



Installation Guide for the

# AV Bridge 2x1

Presentation Switcher

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## Overview

This guide provides information about the AV Bridge 2x1 presentation switcher:

- 999-8250-000 – North America
- 999-8250-001 – Europe/UK
- 999-8250-009 – Australia/New Zealand



## About this Guide

This guide covers:

- Tips for a successful installation
- Connection diagram
- Equipment power-on

## Features

- The perfect solution for rooms where you only need two cameras: 2x1 video switcher bridges two HDMI cameras or other video sources into a soft-client conferencing or IP streaming environment
- Simultaneous USB 3.0 and IP streaming (RTSP or RTMP), video and audio
- Delivers IP stream resolution up to 1080p/30 and USB stream resolution up to 1080p/60
- Supports HDCP
- Multiple audio formats: USB and IP stream, analog, HDMI, Dante®
- Phantom power to microphones
- Connections for up to five external trigger devices

## Unpacking the AV Bridge 2x1

Make sure you received all the items you expected. Here is the packing list for the AV Bridge 2x1.

**AV Bridge 2x1, North America: 999-8250-000**

**AV Bridge 2x1, Europe and UK: 999-8250-001**

**AV Bridge 2x1, Australia and New Zealand: 999-8250-009**

- AV Bridge 2x1
- PoE+ power injector with AC cord set(s)
- Half-rack mounting kit
- 3-position Phoenix-style connectors (qty. 4)
- Cat-5 cable, 3 ft (0.9 m)
- USB 3.0 cable, type A to type B, 6 ft (1.8 m)
- Quick-Start Guide

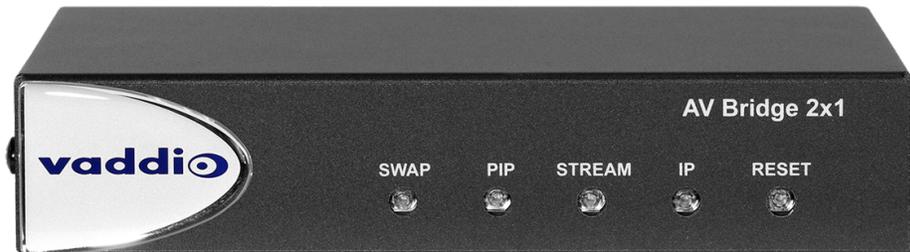
Optional dual half-rack and under-table mounts are also available on [legrandav.com](http://legrandav.com). Contact us if you can't find the mount you need.



## A Quick Look at the AV Bridge 2x1

Physical features of the device – controls, indicators, and connectors.

### Front Panel



- Swap button:
  - Changes the selected input.
  - Exchanges the PIP and main image on the HDMI output, if the PIP is turned on.
- PIP button:
  - Toggles the PIP on or off.
  - Illuminated: PIP is on.
  - Off: PIP is off.
- Stream button:
  - Toggles the stream on or off.
  - Illuminated: Stream is available.
  - Off: Stream is not available.
- IP button:
  - Press to display the device's IP address in the streams. Press again to dismiss the IP address information.
  - Illuminated: Streams and local HDMI output are displaying the IP address.
  - Off: Normal display.
- Reset button:
  - Press to reboot the device.
  - Illuminated: Normal operation.
  - Off: No power to the device.
  - Blinking: Error.
- Dimensionally enhanced puffy badge: We have spared no expense to provide a lovely, dimensionally enhanced logo badge to elevate your visual experience. It's quite shiny. We hope you'll enjoy it.

## Connector Panel



- **Network/PoE+** – Power, control via web interface, Dante audio, and IP streaming.
- **USB 3.0** – Uncompressed video output with PCM audio for conferencing applications.
- **RS-232** – Connect to an optional third-party control system.
- **Trigger** – Connect up to five trigger devices.
- **HDMI In 1** and **HDMI In 2** – HDMI video (and audio, if available) from the connected camera or other HDMI source.
- **HDMI Out** – Output video (and audio, if available) from the selected input.
- **Audio In Mic/Line 1** and **Mic/Line 2** – Microphone or other audio inputs. Can be configured to supply phantom power.
- **Audio Out Line 1** and **Line 2** – Far-end audio from conferencing application or as configured in the audio matrix.

## Installation

This section covers how to install and connect the product. It also provides safety information and other guidance related to installing the product.

### Note

*This product is intended for installation and use only in environments where all RS-232 and PoE/PoE+ connections originate within the building.*

*Or in UL's preferred phrasing...*

**PoE-type networks connected to this equipment are for intra-building use only and should not be connected to lines that run outside the building in which this product is located.**

## Don't Void Your Warranty!

### Caution

*This product is for indoor use. Do not install it outdoors or in a humid environment without the appropriate protective enclosure. Do not allow it to come into contact with any liquid.*

*Do not install or operate this product if it has been dropped, damaged, or exposed to liquids. If any of these things happen, return it to Vaddio for safety and functional testing.*

## Cabling Notes

Use Cat-5e or better cable and standard RJ-45 connectors (568B termination). We recommend using high-quality connectors and a high-quality crimping tool.

### Caution

*When building cables for Vaddio products, do not use pass-through RJ-45 connectors. If they are crimped incorrectly, they can cause intermittent connections and degrade signal quality. Incorrectly crimped pass-through connectors can also damage the connectors on the product, which will void your warranty.*



**Intact** – will make reliable contact with cable connector



**Damaged** – Bent contact fingers will NOT make reliable contact with cable connector

Use Cat-5e or better cable. We recommend using high-quality connectors and a high-quality crimping tool. We recommend shielded cabling if the cables will be coiled, run tightly with other cables, or placed close to sources of electromagnetic interference such as power lines.

### Caution

*Check your cables. Connecting a cable to the wrong port or using the wrong pin-out can result in equipment damage and will void the warranty.*

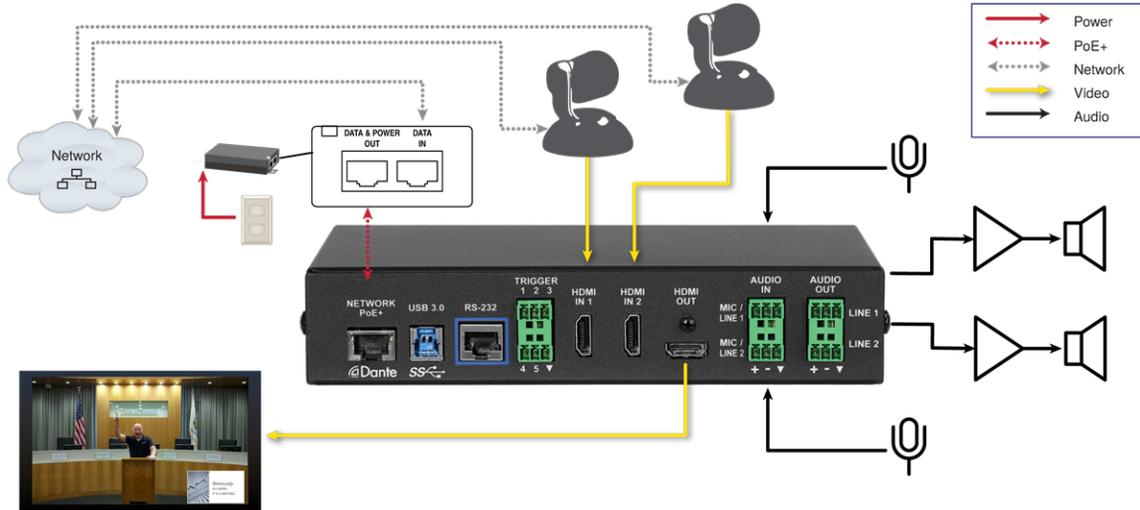


### Pro Tip

*To prevent tragic mishaps, label both ends of every cable.*

## Basic Connections

This diagram shows a basic installation. Cameras or other HDMI sources may be used for both HDMI inputs. The AV Bridge 2x1 does not power the speaker(s). The HDMI output displays video from the selected source; the picture-in-picture (PIP) is from the video source not currently selected – a camera, laptop, or other video source.

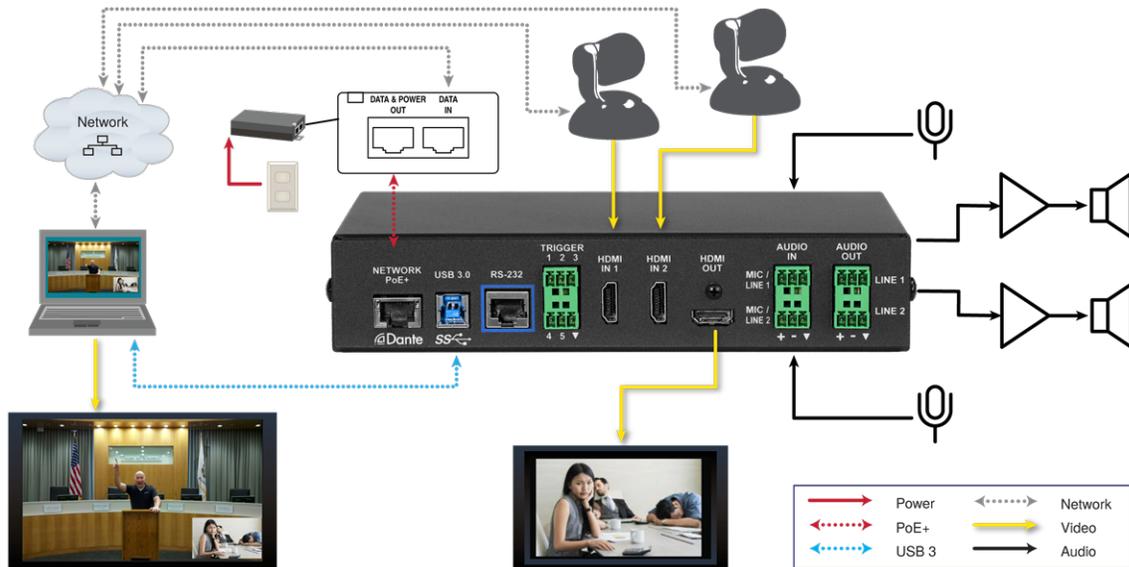


## Basic Connections for Conferencing

Add a laptop and a second HDMI display for conferencing.

In this diagram, the laptop connects to the room's main display, which shows the far-end video from the soft conferencing application on the laptop. (In contrast to the previous diagram, our friend at the podium is on the far end of the call.) The soft conferencing application manages the PIP(s) in this image. The display connected to the HDMI output shows near-end video.

The HDMI output from the AV Bridge 2x1 goes to a "confidence display" showing near-end video only. The image on this display is used as the near-end PIP on the main display. If the PIP is enabled on the AV Bridge 2x1, this is part of the image that others in the conference will see, and the room's main display shows a PIP within the near-end PIP.



## Using Dante Devices with AV Bridge 2x1

The AV Bridge 2x1 presentation switcher is compatible with Dante audio products. These products connect to the AV Bridge 2x1 over the network.

To work with Dante devices, you will need to download and install the free Dante Controller application from Audinate Pty. Ltd.:

[www.audinate.com/products/software/dante-controller](http://www.audinate.com/products/software/dante-controller)

Things to know about Dante Controller:

- Dante Controller does not work over Wi-Fi or across subnets. Your computer must be on the same subnet as the Dante devices you need to work with.
- Device names and IP addresses shown in Dante Controller do not match the corresponding information shown in Vaddio devices' web interfaces.
- Dante Controller allows you to rename devices, so you can make their identifying labels match what's displayed in the Vaddio web interface.

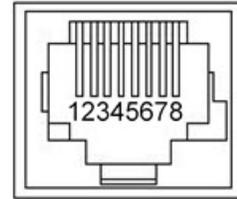
Audinate provides information, training, and documentation for Dante technology on their website.

## RS-232 Serial Communication Settings and Port Pin-outs

The RS-232 serial port (color-coded blue) on the back panel connects to a third-party controller.

### RS-232 connector pin-out:

- Pin 1: Not used
- Pin 2: Not used
- Pin 3: Not used
- Pin 4: Not used
- Pin 5: Not used
- Pin 6: GND
- Pin 7: TXD
- Pin 8: RXD



### Communication parameters:

Parameter	Value
Communication Speed	38400 bps
Start bits	1
Stop bits	1
Data bits	8
Parity	None
Flow control	None

### Caution

*Check your cables. Connecting a cable to the wrong port or using the wrong pin-out can result in equipment damage and will void the warranty.*

Depending on the equipment connected to the RS-232 port, you may need a null-modem (crossover) cable.

## Powering Up

Power up the AV Bridge 2x1 and the connected equipment at the same time, or power up the connected equipment before you power up the AV Bridge 2x1.

## Next Steps

The AV Bridge 2x1 is now ready to configure. Until the product is fully configured, its full functionality is not available. This information is available in the **Complete Manual for the AV Bridge 2x1 Presentation Switcher**.

Download manuals, dimensional drawings, and other information from [www.vaddio.com/support](http://www.vaddio.com/support).

## Troubleshooting and Care

If the equipment does not power up as expected, use this table to determine whether to call Vaddio Technical Support.

### Note

*If the equipment behaves in a way that suggests even a remote possibility of a bad cable, please try a known good cable with the same pin-out. Factory-made cables can be defective. Cables can appear to be good but only work part of the time. A cable may pass a standard continuity check but be unable to pass enough power to the connected device.*

*Crimping tools can crimp unevenly, contacts can break internally, and individual conductors in the cable can break inside the jacketing material. Any of these can result in a cable that passes a continuity check but does not work reliably.*

(The author would like to confess having made more than a few almost-good cables. It happens.)

### Power Issues

What is it doing?	Possible causes	Check and correct
Nothing. The buttons do not light up. 	Power is not connected.	Check the connections from the wall outlet to the PoE+ power injector and from the power injector to the device.
	The wall outlet is not active. (Check by finding out if it powers something else, such as a laptop or phone charger.)	Use a different outlet.
	The device or its power injector is bad.	Contact your reseller or Vaddio Technical Support.
Unresponsive camera (no video, unable to control the camera, or both)	A cable is connected to the wrong port.	Check and correct cable connections.
	A cable is bad. (This can even be a problem with factory cables.)	Check using a known good cable with the same pin-out.
	There is a problem with the camera.	Refer to the troubleshooting information in the camera manual.

## Operation, Storage, and Care

For smears or smudges on the product, wipe with a clean, soft cloth. Do not use any abrasive chemicals.

Keep this device away from food and liquids.

Do not operate or store the device under any of the following conditions:

- Temperatures above 40°C (104°F) or below 0°C (32°F)
- High humidity, condensing or wet environments
- Inclement weather
- Severe vibration
- In any mode of transportation with Tom Hanks
- Dry environments with an excess of static discharge

Do not attempt to take this product apart. There are no user-serviceable components inside.



## Compliance and Conformity Statements

Compliance testing was performed to the following regulations:

FCC Part 15 (15.107, 15.109), Subpart B	Class A
ICES-003, Issue 54: 2012	Class A
EMC Directive 2014/30/EU	Class A
EN 55032: 2015	Class A
EN 55024: November 2010	Class A
IEC 60950-1:2005 (2nd Edition); Am 1: 2009 + Am 2: 2013	Safety
EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013	Safety
IEC 62368-1:2014 (2nd Edition)	Safety

### FCC Part 15 Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B, 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/her own expense.

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference including interference that may cause undesired operation of the device.

Changes or modifications not expressly approved by Vaddio can affect emission compliance and could void the user's authority to operate this equipment.

### ICES-003 Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

## European Compliance

This product has been evaluated for Electromagnetic Compatibility under the EMC Directive for Emissions and Immunity and meets the requirements for a Class A digital device. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

**Standard(s) To Which Conformity Is Declared:**

EMC Directive 2014/30/EU

EN 55032: 2015 – Conducted and Radiated Emissions

EN 55024: November 2010 – Immunity

IEC 60950-1: 2005 (2nd Edition); Am 1: 2009 + Am 2: 2013 – Safety

EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013 – Safety

IEC 62368-1: 2014 (2nd Edition) – Safety

## Photo Credits

This guide may include some or all of these photos.

European Space Agency (ESA) astronaut Samantha Cristoforetti, a Flight Engineer with Expedition 42, photographs the Earth through a window in the Cupola on the International Space Station

By NASA - [https://blogs.nasa.gov/ISS\\_Science\\_Blog/2015/03/06/women-in-space-part-two-whats-gender-got-to-do-with-it/](https://blogs.nasa.gov/ISS_Science_Blog/2015/03/06/women-in-space-part-two-whats-gender-got-to-do-with-it/), Public Domain, <https://commons.wikimedia.org/w/index.php?curid=38834990>

Carl Sagan, Bruce Murray, Louis Friedman (founders) and Harry Ashmore (advisor), on the occasion of signing the papers formally incorporating The Planetary Society

By credit NASA JPL - JPL, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=1180927>

Main Control Room / Mission Control Room of ESA at the European Space Operations Centre (ESOC) in Darmstadt, Germany

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Expedition 42 on orbit crew portrait, International Space Station, Mar. 7, 2015 – Barry Wilmore (Commander) Top, Upside down, to the right cosmonaut Elena Serova, & ESA European Space Agency Samantha Cristoforetti. Bottom center US astronaut Terry Virts, top left cosmonauts Alexander Samokutyaev and Anton Shkaplerov.

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European Space Agency astronaut Luca Parmitano, Expedition 36 flight engineer, outside the International Space Station

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Chris Cassidy, Luca Parmitano, and Karen Nyberg, ISS, 2013. Photo Credit: NASA

Nicolas Altobelli, Rosetta Scientist at ESA's European Space Astronomy Centre, Villanueva de la Cañada, Madrid, Spain

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Andrea Accomazzo, ESA Rosetta Spacecraft Operations Manager, providing a live update from the Main Control Room at ESA's European Space Operations Centre, Darmstadt, Germany during the Rosetta wake-up day.

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May also contain random images of the author's own cats. You're welcome.

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## Glossary

### **AEC**

Acoustic echo cancellation. Audio processing that subtracts the far-end (speaker) audio from the sound that your microphone picks up.

### **bandwidth**

Data transfer rate (bits per second) for the stream. In some cases, using a high bandwidth can slow down other network traffic. On networks with very low bandwidth, video issues may result. Streaming at a lower resolution or frame rate can reduce bandwidth usage.

### **DHCP**

Dynamic Host Configuration Protocol. A network management protocol that assigns an IP address to a device automatically when it is connected to the network.

### **DIY**

Do It Yourself. As in, "You can copy information from this document to create a DIY room guide customized for your conference room." Yes! You can do that! In fact, the "Info for DIY Room Guides" document is specifically designed for you to adapt and customize.

### **EasyMic**

Vaddio's proprietary connectivity standard for conferencing microphones.

### **echo cancellation**

Audio processing that subtracts the far-end (speaker) audio from the sound that your microphone picks up.

### **far end**

(conferencing) A location in the conference other than the one where you are. Far-end video is what you typically see in a conference – the people at the other end of the call.

### **felis catus**

What the internet is made of.

### **full-duplex**

Simultaneous two-way (or multi-way) audio; conference participants at the near end can talk and still hear the participants at the far end(s), as in a face-to-face meeting.

### **gateway**

Network information automatically assigned in a DHCP network. If installing equipment on a non-DHCP network, get this information from the network administrator.

### **HDMI**

(High-Definition Multimedia Interface) A video output format; may also carry audio information.

### **HID audio controls**

(Human Interface Device) Controls to enable conference participants to use the conferencing client to control the audio.

### **HTTP**

HyperText Transfer Protocol. The magic that makes websites work.

**HTTPS**

HyperText Transfer Protocol Secure. The magic that uses encryption to make websites work securely. See **SSL certificate** for more information.

**IP address**

Where a given device is on the IP network, logically. The IP address enables the network to route data to the right device – and that's why IP address conflicts are bad.

**IP address conflict**

Two or more devices attempting to use the same IP address on a network. Results are unpredictable but never good.

**LED**

Light-Emitting Diode. An indicator light.

**MTU**

Maximum Transmission Unit. The largest number of bytes allowed in a packet. If you don't know what that means, don't change MTU size.

**near end**

(conferencing) Your location in a conference. When you mute the video, your camera stops sending near-end video.

**NTP**

Network Time Protocol. Ensures that NTP-enabled devices on the network all show the same system time, so timestamps are accurate.

**PoE, PoE+, PoE++**

Power over Ethernet; a means of powering a device using its network connection. Requires a mid-span power injector. PoE+ and PoE++ deliver more power than PoE.

**RCLB**

Really Cool Logo Badge. A visual cue that the device is a genuine Vaddio product. Accept no substitutes!

**RTMP**

Real-Time Messaging Protocol. Used for livestreaming video (and audio, if available) to a service such as YouTube Live.

**RTSP**

Real-Time Streaming Protocol. Used for streaming video and audio over your network.

**soft conferencing client**

A conferencing application (such as Zoom, Google Hangouts, or Skype for Business) that uses a computer rather than requiring a conferencing codec.

**SSL certificate**

A file used with HTTPS proving that a web page really originates from its purported source. Vaddio devices use self-signed SSL certificates. Since these are not issued by a recognized certificate authority, your browser will pop up security warnings the first time you try to browse to the device's web interface.

**standby mode**

Low-power mode. All inputs and outputs are muted for privacy.

**streaming protocol**

A set of rules that define how video and audio data are sent over the network. See RTMP and RTSP.

**subnet mask**

Network information automatically assigned in a DHCP network. If installing equipment on a non-DHCP network, get this information from the network administrator.

**trigger**

An event that can be associated with a macro (defined command sequence). Devices that originate trigger events are sometimes called triggers or trigger devices.

**UAC drivers**

(Universal Audio Class) Standard USB audio drivers used by Vaddio conferencing products with audio capabilities.

**UCC, UC conferencing**

Unified Communications Conferencing; refers to soft-client conferencing (such as Zoom or Skype for Business) using a computer with USB-connected peripherals.

**USB 2**

An older, lower-speed USB protocol; good for audio but offers lower maximum resolutions for video conferencing. USB 2 products can be connected to USB 2 or USB 3 ports on your computer.

**USB 3**

A high-speed USB protocol, capable of handling high-quality video and audio as in conferencing applications. USB 3 products should be connected to USB 3 ports; performance may be degraded otherwise.

**USB playback**

Audio from other sites (far-end audio) in a conference call.

**USB record**

Audio from your site (near-end audio) in a conference call.

**UVC drivers**

(Universal Video Class) Standard USB video drivers used by Vaddio cameras. They're the reason your computer doesn't have to stop and download a driver when you connect your new Vaddio USB camera to it.

**UVC extensions**

Controls in UVC drivers to allow participants at the far end of a conference to control your camera, if it processes UVC commands. The administrator may choose to disable these.