

## Thunderbolt™ Audio Converter

# TAC-2

## Operation Manual

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## Introduction

### 2-in/2-out Thunderbolt™ audio converter

The **TAC-2** audio converter uses Thunderbolt™, the latest generation of high-speed interface technology. With this, we have realized a system with low latency that was not possible using USB 2.0. Since it also supports recording and playback at up to 24-bit/192kHz, it can also be used for the playback of high-resolution sound sources delivered with superior audio quality over the Internet.

### Attention to audio performance

The entire system reproduces the original audio faithfully. An asynchronous transfer system that is not impacted by computer jitter is used along with the latest AD/DA converter, which supports 192kHz.

### High-performance mic preamps

Burr Brown brand mic preamps that can provide a maximum of +60dB amplification and +48V phantom power are used for each of the inputs.



### TAC-2 MixEfx dedicated mixer application

Use this application to make internal mixer and monitoring effect settings. For details about **TAC-2 MixEfx**, see the ZOOM website (<http://www.zoom.co.jp/downloads/>).



# Usage and safety precautions

## SAFETY PRECAUTIONS

In this operation manual, symbols are used to highlight warnings and cautions that you must read to prevent accidents. The meanings of these symbols are as follows.

|  |  |
|--|--|
|  | Something that could cause serious injury or death           |
|  | Something that could cause injury or damage to the equipment |

Other symbols used

|  |                              |
|--|------------------------------|
|  | An action that is mandatory  |
|  | An action that is prohibited |


## Warnings

### Alterations






-  Do not open the case or modify the product.

## Precautions



### Product handling

-  Do not drop, bump or apply excessive force to the unit.
-  Be careful not to allow foreign objects or liquids enter the unit.

### Operating environment

-  Do not use in extremely high or low temperatures.
-  Do not use near heaters, stoves and other heat sources.
-  Do not use in very high humidity or where it could be splashed by water.
-  Do not use in places with frequent vibrations.
-  Do not use in places with much dust or sand.

### Connection cables and input/output jacks

-  Always turn the power OFF for all equipment before connecting any cables.
-  Always disconnect all connection cables and the AC adapter before moving the unit.

### Volume

-  Do not use at a loud volume for a long time.

## Usage Precautions

### Interference with other electrical equipment

In consideration of safety, the **TAC-2** has been designed to minimize its emission of electromagnetic waves and to suppress interference from external electromagnetic waves. However, equipment that is very susceptible to interference or that emits powerful electromagnetic waves could result in interference if placed nearby. If this occurs, place the **TAC-2** and the other device farther apart. With any type of electronic device that uses digital control, including the **TAC-2**, electromagnetic interference could cause malfunction, corrupt or destroy data and result in other unexpected trouble. Always use caution.

### Cleaning

Use a soft cloth to clean the exterior of the unit if it becomes dirty. If necessary, use a damp cloth that has been wrung out well. Never use abrasive cleansers, wax or solvents such as alcohol, benzene or paint thinner.

### Temperature considerations

Continuous use of this interface for long periods of time, for example, might cause it to become warm. This is normal as long as it does not become too hot to touch.

### Breakdown and malfunction

If the **TAC-2** should malfunction or operate abnormally, disconnect it immediately. Then, contact the retailer where you purchased it or Zoom support and provide the following information: product model, serial number and details of the symptoms of malfunction or abnormal operation, as well as your name, address and telephone number.

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- Thunderbolt and the Thunderbolt logo are trademarks of Intel Corporation in the U.S. and/or other countries.
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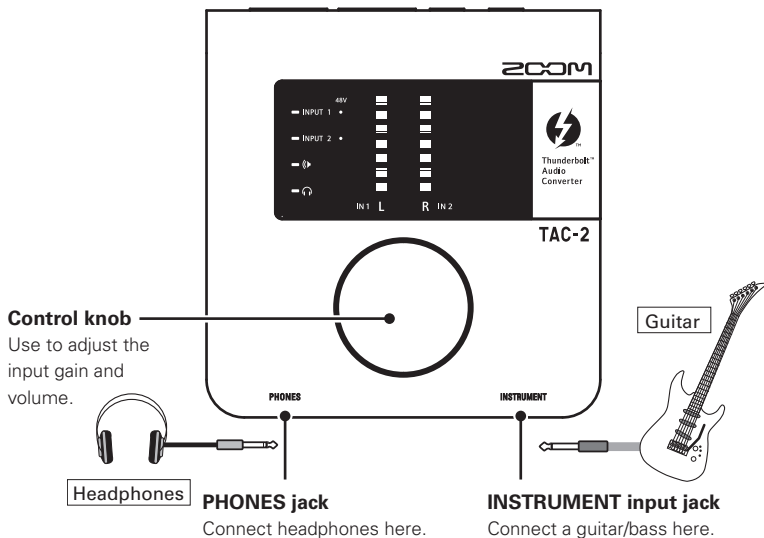
Note: All trademarks and registered trademarks in this document are for identification purposes only and are not intended to infringe on the copyrights of their respective owners.

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# Part Names

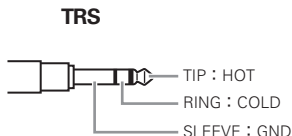
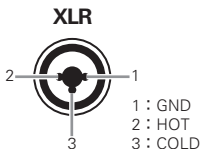
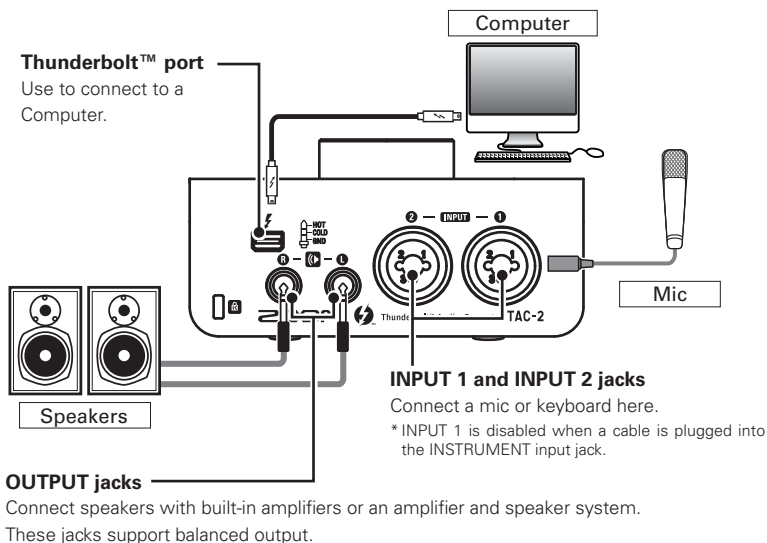
## ■ Top Panel



### HINT

- Press the control knob to cycle through what it controls in the following order: INPUT 1, INPUT 2, INPUT 1+2, OUTPUT, PHONES.

## ■ Rear Panel



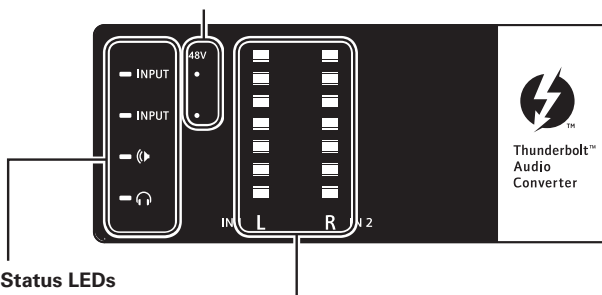
## Part Names (continued)

### ■ Display

This shows the input gain, and input and output levels, for example.

#### +48V indicator

This indicator lights when phantom power is in use and is unlit at other times.



#### Status LEDs

These show the current control knob assignments.

- INPUT 1 : INPUT 1
- INPUT 2 : INPUT 2
- (speaker icon) : OUTPUT
- (headphones icon) : PHONES

#### LED meters

These show the input gain or input/output levels according to the item currently selected for control. If the signal clips when showing input or output levels, the red LED at the very top lights.

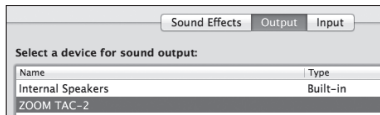
## Installing the driver

1. Download the ZOOM TAC-2 Driver from <http://www.zoom.co.jp/downloads/> to your computer.

### NOTE

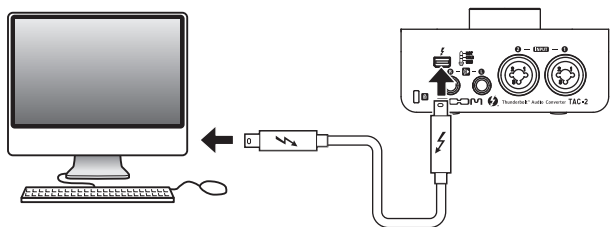
- You can download the latest ZOOM TAC-2 Driver from the above website.
- Do not connect the **TAC-2** when installing the driver.
- The supported operating systems are as follows.  
Mac OS X 10.8.5 (or later)

2. Click the ZOOM TAC-2 Driver.pkg icon to launch the installer.  
Follow the instructions that appear on screen to install the ZOOM TAC-2 Driver.
3. Connect the **TAC-2** and the computer using a Thunderbolt™ cable.
4. Open the Sound pane of the System Preferences and set both the Input and Output to ZOOM TAC-2.



## Turning the Power ON

1. Minimize the volume of the devices connected to the **TAC-2**.
2. Connect the **TAC-2** and the computer using a Thunderbolt™ cable. (This turns the power on.)



### NOTE

- The unit will not turn on if the driver is not installed.  
Follow the instruction on page 7 to install the ZOOM TAC-2 Driver.

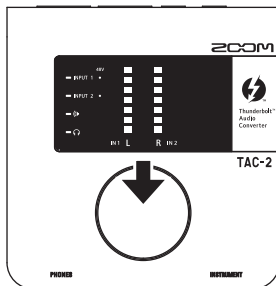
3. Raise the volume of the devices connected to the **TAC-2**.

## Adjusting the OUTPUT volume

### 1. Select .

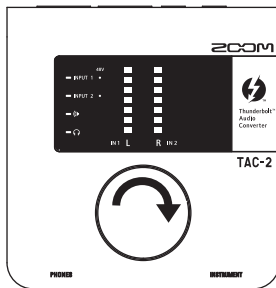
Press repeatedly until the  lights.

Press



### 2. Adjust the volume.

Turn



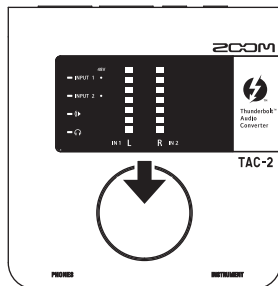
After you finish doing this, the LED meters will automatically resume showing the output levels of the OUTPUT jacks.

## Adjusting the PHONES volume

### 1. Select .

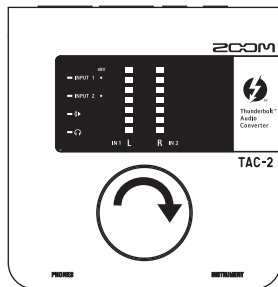
Press repeatedly until the  lights.

Press



### 2. Adjust the volume.

Turn



After you finish doing this, the LED meters will automatically resume showing the output levels of the PHONES jacks.

## Adjusting input gain

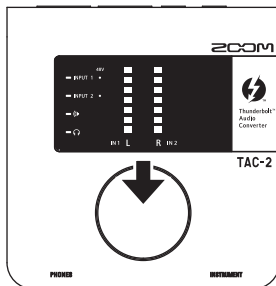
### 1. Select the input that you want to adjust.

Press repeatedly until the LED for the input that you want to adjust lights.

#### HINT

- You can adjust both INPUT 1 and INPUT 2 at the same time.

Press

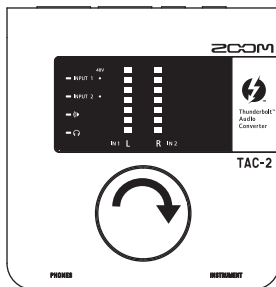


### 2. Adjust the input gain.

#### HINT

- Adjust the gain so that at the maximum input level, the red LEDs at the very top of the LED level meters do not light.

Turn



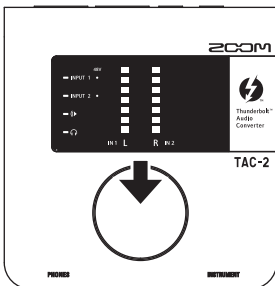
After you finish doing this, the LED meters will automatically resume showing the levels of the selected inputs.

## Using phantom power

1. Select the input to which you want to provide phantom power.

Press repeatedly until the LED for the input to which you want to provide phantom power lights.

Press



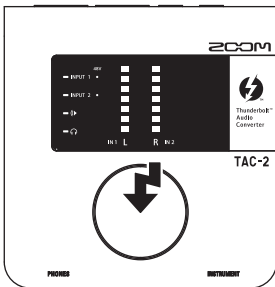
2. Turn phantom power on (or off).

Press and hold for one second.

### HINT

- INPUT 1 and INPUT 2 can both be turned ON/OFF at the same time.

Press and hold



# Troubleshooting

## Cannot select or use the TAC-2 device

- Confirm that the **TAC-2** is connected to the computer correctly.
- Quit all the software that is using the **TAC-2**, and disconnect and reconnect the Thunderbolt™ cable connected to the **TAC-2**.
- Reinstall the driver.

## Playback sound cannot be heard or is quiet

- Check the speaker connections and volume settings on the speakers.
- Adjust the speaker volume or headphone volume on the **TAC-2**.
- Confirm that the Output of the Sound pane of the System Preferences is set to ZOOM TAC-2.

## Recorded audio is too loud, too quiet or silent

- Adjust the input gain of the **TAC-2**.
- Confirm that no connection cable is plugged into the INSTRUMENT input jack. If you want to record using INPUT 1, you must disconnect any connection cable from the INSTRUMENT input jack.
- When using a condenser mic, turn phantom power on.
- Confirm that the Input of the Sound pane of the System Preferences is set to ZOOM TAC-2.

## The sound of the device connected to the input jack is distorted

- Confirm that the red LEDs are not lighting when the LED meters are showing the input levels. If they are lighting, lower the input levels.

## Sound skips during playback or recording

- If you can adjust the audio buffer size of the software that you are using, increase the buffer size.

## Cannot play or record

- Confirm that ZOOM TAC-2 is selected in the Sound pane of the System Preferences.
- Confirm that **TAC-2** is set for input and output in the software that you are using.
- Confirm that **TAC-2** is connected to the computer correctly.
- Quit all the software that is using the **TAC-2**, and disconnect and reconnect the Thunderbolt™ cable connected to the **TAC-2**.

# Specifications

|  |                         |  |  |
|--|-------------------------|--|--|
| <b>Inputs</b>  | INPUT 1/2               | Connector  | XLR/TRS combo jacks (XLR: 2 hot, TRS: TIP hot)                         |
|  |                         | Input gain   | 0, 9–60 dB (in 3dB steps)  |
|  |                         | Input impedance  | 3 k $\Omega$   |
|  |                         | Maximum input level  | +12 dBu (at 0 dBFS)  |
|  |                         | Phantom power  | +48V   |
|  | INSTRUMENT<br>(INPUT 1) | Connector  | Standard phone (disables INPUT 1 when in use)                          |
|  |                         | Input impedance  | 1 M $\Omega$   |
|  |                         | Maximum Input level  | +10 dBu (at 0 dBFS)  |
| <b>Outputs</b>   | OUTPUT<br>L/R           | Connector  | Connector TRS phone (balanced)   |
|  |                         | Maximum output level   | +14 dBu (at 0 dBFS)  |
|  |                         | Output impedance   | 100 $\Omega$   |
|  | PHONES                  | Connector  | Standard stereo phone jack<br>20 mW $\times$ 2 (into 32 $\Omega$ load) |
|  |                         | Maximum output level   | +8 dBu (at 0 dBFS)   |
|  |                         | Output impedance   | 30 $\Omega$  |
| <b>Frequency characteristics</b>                       |                         | At 44.1 kHz  | –2.0 dB: 20 Hz – 20 kHz  |
|  |                         | At 96 kHz  | –2.0 dB: 20 Hz – 40 kHz  |
|  |                         | At 192 kHz   | –2.0 dB: 20 Hz – 60 kHz  |
| <b>Input conversion noise</b>                          |                         | Measured EIN: 125 dB (IHF-A) (with 60dB, 150 $\Omega$ input) |  |
| <b>Dynamic range</b>                                   |                         | AD: 118 dB typical (IHF-A)                                   |  |
|  |                         | DA: 120 dB typical (IHF-A)                                   |  |
| <b>Number of audio recording and playback channels</b> |                         | Recording: 2 channels  |  |
|  |                         | Playback: 2 channels   |  |
| <b>Sampling frequencies</b>                            |                         | 192 kHz, 176.4 kHz, 96 kHz, 88.2 kHz, 48 kHz, 44.1 kHz       |  |
| <b>Bit depth</b>                                       |                         | 24-bit   |  |
| <b>Interface</b>                                       |                         | Thunderbolt™   |  |
| <b>Power Source</b>                                    |                         | Thunderbolt™   |  |
| <b>Power consumption</b>                               |                         | 10 W maximum   |  |
| <b>Dimensions</b>                                      |                         | 129.5 mm (D) $\times$ 120.0 mm (W) $\times$ 51.3 mm (H)      |  |
| <b>Weight (main unit only)</b>                         |                         | 420 g  |  |

• 0 dBm = 0.775 Vrms



## **FCC regulation warning (for U.S.A.)**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## **For EU Countries**



Declaration of Conformity

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