



Description

The Crestron® ZUMMESH-AVBRIDGE and ZUMMESH-AVBRIDGE-I (AV Bridge) are wireless control integration modules that relay RS-232 commands from a wireless keypad to an AV controller.

The AV Bridge functions:

- In a Züm™ wireless lighting system to relay commands from a Züm Wireless AV Keypad to the AV control system
- In an AirMedia® Presentation System to relay commands from an AirMedia Wireless Keypad to the AM-200 or AM-300 AirMedia Presentation System.

NOTES:

- Only one AV Bridge can be installed in any system.
- When using the AV Bridge with an AM-200 or AM-300:
 - To install, refer to the "Installation" section that follows.
 - To configure, refer to the AM-200/AM-300 Product Manual (Doc. 8254) at www.crestron.com/manuals.

Additional Resources

Visit the product page on the Crestron website (www.crestron.com) for additional information and the latest firmware updates. Use a QR reader application on your mobile device to scan the QR image.

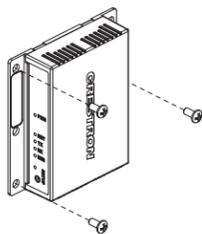


Installation

To install the AV Bridge, do the following:

- Mount the AV Bridge to any flat surface using three screws (not included) that are appropriate for the mounting surface.

NOTE: For best results, position the device to avoid interference from nearby RF sources, obstructions, and metal surfaces.

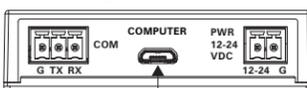


- Make connections to the AV Bridge.

NOTE: Use either the **COM** or **COMPUTER** port (not both) when connecting to the control system or computer. If both connections are made, the AV Bridge will use the **COMPUTER** port to send commands.

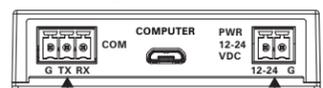
- COMPUTER** - provides power and communications with the controller.
- COM** - provides communications with the controller.
- PWR** - provides power to the AV Bridge when using the **COM** port or when power is not supplied using the **COMPUTER** port.

Connect using the COMPUTER Port



COMPUTER:
To the AV controller

Connect using the COM and PWR Port



COM:
RS-232 to the AV controller

PWR:
From power pack (not included)

COM port specifications:

- G: Ground
- TX: Transmit
- RX: Receive
- Default serial protocol speed: 115.2k baud (8 data bits, 1 stop bits, no flow control, no parity).

How to Set Up a Züm Space and Add Züm Devices

Once all devices are physically installed in a boardroom or conference space, a new Züm space can be created and devices added.

NOTES:

- Only set up one Züm space at a time.
- For simplified setup of a Züm space, use the Züm app on a mobile device.

Step 1 Create a New Züm Space

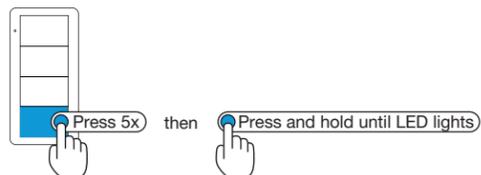
Creating a Züm space defines the area where the devices are located, such as a boardroom or conference room. A Züm space is created with a keypad, dimmer or switch, a J-box device, or an AV Bridge.

NOTES:

- Creating a Züm space can only be performed by one device in the space.
- A Züm space cannot be created from a battery-powered keypad.

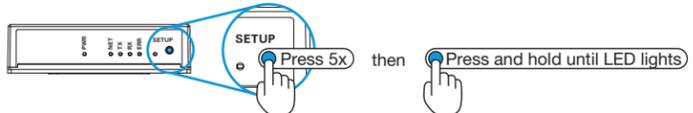
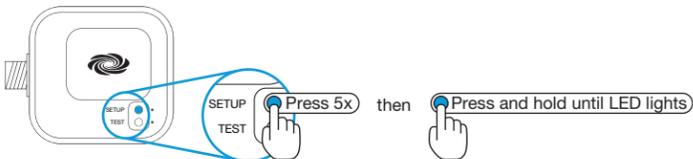
To create a new Züm space using an AC powered keypad, dimmer, or switch:

- Press the bottom button 5 times.
- Press and hold the bottom button until the LED on the device lights. After approximately 3 seconds, the device LED begins slowly flashing. This indicates that the Züm space is now created and in Joining mode, allowing you to add devices.



To create a new Züm space using a J-box device or an AV Bridge:

- Press the **SETUP** button 5 times.
- Press and hold the **SETUP** button until the LED on the device lights. After approximately 3 seconds, the device LED begins slowly flashing. This indicates that the Züm space is now created and in Joining mode, allowing you to add devices.



NOTE: The device that is used to create the Züm space is automatically added to the space and does not need to be added in Step 2.

Step 2 Add the AV Bridge to the Züm Space

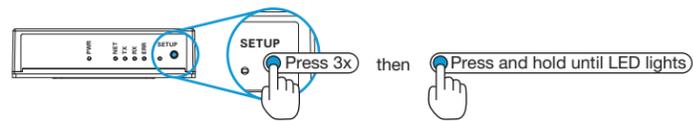
After a new Züm space is created, add the AV Bridge while the space is in Joining mode.

NOTES:

- A Züm mesh device can belong to only one space.
- Joining mode ends automatically after 4 minutes.

To add the AV Bridge.

- Press the **SETUP** button 3 times.
- Press and hold the **SETUP** button until the LED on the AV Bridge lights. The LED on the AV Bridge will start to flash slowly to indicate that it has joined the space.



Step 3 Complete Züm Space Setup

To finish creating a Züm space, press any button on a device that is part of the Züm space to exit Joining mode.

AV Bridge Command List

AV Bridge Serial Protocol and Syntax

Data packets are carriage-return delimited (0xd) ASCII text (lines).

- All commands and responses are case insensitive.
- Line feeds (0x0a) are ignored.
- White space is not permitted in commands, except for pass-through commands.
- The AV Bridge responds to commands with the AVB> prompt.
- Error messages are sent before the prompt.
- Characters sent before the AV Bridge returns the AVB> prompt are discarded.

Special Characters sent to the AV Bridge:

- ! Command: sets a value or triggers an action (e.g., lights off, recall scene, etc.)
- ? Request: used to query a value or state of a Züm device (e.g., the dimmer level)
- \$ Pass-through command: used to invoke debug commands

Special Characters sent from the AV Bridge:

- ~ Response: sent in response to a command (!) or request (?)
- ^ Feedback: sent when a condition in the room changes (e.g., scene change, occupancy change, button press, etc.). The Filter command may prevent certain feedback from being displayed.
- \ line continuation: sent at end of a line when multiple responses are issued

AV Bridge IDs

The AV bridge addresses specific room devices using an AVID (AV Bridge ID). The AVID is comprised of a K (keypad) or L (load controller) and a two digit number that is assigned to the device, such as L01, L02, K01, K02, K03, etc.

NOTES:

- The leading 0 is not needed when referencing an AVID; for example, L1 or L01.
- In the commands that follow, "[id]" would be substituted with an AVID.

Error Responses

The following error messages can be received from the AV system or the AV Bridge.

ERROR TYPE	ERROR RESPONSE	ERROR PRIORITY	COMMENTS
Command error	~error	1	Command not recognized; blank lines not treated as an error
Parameter error	~command.err.param	2	Missing or too many parameters passed or an invalid AVID referenced (e.g., invalid category or two-digit number)
Non-existent device referenced	~command.err.no-exist	3	*command*: any command referencing a device by AVID
Parameter range error	~command.err.range	4	Error with parameter value other than AVID

Command Line Pass-Thru Command

Commands that start "\$" are passed to the AV bridge's command line processor for low-level debugging.

Administrator Commands

Debug Command

The Debug command sets the debug control state. The debug state can also be queried. When the debug state changes, the feedback response is issued by the AV Bridge.

Command Format	Command Response	Query Format	Query Response
!debug.[enable disable]	AVB>	?debug	~debug.[enabled disabled]

Enable debugging:

```
AVB> !debug.enable
AVB>
```

Echo Command

The Echo command enables or disables the device echo. The echo state can also be queried. When the echo state changes, the feedback response is issued by the AV Bridge.

Command Format	Command Response	Query Format	Query Response
!echo.[enable disable]	AVB>	?echo	~echo.[enabled disabled]
Note:	Determines whether the device local echos the incoming character stream.		

Turn on Echo:

```
AVB> !echo.enable
AVB>
```

Fw (Firmware) Command

The Fw query reports the version of the firmware.

Query Format	Query Response
?fw	~fw.[version]

Query the firmware version:

```
AVB> ?fw
~fw.xxxxxxxx
AVB>
```

Reset Command

The Reset command resets the AV Bridge. When the AV Bridge is reset, a feedback response is issued by the AV Bridge.

Command Format	Command Response
!reset	AVB>
Note:	This will reset the AV bridge. The AV bridge will respond with the ~reset confirmation before resetting.

Reset the AV Bridge:

```
AVB> !reset
AVB>
```

SetAVID Command

The SetAVID pass-through command assigns an AVID to a device. This can be used to change an AVID when a device is replaced, or it can be used to implement preplanned AVID assignments based on the device's serial number. The -a parameter allows an AVID to be changed to another AVID. The -s parameter allows an AVID to be assigned to a device based on the device's serial number.

Command Format	Command Response
\$SetAVID -a [AVID] [AVID]	AVB>
\$SetAVID -s [SN] [AVID]	
Note:	Permits reassignment of an AVID.

Replace AVID L01 with L03:

```
AVB> $SetAVID -a [L01] [L03]
AVB>
```

Assign AVID L04 to serial number 123456789:

```
AVB> $SetAVID -s [L04] [123456789]
AVB>
```

DeleteDev Command

The DeleteDev pass-through command deletes a device from the AV Bridge. This can be used to free up an AVID for use by another device, or it can be used to remove a device from the system. The -a parameter allows an AVID to be removed using an AVID. The -s parameter allows an AVID to be removed from a device based on serial number.

Command Format	Command Response
\$DeleteDEV -a [AVID]	AVB>
\$DeleteDEV -s [SN]	
Notes:	Permits deleting an AVID. -s can be used only when in Master mode (i.e., no net bridge in the room).

Delete AVID L01:

```
AVB> $DeleteDEV -a [L01]
AVB>
```

Delete the AVID from a device with the serial number 123456789:

```
AVB> $DeleteDEV -s [123456789]
AVB>
```

Züm Network Management Functions

PermitJoin Command

The PermitJoin command places the room into Joining mode. The room's permitJoin state can also be queried.

Command Format	Command Response	Query Format	Query Response
!permitJoin.[enable disable]	AVB>	?permitJoin	~permitJoin.[enable disable]
Note:	Joining mode automatically times out after 4 minutes.		

Enter Joining mode:

```
AVB> !permitJoin.enable
AVB>
```

Form Command

The Form command creates a new Züm network.

Command Format	Command Response
!form	AVB>
Note:	The device leaves any network and forms a new network. The response should be immediate. The form command puts the network in permit joining mode. It can use PermitJoin command to disable joining immediately. If not, PermitJoin times out.

Form a new network:

```
AVB> !form
AVB>
```

Identify Command

The Identify command identifies AC-powered Züm devices that are part of the network by flashing their LED.

Command Format	Command Response
!identify.[id]stop	AVB>
Notes:	Times out after 3 minutes. The stop parameter stops.

Identify load controller with AVID L01:

```
AVB> !identify.L01
AVB>
```

Join Command

The Join command tells a device to join a Züm network that is in Joining mode.

Command Format	Command Response	Query Format	Query Response
!join	AVB>	?join	~join.[success failure]
Notes:	If the device was commanded to join a network, the ~join response appears only after a success or failure. If a query was issued, the response should be immediate.		

Join a network that is in Joining mode:

```
AVB> !join
~join.success
AVB>
```

Request the join state of the device:

```
AVB> ?join
~join.success
AVB>
```

Button Command

The Button response is sent in response to a button press.

Command Format	Command Response	Feedback Response
!button. [tap]hold[release]. [button].[id].[SN]	AVB>	^button.[tap]hold[release].[button].[id].[SN]
Notes:	Button values: tap, hold, release. SN: serial number string.	

When the AV Bridge receives information about a button 1 hold from a keypad with AVID K01, the AV Bridge sends the following response:

```
AVB> ^button.hold.1.K01.123456789
```

Level Command

The Level command sets the load controller level. The load controller level can also be queried. When the load controller's state changes, the feedback response is issued by the AV Bridge.

Command Format	Command Response	Query Format	Query Response	Feedback Response Format (filter-level == 2)
!level.[level].[id] !level.[level]	AVB>	?level.[id]	^level.[level].[id]	~level.[level].[id]
Notes:	Level is percentage of max brightness (0-100), with or without leading zeros. There is no fade time associated with this command.			

Establish a 50% load level for the load controller assigned to AVID L01:

```
AVB> !level.50.L01
AVB>
AVB> ^level.50.L01
```

Set all load controllers to 100 (when there are two load controllers in the room—AVID L01 and L02).

```
AVB> !level.100
AVB>
AVB> ^level.100.L01
AVB> ^level.100.L02
```

Request a load level of the load controller assigned to AVID L02:

```
AVB> ?level.L02
~level.74.L02
AVB>
```

Filter Command

The Filter command sets the feedback message filtering. The filtering state can also be queried.

Command Format	Command Response	Query Format	Query Response
!filter.[0 1 2]	AVB>	?filter	~filter.[0 1 2]
Notes:	Feedback messages sent for each setting: 0: Only button action messages (default). 1: Button actions and room-level state changes. 2: Button actions, room level, and device level state changes.		

Change the feedback message filtering:

```
AVB> !filter.2
AVB>
```

Dev Command

The Dev command forms a list of all devices in the room.

Query Format	Query Response
?dev	~dev.[Device ID].[status].[SN] or ~dev.none
Notes:	Repeats the response for each device with an AVID. Load controllers follow the form Lxx and keypads follow Kxx. For each device an individual response line is sent. All but the last response have a line continuation character “\” at the end of the line. If no devices exist, response is ~dev.none. Status: “active” or “missing”. SN: Serial number string.

List all devices on the Zum network:

```
AVB> ?dev
~dev.L01.active.123456789\
~dev.K01.active.213456789\
~dev.L02.missing.312456789
AVB>
```

Plug Command

The Plug command turns the plug load controller on or off. The plug load controller state can also be queried. When the plug load controller's state changes, the feedback response is issued by the AV Bridge.

Command Format	Command Response	Query Format	Query Response	Feedback Response Format (filter-level == 2)
!plug.[on off]	AVB>	?plug	~plug.[on off]	^plug.[on off]
Notes:	Plug load controllers cannot be individually controlled. The feedback is OR'd in case there are multiple plug controllers that get out of sync.			

Turn on the plug load controllers:

```
AVB> !plug.on
AVB>
AVB> ^plug.on
```

Ramp Command

The Ramp command increases or decreases the dimmer levels. When the ramp state changes, the feedback response is issued by the AV Bridge.

Command Format	Command Response
!ramp.[up down]stop !ramp.[up down]stop.[id]	AVB>
Notes:	The lights ramp using an up or down command, and then stop with a stop command. The ramp stops based on the device timeout setting or if a stop command is received. When ramping down, lights stop at their minimum level and do not turn off.

Ramp up all load controllers. To prevent ramping to 100, issue the ramp stop command:

```
AVB> !ramp.up
AVB>
AVB> !ramp.stop
AVB>
```

Scenesave Command

The Scenesave command saves the current light levels as a scene.

Command Format	Values	Feedback Response
!scenesave.[number]	1-16	~scenesave.[number]

Save the current light levels for scene 5:

```
AVB> !scenesave.5
AVB>
```

Sync Command

The Sync command queries the system to verify that an AV Bridge is present. When the AV Bridge is booted up, a feedback response is issued by the AV Bridge.

Query Format	Query Response	Feedback Response
?sync	~sync	^sync
Notes:	This allows the AV control system to verify that the AV bridge is up and running.	Sent after boot when AV bridge is ready to process AV commands.

Query the sync status:

```
AVB> ?sync
~sync
AVB>
```

Room-Level Commands

Room-level commands send command and request commands to an entire room. Responses are sent based on the state of the room.

Command Format	Query Format	Query Response	Feedback Response Format (filter-level >=1)
!room.[Field].[value]	?room.[Field]	~room.[Field].[value]	^room.[Field].[value]

Scene Command

The Scene command sets the room lights to their scene levels. The room's current scene can also be queried. When the room's scene changes, the feedback response is issued by the AV Bridge.

Field	Values	Query Format	Query Response	Feedback Response
Scene	1-16	?room.scene	~room.Scene.10	^room.Scene.10

Set a room-level scene to scene 1:

```
AVB> !room.scene.1
AVB>
AVB> ^room.scene.1
```

Request the current scene in the room:

```
AVB> ?room.scene
~room.scene.#
AVB>
```

Occupancy Command

The Occupancy command sets the room occupancy state for the room. The room's occupancy state can also be queried. When the room's occupancy state changes, the feedback response is issued by the AV Bridge.

Field	Values	Query Format	Query Response	Feedback Response
Occupancy	Occupied, Vacant	?room.occupancy	~room.occupancy.[occupied vacant]	^room.occupancy.[occupied vacant]

Set the room as vacant:

```
AVB> !room.occupancy.vacant
AVB>
AVB> ^room.occupancy.vacant
```

Occ-action Command

The Occ-action command enables or disables the occupancy action state for the room. The room's occupancy action status can also be queried. When the room occupancy action status changes, the feedback response is issued by the AV Bridge.

Field	Values	Query Format	Query Response	Feedback Response
Occ-action	Enable, Disable	?room.occ-action	~room.occ-action.[enable disable]	^room.occ-action.[enable disable]

Disable occupancy actions:

```
AVB> !room.occ-action.disable
AVB>
AVB> ^room.occ-action.disable
```

Query occupancy action status:

```
AVB> ?room.occ-action
~room.lights.off
AVB>
```

Lights Command

The Lights command toggles the lights for the room. The room's light state can also be queried. When the room light status changes, the feedback response is issued by the AV Bridge.

Field	Values	Query Format	Query Response	Feedback Response
Lights	On, Off	?room.lights	~room.lights.[on off]	^room.lights.[on off]

Enable occupancy actions:

```
AVB> !room.lights.on
AVB>
AVB> ^room.lights.on
```

Query lights status:

```
AVB> ?room.lights
~room.lights.on
AVB>
```

Photo Command

The room's photocell value can be queried. When the room's photocell value changes, the feedback response is issued by the AV Bridge.

Field	Values	Query Format	Query Response	Feedback Response
Photo	0-65535	?room.photo	~room.photo.[0-65535]	^room.photo.[0-65535]

Query photocell level:

```
AVB> ?room.photo
~room.photo.6813
AVB>
```

Daylight-Action Command

The Daylight-Action command enables or disables daylighting for the room. The room's daylight-action value can also be queried. When the room's daylight-action value changes, the feedback response is issued by the AV Bridge.

Field	Values	Query Format	Query Response	Feedback Response
Daylight-Action	Enable, Disable	?room.daylight-action	~room.daylight-action.[enable disable]	^room.daylight-action.[enable disable]

Enable daylight action:

```
AVB> !room.daylight-action.enable
AVB>
AVB> ^room.daylight-action.enable
```

Query daylight-action status:

```
AVB> ?room.daylight-action
~room.daylight-action.enable
AVB>
```

Regulatory Model: M201909003

This product is listed to applicable UL® Standards and requirements tested by Intertek® services. Ce produit est homologué selon les normes et les exigences UL applicables par Intertek Prestations de service.



As of the date of manufacture, the product has been tested and found to comply with specifications for CE marking.



Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following

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.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 into 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.

Industry Canada (IC) Compliance Statement

CAN ICES-3 (B)/NMB-3(B)

The product warranty can be found at www.crestron.com/warranty.

The specific patents that cover Crestron products are listed at patents.crestron.com.

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