



**4K / UHD**

## **Four-Input HDMI and HDBaseT™ Switcher with Auto-Switching and Return Optical Audio**



AT-JUNO-451-HDBT

Atlona Manuals  
**Switchers**

## Version Information

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Version	Release Date	Notes
1	6/18	Initial release

## Welcome to Atlona!

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Thank you for purchasing this Atlona product. We hope you enjoy it and will take an extra few moments to register your new purchase.

Registration only takes a few minutes and protects this product against theft or loss. In addition, you will receive notifications of product updates and firmware. Atlona product registration is voluntary and failure to register will not affect the product warranty.

To register your product, go to <http://www.atlona.com/registration>

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## Operating Notes

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**IMPORTANT:** Visit <http://www.atlona.com/product/AT-JUNO-451-HDBT> for the latest firmware updates and User Manual.

- **NOTE:** For HDR and 4K/60 4:4:4 content (HDMI data rates exceeding 10 Gbps), the AT-JUNO-451-HDBT is not compatible with transmitters for the AT-HDR-EX-70-2PS, AT-HDR-EX-70C-KIT, or AT-HDR-EX-100CEA-KIT.

# Atlona, Inc. (“Atlona”) Limited Product Warranty

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## Coverage

Atlona warrants its products will substantially perform to their published specifications and will be free from defects in materials and workmanship under normal use, conditions and service.

Under its Limited Product Warranty, Atlona, at its sole discretion, will either:

- repair or facilitate the repair of defective products within a reasonable period of time, restore products to their proper operating condition and return defective products free of any charge for necessary parts, labor and shipping.

OR

- replace and return, free of charge, any defective products with direct replacement or with similar products deemed by Atlona to perform substantially the same function as the original products.

OR

- refund the pro-rated value based on the remaining term of the warranty period, not to exceed MSRP, in cases where products are beyond repair and/or no direct or substantially similar replacement products exist.

Repair, replacement or refund of Atlona products is the purchaser's exclusive remedy and Atlona liability does not extend to any other damages, incidental, consequential or otherwise.

This Limited Product Warranty extends to the original end-user purchaser of Atlona products and is non-transferrable to any subsequent purchaser(s) or owner(s) of these products.

## Coverage Periods

Atlona Limited Product Warranty Period begins on the date of purchase by the end-purchaser. The date contained on the end-purchaser's sales or delivery receipt is the proof purchase date.

### Limited Product Warranty Terms – New Products

- 10 years from proof of purchase date for hardware/electronics products purchased on or after June 1, 2013.
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- Lifetime Limited Product Warranty for all cable products.

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- 3 years from proof of purchase date for all Refurbished (B-Stock) hardware and electronic products purchased on or after June 1, 2013.

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Atlona recommends that end-purchasers contact their authorized Atlona dealer or reseller from whom they purchased their products. Atlona can also be contacted directly. Visit [www.atlona.com](http://www.atlona.com) for Atlona's contact information and hours of operation. Atlona requires that a dated sales or delivery receipt from an authorized dealer, reseller or end-purchaser is provided before Atlona extends its warranty services. Additionally, a return merchandise authorization (RMA) and/or case number, is required to be obtained from Atlona in advance of returns.

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## Exclusions

This Limited Product Warranty excludes:

- Damage, deterioration or malfunction caused by any alteration, modification, improper use, neglect, improper packaging or shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature.

## Atlona, Inc. (“Atlona”) Limited Product Warranty

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- Damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Atlona to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product.
- Equipment enclosures, cables, power supplies, batteries, LCD displays, and any accessories used in conjunction with the product(s).
- Products purchased from unauthorized distributors, dealers, resellers, auction websites and similar unauthorized channels of distribution.

### Disclaimers

This Limited Product Warranty does not imply that the electronic components contained within Atlona’s products will not become obsolete nor does it imply Atlona products or their electronic components will remain compatible with any other current product, technology or any future products or technologies in which Atlona’s products may be used in conjunction with. Atlona, at its sole discretion, reserves the right not to extend its warranty offering in instances arising outside its normal course of business including, but not limited to, damage inflicted to its products from acts of god.

### Limitation on Liability

The maximum liability of Atlona under this limited product warranty shall not exceed the original Atlona MSRP for its products. To the maximum extent permitted by law, Atlona is not responsible for the direct, special, incidental or consequential damages resulting from any breach of warranty or condition, or under any other legal theory. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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To the maximum extent permitted by law, this limited product warranty and the remedies set forth above are exclusive and in lieu of all other warranties, remedies and conditions, whether oral or written, express or implied. To the maximum extent permitted by law, Atlona specifically disclaims all implied warranties, including, without limitation, warranties of merchantability and fitness for a particular purpose. If Atlona cannot lawfully disclaim or exclude implied warranties under applicable law, then all implied warranties covering its products including warranties of merchantability and fitness for a particular purpose, shall provide to its products under applicable law. If any product to which this limited warranty applies is a “Consumer Product” under the Magnuson-Moss Warranty Act (15 U.S.C.A. §2301, ET SEQ.) or other applicable law, the foregoing disclaimer of implied warranties shall not apply, and all implied warranties on its products, including warranties of merchantability and fitness for the particular purpose, shall apply as provided under applicable law.

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Atlona’s Limited Product Warranty offering gives legal rights, and other rights may apply and vary from country to country or state to state. This limited warranty is void if (i) the label bearing the serial number of products have been removed or defaced, (ii) products are not purchased from an authorized Atlona dealer or reseller. A comprehensive list of Atlona’s authorized distributors, dealers and resellers can be found at [www.atlona.com](http://www.atlona.com).

## Important Safety Information



CAUTION: TO REDUCT THE RISK OF  
ELECTRIC SHOCK  
DO NOT OPEN ENCLOSURE OR EXPOSE  
TO RAIN OR MOISTURE.  
NO USER-SERVICEABLE PARTS  
INSIDE REFER SERVICING TO  
QUALIFIED SERVICE PERSONNEL.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.

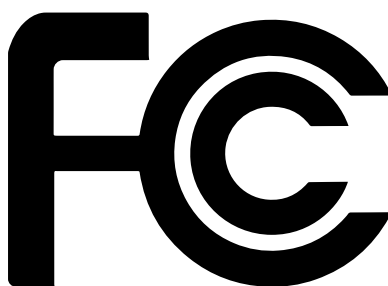


The information bubble is intended to alert the user to helpful or optional operational instructions in the literature accompanying the product.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this product near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of a polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the product.
11. Only use attachments/accessories specified by Atlona.
12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
13. Unplug this product during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the product has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the product, the product has been exposed to rain or moisture, does not operate normally, or has been dropped.



## FCC Statement



FCC Compliance and Advisory Statement: This hardware 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. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed or 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: 1) reorient or relocate the receiving antenna; 2) increase the separation between the equipment and the receiver; 3) connect the equipment to an outlet on a circuit different from that to which the receiver is connected; 4) consult the dealer or an experienced radio/TV technician for help. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Where shielded interface cables have been provided with the product or specified additional components or accessories elsewhere defined to be used with the installation of the product, they must be used in order to ensure compliance with FCC regulations.

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## Introduction

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The Atlona **JunoX™451 HDBT (AT-JUNO-451-HDBT)** is a 4x1 switcher for high dynamic range (HDR) formats. The JunoX 451 HDBT features three HDMI inputs, plus an HDBaseT input for receiving video, embedded audio, and Ethernet over distances up to 330 feet (100 meters). It is HDCP 2.2 compliant and supports 4K/UHD video @ 60 Hz with 4:4:4 chroma sampling, as well as HDMI data rates up to 18 Gbps. The JunoX 451 HDBT is ideal for receiving 4K HDR over HDBaseT from an Atlona Opus™ Series matrix switcher, and is also compatible with the Atlona UHD-PRO3, UHD-CAT, and SW Series for data rates up to 10 Gbps. It includes EDID management features and automatic input switching. The JunoX 451 HDBT also supports the HDMI Audio Return Channel for receiving digital audio from a television, and includes a TOSLINK digital audio output for sending this audio to an AV receiver or soundbar. This JunoX Series switcher can be controlled via Ethernet, RS-232, and IR. A handheld IR remote control is included.

## Features

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- 4x1 HDMI Switcher
- 4K/UHD capability @ 60 Hz with 4:4:4 chroma sampling, plus support for HDR formats
- HDCP 2.2 compliant
- Automatic input selection using hot plug detect and video detection technology
- EDID management
- Delivers return audio from a TV to an optical digital audio output
- TCP/IP, RS-232, and IR control
- Front panel input selection status LEDs
- Award-winning 10 year limited product warranty

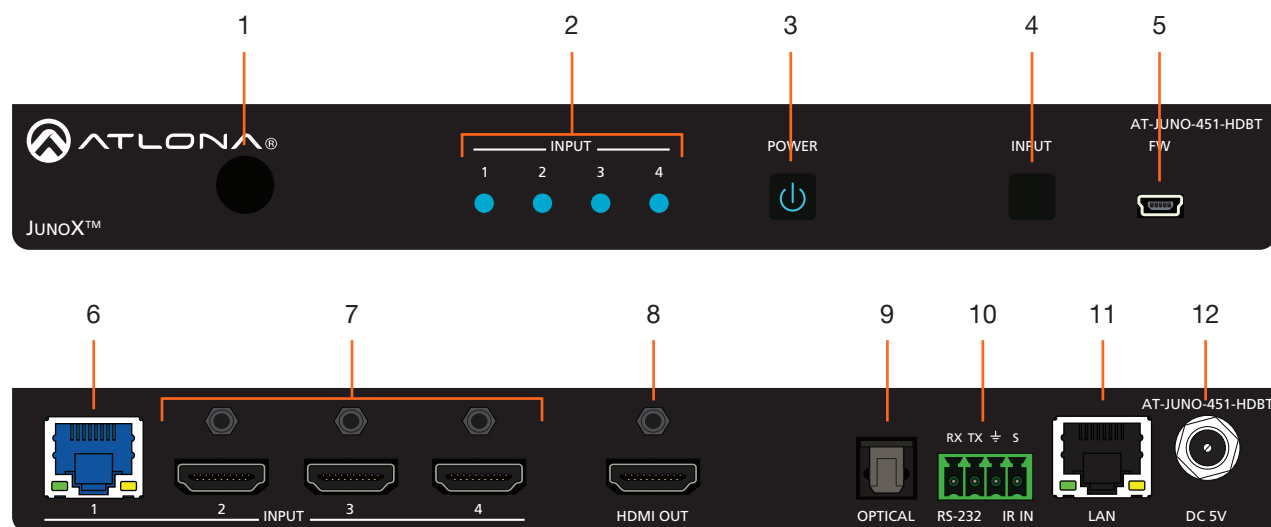
## Package Contents

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1 x AT-JUNO-451-HDBT  
1 x 4-pin captive screw connector  
2 x Mounting plates  
4 x Rubber feet  
4 x Screws  
1 x IR remote control  
1 x DC 5V power supply  
1 x IEC cord  
1 x Installation Guide



## Panel Description



### 1 IR Window

Receives IR signals from the included IR remote.

### 2 Input Indicators

These LED indicators glow solid blue to indicate the active input.

### 3 POWER

Press this button to power-on or power-off the unit.

### 4 INPUT

Press and release this button to cycle through each of the inputs.

### 5 FW

Connect a mini USB cable to this port to update the firmware.

### 6 HDBaseT Input

Connect a transmitter, such as the AT-UHD-PRO3-44M, to this port using an Ethernet cable.

### 7 HDMI Inputs

Connect an HD/UHD source to each of these HDMI ports.

### 8 HDMI OUT

Connect an HDMI cable from this port to a display or other sink device. This output supports multichannel audio.

### 9 OPTICAL

Connect an optical audio cable from this TOSLINK port to an audio output device. This port is part of the Audio Return Channel (ARC): audio from the display is routed upstream, back to the switcher over HDMI, to this port.

### 10 RS-232 / IR IN

Connect the included 4-pin captive screw block to this port. Refer to [RS-232 / IR Control \(page 25\)](#) for wiring information, if necessary.

### 11 LAN

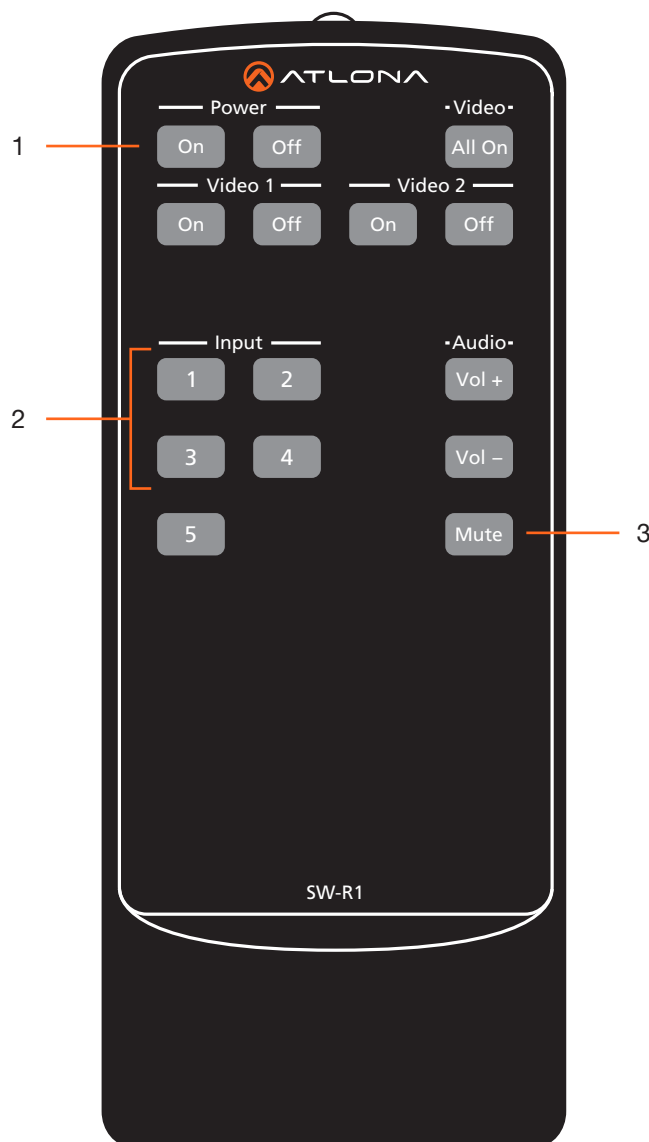
Connect an Ethernet cable from this port to a Local Area Network (LAN).

### 12 DC 5V

Connect the included 5 V DC power supply to this power receptacle.

## IR Remote Control

The AT-JUNO-451-HDBT includes an IR remote control unit, allow the control of the AT-JUNO-451-HDBT from a remote location.



### 1 On / Off buttons

Press the **On** button to power-on the unit. Press the **Off** button to power-off the unit.

### 2 Input

Press these buttons (**1 - 4**) to select the desired input.

### 3 Mute

Press this button to toggle audio muting on the **HDMI OUT** port. The **Output 1** toggle switch, in the web GUI, will also change to reflect the current muting state. Refer to [A/V Settings page \(page 32\)](#) for more information.

# Installation

## Connection Instructions

1. Connect an HD/UHD source to each of the three HDMI inputs (**INPUT 2 - INPUT 4**).
2. Connect an optical audio cable from the **OPTICAL** port to a sound bar or other audio output device.
3. Connect an Ethernet cable from the **LAN** port to the Local Area Network (LAN). Ethernet cables should use EIA/TIA-568B termination:
4. Connect a compatible transmitter to the HDBaseT (**INPUT 1**) port on the AT-JUNO-451-HDBT.

Refer to the tables below for recommended cabling when using Altona products with HDBaseT technology. The green bars indicate the signal quality when using each type of cable. Higher-quality signals are represented by more bars. *These tables are for guidance, only. Performance may vary, based on environmental factors.*



**IMPORTANT:** For HDR and 4K/60 4:4:4 content (HDMI data rates exceeding 10 Gbps), the AT-JUNO-451-HDBT is not compatible with transmitters for the AT-HDR-EX-70-2PS, AT-HDR-EX-70C-KIT, or AT-HDR-EX-100CEA-KIT.

Core	Shielding	CAT5e	CAT6	CAT6a	CAT7
Solid	UTP (unshielded)	■	■■■	■■■■	N/A
	STP (shielded)	■■	■■■■	■■■■■	■■■■■
Performance Rating (MHz)		350	500	600	800

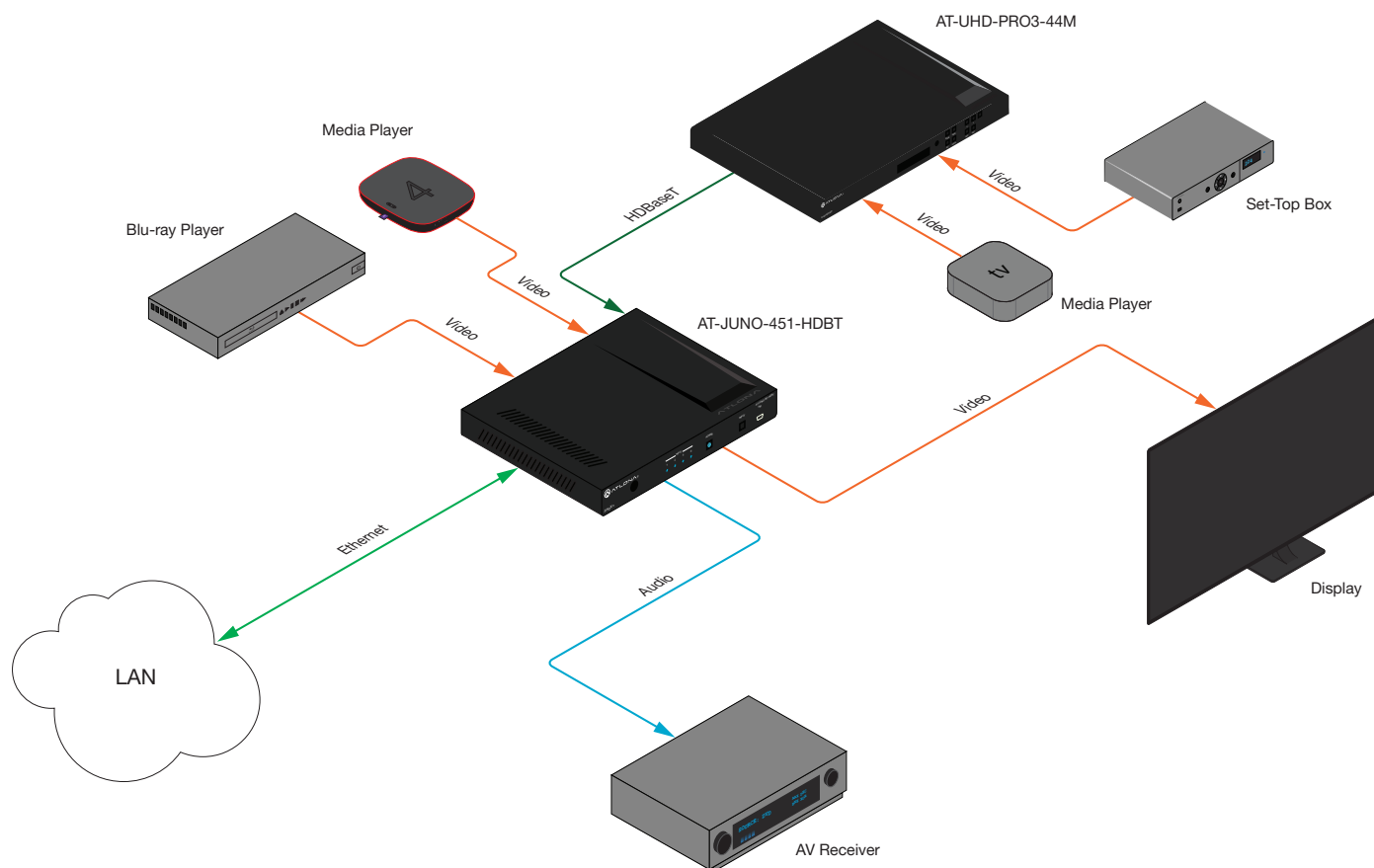
Cable	Max. Distance @ 4K	Max. Distance @ 1080p
CAT5e / CAT6	295 feet (90 meters)	330 feet (100 meters)
CAT6a / CAT7	330 feet (100 meters)	330 feet (100 meters)



**IMPORTANT:** Stranded or patch cable is not recommended due to performance issues. Shielded cables are strongly recommended to minimize signal noise and interference.

5. Connect the included four-pin captive screw block to the **RS-232 / IR IN** port. Refer to [RS-232 / IR Control \(page 25\)](#) for wiring information, if necessary.
6. Connect the included 5 V DC power supply to the **DC 5V** power receptacle.
7. Connect the power supply to an available electrical outlet.

## Connection Diagram



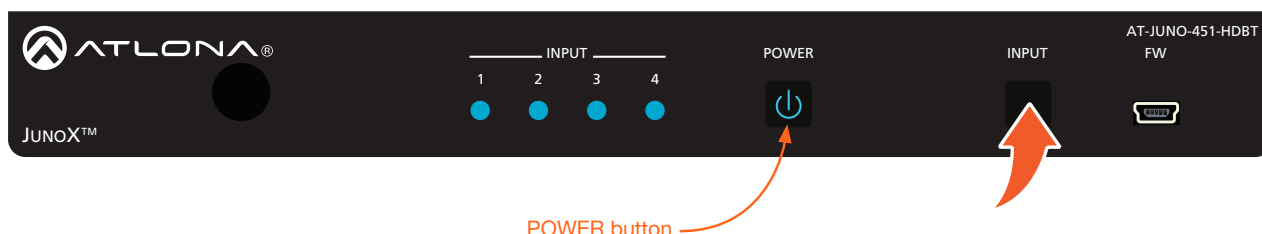
## IP Configuration

The AT-JUNO-451-HDBT is shipped with DHCP enabled. Once connected to a network, the DHCP server (if available), will automatically assign an IP address to the unit. Use an IP scanner, along with the MAC address on the back of the unit, to identify both the unit and its IP address on the network. If a static IP address is desired, the unit can be switched to static IP mode. Use one of the following procedures to switch between DHCP and static IP mode. The default static IP address of the AT-JUNO-451-HDBT is 192.168.1.254.

If the AT-JUNO-451-HDBT is unable to detect a DHCP server within 15 seconds, then the unit will set all IP settings to zero.

### Setting the IP Mode

1. Make sure the AT-JUNO-451-HDBT is powered.
2. Connect an Ethernet cable between the LAN port of the AT-JUNO-451-HDBT and the Local Area Network (LAN).



3. Press and hold the **INPUT** button on the front panel for approximately 10 seconds. Release the **INPUT** button once the **POWER** button begins to flash blue and red. The number of flashes will indicate the currently selected IP mode.

POWER button flashes	Description
Two	Static IP mode
Four	DHCP mode

### Setting the IP Address Using Commands

Use the IPStatic and IPDHCP commands to switch between DHCP and IP mode through RS-232 or Telnet. Refer to API documentation for more information. All commands and their arguments are case-sensitive.

- **Setting static IP mode**

1. Connect to the AT-JUNO-451-HDBT using RS-232 or Telnet.
2. At the command line, execute the IPDHCP command using the off argument, as shown.

```
IPDHCP off
```

- Execute the IPStatic command. This command requires three arguments: the desired IP address of the AT-JUNO-451-HDBT, the subnet mask, and the gateway address. All arguments must be entered in dot-decimal notation. The following is an example:

```
IPStatic 192.168.1.112 255.255.255.0 192.168.1.1
```

└── IP address ─┘
└── Subnet mask ─┘
└── Gateway ─┘

- Setting DHCP mode**

- Connect to the AT-JUNO-451-HDBT using RS-232 or Telnet.
- At the command line, execute the IPDHCP command using the on argument, as shown. All characters are case-sensitive.

```
IPDHCP on
```

Once DHCP is enabled, the unit will be assigned an IP address by the DHCP server (if present).

### Setting the IP Address using the Web GUI

The **System** page (page 37), in the web GUI, allows the AT-JUNO-451-HDBT to use either DHCP or static IP mode. In order to access the web GUI, the IP address of the AT-JUNO-451-HDBT must be known. Refer to [Introduction to the Web GUI](#) (page 29).

- Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
- Log in, using the required credentials. The factory-default username and password are listed below:

Username: root  
Password: Atlona

- Click the **System** tab.





IP Mode:	<b>STATIC IP</b>	
IP:	10.0.1.109	
Netmask:	255.255.255.0	<b>Save</b>
Gateway:	10.0.1.1	
Telnet Port:	23	

- Click the **IP Mode** toggle to switch between the **DHCP** and **STATIC IP** setting. When set to **STATIC IP**, the **IP**, **Netmask**, and **Gateway** fields can be modified.
- Click the **Save** button to save the changes.

## Basic Operation

### LED Indicators

The LED indicators on both the front of the unit provide basic information on the current status of the AT-JUNO-451-HDBT.

LED		Description
POWER	Blue	 <ul style="list-style-type: none"> <li>Unit is receiving power.</li> </ul>
	Off	 <ul style="list-style-type: none"> <li>Unit is not powered.</li> <li>Press the POWER button to power the unit.</li> <li>Check the power supply and make sure it is securely fastened to the locking connector on the rear of the unit.</li> <li>Make sure that the power supply is connected to an available electrical outlet and that the outlet is “live” (some outlets are controlled by a wall switch).</li> </ul>
INPUT	Blue	 <ul style="list-style-type: none"> <li>The input is the currently selected (active) input.</li> </ul>
	Off	 <ul style="list-style-type: none"> <li>The input is not active.</li> </ul>

## Input Switching

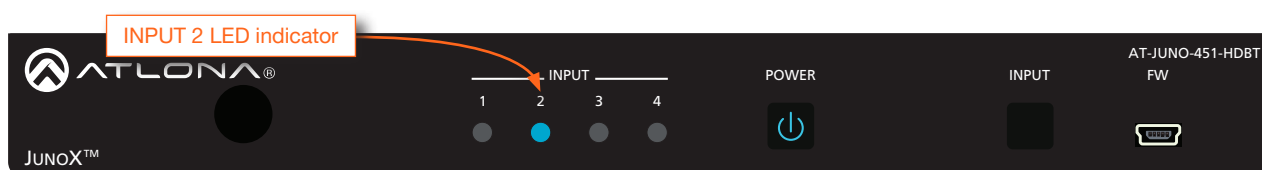
Switching between any of the four input ports can be performed either manually or automatically. The following section covers both methods.

### Manual Switching

1. Press and release the **INPUT** button on the front panel to cycle between **INPUT 1**, **INPUT 2**, **INPUT 3**, and **INPUT 4** HDMI inputs. The **INPUT 1** is the factory-default setting.



After the **INPUT** button is pressed, the INPUT LED indicator will advance to the next input, in sequence. In this example, **INPUT 2** is the active input and is indicated by the **INPUT 2** LED indicator on the front panel.



2. Press the **INPUT** button again to switch to **INPUT 3**. Once **INPUT 4** is selected, and the **INPUT** button is pressed again, the unit will return to **INPUT 1**.

Manual input switching can also be performed under the [A/V Settings page \(page 32\)](#) of the web GUI, by clicking the **Input Selection** drop-down list and selecting the desired input. In addition, the x1AVx1 command can also be used. Refer to the *Application Programmer's Interface* for more information.



**NOTE:** The AT-JUNO-451-HDBT retains the currently selected input, even after the unit is powered-off then powered-on.



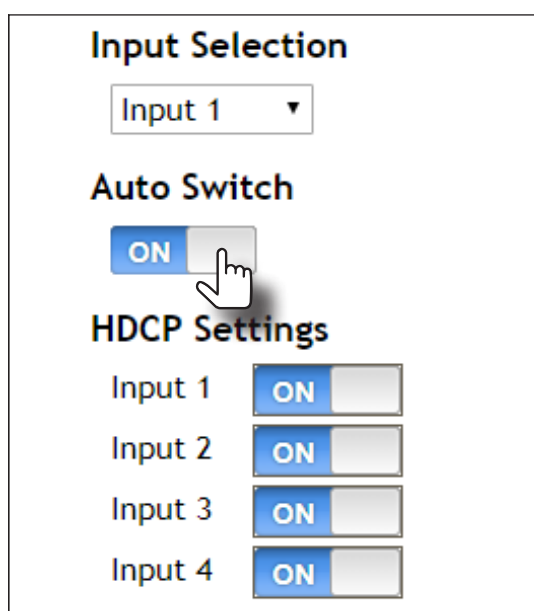
### Auto Switching

Auto-switching can also be used to automatically select an input. Auto-switch is enabled by default and must be enabled for this feature to work. When auto-switching is enabled, the AT-JUNO-451-HDBT will automatically switch inputs, based on the presence of an input signal.

1. Enable auto-switching by using one of the following methods.

#### Using the web GUI

- a. Login to the web GUI and access the [A/V Settings page \(page 32\)](#).
- b. Click the **Auto Switch mode** toggle switch to the **ON** position (if not already in the ON position). This is the default setting.



2. Connect a source to any of the four input ports on the rear panel. The AT-JUNO-451-HDBT will automatically switch to the port with the connected source. The following rules apply to auto-switching.
  - If a source is disconnected, then the AT-JUNO-451-HDBT will fallback to a port with an active source.
  - If all sources are disconnected, then the AT-JUNO-451-HDBT will retain the port of the the last-connected source.

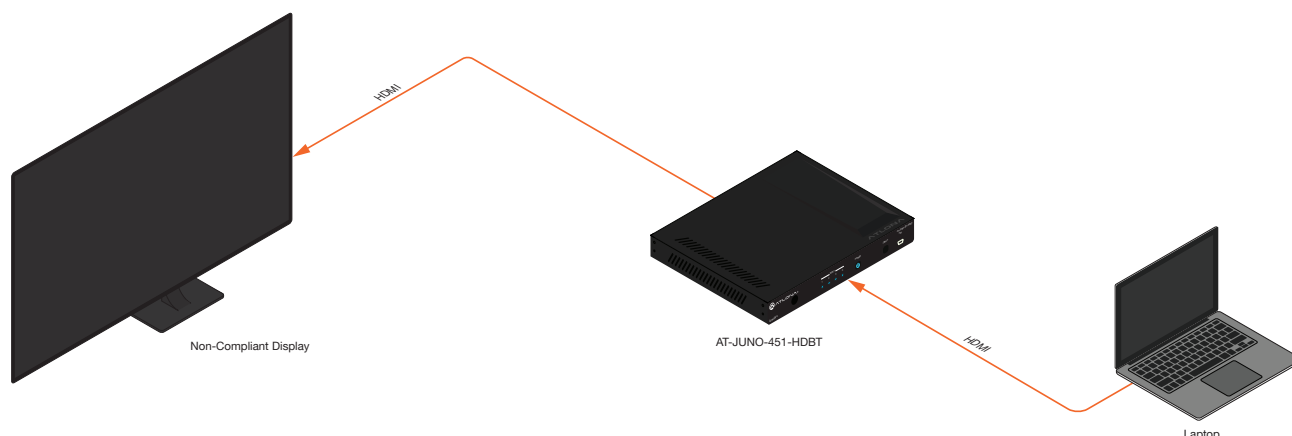


**NOTE:** The AT-JUNO-451-HDBT retains the currently selected input, even after the unit is powered-off then powered-on.

### HDCP Settings

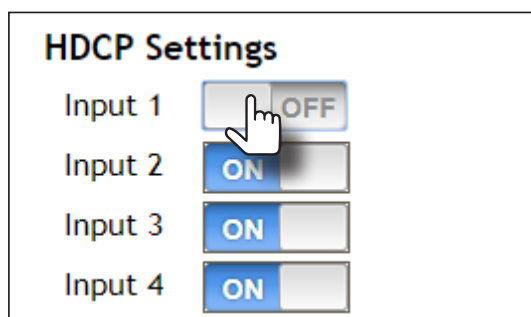
Normally, if a source is transmitting HDCP content to a display that is not HDCP-compatible, then the resulting image on the display will result in “snow”, image flickering, or no picture.

For example, in the illustration below, a laptop source is connected to the AT-JUNO-451-HDBT. A non-compliant display is connected to the AT-JUNO-451-HDBT using an HDMI cable.



By default, the laptop may transmit HDCP content. However, when connected to a display that does not support HDCP, the laptop must be instructed to send non-HDCP content, in order for the content to be displayed.

1. Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:  
  
Username: root  
Password: Atlona
3. Click **A/V Settings** in the menu bar.
4. Click the **Input 1** toggle switch, under HDCP Settings, and set it to the **OFF** position. This will instruct the source device to send non-HDCP content, if possible.



**NOTE:** Not all source devices are capable of transmitting non-HDCP content. For example, Sony PlayStation® gaming consoles and Mac® computers always transmit HDCP-encrypted content.

### Controlling Audio

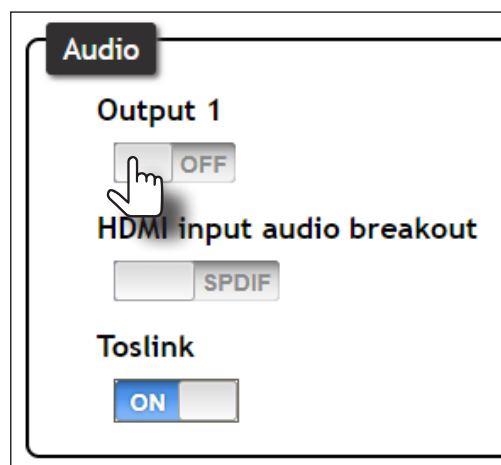
The AT-JUNO-451-HDBT provides complete control over audio muting for both the HDMI OUT and OPTICAL outputs.

#### HDMI Output Muting

1. Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:

Username: root  
Password: Atlona

3. Click **A/V Settings** in the menu bar.
4. Locate the **Audio** section.
5. Click the **Output 1** toggle switch to the **OFF** position. When set to the **OFF** position, the audio on the **HDMI OUT** port will be muted. To re-enable the audio for the **HDMI OUT** output, set the toggle switch to the **ON** position.



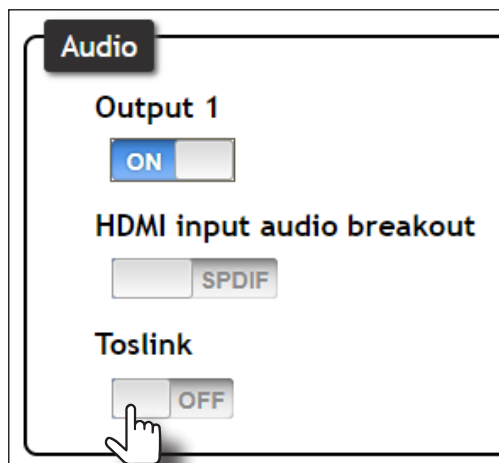
#### Optical Output Muting

1. Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:

Username: root  
Password: Atlona

3. Click **A/V Settings** in the menu bar.
4. Locate the **Audio** section.

- Click the **Toslink** toggle switch to the **OFF** position. When set to the **OFF** position, the audio on the **OPTICAL** port will be muted. To re-enable the audio for the **OPTICAL** output, set the toggle switch to the **ON** position.



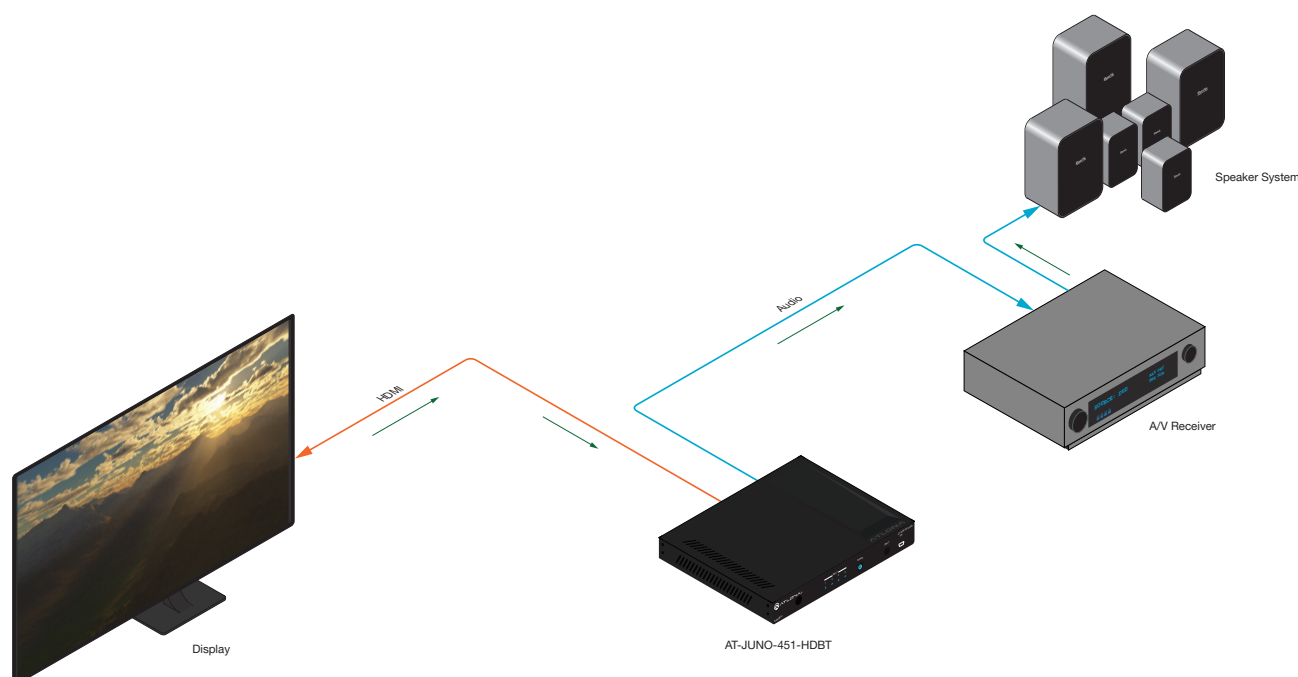
### Using the Audio Return Channel (ARC)

The Audio Return Channel (ARC) allows audio to be sent upstream, from the display device, to the AT-JUNO-451-HDBT over an HDMI cable. The audio is then output over the OPTICAL port. This technique can be used to send audio from a Smart TV, using an app such as Netflix®, to an A/V receiver, providing a multichannel audio experience. The advantage of ARC is that no additional audio cables are required to be connected between the display and the audio output device.

The illustration below, shows an example of how the Audio Return Channel works. The dark green lines identify the audio coming from the display. The instructions on the following page will reference the diagram below.



**NOTE:** When ARC is enabled, the HDMI inputs will be disabled. To re-activate the HDMI inputs, ARC must be disabled.

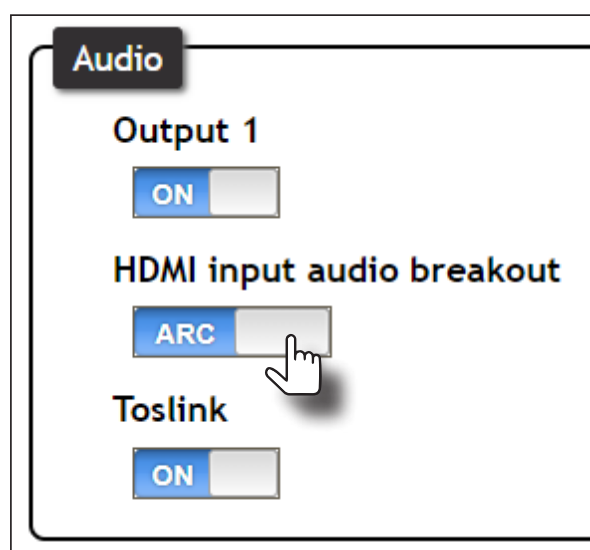


## Basic Operation

1. Connect an HDMI cable from the **HDMI OUT** port on the AT-JUNO-45-HDBT to the HDMI input port on the display. This cable is used to carry the audio from the display to the AT-JUNO-451-HDBT.
2. Connect an optical cable from the **OPTICAL OUT** port on the AT-JUNO-451-HDBT to an A/V receiver. The audio from the display is output over the optical cable.
3. Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
4. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:

Username: root  
Password: Atlona

5. Click **A/V Settings** in the menu bar.
6. Locate the **Audio** section.
7. Click the **HDMI input audio breakout** toggle switch to the **ARC** position. The default setting is **SPDIF**.
8. Set both the **Toslink** and **Output 1** toggle switches to the **ON** position.



Setting	Description
SPDIF	The HDMI output audio will also be output using the <b>OPTICAL</b> port on the back of the unit.
ARC	Audio being returned from the display, over ARC, will be output on the <b>OPTICAL</b> port on the AT-JUNO-451-HDBT. It should be noted that the audio is limited to formats supported by the SPDIF output, such as PCM, Dolby® Digital, and some formats of DTS. Lossless audio formats, such as Dolby TrueHD and DTS-HD Master Audio™, are not supported by ARC or SPDIF.

9. Setup is complete. Audio from the display will now be heard over the A/V receiver. To disable ARC and hear the audio from the HDMI inputs, set the **HDMI input audio breakout** toggle switch to the **SPDIF** position.

Refer to the next page for information on how to toggle between HDMI inputs and ARC, using a control system.

### Switching between ARC and HDMI inputs

Switching between HDMI inputs and ARC should be performed using a control system. The following describes the setup process.

1. Controlling the AT-JUNO-451-HDBT can be accomplished through either IP or RS-232.
  - If using RS-232, refer to [RS-232 / IR Control \(page 25\)](#) for more information.
  - If controlling over IP, connect an Ethernet cable from the control system to the LAN port on the AT-JUNO-451-HDBT. Refer to the control system user manual for any necessary configuration details.
2. Send the AudioARC command to set the desired operation:

AudioARC ARC	// enables ARC; only audio from the downstream display is output to the <b>OPTICAL OUT</b> port.
AudioARC SPDIF	// disables ARC; HDMI inputs are enabled and the embedded HDMI audio is also output to the <b>OPTICAL OUT</b> port.

Refer to the AT-JUNO-451-HDBT API manual for a complete listing of commands.

## Managing Users

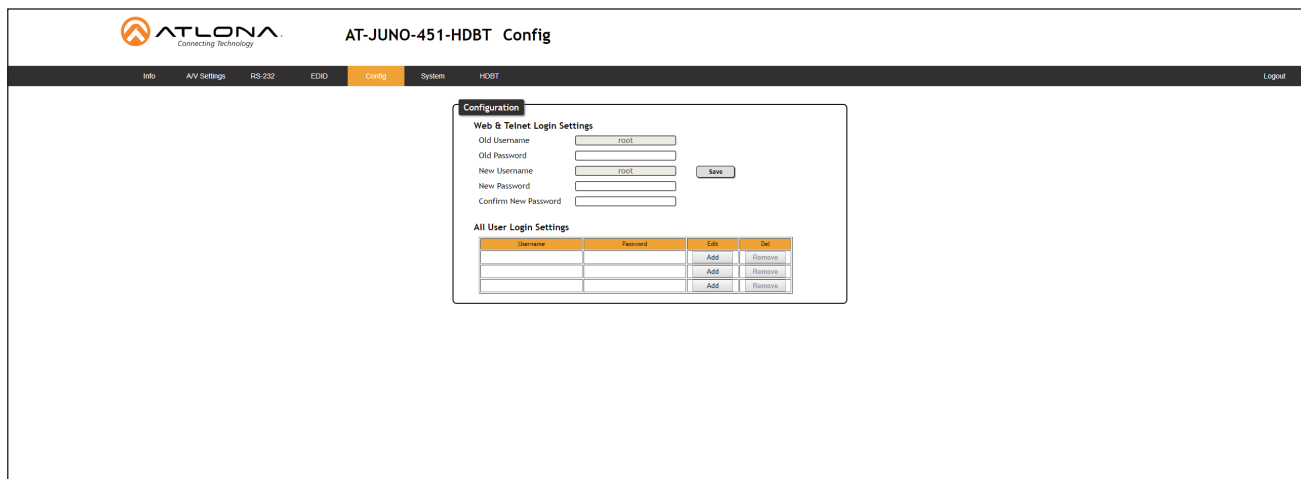
The AT-JUNO-451-HDBT allows the admin user to create, edit, and remove additional TCP/IP users. All users have the same level of access to control the AT-JUNO-451-HDBT. However, only the admin user is allowed to manage other users. Up to three additional users can be created.

### Adding Users

1. Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:

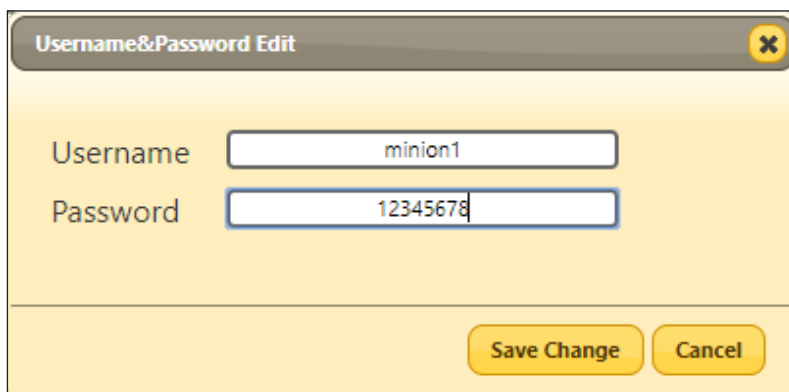
Username: root

Password: Atlona



Username	Password	Edit	Del
		Add	Remove
		Add	Remove
		Add	Remove

3. Click the **Config** tab.
4. Click the **Add** button, under the **Edit** column.



5. Enter the desired username and password in the **Username&Password Edit** dialog box.
6. Click the **Save Change** button to commit changes or click the **Cancel** button to return to the **Config** page without adding the user.

Once created, the new user and the associated password will appear under the **All User Login Settings** section. To login with the new username, click **Logout** in the upper-right corner of the screen, then enter the login credentials for the user on the **Login** page.

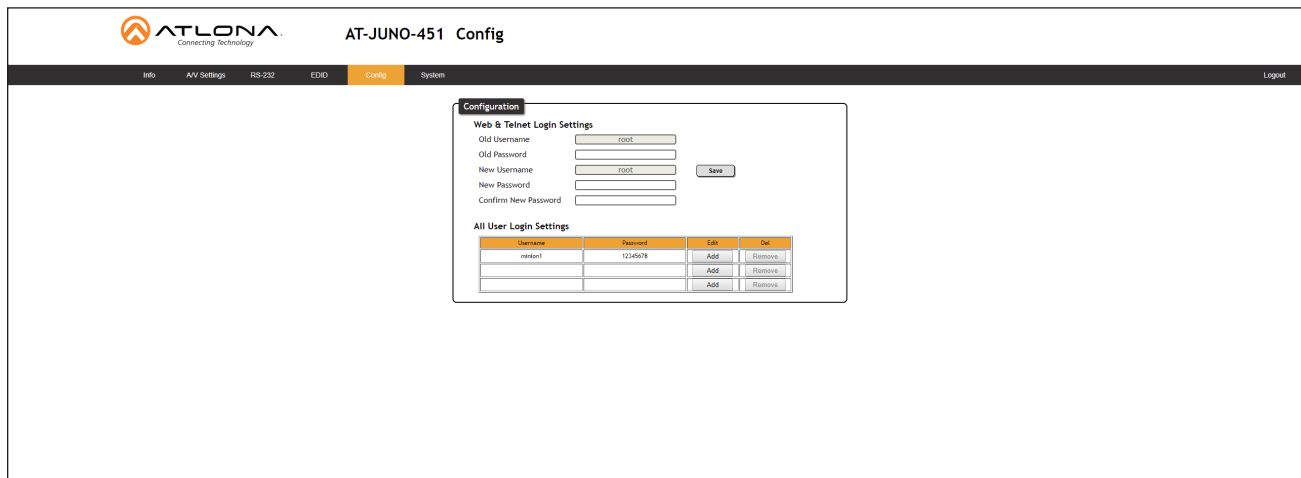
## Editing / Deleting Users

The username and password of a user can be changed using this method.

1. Open the desired web browser and enter the IP address of the AT-JUNO-451-HDBT.
2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:

Username: root

Password: Atlona



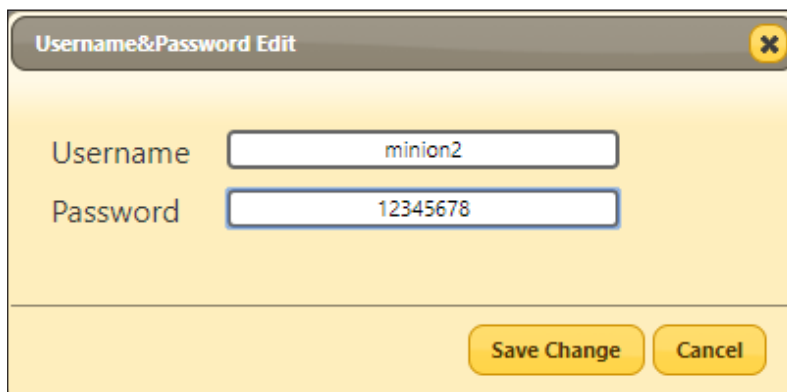
The screenshot shows the AT-JUNO-451 Config web interface. The top navigation bar includes links for Info, AVI Settings, RS-232, EDID, Config (selected), and System. A Logout link is in the top right. The main content area is titled 'Configuration' and contains two sections:

- Web & Telnet Login Settings:** This section has input fields for Old Username (root), Old Password, New Username (root), New Password, and Confirm New Password. A Save button is located to the right of the New Password field.
- All User Login Settings:** This section contains a table with columns for Username, Password, Edit, and Del.

Username	Password	Edit	Del
minion1	12345678	Add	Remove
		Add	Remove
		Add	Remove

## Editing Users

- a. Click **Config** in the menu bar.
- b. Click the **Edit** button next to the user to be changed.
- c. Enter the new information for the user in the **Username&Password Edit** dialog box.
- d. Click the **Save Change** button to commit changes or click the **Cancel** button to return to the **Config** page without making changes.



The screenshot shows the 'Username&Password Edit' dialog box. It has a title bar with a close button (X). The dialog contains two input fields: Username (minion2) and Password (12345678). At the bottom, there are two buttons: 'Save Change' and 'Cancel'.

## Deleting Users

- a. Click the **Remove** button next to the user to be deleted.



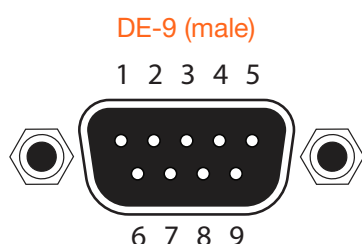
## Advanced Operation

### RS-232 / IR Control

The AT-JUNO-451-HDBT provides an RS-232 / IR port, allowing the unit to be managed using a control system.

RS-232 is serial data protocol that allows Data Terminal Equipment (DTE) devices, such as a computer or control system, to communicate with Data Communication Equipment (DCE) devices, such as the AT-JUNO-451-HDBT or a display. Although IP control is available, RS-232 still plays an integral part of many control systems.

Although the 25-pin D-type connector (DB-25) was defined as the RS-232 standard, it is now commonly implemented in a nine-pin (DE-9) connector package. Each pin is numbered, as shown below.



DTE Pin Descriptions

Pin	Signal	Description
1	DCD	Data Carrier Detect
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground (Signal)
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

DCE Pin Descriptions

Pin	Signal	Description
1	DCD	Data Carrier Detect
2	TxD	Transmit Data
3	RxD	Receive Data
4	DSR	Data Set Ready
5	GND	Ground (Signal)
6	DTR	Data Terminal Ready
7	CTS	Clear to Send
8	RTS	Ready to Send
9	RI	Ring Indicator

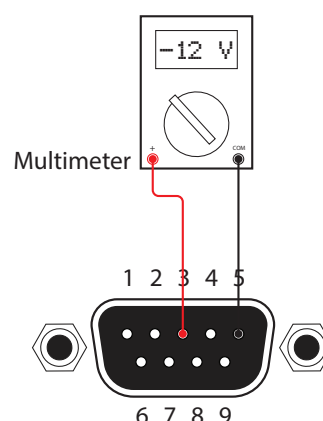
### Determining the Port Type

Most DTE devices provide a male connector, while DCE devices have a female connector. However, this is not always the case. If the port type is unknown, then a multimeter can be used to determine whether the port is DTE or DCE:

1. Turn on the multimeter and set it to measure DC voltage.
2. Connect the positive and negative leads to pins 3 and 5, respectively.
3. Check the voltage reading:

If the voltage is between -3 V DC and -15 V DC, then the device is DTE. Otherwise, it is DCE.

Voltage levels between -3 V and -15 V DC represent a logic "1".  
Voltage levels between +3 V and +15 V DC represent a logic "0".



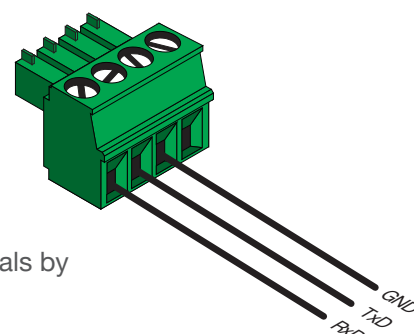
### Cable Assembly

When connecting a DTE device to a DCE device, a *straight-through* cable should be used. A straight-through cable is wired in such a way that the pins on one side of the cable are connected to the corresponding pins on the opposite side of the cable, as shown in the table below. However, the AT-JUNO-451-HDBT will use only TxD, RxD, and GND signals when communicating with a control system or computer.

#### Straight-Through Cable

Pin	Signal		Signal	Pin
1	DCD	←→	DCD	1
2	RxD	←→	TxD	2
3	TxD	←→	RxD	3
4	DTR	←→	DSR	4
5	GND	←→	GND	5
6	DSR	←→	DTR	6
7	RTS	←→	CTS	7
8	CTS	←→	RTS	8
9	RI	←→	RI	9

1. Identify the DE-9 connector that will be attached to the control system or computer (DCE) equipment.
2. Remove the DE-9 connector at the opposite end of the cable with wire cutters.
3. Remove at least 1" of the cable insulation to expose each of the nine wires.
4. Locate a multimeter and set it to the "continuity" function.
5. Attach one of the leads from the multimeter to pin 2 on the DE-9 connector.
6. Take the other lead and probe each of the wires on the opposite end of the cable. When the wire connected to that pin is detected, the multimeter will emit an audible tone. Once this occurs, identify the current wire, and move it to the side.
7. Repeat step 6 for pin 3 and pin 5 on the DE-9 connector.
8. Group the remaining wires and pull them aside. Electrical tape can be use to secure the wires to the outside of the RS-232 cable.
9. Remove at least 3/16" (5 mm) of insulation from the TxD, RxD, and GND wires.



10. Locate the included 4-pin captive screw block and open each of the terminals by turning the screws counter-clockwise, using a small regular screwdriver.
11. Insert the TxD, RxD, and GND wires into correct terminal, as shown, and tighten the screws to secure each wire. Do not overtighten.
12. Connect the captive screw connector to the **RS-232 / IR IN** port on the AT-JUNO-451.

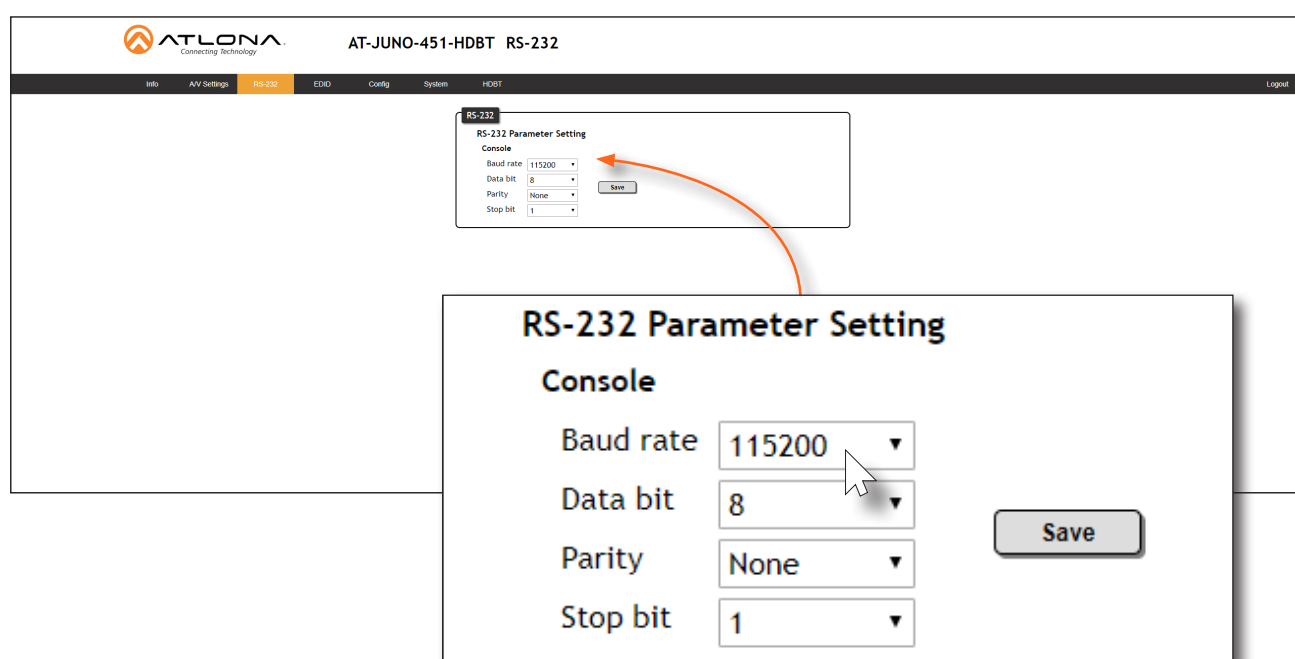
## Configuration

1. Launch a web browser and login to the web GUI. Refer to [Introduction to the Web GUI \(page 29\)](#) for more information. The factory-default username and password are listed below:

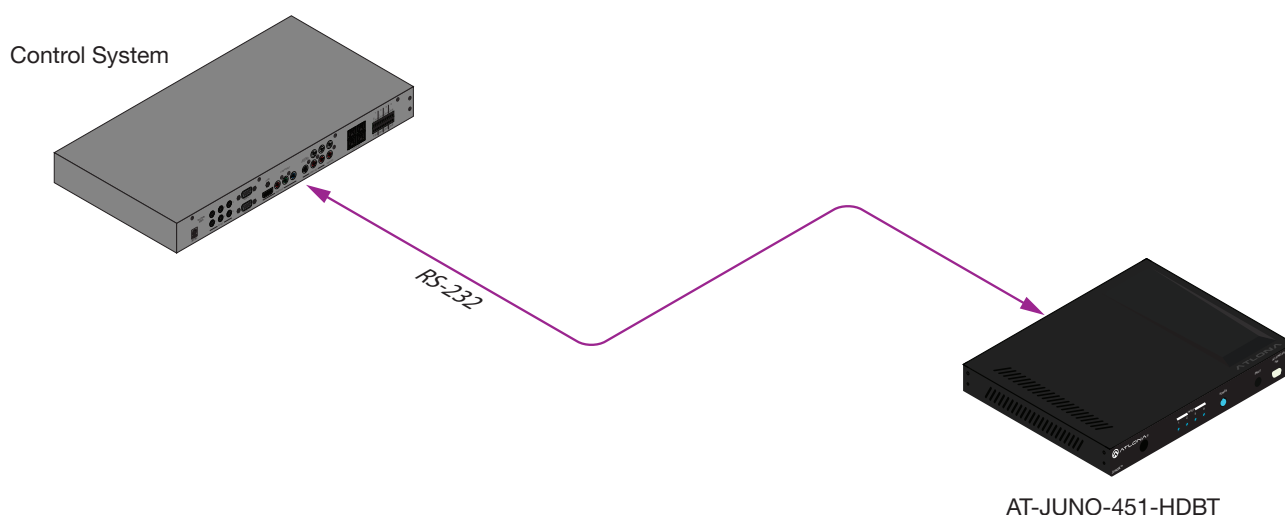
Username: root

Password: Atlona

2. Click **RS-232** in the menu bar.
3. Select the proper baud rate, data bit, parity, and stop bit settings. These settings must correspond with the control system RS-232 settings.



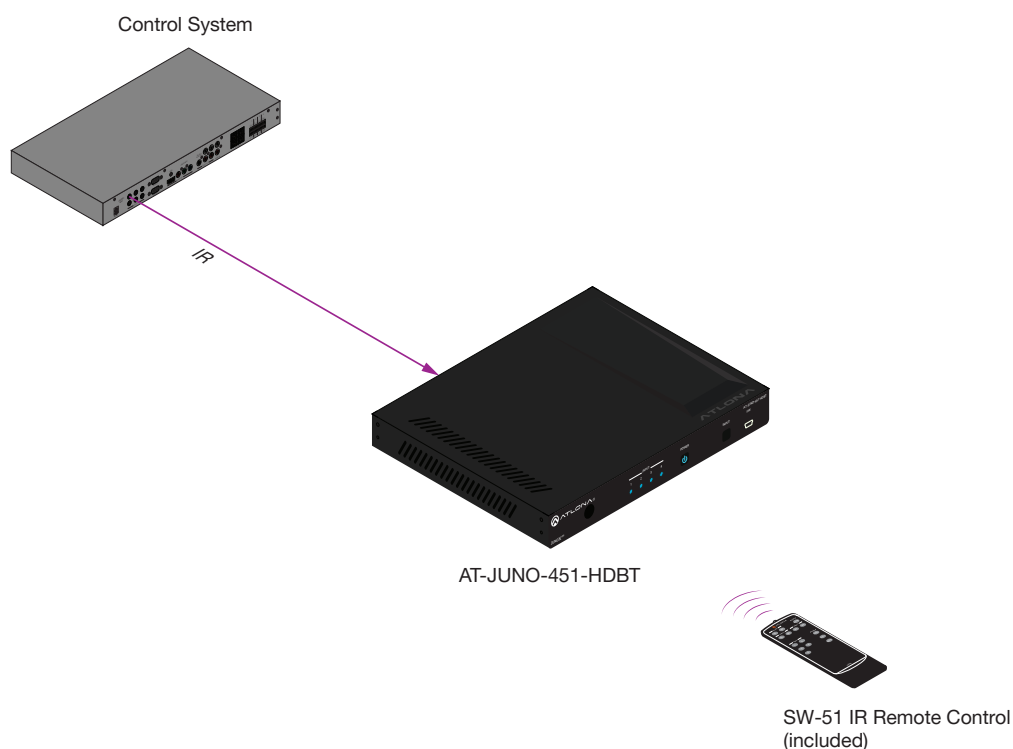
4. Click the **Save** button to commit changes.



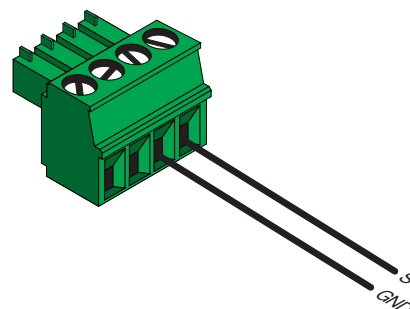
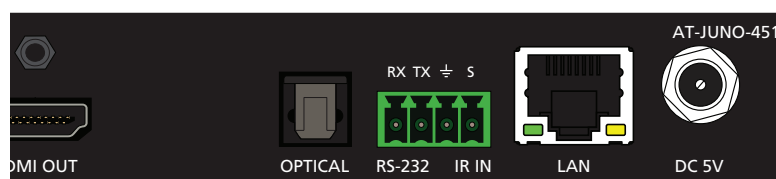
### IR Control

The illustration below, shows an example of how electrical IR, from either a control system or the included IR remote, can be used to control the AT-JUNO-451-HDBT.

To use electrical IR from a control system, the IR commands from the included remote must be “learned”. The AT-JUNO-451-HDBT only supports IR codes from the included IR remote control unit. Third-party IR remotes are not supported.



1. Remove at least 3/16" (5 mm) of insulation from the GND and S wires.
2. Locate the included 4-pin captive screw block and open each of the terminals by turning the screws counter-clockwise, using a small regular screwdriver.
3. Insert the GND and S wires into correct terminal, as shown, and tighten the screws to secure each wire. Do not overtighten.
4. Connect the captive screw connector to the **RS-232 / IR IN** port on the AT-JUNO-451-HDBT.
5. Connect the GND and S wires to the control system or to the AT-VCC-IR-KIT.



## The Web GUI

### Introduction to the Web GUI

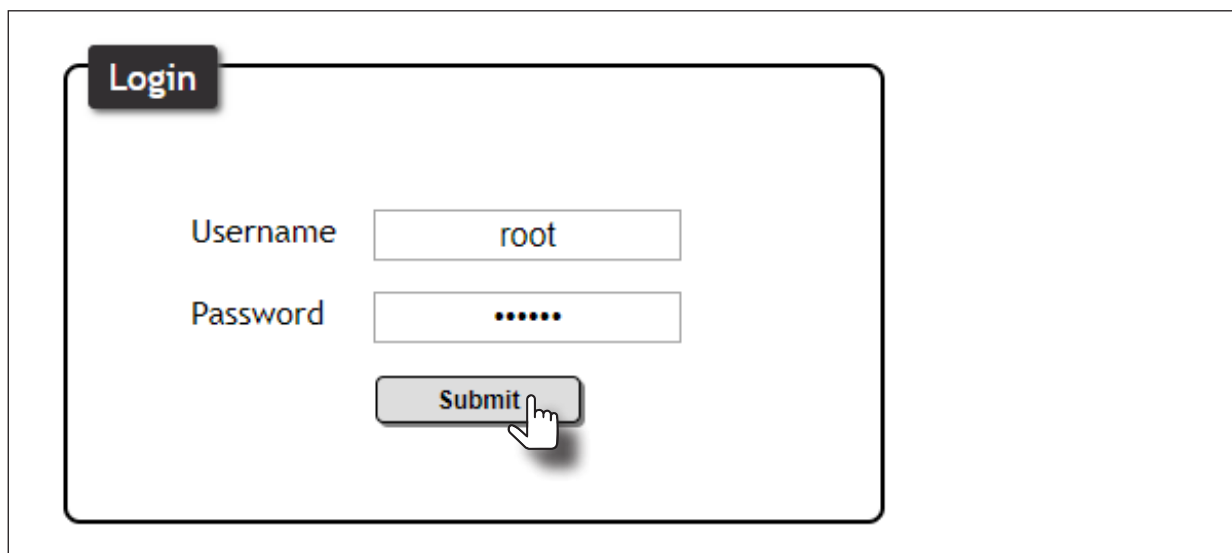
The AT-JUNO-451-HDBT includes a built-in web GUI. Atlona recommends that the web GUI be used to set up the AT-JUNO-451-HDBT, as it provides intuitive management of all features.

The AT-JUNO-451-HDBT is shipped with DHCP enabled. Once connected to a network, the DHCP server will automatically assign an IP address to the unit. Use an IP scanner to determine the IP address of the AT-JUNO-451-HDBT. If a static IP address is desired, refer to [IP Configuration \(page 13\)](#). The default static IP address of the AT-JUNO-451-HDBT is 192.168.1.254.

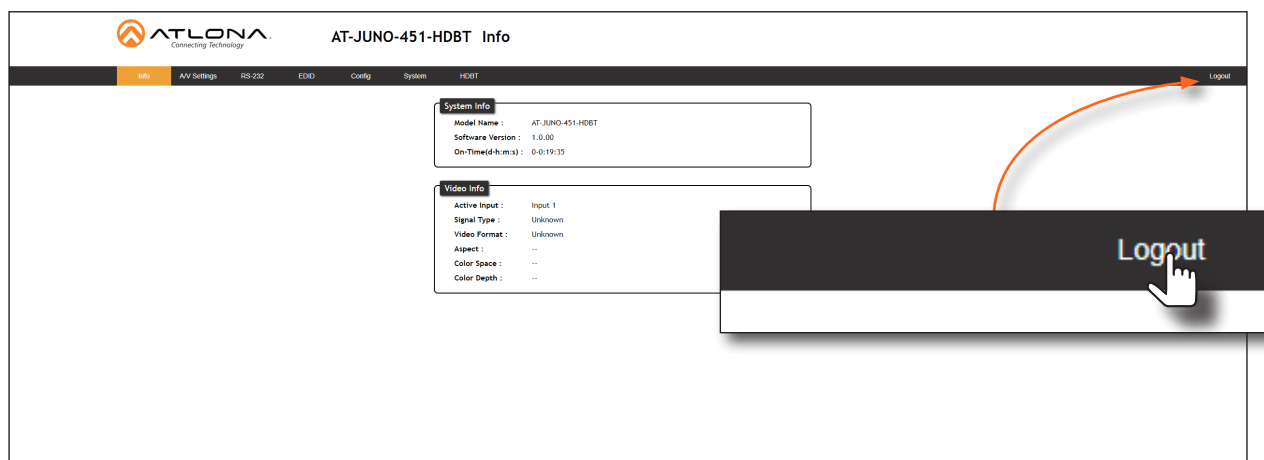
1. Launch a web browser.
2. In the address bar, type the IP address of the AT-JUNO-451-HDBT.
3. The **Login** page will be displayed.



4. Type root, using lower-case characters, in the **Username** field.
5. Type Atlona in the **Password** field. This is the default password. The password field is case-sensitive. When the password is entered, it will be masked. The password can be changed, if desired. Refer to the [Config page \(page 36\)](#) for more information.
6. Click the **Submit** button or press the ENTER key on the keyboard.



7. The **Info** page will be displayed.

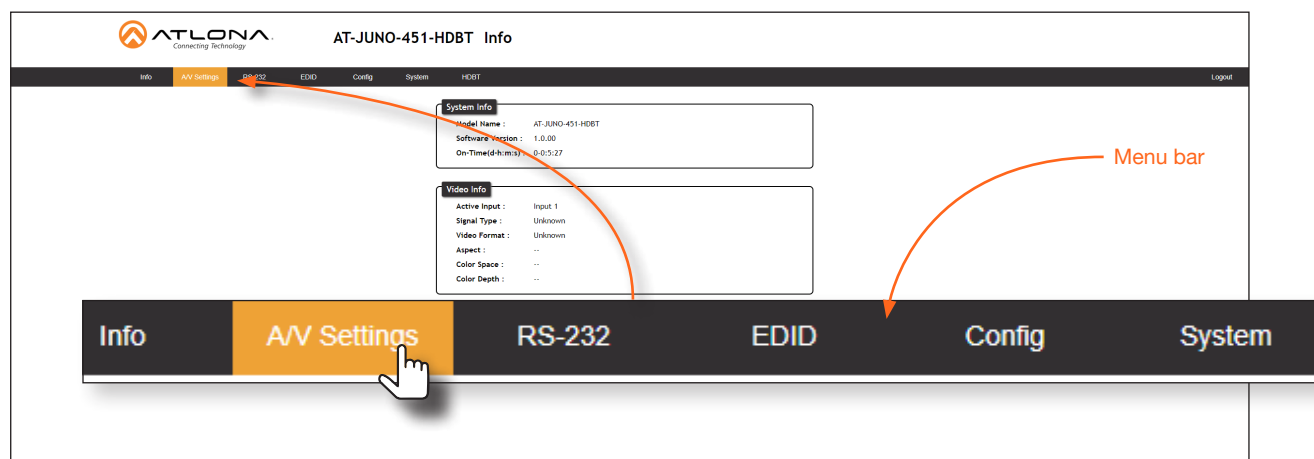


8. Click **Logout**, on the far-right side of the menu bar, to log out of the web GUI and return to the **Login** page.

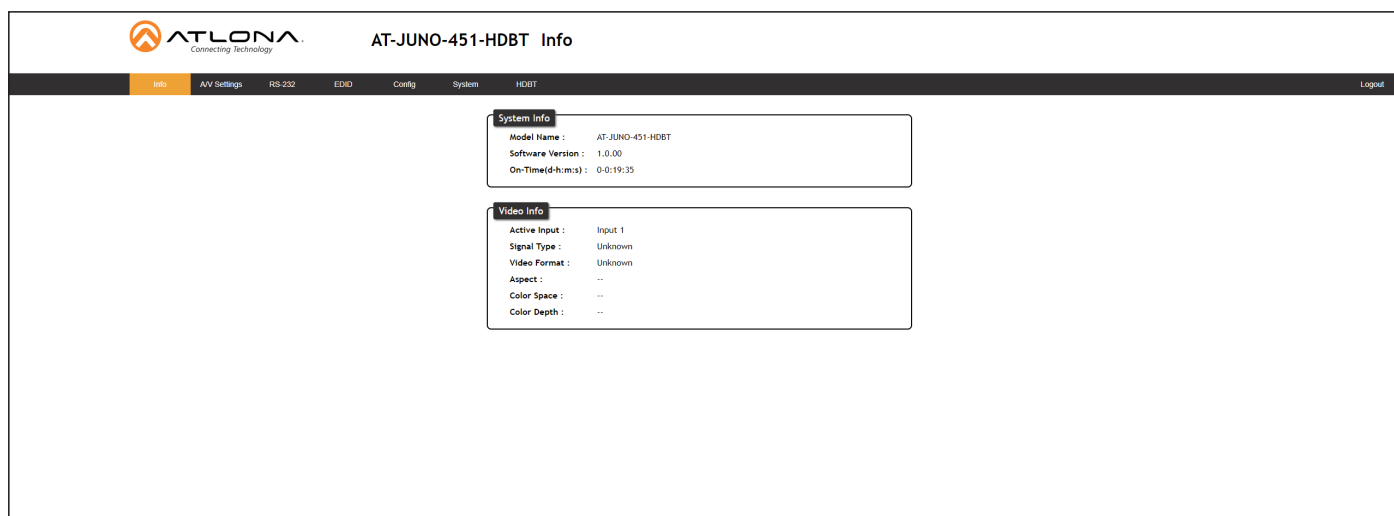
## Menu Bar

The dark-colored bar, near the top of the screen, is the menu bar. When the mouse is moved over each menu element, it will be highlighted in light orange. Once the desired menu element is highlighted, click the left mouse button to access the settings within the menu.

In this example, moving the mouse over the **A/V Settings** menu item will highlight it. Click the **A/V Settings** menu item to display the **A/V Settings** page.



## Info page



### Model Name

The model SKU of this product.

### Software Version

The version of firmware that the AT-JUNO-451-HDBT is running. Always make sure to check the AT-JUNO-451-HDBT product page, on the Atlona web site, for the latest version of firmware.

### On-Time (h-m)

The time elapsed since the unit was last powered-on. Turning the unit “off”, using the PWOFF command, will not reset this field.

### Active Input

The currently selected input. The active input can be changed under the [A/V Settings page \(page 32\)](#) or by pressing and releasing the **INPUT** button on the front panel.

### Signal Type

Displays the input resolution of the source device.

### Video Format

Displays the video format.

### Aspect

Displays the aspect ratio of the input video source.

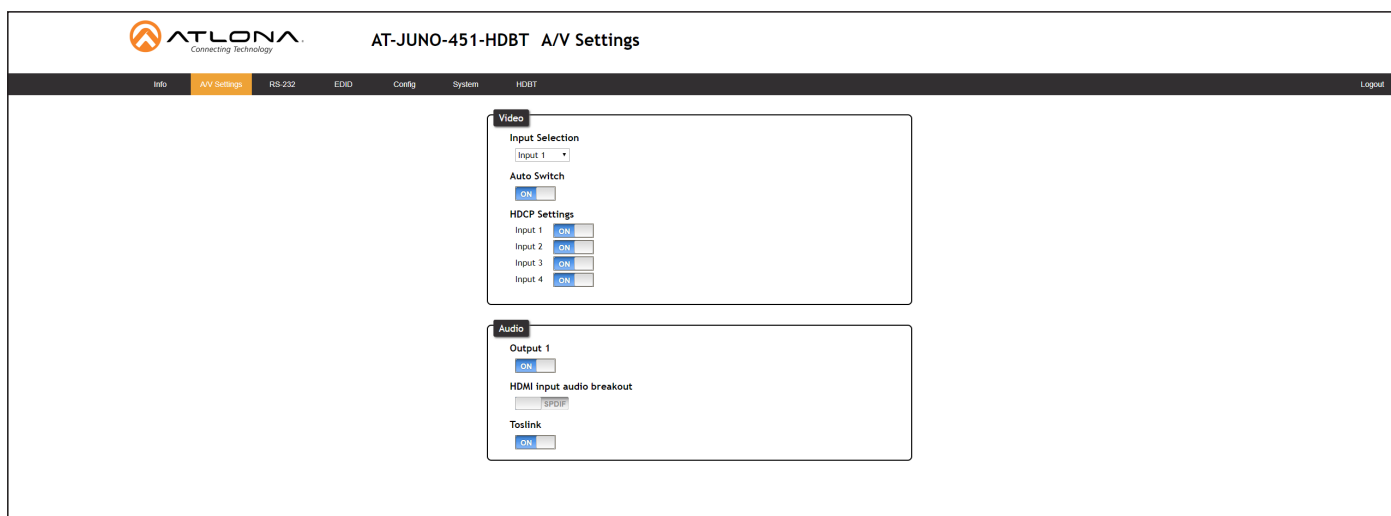
### Color Space

Displays the color space of the input video source.

### Color Depth

Displays the color depth of the input video source.

## A/V Settings page



### Video

#### Input Selection

Click this drop-down list to select the desired input.

Setting	Port
Input 1	INPUT 1 (HDBaseT)
Input 2	INPUT 2
Input 3	INPUT 3
Input 4	INPUT 4

#### Auto Switch

Set the **Auto Switch** mode toggle to ON to enable auto-switching. When auto-switching is enabled, the switcher will automatically switch to the previous input, if a signal loss is detected on the current input. If a new source is connected, the AT-JUNO-451-HDBT will automatically switch to that input. The default setting is ON.

#### HDCP Settings

Sets the HDCP reporting mode of the specified HDMI port: Input 1 = INPUT 1 (HDBaseT), Input 2 = INPUT 2, Input 3 = INPUT 3, Input 4 = INPUT 4. Some devices will transmit HDCP content if an HDCP-compliant display/sink is detected. Setting this value to OFF, will instruct the source to send non-HDCP content (if possible) to non-HDCP display and/or sink devices. Note that setting this value to OFF will not decrypt HDCP content.

Setting	Description
ON	HDCP content is always transmitted by the source
OFF	Instructs the source to send non-HDCP content, if possible



## Audio

### Output 1

Mutes or un-mutes the HDMI audio output. Set the **Output** toggle to OFF to disable HDMI audio on the output. The default setting is ON.

### HDMI Input audio breakout

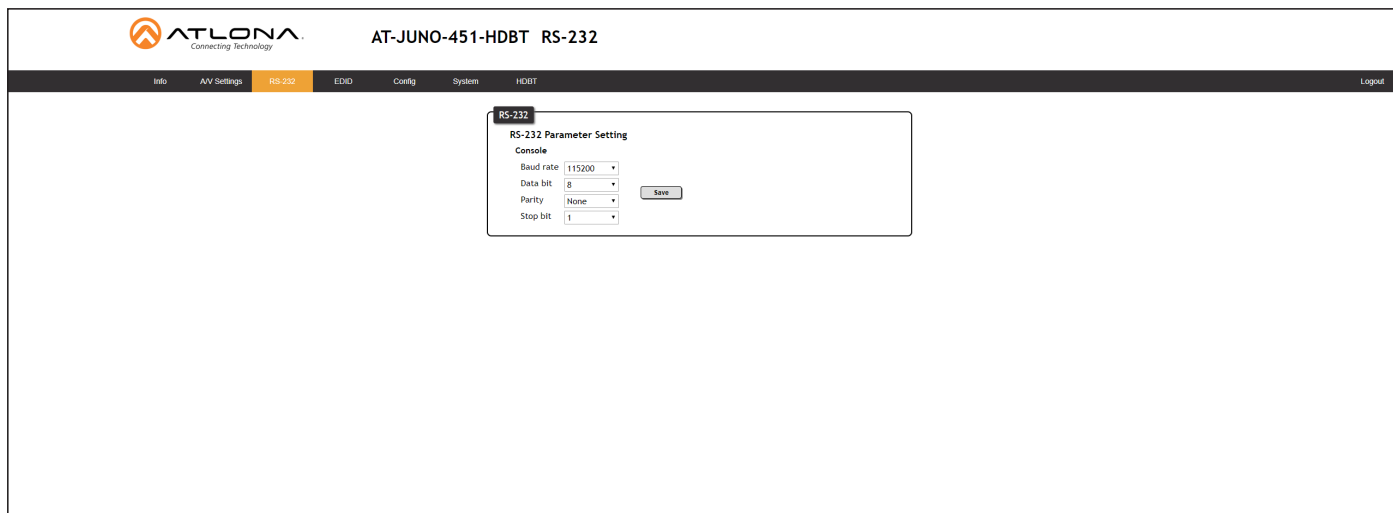
Sets the audio source used by the **OPTICAL** port on the unit. The default setting is SPDIF.

Setting	Description
SPDIF	The HDMI output audio will also be output using the <b>OPTICAL</b> port on the back of the unit.
ARC	Audio being returned from the display, over ARC, will be output on the <b>OPTICAL</b> port on the AT-JUNO-451-HDBT. It should be noted that the audio is limited to formats supported by the SPDIF output, such as PCM, Dolby® Digital, and some formats of DTS. Lossless audio formats, such as Dolby TrueHD and DTS-HD Master Audio™, are not supported by ARC or SPDIF.

### Toslink

Click this toggle to enable or disable the **OPTICAL** port on the back panel. By default, this option is set to OFF (disabled).

## RS-232 page

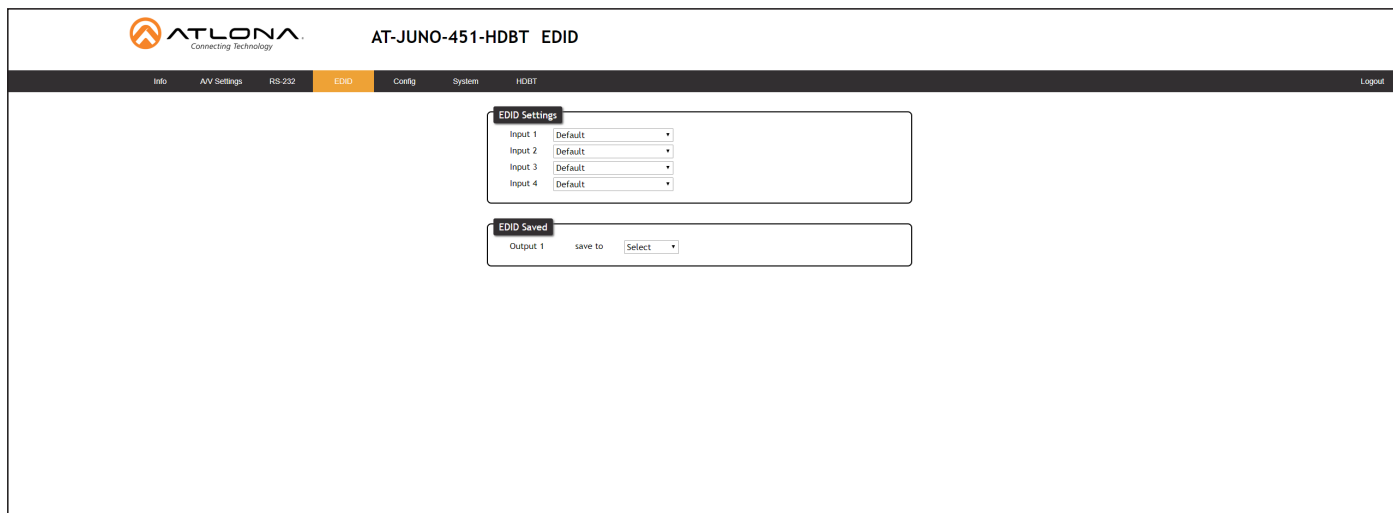


### RS-232 Parameter Setting

Click each of these drop-down boxes to select the desired baud rate, data bits, parity bit, and stop bit.

Setting	Description
Baud rate	Sets the baud rate. The following options are available: 2400, 9600, 19200, 38400, 56000, 57600, 115200.
Data bit	Sets the number of data bits used to represent each character of data. The following options are available: 7 or 8.
Parity	Sets the parity bit, which can be included with each character to detect errors during the transmission of data. The following options are available: None, Odd, or Even.
Stop bit	Sets the stop bit. Stop bits are sent at the end of each character, allowing the client to detect the end of a character stream. The following options are available: 1 or 2.

## EDID page



### EDID Settings

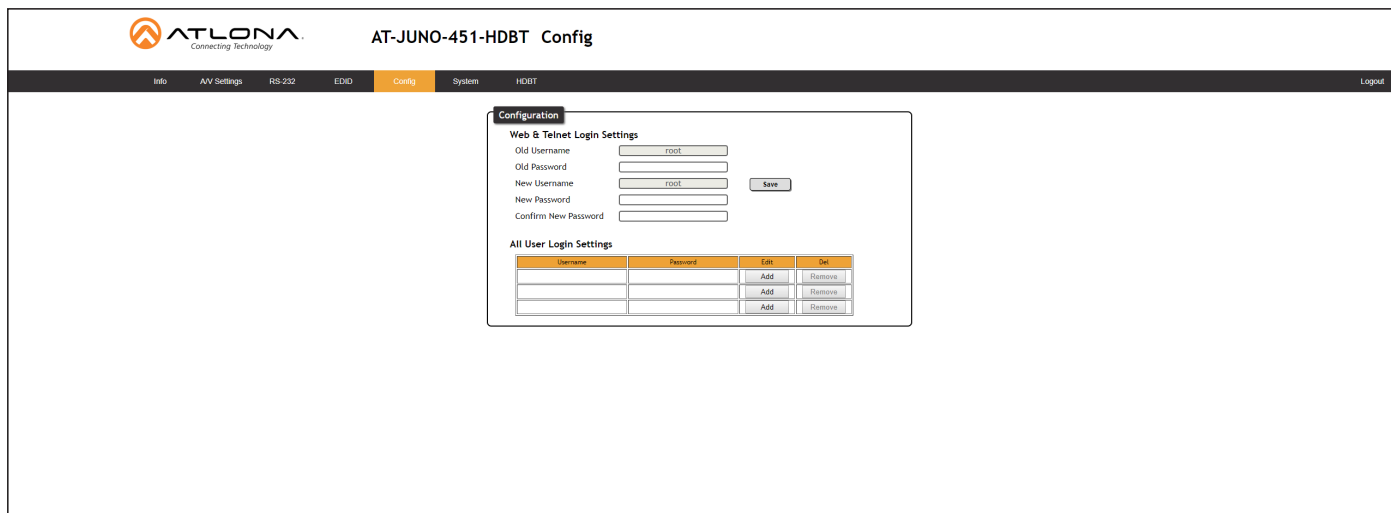
Click these drop-down lists to select the desired EDID to be used for each input. Input 1 = INPUT 1, Input 2 = INPUT 2, Input 3 = INPUT 3, Input 4 = INPUT 4. The source device will use the information in the EDID, before sending A/V data to the sink device.

EDID listing	
Default	1280x800 DVI
1080P 2CH	1920x1200 DVI
1080P MCH	3840x2160@60 4:2:0 2CH
1080P DD	3840x2160@60 4:2:0 MCH
1080P 3D 2CH	3840x2160@30 4:4:4 2CH
1080P 3D MCH	3840x2160@30 4:4:4 MCH
1080P 3D DD	4096x2160@60 4:2:0 2CH
720P 2CH	4096x2160@60 4:2:0 MCH
720P DD	3840x2160@60 4:4:4 2CH
1280x800 2CH	3840x2160@60 4:4:4 MCH
1366x768 2CH	4K 60 4:2:0 HDR 2CH
1080P DVI	4K 60 4:2:0 HDR multichannel audio (HD lossless)

### EDID Saved

Click this drop-down list to select the memory location to save the downstream EDID. Eight memory locations are available. Once an EDID is saved to a memory location, it can be access from the **EDID Settings** drop-down lists.

## Config page



ATLONA<sup>®</sup> Connecting Technology

AT-JUNO-451-HDBT Config

Info AV Settings RS-232 EDID **Config** System HDBT Logout

**Configuration**

**Web & Telnet Login Settings**

Old Username

Old Password

New Username

New Password

Confirm New Password

Save

**All User Login Settings**

Username	Password	Edit	Del
		Add	Remove
		Add	Remove
		Add	Remove

### Old Username

This field cannot be changed. “root” is the administrator user.

### Old Password

Enter the current password for the “root” username in this field. The default password is “Atlona”.

### New Username

This field cannot be changed.

### Save

Click this button to save all changes.

### New Password

Enter the new password for the “root” username in this field.

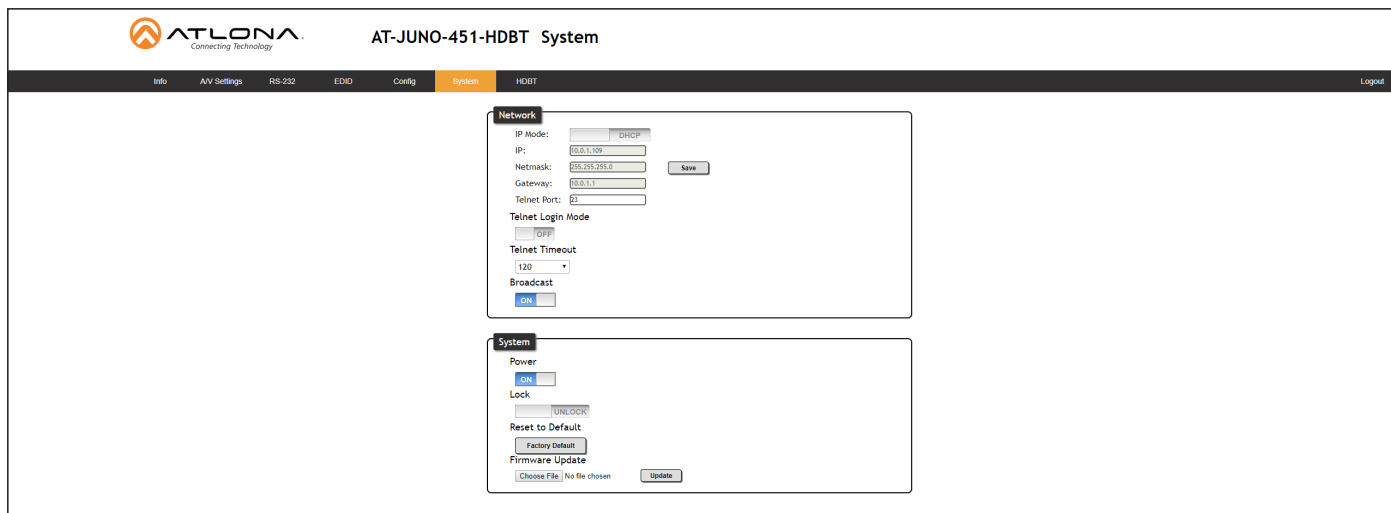
### Confirm New Password

Verify the new password by retyping it in this field.

### All User Login Settings

- Username**  
Displays the username.
- Password**  
Displays the password for the associated username.
- Edit**  
Click the **Add** button, in this column, to edit the username and password in the row.
- Del**  
Click the **Remove** button to delete the user in the row. This button will only be available if both a username and password have been created.

## System page



ATLONA<sup>®</sup> AT-JUNO-451-HDBT System

Info AV Settings RS-232 EDID Config **System** HDBT Logout

**Network**

IP Mode:

IP:

Netmask:

Gateway:

Telnet Port:

Telnet Login Mode:

Telnet Timeout:

Broadcast:

**System**

Power:

Lock:

Reset to Default:

Firmware Update:  No file chosen

## Network

### IP Mode

Click this toggle to set the IP mode of the AT-JUNO-451-HDBT. The default setting is DHCP. Available settings: **STATIC IP**, **DHCP**.

### IP

Enter the IP address of the AT-JUNO-451-HDBT in this field. This field will only be available if **IP Mode** is set to **STATIC IP**. The default IP address is 192.168.1.254.

### Netmask

Enter the subnet mask in this field. This field will only be available if **IP Mode** is set to **STATIC IP**.

### Gateway

Enter the gateway (router) address in this field. This field will only be available if **IP Mode** is set to **STATIC IP**.

### Telnet Port

Enter the Telnet listening port in this field.

### Telnet Login Mode

Click this toggle to set the login mode to either **ON** or **OFF**. If this feature is set to **ON**, then the AT-JUNO-451-HDBT will prompt for both the username and password at the start of a Telnet session. Use the same credentials as the web GUI.

### Telnet Timeout

Click this drop-down list to select the timeout interval, in seconds, before the Telnet connection is automatically closed after no activity. Range: 1 to 3600 (seconds).

### Broadcast

By default, broadcast mode is set to **ON**. When set to **ON**, any system changes will be announced over TCP/IP connections. To separate control between the web GUI and Telnet, set this feature to OFF. Read queries, such as IPCFG and Type commands, are not announced and will only return information to the requester.

## System

### Power

Under normal operation conditions, this toggle is set to **ON**. Click this toggle to **OFF**, to turn the AT-JUNO-451-HDBT “off”. When “off”, the **POWER** LED indicator on the front panel will turn red. The PWOFF and PWON commands can also be used to control the power state.

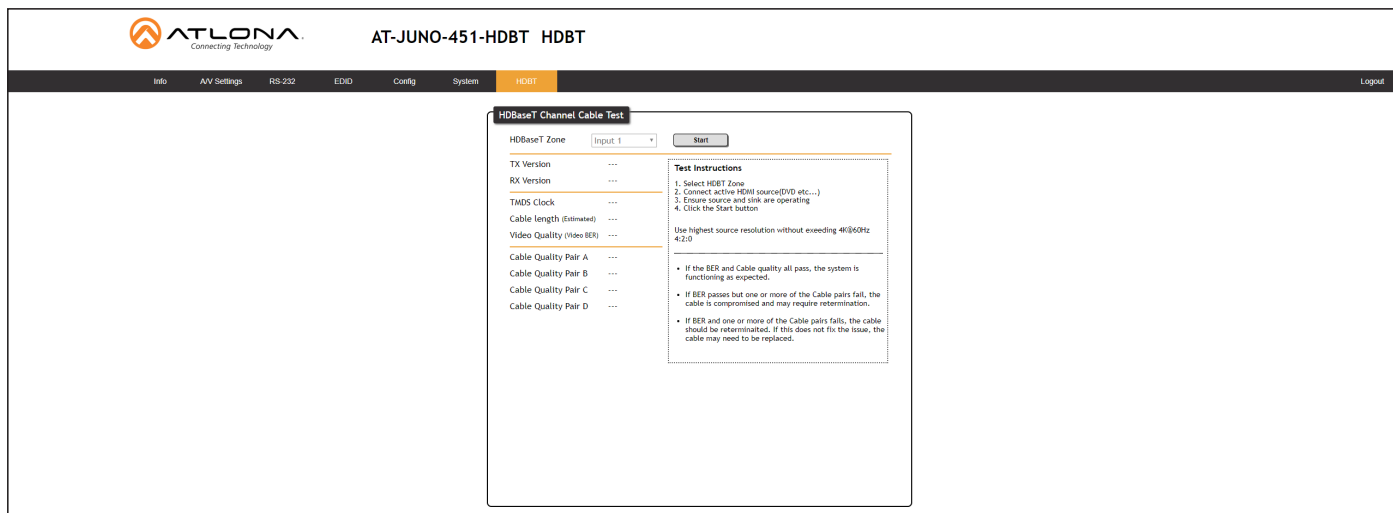
### Reset to Default

Click the **Factory Default** button to set the AT-JUNO-451-HDBT to factory-default settings.

### Firmware Update

Click the **Choose File** button to select the firmware file, when upgrading the firmware on the AT-JUNO-451-HDBT. Once the firmware file is selected, click the **Update** button. Refer to [Updating the Firmware \(page 40\)](#) for more information.

## HDBT page



ATLONA Connecting Technology

AT-JUNO-451-HDBT HDBT

Info AV Settings RS-232 EDID Config System **HDBT** Logout

**HDBT Channel Cable Test**

HDBT Zone: Input 1

TX Version ---

RX Version ---

TMDS Clock ---

Cable length (Estimated) ---

Video Quality (Video BER) ---

Cable Quality Pair A ---

Cable Quality Pair B ---

Cable Quality Pair C ---

Cable Quality Pair D ---

**Test Instructions**

1. Select HDBT Zone
2. Connect active HDMI source(DVD etc...)
3. Ensure source and sink are operating
4. Click the Start button

Use highest source resolution without exceeding 4K@60Hz 4:2:0

- If the BER and Cable quality all pass, the system is functioning as expected.
- If BER passes but one or more of the Cable pairs fail, the cable is compromised and may require retermination.
- If BER and one or more of the Cable pairs fails, the cable should be reterminated. If this does not fix the issue, the cable may need to be replaced.

### HDBaseT Zone

The AT-JUNO-451-HDBT has only a single HDBaseT output. Therefore, this drop-down list is disabled.

### Start

Click the **Start** button to begin the HDBaseT testing process. During testing, the button text will change to “Stop”. Click the **Stop** button to halt the HDBaseT testing process. HDBaseT testing can be performed at any time, while the unit is powered. Refer to the instructions on this web page for information on how to interpret the BER and cable test results.

### TX Version

The version of the Valens chip on the transmitter.

### RX Version

The version of the Valens chip on the receiver.

### TMDS Clock

Displays the pixel clock speed. If no source is connected, then this field will display as “None”.

### Cable length (Estimated)

This field indicates the approximate length of the Ethernet cable connected between the HDBaseT port on the AT-JUNO-451-HDBT and the receiver. If the cable length is less than 15 feet, then this value will be displayed as 0 (zero).

### Video Quality (Video BER)

The Bit Error Rate (BER). This field displays either PASS or FAIL during a test.

### Cable Quality Pair (A, B, C, D)

Each of these fields will display either PASS or FAIL during a test.

## Appendix

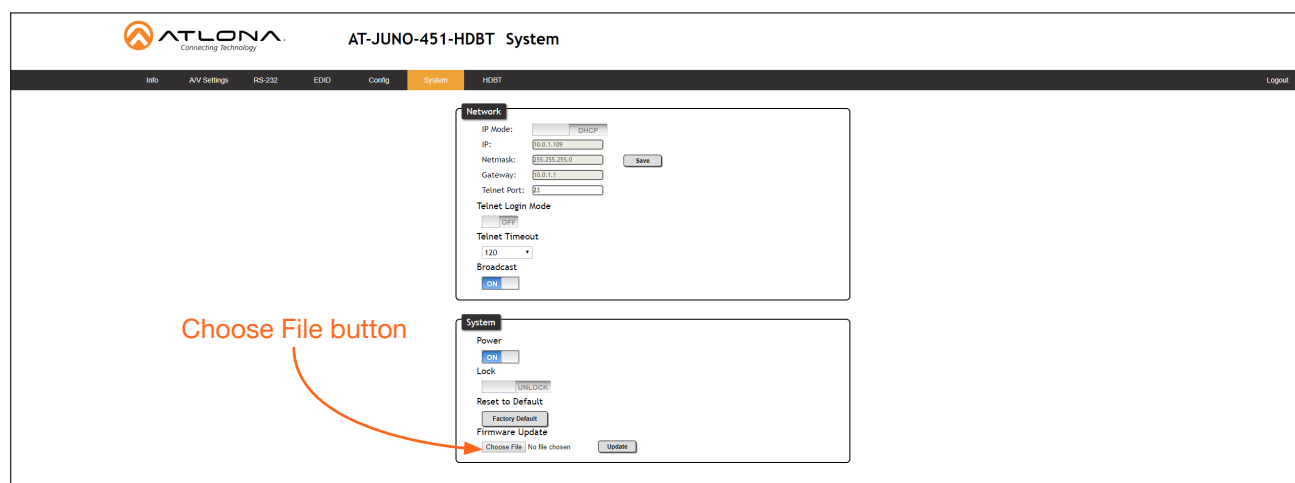
### Updating the Firmware

Updating the firmware can be completed using either the USB interface or the web GUI. Atlona recommends using the web GUI for updating the firmware. However, if a network connection is not available, the AT-JUNO-451-HDBT firmware can be updated using a USB-A to USB mini-B cable.

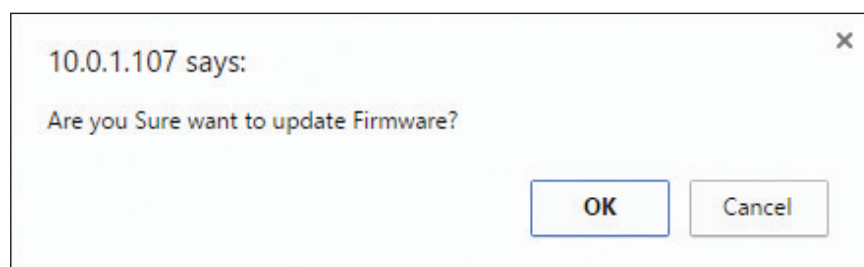
#### Using the Web GUI

Requirements:

- AT-JUNO-451-HDBT
  - Firmware file
  - Computer running Microsoft Windows
1. Connect an Ethernet cable from the computer, containing the firmware, to the same network where the AT-JUNO-451-HDBT is connected.
  2. Go to the **System** page (page 37) in the web GUI.



3. Click the **Choose File** button, under **Firmware Update**.
4. Browse to the location of the firmware file, select it, and click the **Open** button.
5. Click the **Update** button to begin the update process.
6. The following message box will be displayed.



7. Click the **OK** button to begin the firmware update process. Click the **Cancel** button to cancel the process.
8. After the firmware update process is complete, the **Login** screen will be displayed.



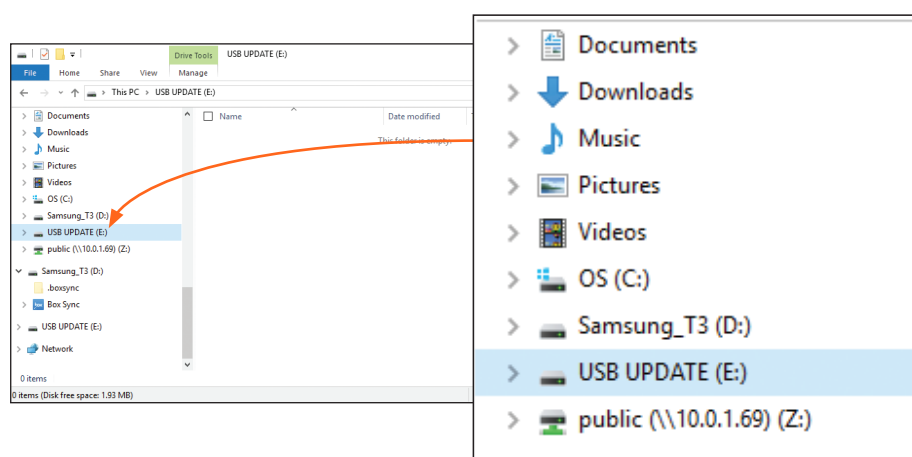
## Using USB

### Requirements:

- AT-JUNO-451-HDBT
- Firmware file
- Computer running Microsoft Windows
- USB-A to USB mini-B cable

1. Disconnect power from the AT-JUNO-451-HDBT.
2. Press and hold the **INPUT** button while connecting power to the AT-JUNO-451-HDBT.
3. Release the INPUT button. The **POWER** button will glow solid red, indicating that the AT-JUNO-451-HDBT is in update mode.
4. Connect the USB-A to USB mini-B cable between the PC and the firmware port on the AT-JUNO-451-HDBT. The unit will be powered by the USB cable.
5. The USB UPDATE folder will be displayed.

If this folder is not displayed, automatically, select the USB UPDATE drive from Windows Explorer.



7. Delete all files from the USB UPDATE drive, if any are present.
8. Drag-and-drop the firmware file to the drive. During the firmware update procedure, the **POWER** button will flash.
9. After the file has been copied, disconnect the USB cable from both the computer and the AT-JUNO-451-HDBT.
10. The firmware update process is complete.

## Default Settings

The following tables list the factory-default settings for the AT-JUNO-451-HDBT.

Feature	Settings	
A/V Settings	<b>Video</b>	
	Input Selection	Input 1
	Auto Switch	ON
	<b>HDCP Settings</b>	
	Input 1	ON
	Input 2	ON
	Input 3	ON
	Input 4	ON
	<b>Audio</b>	
	Output 1	ON
RS-232	HDMI input audio breakout	SPDIF
	Toslink	ON
	Baud rate	115200
	Data bit	8
EDID	Parity	None
	Stop bit	1
	<b>EDID Settings</b>	
	Input 1	Default
	Input 2	Default
	Input 3	Default
Config	Input 4	Default
	<b>EDID Saved</b>	
	Output 1	---
System	Username (default)	root
	Password (default)	Atlona
System	<b>Network</b>	
	IP Mode	DHCP
	Static IP Address (default)	192.168.1.254
	Netmask	255.255.255.0
	Gateway	192.168.1.1
	Telnet Port	23
	Telnet Login Mode	OFF
	Telnet Timeout	120
	Broadcast	ON
	<b>System</b>	
	Power	ON
	Lock	UNLOCK
	HDBaseT Zone	Input 1 (cannot be changed)
HDBT		

## Specifications

Connectors, Controls, and Indicators	
INPUT (HDBaseT)	1 - RJ45
INPUT (HDMI)	3 - Type A, 19-pin female
OUTPUT	1 - Type A, 19-pin female
OPTICAL	1 - TOSLINK™
RS-232 / IR	1 - 5-pin captive screw
LAN	1 - RJ45
DC 5V	1 - Barrel connector, 5.5 mm, locking
FW	1 - Type mini-B, 5-pin female
INPUT button	1 - momentary, tact-type
POWER button	1 - momentary, tact-type, backlit power LED
Input Indicators	4 - LED, blue
IR window	1 - Round, front panel

Video	
UHD/HD/SD	4096x2160@24/25/30/50/60Hz, 3840x2160@24/25/30/50/60Hz, 2048x1080p, 1080p@23.98/24/25/29.97/30/50/59.94/60Hz, 1080i@50/59.94/60Hz, 720p@50/59.94/60Hz, 576p, 576i, 480p, 480i
VESA	2560x2048, 2560x1600, 2048x1536, 1920x1200, 1680x1050, 1600x1200, 1600x900, 1440x900, 1400x1050, 1366x768, 1360x768, 1280x1024, 1280x800, 1280x768, 1152x768, 1024x768, 800x600, 640x480
Color Space	YUV, RGB
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0*
Color Depth	8-bit, 10-bit, 12-bit
HDR	HDR10 and Dolby® Vision™ @ 60 Hz

Audio	
HDMI IN / HDBaseT IN	PCM 2Ch, LPCM 5.1, LPCM 7.1, Dolby® Digital, DTS® 5.1, Dolby Digital Plus™, Dolby TrueHD, DTS-HD Master Audio™, Dolby Atmos®, DTS:X
Sample Rate	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
Bit Rate	24-bit (max.)

Resolution / Distance	4K - Feet	4K - Meters	1080p - Feet	1080p - Meters
HDMI IN/OUT	15	5	30	10
CAT5e/6	115	35	200	60
CAT6a/7	130	40	230	70

\*4096x2160@50/60Hz and 3840x2160@50/60Hz supports 8-bit 4:2:0 chroma subsampling, only.

Signal	
Maximum TMDS Clock	600 MHz
HDBaseT	18 Gbps
HDMI	2.0
USB	2.0
HDCP	2.2

Temperature	Fahrenheit	Celsius
Operating	32° to 122°	0° to 50°
Storage	-4° to 140°	-20° to 60°
Humidity (RH)	20% to 90%, non-condensing	

Power	
Consumption	6.6 W
Idle Consumption	5.9 W
Supply	Input: 100 - 240 V AC, 50/60 Hz, Output: 5 V DC

Dimensions	Inches	Millimeters
H x W x D	1.0 x 8.6 x 5.9	26 x 219 x 152

Weight	Pounds	Kilograms
Device	1.82	0.82

Certification	
Device	CE, FCC
Power Supply	CE, FCC, Level VI, RoHS, cULus, RCM, CCC

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