single device on the Dante network with a primary / secondary redundant configuration.

# Features

Rugged construction
10 AD converters to Dante (one per slot)
10 DA converters from Dante (one per slot)
4 additional DA converters for future use
Standard RJ45 Ethernet connectors


**D510dante module installed in D510r**

# Installation

## Unpacking

The unit has been carefully packed and inside the box you will find the following items.

D510dante
8 M3 x 6mm Countersunk Pozidriv Screws
Safety Sheet

It is always a good idea to save the original box and packing just on case you ever need to send the unit in for service.

## Safety Notices

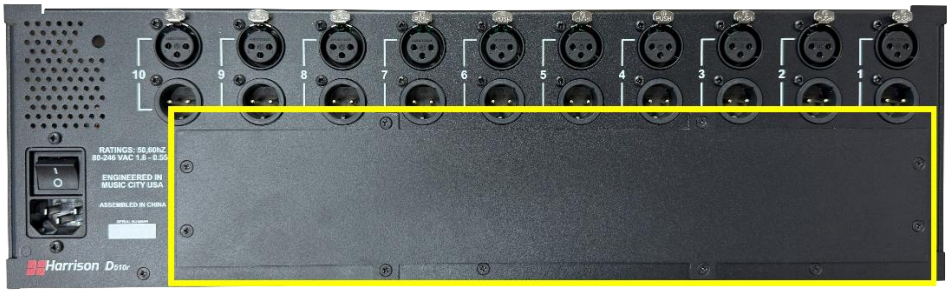
Please read the safety notice information included on the Safety Sheet inside the box before using the D510dante. This information is also available in Appendices section of this User Guide.

## Introduction

This document provides instructions for installing the D510dante Interface. The D510dante is an upgrade for the D510r that attaches to the back panel and enables Dante connectivity.

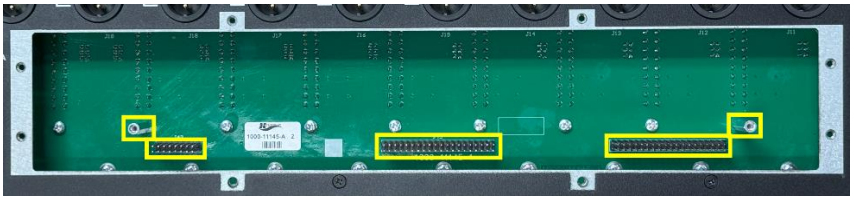
## Step 1

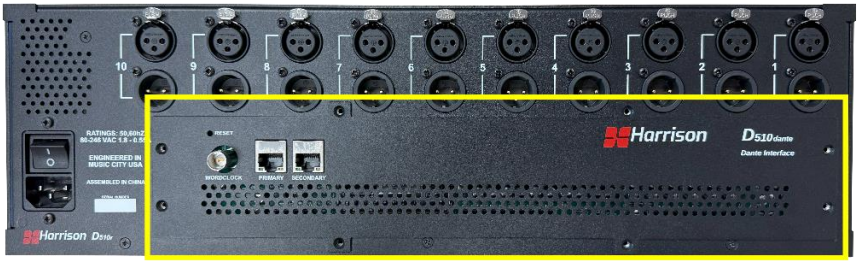
Remove the blank plate from the back of the D510r by removing the 8 screws.



## Step 2

Install the D510dante into the back of the D510r. Make sure to line up all pins and guideposts.






## Step 3

Install the 8 included screws.

# Tutorial

## Inputs and Outputs

Analog input and outputs are nominal +4 dBu level. The converters are directly interfaced to the Dante interface module. Supporting the Dante module is a multiport Ethernet switch with integrated Gigabit Ethernet PHYs. Two Ethernet connections are provided on RJ45 jacks and are configured by the Dante module to operate as a hub/switch a primary / secondary redundant mode.

Typical interconnection of the D510dante provide a single Ethernet link to the DAW or other network infrastructure and use an external hub/switch to connect to the network.

It is recommended that a Gigabit Ethernet (1000-BASE-T) network is used, with a Gigabit Ethernet port on the DAW or network end and a Gigabit Ethernet external switch (if used), all connected with high quality CAT5E or CAT6 cables.

## Dante Wordclock

On Dante networks, almost any device on the network may be specified in the Dante network management software as the wordclock master. In typical setups the console might be a wordclock slave to another device on the Dante network such as an I/O device, or might itself be the wordclock master.

Should the user choose to have the D510dante module as the network clock master, the D510dante module Dante can be designated the network wordclock master using its internal clock.

A BNC connector is provided on the D510dante module for connection of a TTL wordclock. While not absolutely standardized, guidelines for TTL wordclocks can be found in AES standard AES-11. The recommendations specify 75 ohm coax cabling and terminations. This connector is unterminated, so the required 75 ohm terminating resistor would have to be supplied externally. Note that there are 2 types of BNC connectors, with 75 and 50 ohm impedances. The 75 ohm type is used on the D510dante module and should be connected using the matching type of connector, coax cable and terminating resistor.

## Dante Channel Assignments

The D510dante module is supplied with the Dante connections prewired. The following table lists the standard Dante connections provided.

| | |
|---|---|
| Slot 01 In | Slot 01 Out |
| Slot 02 In | Slot 02 Out |
| Slot 03 In | Slot 03 Out |
| Slot 04 In | Slot 04 Out |
| Slot 05 In | Slot 05 Out |
| Slot 06 In | Slot 06 Out |
| Slot 07 In | Slot 07 Out |
| Slot 08 In | Slot 08 Out |
| Slot 09 In | Slot 09 Out |
| Slot 10 In | Slot 10 Out |
| Mixer PC 1 In | |
| Mixer PC 2 In | |
| Mixer PC 3 In | |
| Mixer PC 4 In | |

Dante Controller software permits renaming of the Dante signals on the Dante Controller router page. This is left to the user if the standard signal naming needs to be changed to suit a particular studio installation.

# Specifications

## General

10 Inputs

14 Outputs

AKM ADC

AKM DAC

## ADC

THD+N, 1kHz 24dBu:  < 0.0008%

Noise A-Weighted: < -95 dBu

Frequency Response:  20 Hz – 20 KHz +/- 0.25 dB

## DAC

THD+N, 1kHz 18dBu:  < 0.006%

Noise A-Weighted: < -85 dBu

Frequency Response:  20 Hz – 20 KHz +/- 0.25 dB

## Connectors

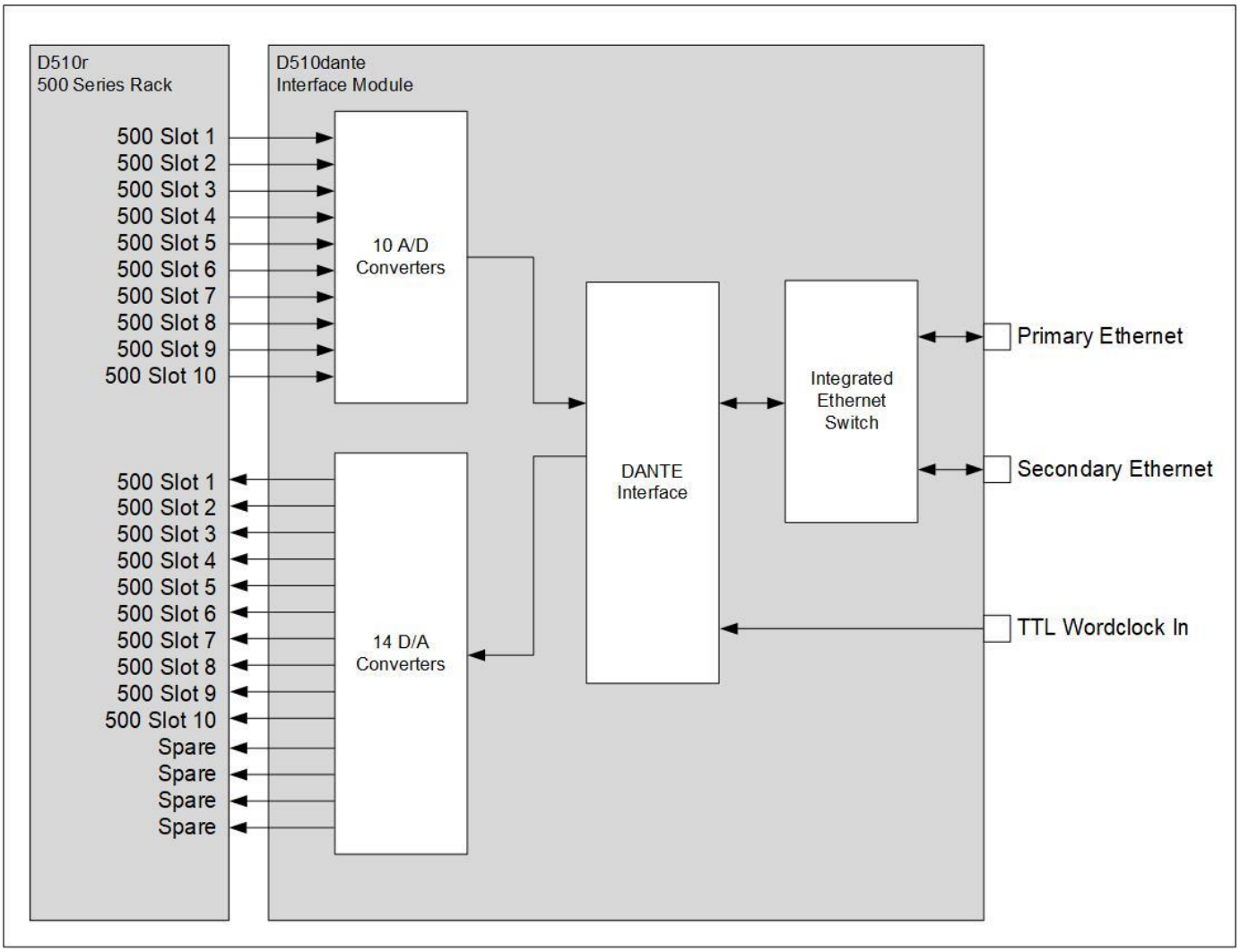
2 x RJ45 Network Ports (Primary and Secondary)

BNC TTL Wordclock

## Latency

DA + AD <> Dante - 48kHz and 96kHz = 43.2 samples (0.9ms@48kHz, 0.45ms@96kHz)

## D510dante Block Diagram



# Overview D510mx


### D510mx Introduction

Another of the advanced and unique features of the Harrison D510r 500 rack unit is ability to add a D510mx “mixer” interface module providing an integrated 10 x 2 analog mixer to the 510r rack.

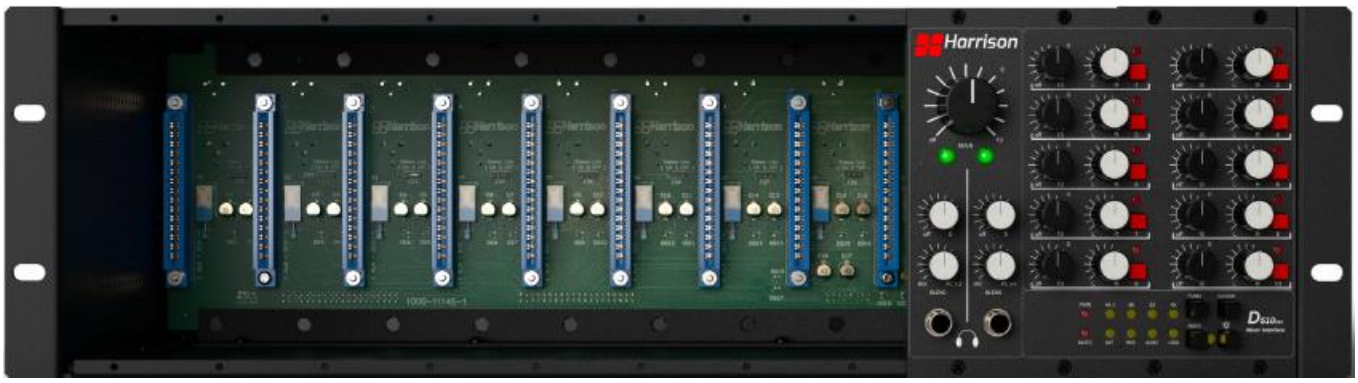
When the D510mx is installed in the D510r rack, eight 500 series module slots are available for any combination of 500 series modules. The outputs from each 500 module slot feed the first 8 inputs to the D510mx. Inputs 9 and 10 to the D510mx are fed from the 9th and 10th slot input XLR connectors on the rear of the D510r rack. Each input to the D510mx has a level, pan and stereo bus routing switch. These controls allow a stereo mix to be created in conjunction with the individual 500 slot outputs.

A Main stereo output level control with metering LEDs, and 2 front panel headphone feeds round out the D510mx functionality.

The D510mx combined with the D510r turns theD510 system into an analog summing mixer. Combining the D510r, D510dante and the D510mx turns the D510 system into a powerful computer interface utilizing your favorite 500 series modules as the input sources.

# Features

Rugged construction
10 inputs (8 from slots 1-8, 9 and 10 from the rear XLR inputs)
Level, pan and routing control for each input
Main stereo output with level control and metering LEDs
2 x front panel headphone outputs.




**D510mx module installed in D510r**

# Installation

## Unpacking

The unit has been carefully packed and inside the box you will find the following items.

D510mx
40-Pin Ribbon Cable
8 440 x 1/14 Pozidriv Flathead Black Zinc Plated Screws
Safety Sheet

It is always a good idea to save the original box and packing just on case you ever need to send the unit in for service.

## Safety Notices

Please read the safety notice information included on the Safety Sheet inside the box before using the D510dante. This information is also available in Appendices section of this User Guide.

## Introduction

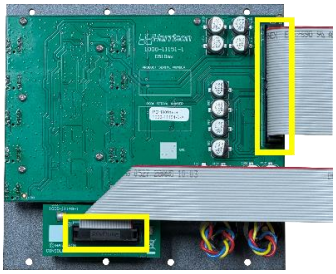
This document provides instructions for installing the D510mx Rack Mixer. The D510mx is an upgrade for the D510r that attaches to the front of the unit and provides a mixing interface with two headphone outputs. Note that the D510mx requires slots 9 and 10 of the D510r to be empty. Please see the user manual for operating instructions.

## Step 1 – Power and remove Status Panel

This document provides instructions for installing the D510mx Rack Mixer. The D510mx is an upgrade for the D510r that attaches to the front of the unit and provides a mixing interface with two headphone outputs. Note that the D510mx requires slots 9 and 10 of the D510r to be empty. Please see the user manual for operating instructions.


First, make sure the D510r is turned off. Then, remove the Status Panel from the D510r by removing all four screws from the front and disconnecting the 20-pin ribbon cable from the back.

## Step 2 – Connect Cables



Plug the included 40-pin ribbon cable into the motherboard of the D510r. Then, plug both ribbon cables into the back of the D510mx.

### Step 3 – Mount D510mx Mixer Panel

Secure the D510mx onto the right side of the D510r using the 8 included screws.

# Tutorial

### Mixer Front Panel Controls


### 1 – Mix Bus Routing

Each of the 10 D510mx sources can rout independently to the D510mx mix bus via the red switch. The associated LED lights when the signal is routed to the mix bus.

## 2 – Pan

When any of the 10 signals are routed to mix bus, the white knob associated with each input is used to pan the signal to the stereo bus.

## 3 – Level Control

When any of the 10 signals are routed to mix bus, the black knob associated with each input is used to adjust the level of the signal to the stereo bus.

## 4 – Main Output Level

The large black knob is used to adjust the level of the Main stereo output of the D510mx

## 5 – Main Output LED Meters

A bi-colored LED provides L and R metering of the Main Output. Green (present) Yellow (0dB) Red (peak).

## 6 – Headphone Blend

The Blend knob adjusts the mix between the D510mx Main Output and the return of the stereo signal via Dante. Note: This function is only applicable if the D510Dante interface is installed in the D510r with the D510mx.

## 7 – Headphone Output Level

Separate Headphone output level controls are provided one for each headphone output.

## 8 – Headphone Jack

Separate Headphone TRS jacks are provided one for each headphone output.

## 9 – Power LED

The red PWR LED comes on when the D510r has power. Note: The rest of the controls on the lower right section of the D510mx are reserved for future use.

# Configuration Options

**D510r**

**D510r + D510dante**

**D510r + D510mx**

**D510r + D510mx + D510dante**

| D510 Configuration | 500 Slots | Analog In | Analog Out | 10 A/D Dante | 14 D/A Dante | 10x2 Analog Mixer | Stereo Analog Out | 2 x Headphone Out |
|---|---|---|---|---|---|---|---|---|
|  D510r | 10 | X | X | | | | | |
|  D510r  D510dante | 10 | X | X | X | X | | | |
|  D510r D510mx | 8 | X | X | | | X | X | X |
|  D510r D510mx  D510dante | 10 | X | X | X | X | X | X | X |

# Specifications

## General

The Harrison D510mx Mixer Module is an upgrade for the D510r that attaches to the front of the unit and provides a mixing interface with two headphone outputs.

## D510mx Inputs

- Minimum Gain: <= -81 dB
  - Noise A-Weighted @ Min Gain: < -87 dBu
- Unity 0 dB
  - THD+N, 1kHz 10 dBu @ Mid Gain:  < 0.003%

- Noise A-Weighted @ Mid Gain: < -87 dBu
- Maximum Gain: 11.5 dB
  - THD+N, 1kHz 0dBu @ Max Gain: < 0.003%
  - Noise A-Weighted @ Maximum Gain: < -85 dBu
- Maximum Input Level: +24 dBu
- Frequency Response: 20 Hz – 20 KHz +/- 0.25 dB
- Pan – 3dB Pan Law

### D510dante Inputs (when optional D510dante interface is installed)

- Maximum Input Level: +24 dBu
- Frequency Response: 20 Hz – 20 KHz +/- 0.25 dB

### Main Outputs

- Maximum Output Level - +24 dBu
- Minimum Gain: <= -85 dB
  - Noise A-Weighted @ Min Gain: < -97 dBu
- Unity 0 dB
  - THD+N, 1kHz 10 dBu @ Mid Gain: < 0.003%
- Noise A-Weighted @ Mid Gain: < -87 dBu
- Maximum Gain: 9.5 dB
  - THD+N, 1kHz 10 dBu @ Max Gain: < 0.003%
  - Noise A-Weighted @ Maximum Gain: < -78 dBu

### Headphone Outputs

- Maximum Output Level - +21 dBu
- Minimum Gain: <= -78 dB
  - Noise A-Weighted @ Min Gain: < -87 dBu
- Maximum Gain: 0 dB
  - THD+N, 1kHz 20 dBu @ Max Gain: < 0.004%
  - Noise A-Weighted @ Maximum Gain: < -82 dBu

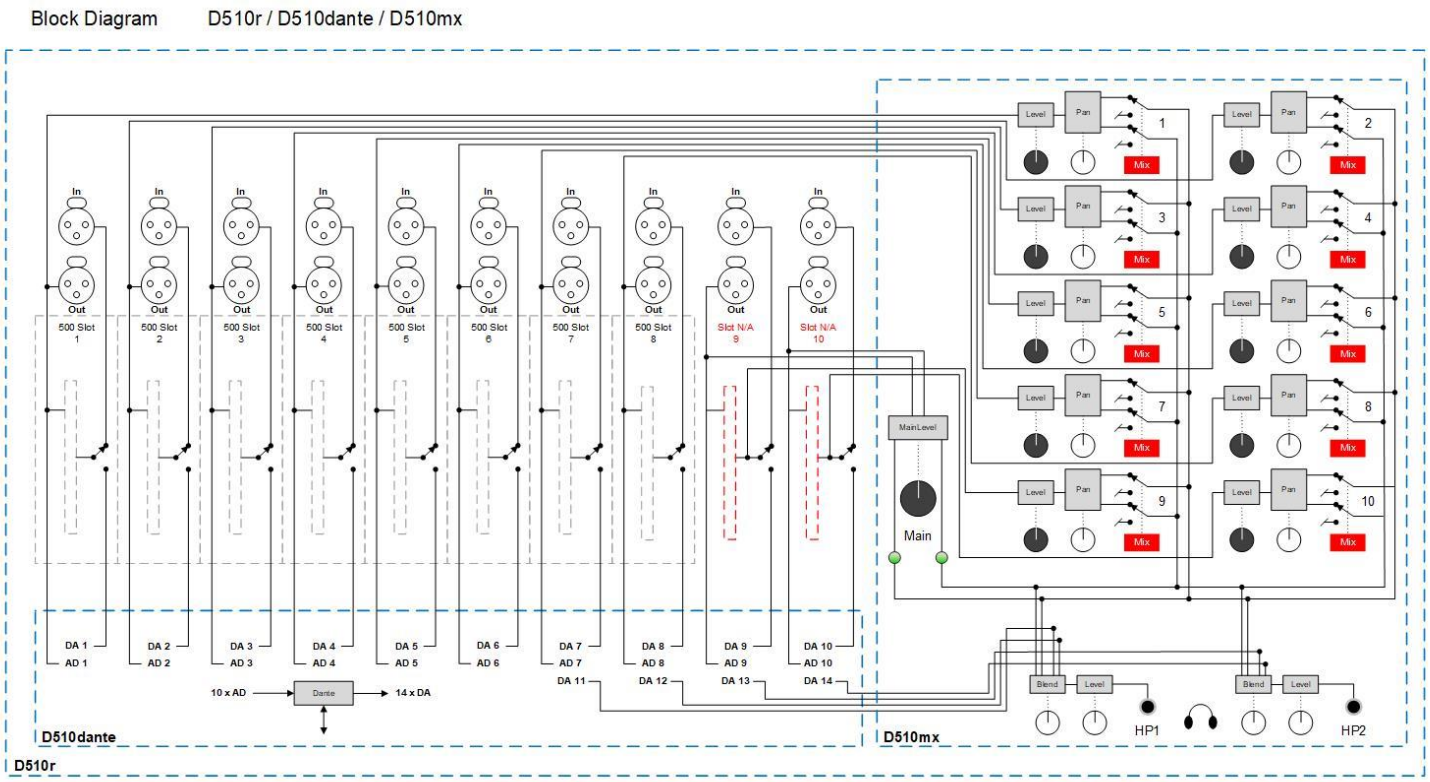
### Signal Metering

- 3x tri-colour LED signal presence
  - Green: >= -14 dBu, < 4 dBu
  - Orange: >= 4 dBu, < 18 dBu
  - Red: >= 18 dBu

### Connectors

- TRS Stereo Headphone Output (2)

# Block Diagram



# Safety Notices

## General Safety

• Please read and keep this document and adhere to all warnings and instructions.

• This electrical equipment should not be exposed to dust, water, or other liquids.

• Clean only with dry cloth or products compatible with electrical devices and never when the unit is powered.

• Do not operate near any heat sources, in direct sunlight or near naked flames.

• Do not place heavy objects on the unit.

• Only use attachments/accessories recommended by the manufacturer.

• Unplug this apparatus during lightning storms or when unused for long periods of time.

• Do NOT modify this unit, alterations may affect performance, safety and/or international compliance standards.

• The unit can only be serviced by qualified personnel – seek immediate service if the console has been exposed to water or if it ceases to operate normally.

• Harrison does not accept liability for damage caused by maintenance, repair or modification by unauthorized personnel.

• When using this apparatus either fix it into a standard 19” rack or place it on a secure level surface.

• If the unit is rack mounted, fit all rack screws. Rack shelves are recommended.

• Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.

• Always allow free flow of air around the unit for cooling.

• Ensure that no strain is placed on any cables connected to this apparatus. Ensure that all such cables are not placed where they can be stepped on, pulled, or tripped over.

## Power Safety

• This equipment is supplied with mains lead however if you wish to use a mains cables of your choice refer to the following information: • Refer to the rating label on rear of the unit and always use a suitable mains cord.

• The unit should ALWAYS be earthed.

• Please use-compliant 60320 C13 TYPE SOCKET. When connecting to supply outlets ensure that appropriate sized conductors and plugs are used to suit local electrical requirements.

• Maximum cord length should be 4.5m(15’).

• The cord should bear the approval mark of the country in which it is to be used. Additionally:

• The appliance coupler is used as the disconnect device, ensure that it is connected to an unobstructed wall outlet.

• Connect only to an AC power source that contains a protective earthing (PE) conductor.

• Only connect units to single phase supplies with the neutral conductor at earth potential. ATTENTION! This product must always be earthed. CAUTION! No user-serviceable parts inside. In the event of damage to the unit contact Solid State Logic. Service or repair must be done by qualified service personnel only.

**Additionally:**

• The appliance coupler is used as the disconnect device, ensure that it is connected to an unobstructed wall outlet.

• Connect only to an AC power source that contains a protective earthing (PE) conductor.

• Only connect units to single phase supplies with the neutral conductor at earth potential

**ATTENTION!** This product must always be earthed.

**CAUTION!** No user-serviceable parts inside. In the event of damage to the unit contact Solid State Logic. Service or repair must be done by qualified service personnel only.

UK CA

This product complies with the following United Kingdom Legislation:
UK Electrical Equipment (Safety) Regulations 2016 (SI 2016/1101)
UK Electromagnetic Compatibility Regulations 2016 (SI 2016/1091).
The Eco-design requirements for Energy related products (ErP) 2009/125/EC.
The Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS2) Regulations 2012 (SI 2012/3032).

CE

This product complies with the following European Union Harmonisation Legislation:
EU Low Voltage directive (LVD) 2014/35/EU,
EU Electromagnetic Compatibility directive (EMC) 2014/30/EU.
The Eco-design requirements for Energy related products (ErP) 2009/125/EC.
The Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment Directive (RoHS2) 2011/65/EU.

**Instructions for disposal of WEEE by users in the European Union**

The symbol shown here, which is on the product or on its packaging, indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

## FCC Certification

• This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the user:

• Do not modify this unit! This product, when installed as indicated in the instructions contained in the installation manual, meets FCC requirements.

• Important: This product satisfies FCC regulations when high quality shielded cables are used to connect with other equipment. Failure to use high quality shielded cables or to follow the installation instructions may cause electromagnetic interference with appliances such as radios and televisions and will void your FCC authorization to use this product in the USA.

• 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.

## Industry Canada Compliance

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## Electromagnetic Compatibility

BS EN 55032:2015, Class A. BS EN 55035:2017.

WARNING: The audio input/output ports are screened cable ports and any connections to them should be made using braid screened cable and metal connector shells to provide a low impedance connection between the cable screen and the device.

## Electrical Safety

IEC 62368-1:2018

BS EN IEC 62368-1:2020+A11:2020

CSA CAN/CSA-C22.2 No. 62368-1 3rd Ed.

UL 62368-1 3rd Ed.

**WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov

## Environmental

Temperature: Operating: +1 to 30 degrees Celsius.  Storage: -20 to 50 degrees Celsius.

## Further information

For additional information, product downloads, knowledge base and technical support visit the www.harrisonaudio.com.

## ECO Statement

80% recycled cardboard will be used in the packaging design as a minimum.

100% recyclable packaging.

No polyfoam will be used in the packaging design. Pulp based packaging inserts will be used as an alternative.

Packaging will be optimized to reduce its volume and weight and packaging materials will be easily separated for recycling.

Where allowed, user documentation will be available for download only.  Only mandatory safety information will be provided in hard copy.

80% post-consumer recycled aluminum will be used in the front panel design.

Given their major contribution to the product's carbon footprint, PCBs will be optimized to minimize board area, layer count and to limit wastage.

Low power operation will be a focus throughout the design.

To promote switching off the unit after use, the power switch will be located on the front panel to maintain accessibility when rack mounted.

Component selection and lifetime testing will be based on a minimum life expectancy of 10 years. The design will support user servicing allowing individual connectors, pots, switches, and other parts to be replaced easily to ensure economically viable repair by a competent user or local repair center extending the product's service life.

The unit's construction method will allow easy dis-assembly supporting separating and recycling core components when the product reaches its end of life.