Dante-MY16-AUD2

Audio Interface Card



Getting Started Guide

v1.1 :: May 2016

<u>Audinate</u>



To avoid the possibility of personal physical injury or damage to the card, always take sensible precautions when using this card including but not limited to the following:

- Only install the card in compatible Yamaha audio devices and observe any restrictions on the maximum number of expansion cards that can be simultaneously installed. For more information see the Yamaha Pro Audio web site www.yamahaproaudio.com
- Do not attempt to modify the card or disassemble it.
- Disconnect the power cable of the audio device before installing this card. Turn off any peripheral devices connected to the audio device and unplug all related cables.
- Handle the card carefully and avoid touching exposed connectors and metal parts.
- Drain any static electricity from your body or clothing before handling the card.
- Do not drop the card or subject it to physical shock.
- Avoid loose screws or other extraneous metal objects coming into contact with the card when installed and powered up.
- Do not expose the card to sudden temperature changes from cold to hot.
- Do not expose the card to rain or moisture.
- Avoid installing this unit where foreign objects may fall onto this unit and/or this unit may be exposed to liquid dripping or splashing.

Audinate cannot be held responsible for any loss or destruction of data or damage caused by improper use of or modifications to the device.

Information for Users on Collection and Disposal of Old Equipment



This symbol on the products, packaging, and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling of old products, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC. By disposing of these products correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate

waste handling. For more information about collection and recycling of old products, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

[For business users in the European Union]

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]

This symbol is only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Regulatory Information

FCC Information (USA)

- IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT! This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Audinate may void your authority, granted by the FCC, to use the product.
- IMPORTANT: When connecting this product to accessories and/or another product use only high quality shielded cables. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.
- 3. NOTE: This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. Compliance with FCC regulations does not guarantee

that interference will not occur in all installations. If this product is found to be the source of interference. which can be determined by turning the unit "OFF' and "ON", please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/ so In the case of radio or TV interference, relocate/ reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave., Buena Park, CA 90620. The above statements apply ONLY to those products distributed by Yamaha Corporation of America or its subsidiaries.

*This applies only to products distributed by YAMAHA CORPORATION OF AMERICA (Class B)

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.

COMPLIANCE INFORMATION STATEMENT (DECLARATION OF CONFORMITY PROCEDURE)

Responsible Party : Yamaha Corporation of America

Address : 6600 Orangethorpe Ave., Buena Park, Calif. 90620

Telephone : 714-522-9011

Type of Equipment : Dante INTERFACE CARD

Model Name : Dante-MY16-AUD2

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.

See user manual instructions if interference to radio reception is suspected.

* This applies only to products distributed by YAMAHA CORPORATION OF AMERICA. (FCC DoC)

CANADA

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

- This applies only to products distributed by Yamaha Canada Music Ltd. (class B)
- Ceci ne s'applique qu'aux produits distribués par Yamaha Canada Musique Ltée.

이 기기는 가정용(B급) 전자파적 합기기로서 주로 가정에서 사용하는 것을 목적 으로 하며, 모든 지역에서 사용할 수 있습니다.

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Welcome

Thank you for choosing the Audinate Dante-MY16-AUD2 Interface Card. This card is an expansion card for use with compatible Yamaha professional audio equipment. It allows the transmission and reception of up to 32 (16x16) channels at 44.1kHz or 48kHz, or 16 (8x8) channels at 88.2kHz or 96kHz of uncompressed 16, 24 or 32-bit digital audio data, using Audinate's Dante[™] audio networking standard.

Dante allows real-time very low latency transmission and reception of multiple channels of uncompressed digital audio over IP networks and Gigabit or 100Megabit Ethernet. A single 1Gigabit link can handle many hundreds of bidirectional channels of audio data on a network shared with control and other traffic.

In order to take full advantage of this product and of Dante networking we strongly recommend that you read this guide thoroughly and keep it in a safe place for further reference. Also ensure that you consult the additional sources of information referred to in this document.

Before you install one or more expansion cards in any Yamaha equipment always check for any special requirements or restrictions that it may have - please refer to the Yamaha Pro Audio website at www.yamahaproaudio.com.

Package Contents

- Dante-MY16-AUD2 card
- This Getting Started Guide
- Download Your Software Card, including your DVS Token

About Dante Networking

Dante delivers something every audio professional needs; a no hassle, self-configuring, true plug-and-play digital audio network that uses standard Internet Protocols over Gigabit or 100Megabit Ethernet. Patented Dante technology distributes digital audio plus integrated control data with imperceptible latency, sample-accurate playback synchronization, extreme reliability and high channel counts.

About Dante Networking (cont'd)

Sample-accurate timing with inaudibly low latency. Dante uses audio-independent, high- accuracy network synchronization standards to ensure all Dante devices are synchronized at all times. Sample-accurate playback with extremely low latency and jitter is achieved without limiting your audio sample rates and network layout options.

True Ethernet and IP network compatibility. Dante networking runs over inexpensive off-the-shelf computer networking hardware, and does not require dedicated network infrastructure. Ethernet switches transmit Dante digital media streams alongside ordinary data traffic, so you can integrate professional media operations into properly designed pre-existing networks.

Easy to set up and use. Our innovative configuration protocols make networking a true plug-and-play process with automatic device discovery and system configuration. Simply connect your Dante-MY16-AUD2 to a network and it will automatically configure its network interface before finding and being found by other Dante-enabled devices on the network. Instead of "magic numbers", you label Dante network devices and their audio channels with names that make sense to you.

Using Dante Controller (a free application for PC or Mac), you can instantly see all Dante-enabled devices on the network, edit channel and device labels as you like, and route audio with a single click. With Dante Virtual Soundcard, your computer looks and acts like any other Dante-enabled device on the network. Just connect your computer to a network switch to use digital audio processing, recording or playback software on the network. You can also use Dante Via[™] to 'Dante-enable' all audio applications and devices installed on or connected to your computer, and to route audio to and from a Dante network. See www.audinate.com for more information.

Dante-MY16-AUD2 Overview

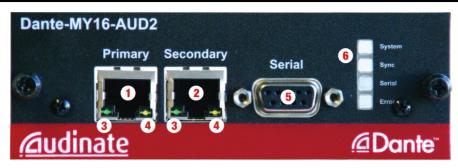
The Dante-MY16-AUD2 card can be configured to handle 16 input channels and 16 output channels at 44.1kHz or 48kHz, or 8 input channels and 8 output channels at 88.2kHz or 96kHz, of 16, 24 or 32-bit uncompressed digital audio data using Audinate's Dante audio networking standard.

Sample rates	44.1kHz, 48kHz, 88.2kHz and 96kHz
Sample rate pull-up/down	+4.1667, +0.1, -0.1, and - 4.0 %
Audio channels	16x16 @ 44.1kHz and 48kHz OR 8x8 @ 88.2kHz and 96kHz
Sample bit-depth	16, 24 or 32-bit PCM
Audio transport formats	Dante Audio over IP, AES67 RTP
Network	2 x Gigabit (1000Mbps) Ethernet RJ45 connectors
Redundancy	Glitch-free Dante audio redundancy using dual Ethernet networks (redundant mode)
Daisy chaining	Daisy chain multiple Dante-MY16-AUD2 cards together (switched mode)
HA Remote	Support for HA Remote capable Yamaha products
Expandable	Install up to four Dante-MY16-AUD2 cards in available MY16-compatible slots for up to 64x64 audio channels
Compatible Yamaha equipment:	Compatible with a range of digital mixing consoles, processors and power amps equipped with MY16-interface compatible card slots, including:
Digital Mixers	CS-R10, DSP-R10, RPio622, CL5/3/1, QL5/1, PM5D, DSP5D, M7CL, LS9, DM2000, DM1000, 02R96, 01V96, 01V96i
Interfaces	RSio64-D
Processors	MRX7-D, MTX5-D, DME24N, DME64N
Power Amps	Tx4n, Tx5n, Tx6n
Synchronization	High quality on-board VCXO clock can provide master clock OR slave from audio equipment; automatic synchronization with Dante network

Specification Summary

Dante-MY16-AUD2 Getting Started Guide

Features & Functions



A picture of the Dante-MY16-AUD2 faceplate is shown above. Referring to the diagram:

- 1. Primary RJ45 Gigabit Ethernet connectors always used.
- Secondary RJ45 Gigabit Ethernet connector for use when glitch free redundancy or daisy chaining is required. See the Connection Examples section for more information on setting up redundant and daisychained networks.
- 3. Link status / activity LED: green indicates an established link; flashing indicates link activity.
- 4. Gigabit link status LED: orange indicates an established Gigabit Ethernet link.
- 5. Serial port: can be used to bridge third party serial data between compatible Dante enabled devices.
- 6. Status LEDs.

The status LEDs indicate the following conditions:

- System Indicates the status of the Dante system on this card. A green light indicates the system is operating properly. An amber or red light indicates that the system has failed to boot correctly.
- Sync Indicates the synchronization status of the Dante device. A solid green light indicates that the device is a network slave and is synchronized to the network master. A flashing green light indicates that the device is the network clock master. An orange light indicates the syncing is in progress. A red light indicates a network synchronization error. Obtaining network sync may take up to 45 seconds.
- Serial indicates Rx and Tx activity via either the external or HA remote serial port.
- **Error** Solid orange indicates that the Yamaha host equipment and the Dante-MY16-AUD2 card are not in lock. Obtaining sync lock may take up to 45 seconds when multiple cards are installed. If sync is not achieved in 45 seconds, check the word clock configuration in both the Dante-MY16-AUD2 the card and the Yamaha equipment. Periods of solid red indicates network errors are being detected (such as dropped or corrupt packets).
- All LEDs flashing green all LEDs will flash green when the card's Identify function has been activated using the Dante Controller or web interface.

Getting Started

To get started with your Dante-MY16-AUD2 card, you will need to:

- Install your card please refer to the User manual for the relevant Yamaha equipment for instructions.
- Download and install the Dante Controller audio routing software.
- Download, install and activate Dante Virtual Soundcard to use with to a PC or Mac audio application.
- Set up your Ethernet network.
- Configure your Dante device and clock settings.
- Set up audio routing.

Dante Controller

Dante Controller is a free software application for Windows and OS X that allows you to configure your Dante-MY16-AUD2 card, set up audio routing, and monitor and manage a network of Dante-enabled devices.

Dante Controller can be downloaded the **Downloads** > **Firmware and Software** section of the Yamaha Pro Audio website: www.yamahaproaudio.com

For information on how to use Dante Controller (including the minimum system requirements), refer to the Dante Controller User Guide, which is installed with the application, and also available online at the Yamaha Pro Audio website.

Dante Virtual Soundcard

Dante Virtual Soundcard uses the standard Ethernet port on your PC or Mac to turn your computer into a Danteenabled device on the network. Dante Virtual Soundcard allows applications such as Cubase, Nuendo, Pro Tools and other audio processing, recording or playback applications to directly send and receive audio to and from other Dante devices over the network, without the need for any additional hardware.

Dante Virtual Soundcard can be downloaded the **Downloads** > **Firmware and Software** section of the Yamaha Pro Audio website: www.yamahaproaudio.com

For information on how to use Dante Virtual Soundcard (including the minimum system requirements), refer to the Dante Virtual Soundcard User Guide, which is also available from the Yamaha Pro Audio website. In order to activate Dante Virtual Soundcard, you will need the DVS Token printed on the 'Download your software' card included with your hardware. Refer to 'Activating Dante Virtual Soundcard' (later in this guide) for information about how to activate Dante Virtual Soundcard.

You can also use Dante Via to route Dante audio - see www.audinate.com for more information.

Connection Examples

Example 1: Connect a Dante-MY16-AUD2 card to your PC or other Dante-enabled equipment directly using a standard Cat5 or Cat6 Ethernet cable:

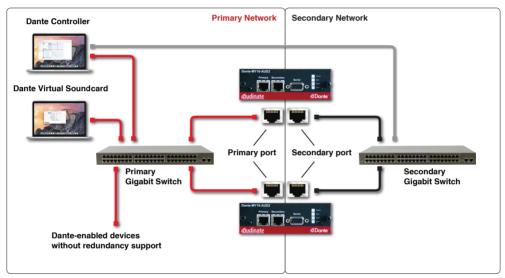


Connection Examples (contd.)

Example 2: Connect your PC or other Dante-enabled equipment and Dante-MY16-AUD2 card (or multiple cards) using a Gigabit switch:



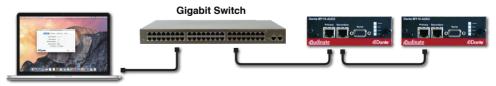
For glitch-free Dante Redundancy: Connect Dante Controller, your Dante-MY16-AUD2 cards and other redundant Dante-enabled audio equipment using duplicate Gigabit switches and Ethernet cables to protect against possible cable or switch failures. Connect Dante Virtual Soundcard and other non-redundant Dante-enabled audio equipment to the **Primary** Dante Network. Requires that the Dante-MY16-AUD2 cards are configured to use Redundant mode.



Note: Dante Virtual Soundcard does not support Dante Redundancy, or connect to Dante secondary networks.

Dante Redundancy can be set up and used between any supporting Dante-enabled audio equipment, including Dante-MY16-AUD2 cards.

Example 3: Connect multiple Dante-MY16-AUD2 cards to each other in a daisy chain configuration. Requires that up-stream Dante-MY16-AUD2 cards are configured (using Dante Controller) to use Switched mode.



Basic Operation

To set up and manage the Dante-MY16-AUD2 card you need Audinate's Dante Controller software. Please refer to the Dante Controller online user guide for further information on how to use this application.

Setting the Dante device name

The default device name for Dante-MY16-AUD2 cards is MY16-2-nnnnnn, where nnnnnn is a unique alphanumeric identifier. To set a custom name for the Dante-MY16-AUD2 card, open Dante Controller and select the device you wish to control in the Device View (CTRL+D). Select the Config tab to open the configuration screen for the device, and use the Rename Device field to give the device a new name (note that the name must be unique).

Setting the sample rate

To select the sample rate for the Dante-MY16-AUD2 card, open Dante Controller and select the device you wish to control in the Device View (CTRL+D). Select the Config tab to open the configuration screen for the device, and use the Sample Rate field to view and select the sample rate you wish to set. You must power cycle the host Yamaha equipment to apply the new sample rate setting.

Note: Dante-MY16-AUD2 cards installed in the same Yamaha equipment must all be set to the same sample rate. Note: Make sure that all Yamaha equipment slots with Dante-MY16-AUD2 cards installed are set to "double speed" (NOT "double channel") if using a sample rate of 88.2kHz or 96kHz.

Configuring your clock

Configuring clocking can be confusing. Please refer to the Dante Controller and the Dante-MY16-AUD2 User Guide and other Dante documentation available at www.audinate.com for more information on this topic.

Before you configure your clock, you will need to decide whether your Yamaha equipment should be the clock master or whether it should sync to one of the Dante-MY16-AUD2 cards and use the Dante network clock. The Yamaha equipment will need to be configured accordingly – please consult your Yamaha Equipment manual.

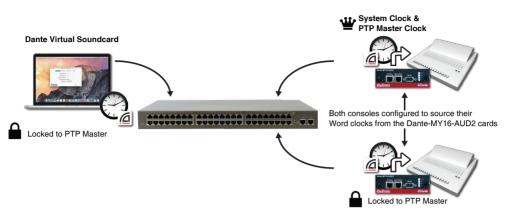
Setting the clock source for a Dante-MY16-AUD2 card

To check or set the word clock source for a Dante-MY16-AUD2 card, open Dante Controller and click the Clock Status tab. All Dante-enabled devices present on the network are listed along with current clock information. To configure a Dante-MY16-AUD2 card to use its host Yamaha equipment clock, select the 'Slave to External Word Clock' setting. This will be unchecked by default, and the Dante-MY16-AUD2 will use its onboard VCXO (synced to the current Dante network master clock) as the word clock source.

Default clock setup: Yamaha equipment synced to Dante network clock

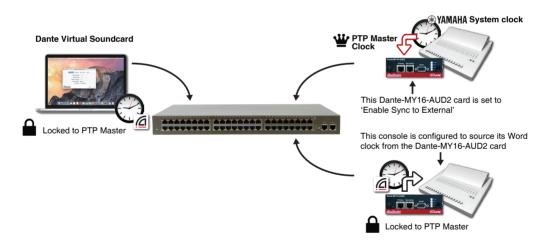
In the following example, both Dante-MY16-AUD2 cards have Slave to External Word Clock unchecked, and both Yamaha consoles are configured to source their word clock from the Dante-MY16-AUD2 slot. The system is driven from the Dante network using the PTP Master Clock (automatically selected from the best clocks on the network).

Basic Operation (contd.)



Alternative clock setup: Dante network clock synced to Yamaha equipment

In this example, a Yamaha console has been chosen to provide the word clock for the network. The Dante-MY16-AUD2 card installed on that console is set to 'Slave to External Word Clock', and the Yamaha console has been configured to provide its internal word clock. The Yamaha console clock is now the system clock - it drives the installed Dante-MY16-AUD2 clock, which becomes the PTP Master Clock for the Dante network.



Note: You should usually set only one Dante device on the network to operate in external word clock mode. Under normal circumstances, a Dante device with 'Slave to External Word Clock' set will automatically become the Dante network clock master.

Checking your clock configuration

Dante Controller can be used to view the Dante clock status of all devices on the network, and to display who is the Dante clock master. To view, open Dante Controller and click the Clock Status tab.

Advanced clock configuration

There may also be some occasions where you want to force a Dante device to become the Dante network clock master, or to configure clocking redundancy. Please refer to the Dante-MY16-AUD2 User Guide, Dante Controller User Guide and Dante documentation available on the Audinate website for further information.

Configuring audio routes

Use the Dante Controller to configure channel routing between Dante devices. Using the grid view, click the intersection of a transmit and receive channel to configure an audio flow. A green icon will appear when the audio flow is established. Click again to remove the flow. Please refer to the Dante Controller online help for more information.

Multicast and Unicast modes

Dante flows can be established as Unicast or Multicast. Unicast ensures that packets only traverse the network links between the transmitter and receiver, whereas multicast typically floods throughout the network. Multicast is usually recommended when a number of devices need to receive the same audio source. The Dante-MY16-AUD2 card also supports AES67 multicast flows. Please refer to the Dante Controller online help for more information.

Setting Latency

The device latency of your Dante-MY16-AUD2 card can be adjusted using Dante Controller. Latency adjustments maybe required for daisy chain configurations. Please refer to the Dante Controller online help for more information.

Activating Dante Virtual Soundcard

In order to activate Dante Virtual Soundcard, you will need the DVS Token from the 'Download your software' card included with your hardware.

The DVS Token can be redeemed for a Dante Virtual Soundcard license ID, via the Audinate website. You can then use your license ID to activate Dante Virtual Soundcard.

To redeem your DVS Token for a license ID, go to: www.audinate.com/RedeemDVSToken

You will need to log in to the Audinate website, or register an account if you have not done so already.

- 1. Type your token into the **DVS Token** text field.
- 2. Enter the text you would like to appear on the licensing screen of the Dante Virtual Soundcard application (for example, 'John Smith' or 'Bondi High School').
- 3. Click Next.

Your license ID will be displayed. Record your license ID and store it somewhere safe. You can however log into the Audinate website to view your license ID at any time (at My Account > My Products).

To activate Dante Virtual Soundcard, start the application, and paste or type your license ID into the text field on the Licensing tab, then click **Activate**.

Getting Further Information

Reading the Dante-MY16-AUD2 User Guide, Dante Virtual Soundcard User Guide and Dante Controller User Guide is recommended, as they contain more detailed information about configuring and using Dante.

These documents are available from the Dante-MY16-AUD2 pages at the Yamaha Pro Audio website: www.yamahaproaudio.com

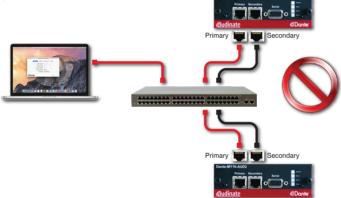


Important Notices

TO AVOID COMMON CONFIGURATION ERRORS, PLEASE READ THE FOLLOWING NOTICES.

Unsupported Network Configurations

- 1. Do not connect Dante Primary and Secondary redundant networks to the same switch.
- When using Dante redundancy with any Dante-enabled device, including Dante-MY16-AUD2 cards, two separate networks must be used. You CANNOT connect any secondary network connections to a switch used for the primary network, or any primary network connections to a switch used for the secondary network.



- The use of 100 Mbps network with Dante-MY16-AUD2 cards is NOT SUPPORTED. You must only connect Dante-MY16-AUD2 cards to Gigabit interfaces:
- Gigabit switches, or a Gigabit port on an Ethernet switch
- Gigabit network interface on a PC or Mac
- Other Dante-enabled devices with Gigabit interfaces

Sample Rate Configuration

You will need to use the Dante Controller to view and set Dante-MY16-AUD2 sample rate. Please read the Dante-MY16-AUD2 and Dante Controller User Guides for instructions.

Some important points:

 Make sure all Dante-MY16-AUD2 cards installed in the same Yamaha equipment are set to the same sample rate.



If the Yamaha equipment is providing the clock source (set to Int) all Dante-MY16-AUD2 cards should be set to this rate.

 If using 88.2kHz or 96kHz, make sure your Yamaha equipment is set to double-speed, not doublechannel.

Please refer to the manual for your Yamaha equipment for configuration instructions as necessary.

Word Clock Configuration

You will need to use the Dante Controller to view and set Dante clocking. Please read the Dante-MY16-AUD2 and Dante Controller User Guides for instructions.

Some important points:

- If your Yamaha equipment is providing Word Clock to your Yamaha cards (Word Clock set to Internal), make sure one of the cards is set to 'Slave to External Word Clock'.
- If your Yamaha equipment is deriving its Word Clock from the Dante-MY16-AUD2 cards(s) (Word Clock set to a Slot), make sure none of the cards are set to 'Slave to External Word Clock'.

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For further information and to access copies of each of these licenses, please visit our website:

http://www.audinate.com/software-licensing-notice

End User License Agreement

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Limited Product Warranty

1 GENERAL TERMS

Subject to the provisions of this Warranty, Audinate warrants that the Product(s) herein shall conform to their Specifications and that the Hardware shall be free from material defects in materials and workmanship.

- a. This Warranty applies to all original purchases of Audinate supplied Product.
- b. The effective period of this Warranty shall start on the date of original purchase of Product by the End-User.
- c. The effective warranty period shall be
 - i. Two (2) years (the "EU Warranty Period") from the purchase date if the Product is purchased and used in the European Union Countries.
 - ii. One (1) year (the "Warranty Period") from the purchase date if the Product is purchased and used in the rest of the world outside the European Union Countries.
- d. The End-User acknowledges that Audinate does not represent or warrant that the Product provided by Audinate under this Warranty, will guarantee uninterrupted or error-free operation. Audinate shall make all reasonable efforts to ensure that Product defects will be corrected.
- e. Yamaha and Yamaha Subsidiaries shall provide the First Line and Second Line Support services related to End-User customer support incidents.

2 LIMITATIONS AND QUALIFICATIONS OF WARRANTY

- a. This Warranty does not apply to any damage, defect or failure if and to the extent such damage, defect or failure is caused by:
 - Damage, deterioration, or malfunction from accident, negligence, misuse, mishandling, improper installation or operation, or failure to follow instructions from Audinate's End-User manual or documentation for the Product.
 - ii. Damage during shipment (claims must be presented to the carrier) or cosmetic damage.
 - iii. Repair or attempted repair by anyone, other than Audinate, or its authorized repair center,
 - Any unit in which has been altered, or on which the serial number has been a defaced, modified, or removed.
 - v. Deterioration due to water, perspiration, corrosive atmosphere, or other external causes such as extreme temperature or humidity
 - vi. Damages attributed to power line surge or related electrical abnormalities, lightning damage, or other acts of force Majeure.
 - vii. RFI/EMI interference noise caused by improper grounding or the improper use of either certified, or uncertified equipment, if applicable,
 - viii. Any evidence of alteration, erasing, or forgery of proof-of purchase documents will cause this warrant to become void.
- b. This warranty covers only the original End-User purchaser and is not transferable. The original invoice or sales receipt (showing date of purchase, product code and dealer's name) MUST be supplied with the defective product, along with a statement detailing the fault. In the absence of this clear proof of purchase, Audinate reserves the right to refuse to provide free of charge service and the product may be returned at the customer's expense.

3 LIMITATIONS ON DAMAGES

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