4K / UHD
Four-Input HDMI Switcher
with Auto-Switching and Return Optical Audio

Version Information

Version	Release Date	Notes
5	Jun 2023	- New color format. - removed "welcome" section from page 3. - updated contact information. - added warranty QR code.

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Operating Notes

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

ℹ️ **NOTE:** The AT-JUNO-451 no longer ships with an IR remote control. However, IR documentation remains for units currently in the field.

Warranty

To view the product warranty, use the following link or QR code:

https://atlona.com/warranty/.

Safety and Certification

```
CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
```

```
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 Compliance

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.

Copyright, Trademark, and Registration

Table of Contents

Introduction

The Atlona JunoX™ 451 (**AT-JUNO-451**) is a 4×1 HDMI switcher for high dynamic range (HDR) formats. 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 is ideal for residential applications with the latest as well as emerging 4K/UHD and HDR sources and displays. It is compatible with all video resolutions, audio formats, and color space formats supported in the HDMI 2.0a specification, plus the ability to pass metadata for HDR content. The JunoX 451 includes EDID management features and automatic input switching. It also supports the HDMI Audio Return Channel (ARC) for receiving digital audio from a television. A TOSLINK digital audio output is provided for sending ARC or de-embedded HDMI audio to an AV receiver or soundbar. This JunoX Series HDMI switcher can be controlled via Ethernet, RS-232, and IR.

Features

- 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
- HDMI audio de-embedding
- Easy, GUI-based configuration using integrated web server
- TCP/IP, RS-232, and IR control
- Multichannel audio compliant
- Front panel input selection status LEDs
- Award-winning 10 year limited product warranty

Package Contents

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

Panel Description
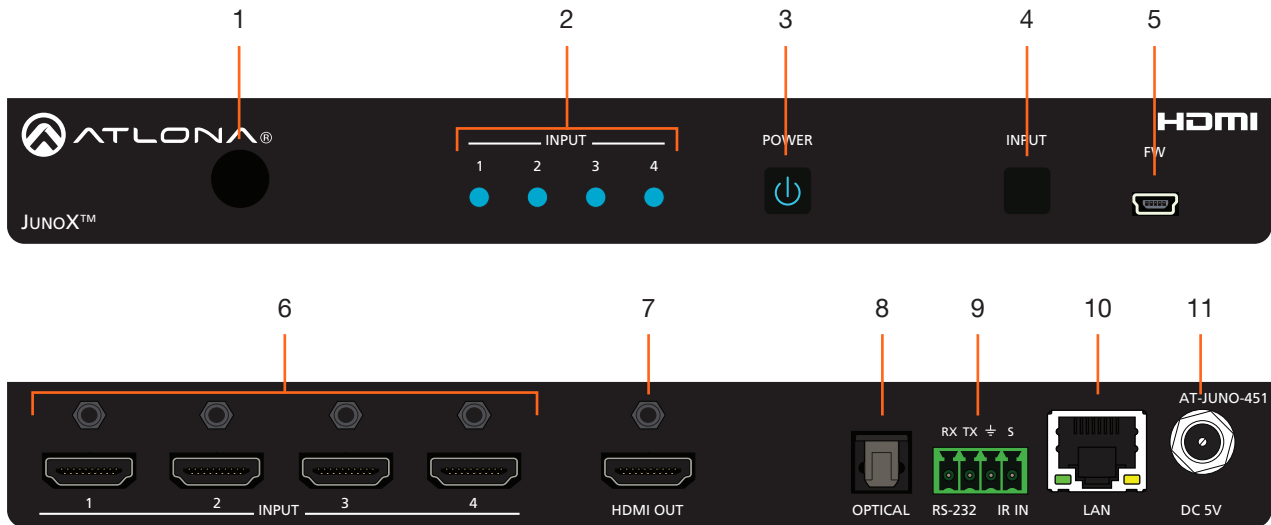
1 IR Window
Receives IR signals from the IR remote.

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. When powered, the LED backlight will be blue.

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 INPUT (1 - 4)
Connect an HDR sources to each of these HDMI ports.

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

8 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.

9 RS-232 / IR IN
Connect the included 4-pin captive screw block to this port. Refer to RS-232 / IR Control (page 23) for wiring information, if necessary.

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

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

Installation

Connection Instructions

1. Connect an HD/UHD source to each of the four HDMI inputs (**INPUT 1** - **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.

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

5. Connect the included four-pin captive screw connector to the **RS-232 / IR IN** port. Refer to RS-232 / IR Control (page 23) for more information.

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
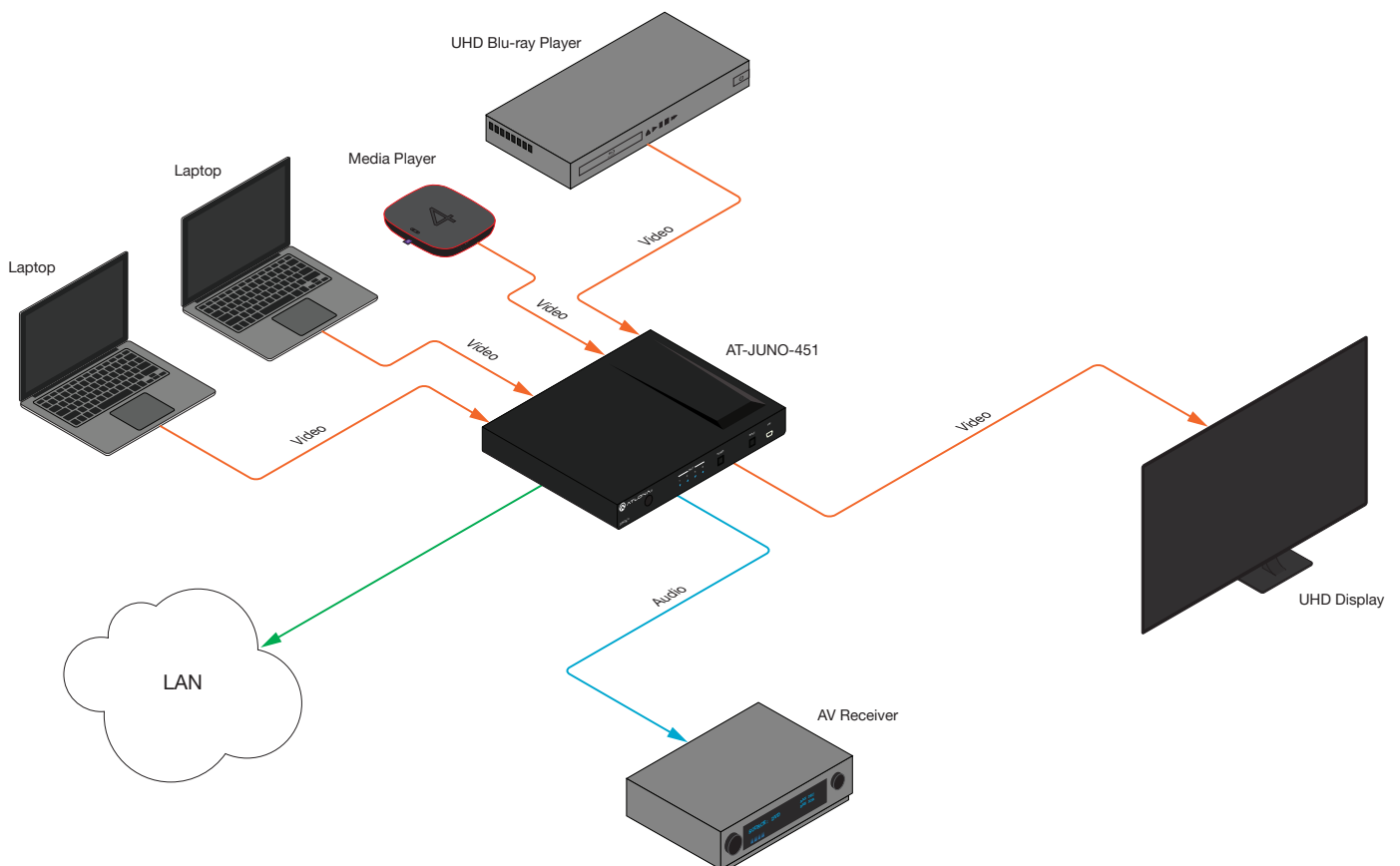
IP Configuration

The AT-JUNO-451 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 is 192.168.1.254.

If the AT-JUNO-451 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 is powered.

2. Connect an Ethernet cable between the LAN port of the AT-JUNO-451 and the Local Area Network (LAN).
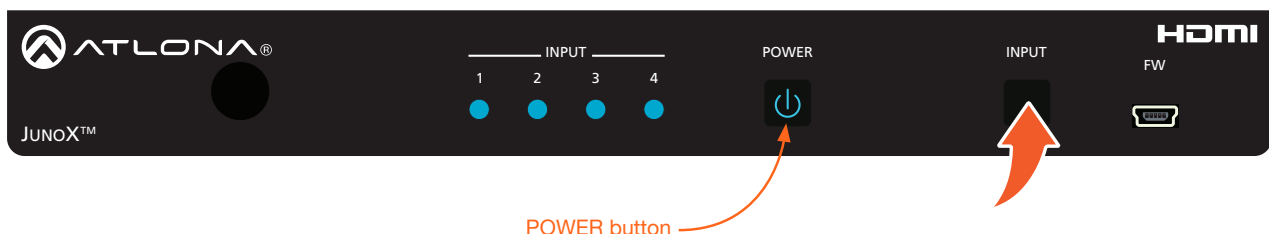
POWER button

3. Press and hold the **INPUT** button on the front panel for 20 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 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, 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**

    1. Connect to the AT-JUNO-451 using RS-232 or Telnet.

    2. 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 Server

The System page (page 35), in the web server, allows the AT-JUNO-451 to use either DHCP or static IP mode. In order to access the web server, the IP address of the AT-JUNO-451 must be known. Refer to Web Server (page 27).

1. Open the desired web browser and enter the IP address of the AT-JUNO-451.

2. Log in, using the required credentials. The factory-default username and password are listed below:

Username: root
Password: Atlona

3. Click the **System** tab.

4. 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.

5. Click the **Save** button to save the changes.

Displaying the IP Address

Press and hold the **INPUT** button on the front panel for 10 seconds, to display the IP address of the AT-JUNO-451, in the upper-left corner of the connected display.

Device 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.

LED			Description
POWER	Blue		• Unit is receiving power.
	Off		• Unit is not powered. • Press the POWER button to power the unit. • Check the power supply and make sure it is securely fastened to the locking connector on the rear of the unit. • 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).
INPUT	Blue		• The input is the currently selected (active) input.
	Off		• The input is not active.

Input Switching

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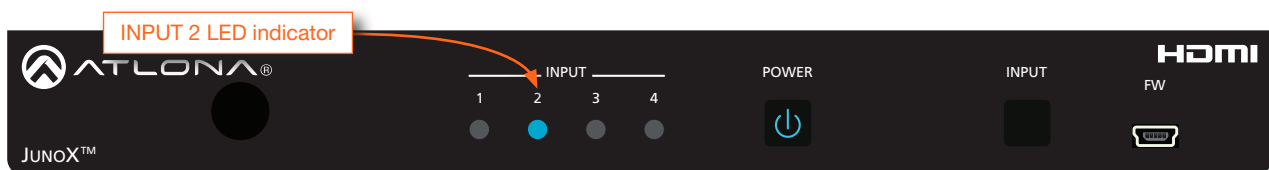
Manual Switching

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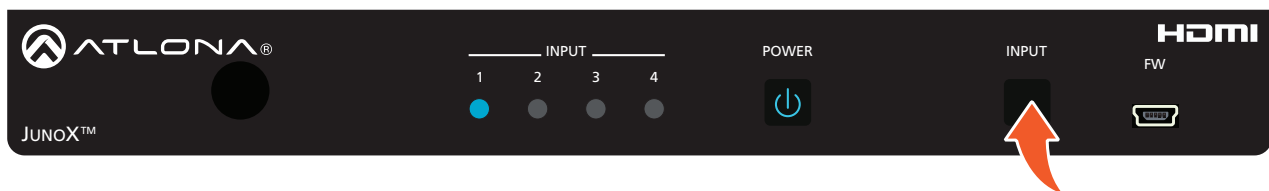
After the **INPUT** button is pressed, the INPUT LED indicator will advance to the next input, in sequence. In this example, **INPUT 2** is the active input and is indicated by the **INPUT 2** LED indicator on the front panel.

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 30) of the web server, 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 retains the currently selected input, even after the unit is powered-off then powered-on.
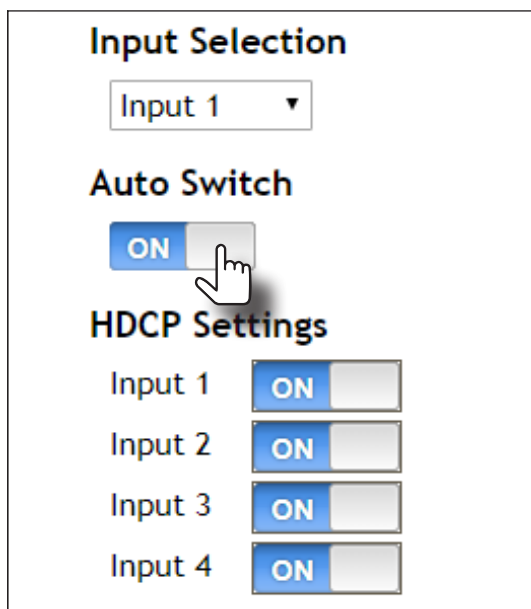
Auto Switching

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 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 Server

   a. Login to the web server and access the A/V Settings page (page 30).

   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 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 will fallback to a port with an active source.

   - If all sources are disconnected, then the AT-JUNO-451 will retain the port of the the last-connected source.

> **NOTE:** The AT-JUNO-451 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. A non-compliant display is connected to the AT-JUNO-451 using an HDMI cable.
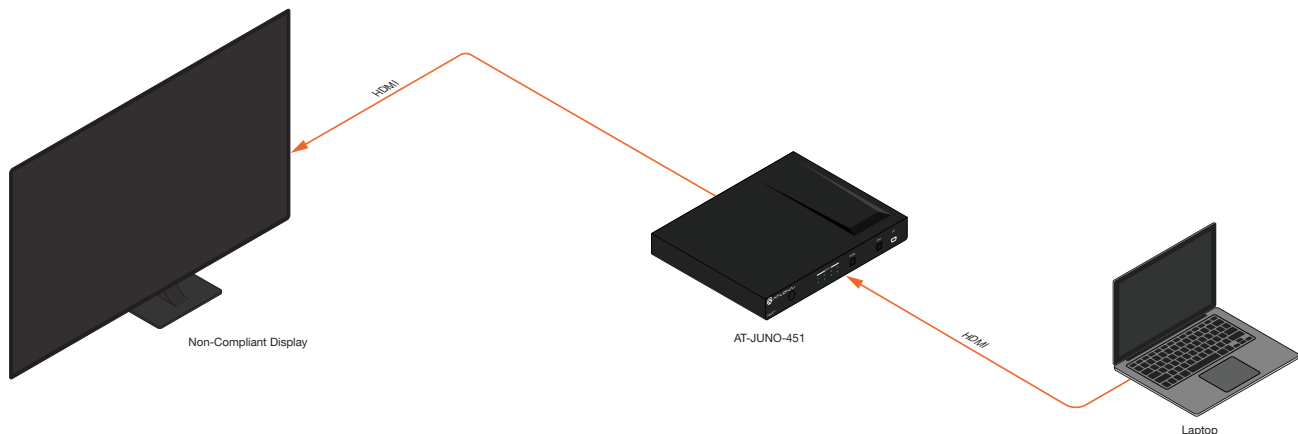
By default, the laptop may transmit HDCP content. However, when connected to a display that does not support HDCP, the laptop must be instructed to send non-HDCP content, in order for the content to be displayed.

1. Open the desired web browser and enter the IP address of the AT-JUNO-451.

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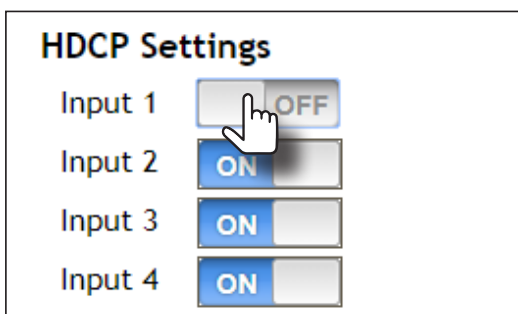
> **NOTE:** Not all source devices are capable of transmitting non-HDCP content. For example, Sony PlayStation® gaming consoles and Mac® computers always transmit HDCP-encrypted content.

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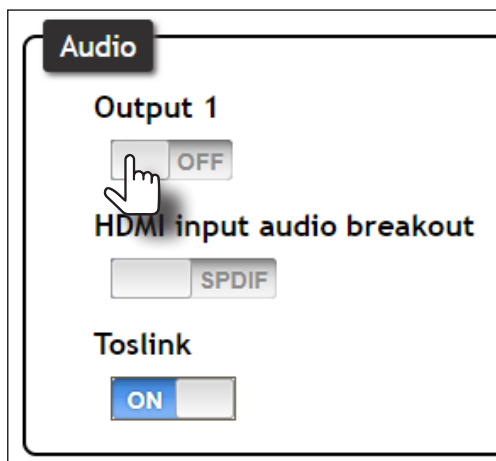
The AT-JUNO-451 provides complete control over audio muting for both the HDMI OUT and OPTICAL outputs.

HDMI Output Muting

1. Open the desired web browser and enter the IP address of the AT-JUNO-451.

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.

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 **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.
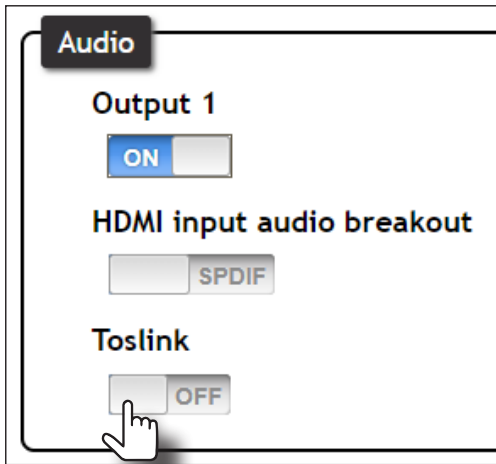

Using the Audio Return Channel (ARC)

The Audio Return Channel (ARC) allows audio to be sent upstream, from the display device, to the AT-JUNO-451 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.
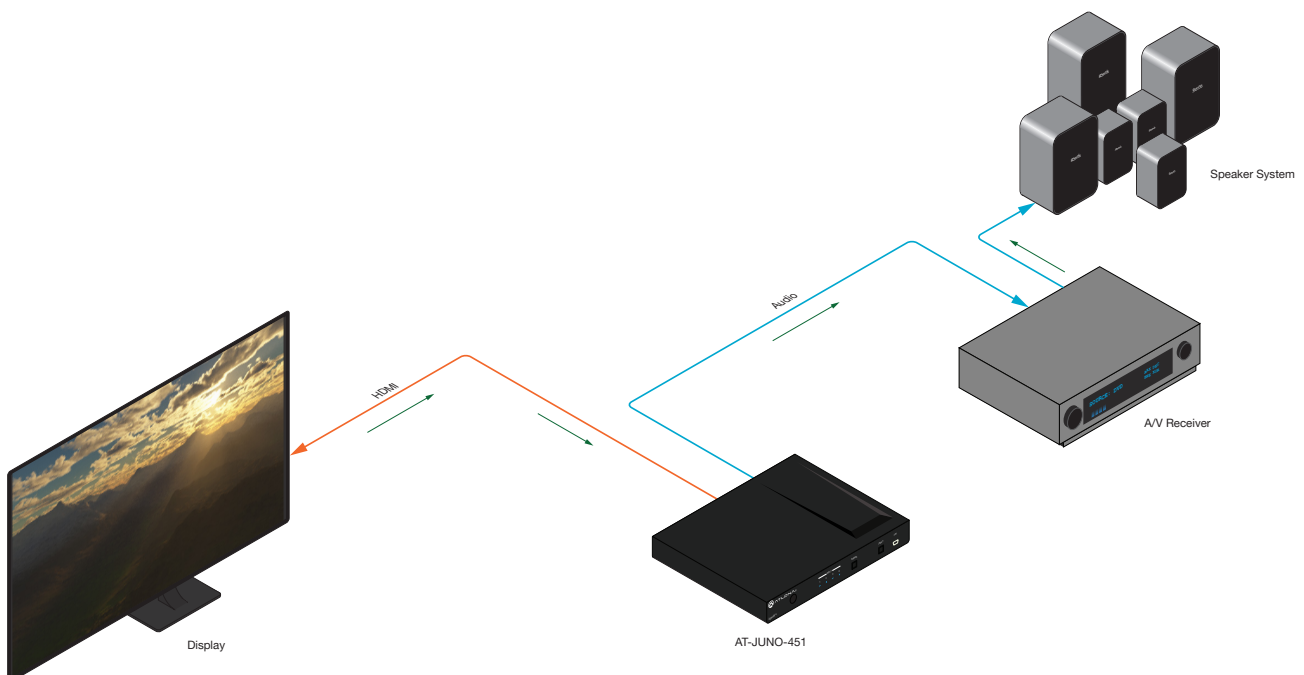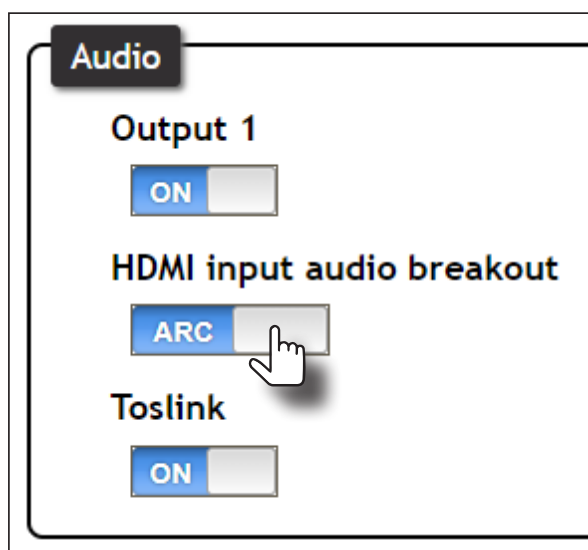
1. Connect an HDMI cable from the **HDMI OUT** port on the AT-JUNO-451 to the HDMI input port on the display. This cable is used to carry the audio from the display to the AT-JUNO-451.

2. Connect an optical cable from the **OPTICAL OUT** port on the AT-JUNO-451 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.

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 **OPTICAL** port on the back of the unit.
ARC	Audio being returned from the display, over ARC, will be output on the **OPTICAL** port on the AT-JUNO-451. 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 can be accomplished through either IP or RS-232.

    •   If using RS-232, refer to RS-232 / IR Control (page 23) for more information.

    •   If controlling over IP, connect an Ethernet cable from the control system to the LAN port on the AT-JUNO-451. 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 **OPTICAL OUT** port.

    AudioARC SPDIF   // disables ARC; HDMI inputs are enabled and the embedded HDMI audio
                            is also output to the **OPTICAL OUT** port.

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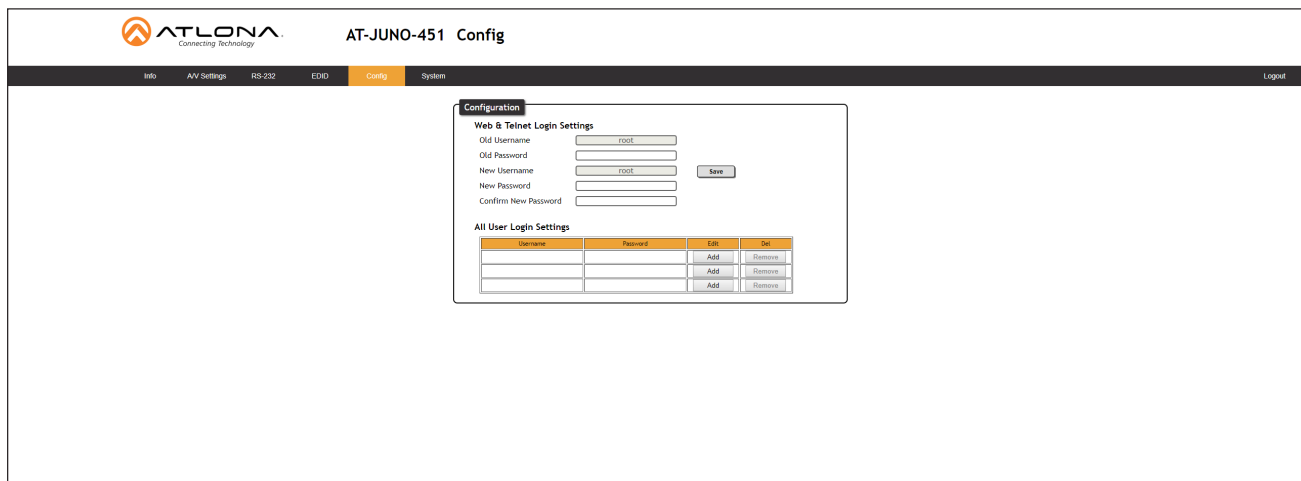
Managing Users

The AT-JUNO-451 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. 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.

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 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

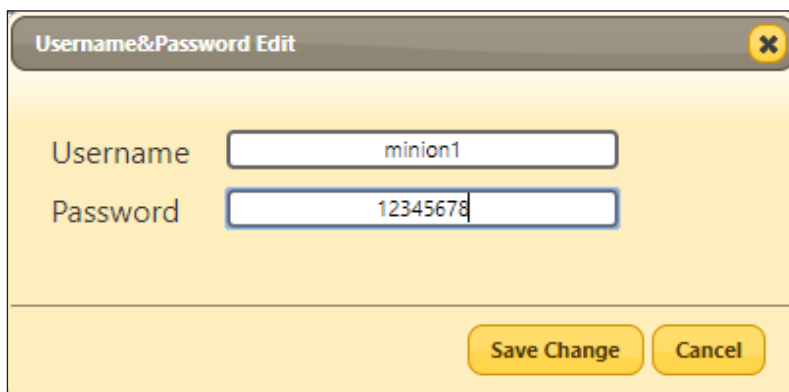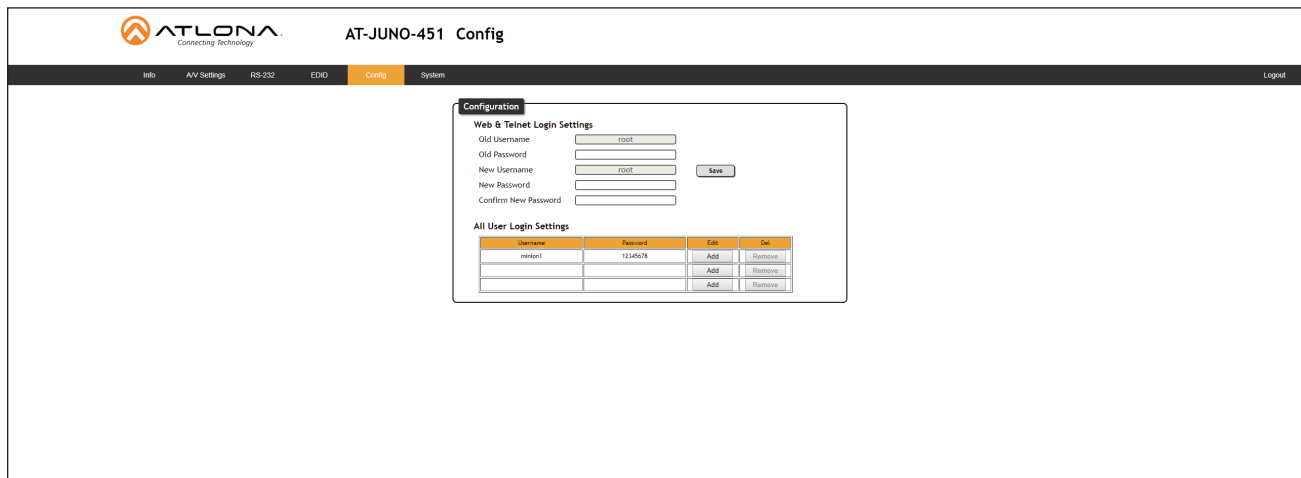The username and password of a user can be changed using this method.

1. Open the desired web browser and enter the IP address of the AT-JUNO-451.

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

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.

Deleting Users

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

Resetting to Factory Defaults

The following procedure will reset the AT-JUNO-451 to factory-default settings. The network IP mode will be set to DHCP mode.

Using the Front Panel

1. Make sure the unit is powered.

2. Simultaneously press and hold the **POWER** and **INPUT** buttons for more than 15 seconds.

3. Release both buttons.

4. The factory-reset process is complete.
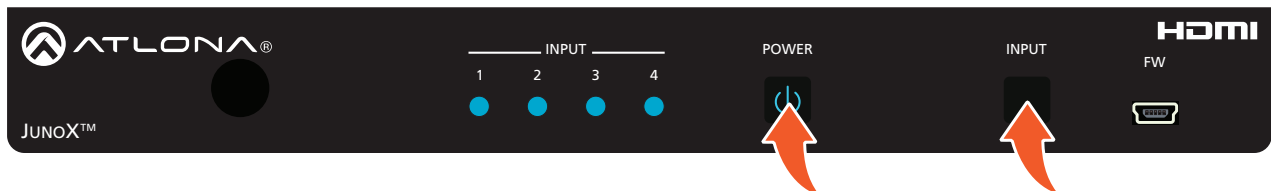
Using the Web Server

1. Open the desired web browser and enter the IP address of the AT-JUNO-451.

2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:
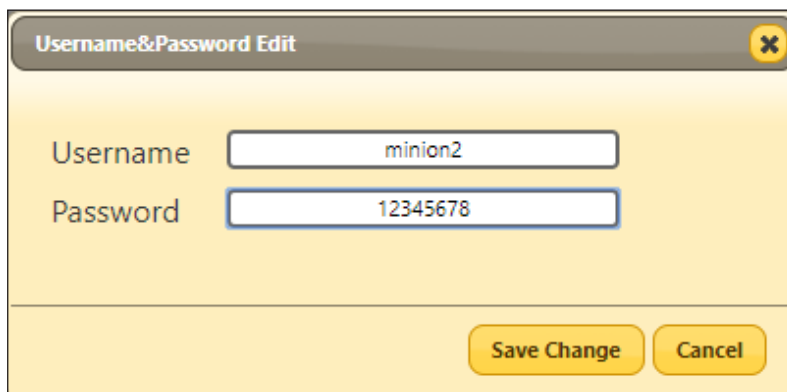
   Username: root
   Password: Atlona

3. Click the **System** tab.
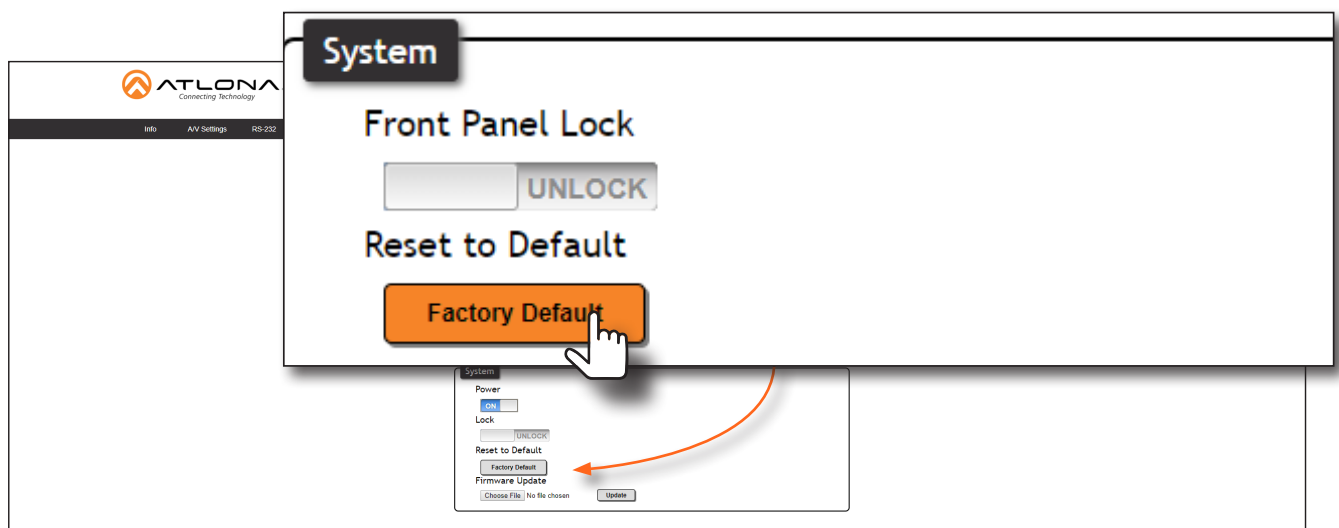
4. Click the **Factory Default** button.

5. The following message will be displayed at the top of the screen. Click **OK** to continue with the factory-default reset procedure. Click **Cancel** to abort the process.
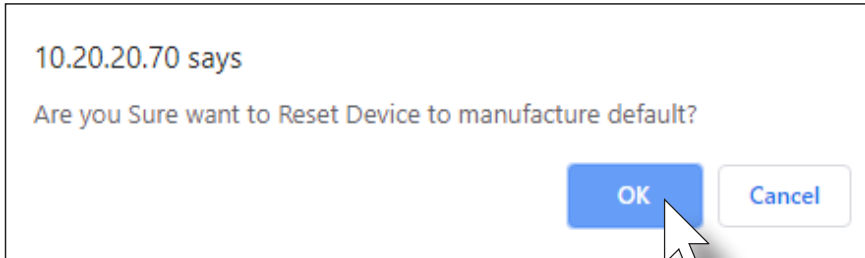
6. Once the factory-default process is complete, the web server **Login** screen will be displayed.

7. The factory-reset process is complete.

RS-232 / IR Control

The AT-JUNO-451 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 a computer or control system, to communicate with Data Communication Equipment (DCE) devices, such as the AT-JUNO-451 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.

DE-9 (male)

1 2 3 4 5

6 7 8 9

DE-9 (female)

5 4 3 2 1

9 8 7 6

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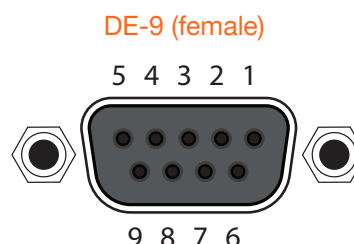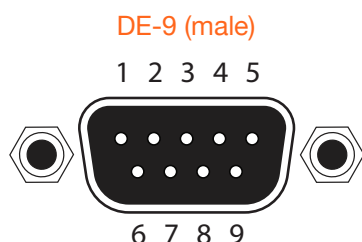
Pin	Signal	Description
1	DCD	Data Carrier Detect
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground (Signal)
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

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".

-12 V

Multimeter

+   COM

1 2 3 4 5

6 7 8 9
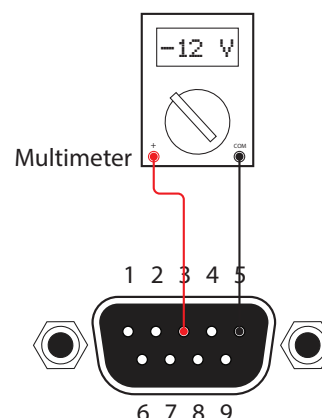
Cable Assembly

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 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.
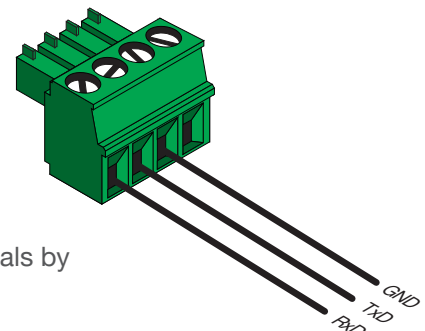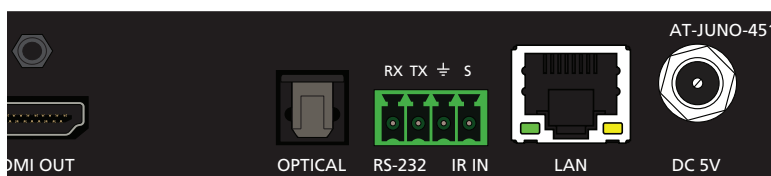
10. Locate the included 4-pin captive screw block and open each of the terminals by turning the screws counter-clockwise, using a small regular screwdriver.

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 server. Refer to Web Server (page 27) 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.
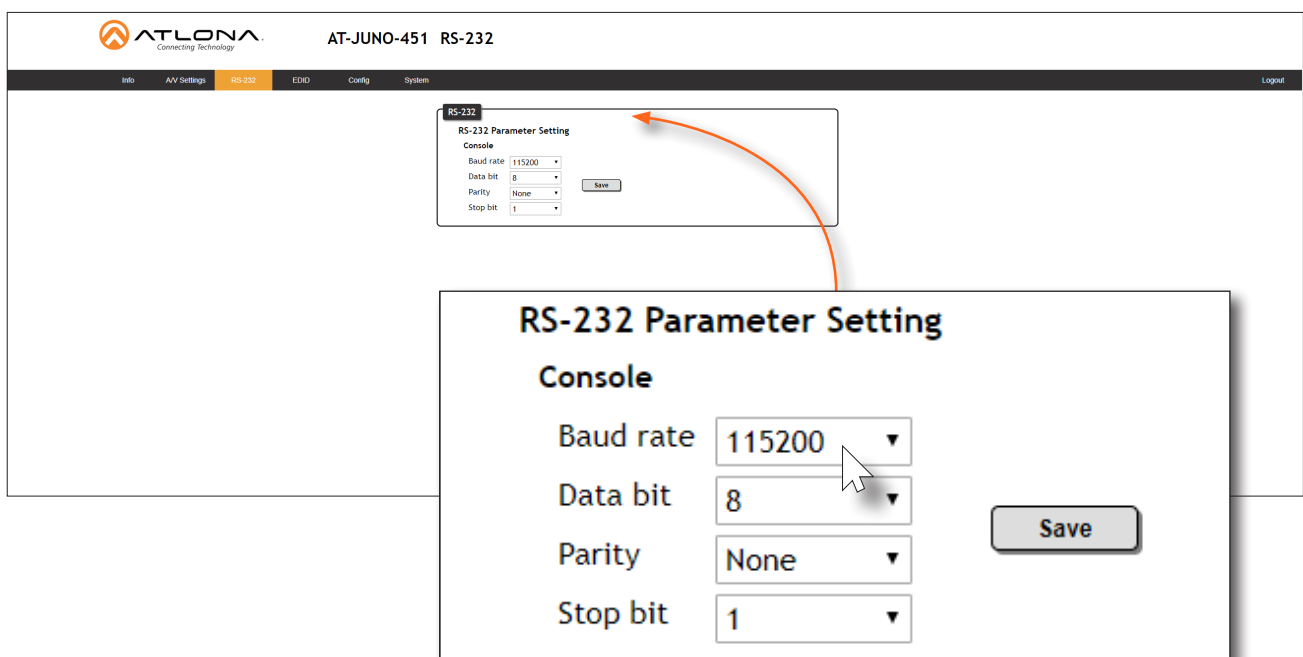
4. Click the **Save** button to commit changes.
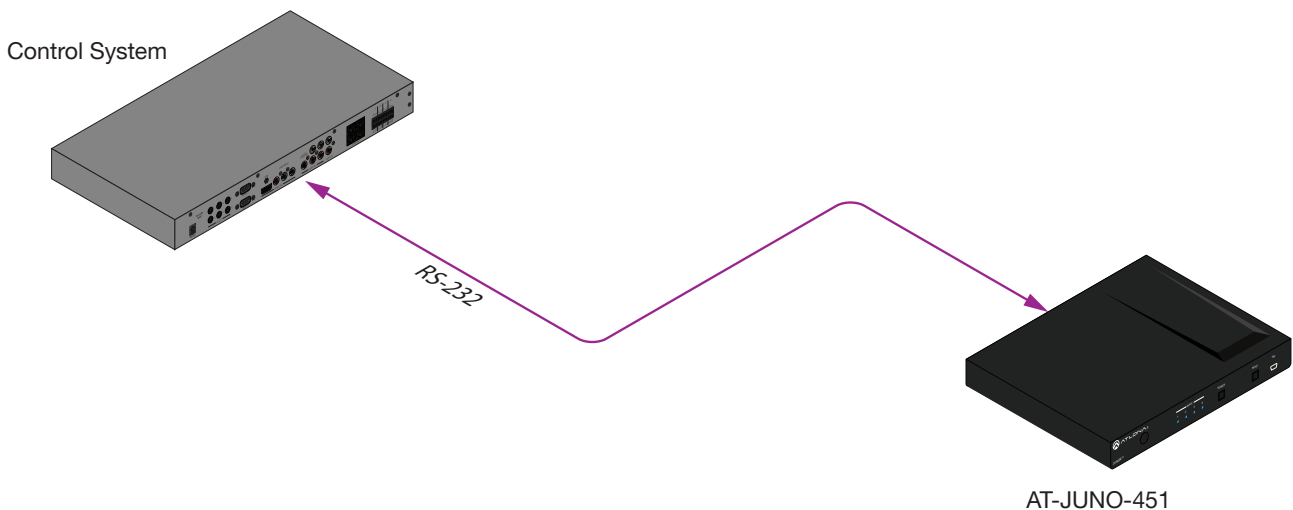
IR Control

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

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

> **i** **NOTE:** The AT-JUNO-451 no longer ships with an IR remote control. However, IR documentation remains for units currently in the field.

Control System

IR

AT-JUNO-451

SW-51 IR Remote Control
(included)
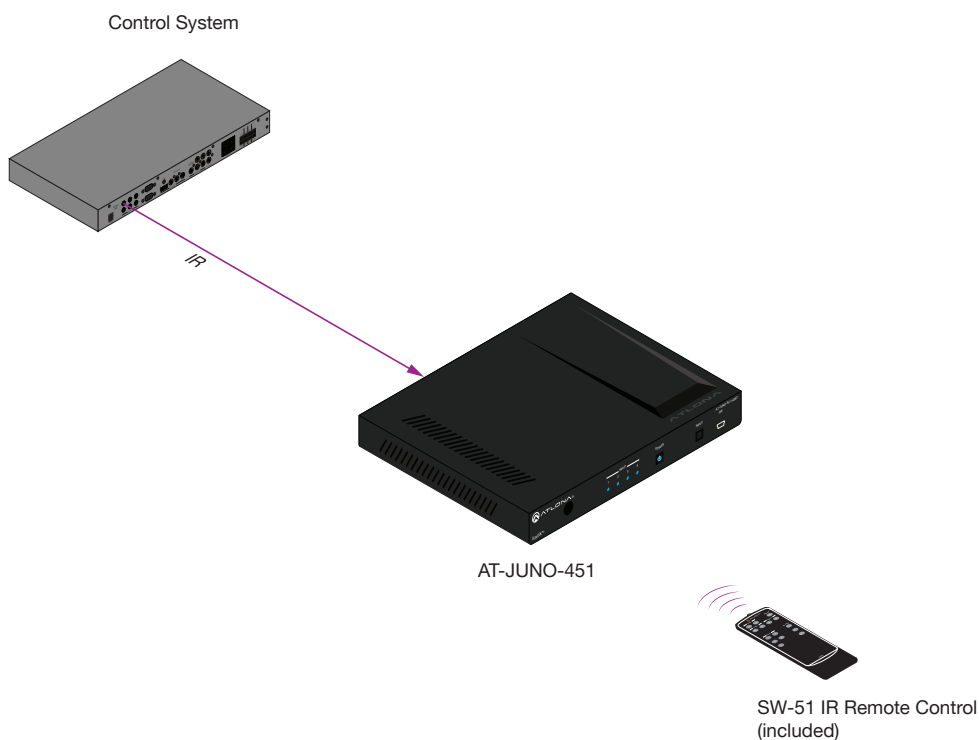
1. Remove at least 3/16" (5 mm) of insulation from the GND and S wires.

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.

5. Connect the GND and S wires to the control system or to the AT-VCC-IR-KIT.

AT-JUNO-451

RX TX ⏚ S

DMI OUT   OPTICAL   RS-232   IR IN   LAN   DC 5V

S
GND
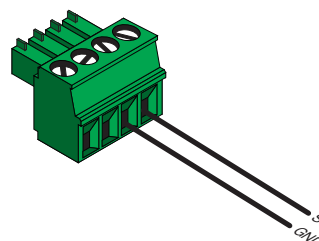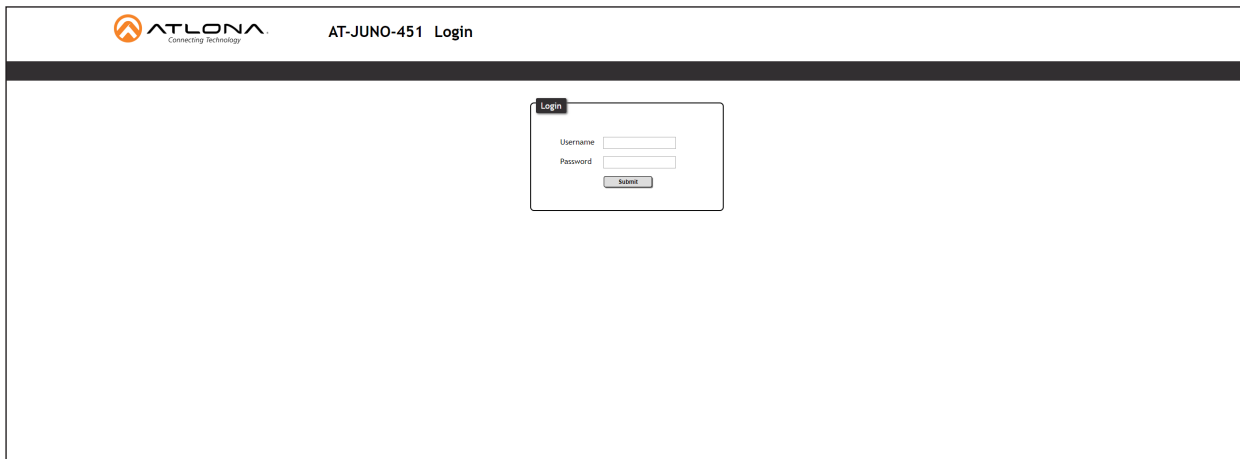
Configuration and Management Interfaces

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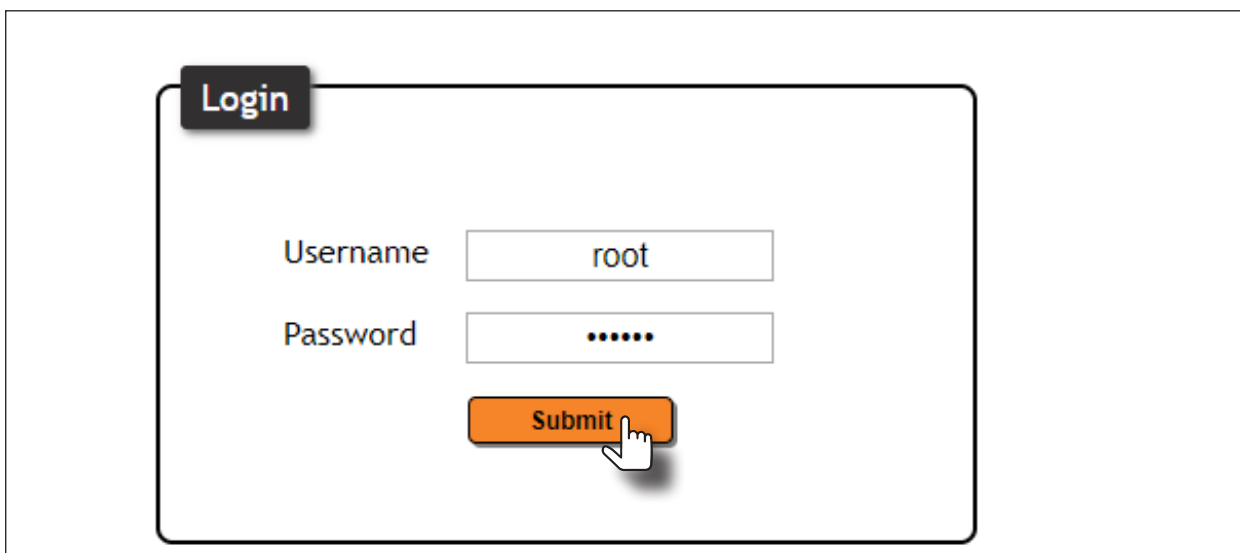
The AT-JUNO-451 includes a built-in web server. Atlona recommends that the web server be used to set up the AT-JUNO-451, as it provides intuitive management of all features.

The AT-JUNO-451 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. If a static IP address is desired, refer to IP Configuration (page 9). The default static IP address of the AT-JUNO-451 is 192.168.1.254.

1. Launch a web browser.

2. In the address bar, type the IP address of the AT-JUNO-451.

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 34) for more information.

6. Click the **Submit** button or press the ENTER key on the keyboard.

7. The **Info** page will be displayed.
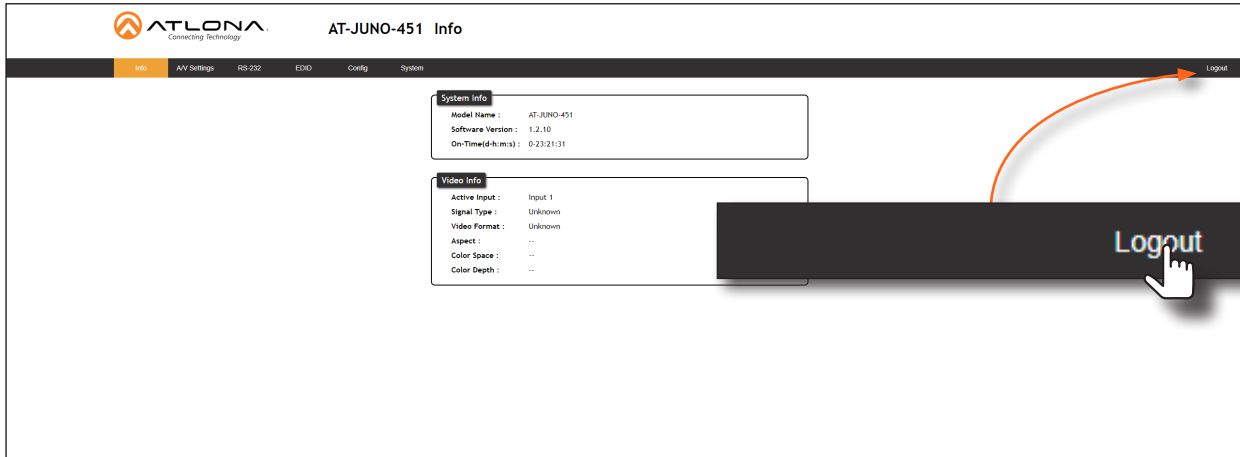
8. Click **Logout**, on the far-right side of the menu bar, to log out of the web server and return to the **Login** page.

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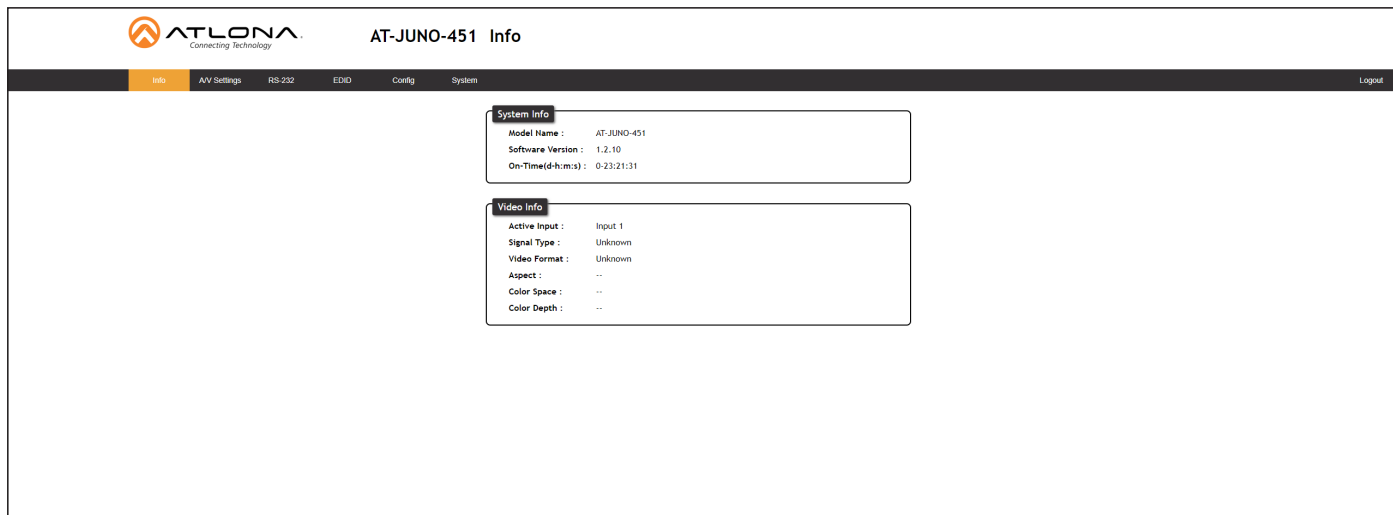
The dark-colored bar, near the top of the screen, is the menu bar. When the mouse is moved over each menu element, it will be highlighted in light orange. Once the desired menu element is highlighted, click the left mouse button to access the settings within the menu.

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 is running. Always make sure to check the AT-JUNO-451 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 30) 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.
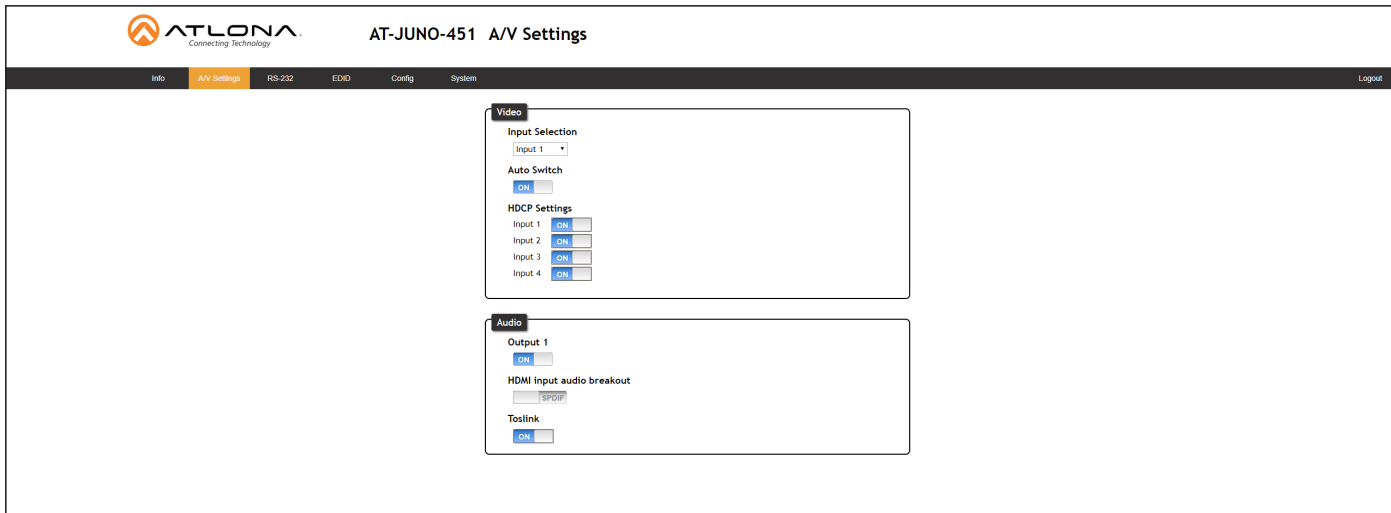
Color Space
Displays the color space of the input video source.

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 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 <u>not</u> 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
Toggles audio muting on the **HDMI OUT** port. 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.
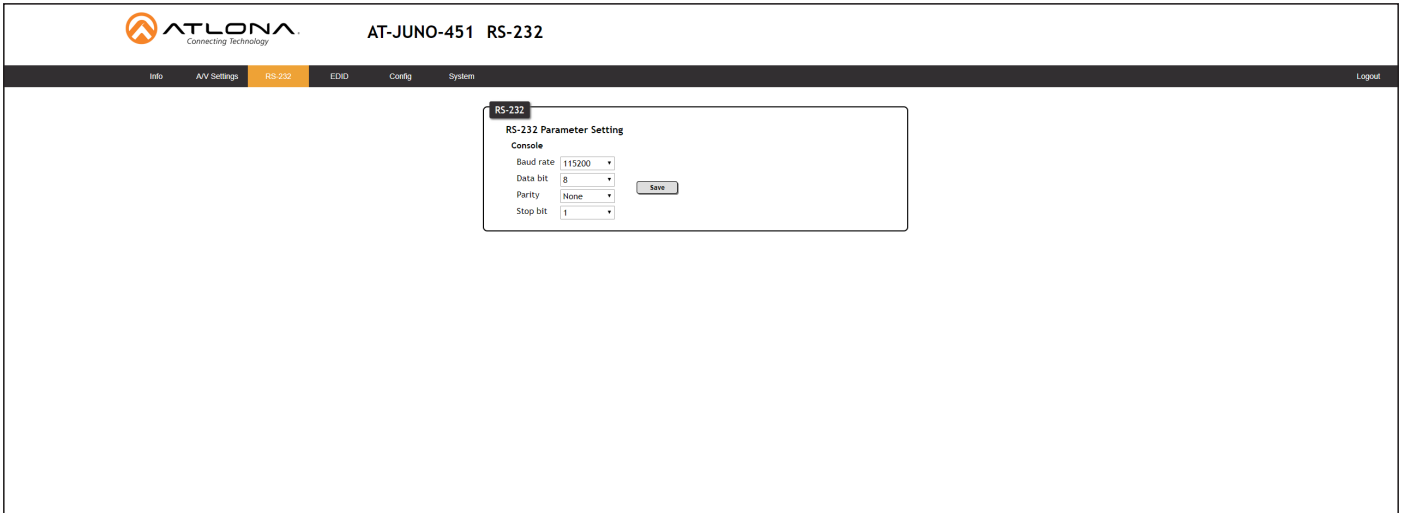
Setting	Description
SPDIF	The HDMI output audio will also be output using the **OPTICAL** port on the back of the unit.
ARC	Audio being returned from the display, over ARC, will be output on the **OPTICAL** port on the AT-JUNO-451. It should be noted that the audio is limited to formats supported by 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.
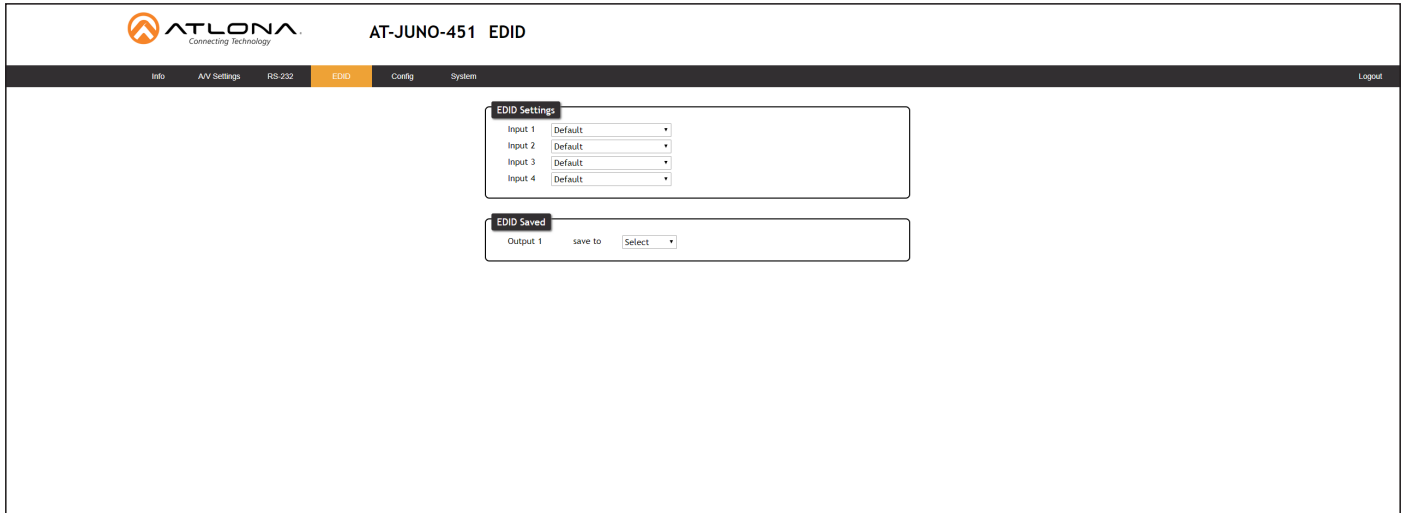
Setting	Description
Baud rate	Sets the baud rate. The following options are available: 2400, 9600, 19200, 38400, 56000, 57600, 115200.
Data bit	Sets the number of data bits used to represent each character of data. The following options are available: 7 or 8.
Parity	Sets the parity bit, which can be 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.
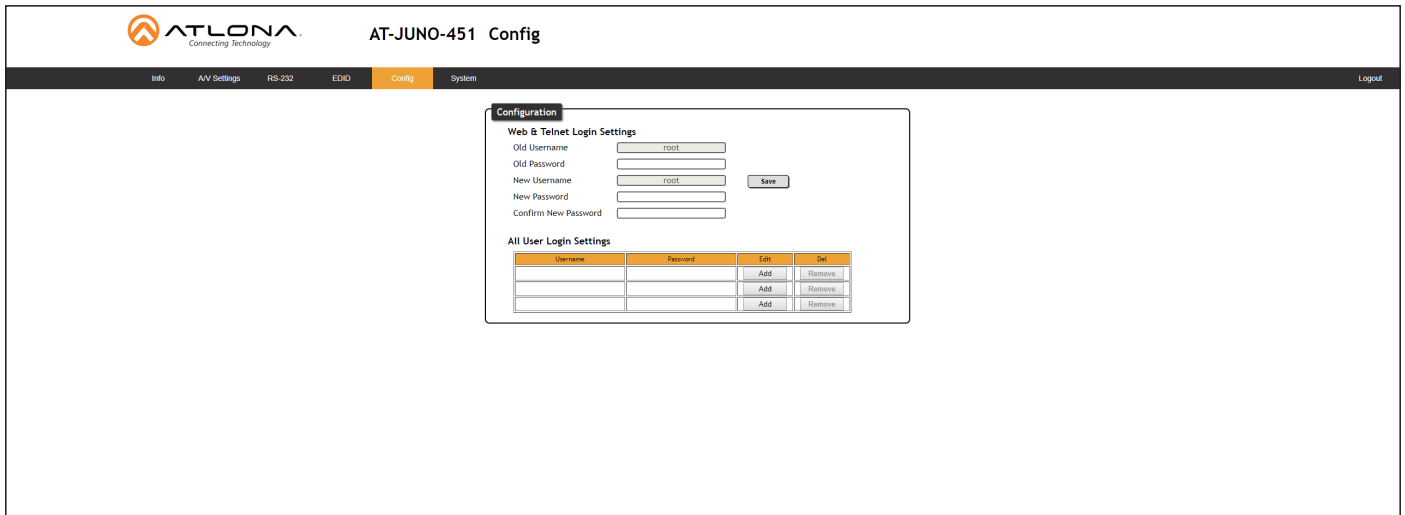
EDID listing	
Default	1280x800 DVI
1080P 2CH	1920x1200 DVI
1080P MCH	3840x2160@60 4:2:0 2CH
1080P DD	3840x2160@60 4:2:0 MCH
1080P 3D 2CH	3840x2160@30 4:4:4 2CH
1080P 3D MCH	3840x2160@30 4:4:4 MCH
1080P 3D DD	4096x2160@60 4:2:0 2CH
720P 2CH	4096x2160@60 4:2:0 MCH
720P DD	3840x2160@60 4:4:4 2CH
1280x800 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

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.
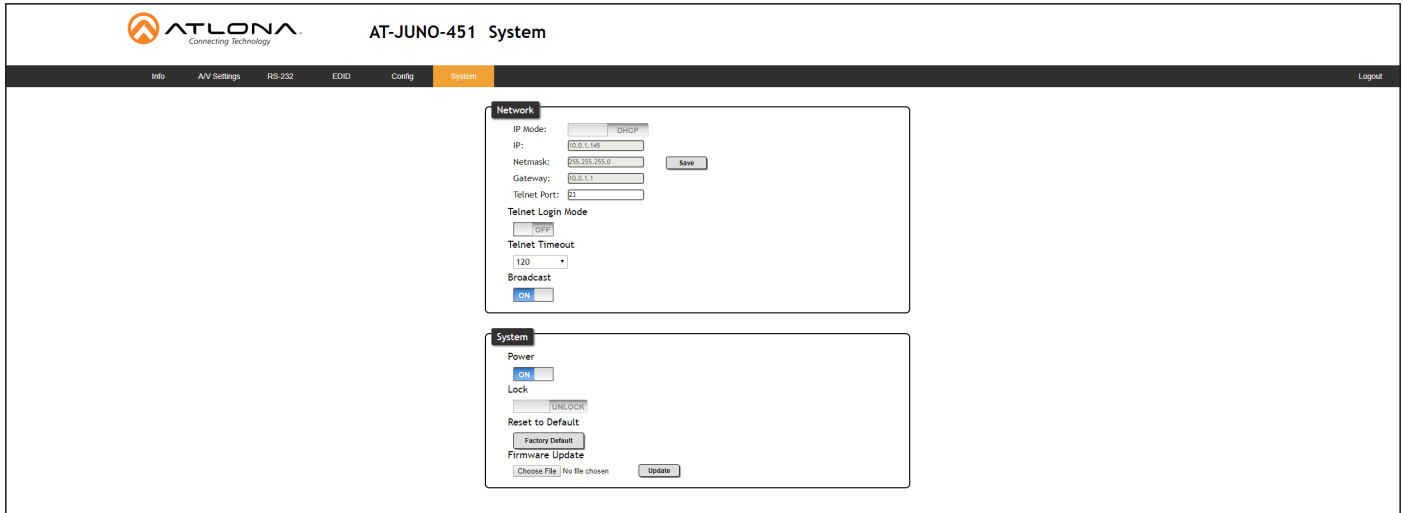
All User Login Settings

- **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

Network

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

IP
Enter the IP address of the AT-JUNO-451 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 will prompt for both the username and password at the start of a Telnet session. Use the same credentials as the web server.

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 server 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 "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 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. Once the firmware file is selected, click the **Update** button. Refer to Updating the Firmware (page 37) for more information.

Appendix

Updating the Firmware

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

Using the Web Server

Requirements:

- AT-JUNO-451
- 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 is connected.

2. Go to the System page (page 35) in the web server.
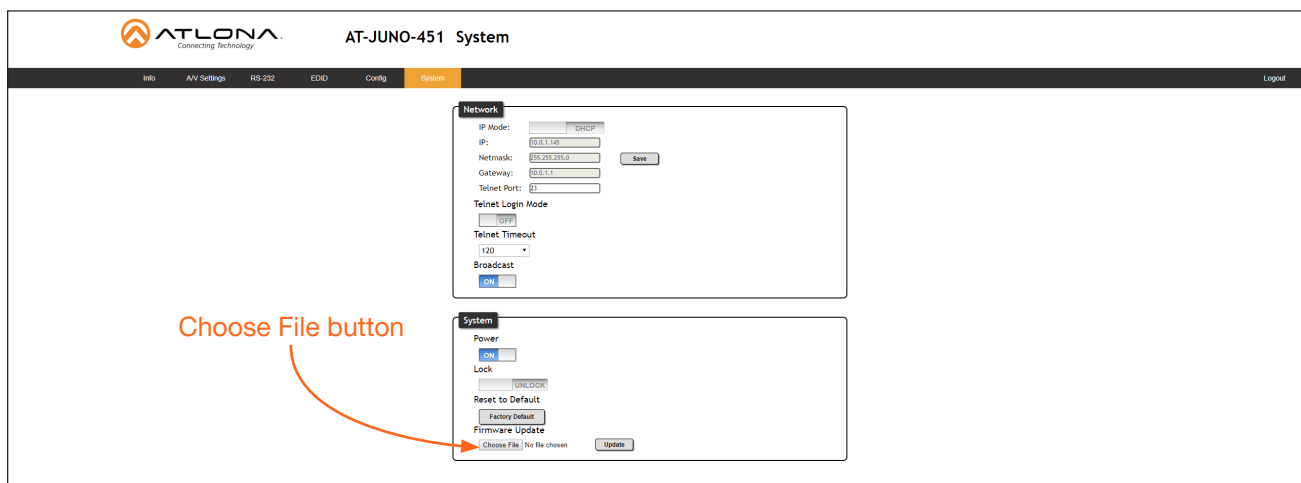
Choose File button

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.

10.0.1.107 says:

Are you Sure want to update Firmware?
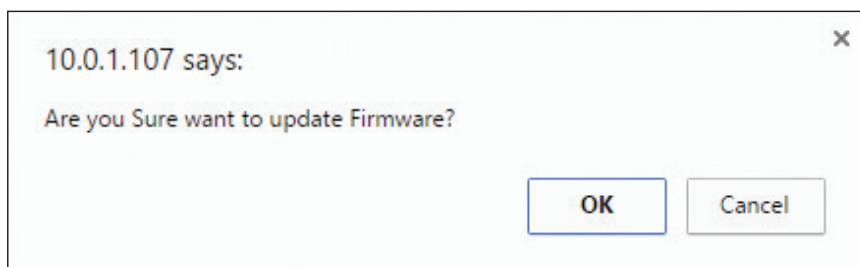
OK   Cancel

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
- Firmware file
- Computer running Microsoft Windows
- USB-A to USB mini-B cable

1. Disconnect power from the AT-JUNO-451.

2. Press and hold the **INPUT** button while connecting power to the AT-JUNO-451.

3. Release the INPUT button. The **POWER** button will glow solid red, indicating that the AT-JUNO-451 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. 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.
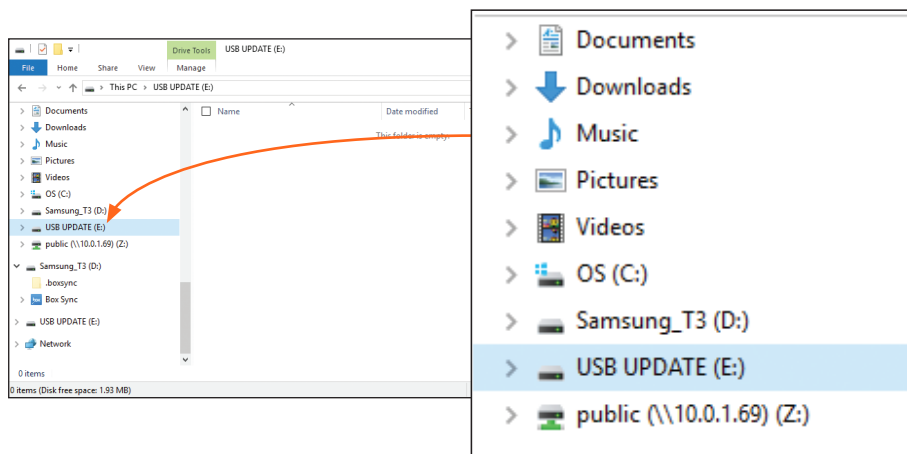
7. Delete all files from the USB UPDATE drive, if any are present.

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.

10. The firmware update process is complete.

Default Settings

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

Feature	Settings	
A/V Settings	**Video**	
	Input Selection	Input 1
	Auto Switch	ON
	HDCP Settings	
	Input 1	ON
	Input 2	ON
	Input 3	ON
	Input 4	ON
	Audio	
	Output 1	ON
	HDMI input audio breakout	SPDIF
	Toslink	ON
RS-232	Baud rate	115200
	Data bit	8
	Parity	None
	Stop bit	1
EDID	**EDID Settings**	
	Input 1	Default
	Input 2	Default
	Input 3	Default
	Input 4	Default
	EDID Saved	
	Output 1	---
Config	Username (default)	root
	Password (default)	Atlona
System	**Network**	
	IP Mode	DHCP
	Static IP Address (default)	192.168.1.254
	Netmask	255.255.0.0
	Gateway	192.168.1.1
	Telnet Port	23
	Telnet Login Mode	OFF
	Telnet Timeout	120
	Broadcast	ON
	System	
	Power	ON
	Lock	UNLOCK

IR Remote Control

> ℹ️ **NOTE:** The AT-JUNO-451 no longer ships with an IR remote control. However, IR documentation remains for units currently in the field.
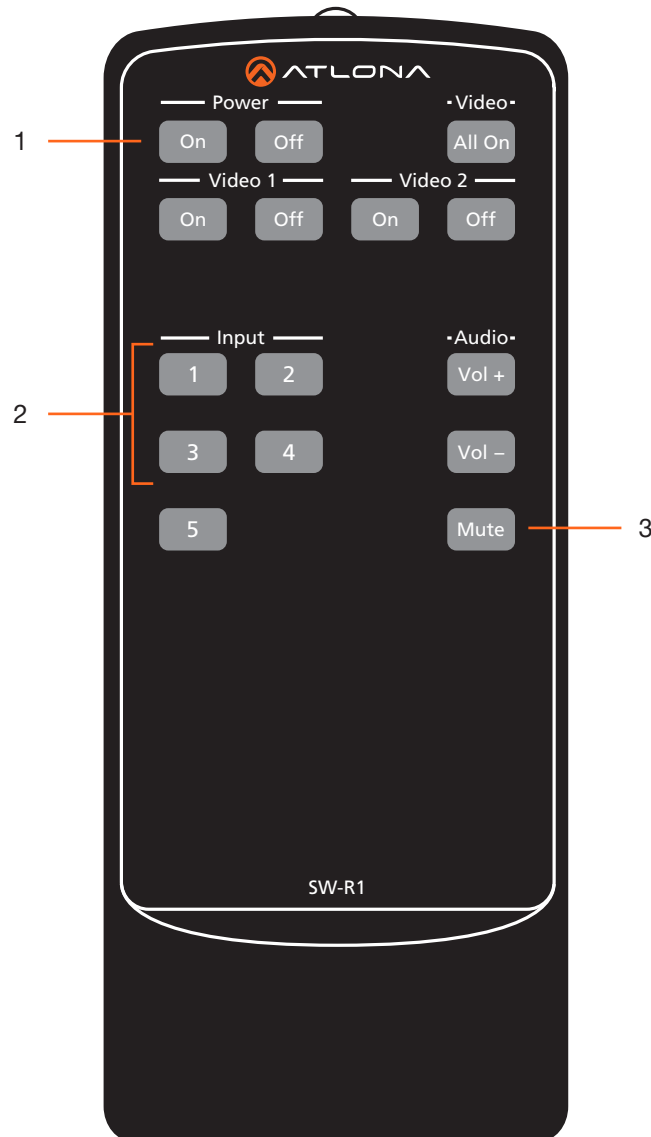
1   **On / Off buttons**
Press the **On** button to power-on the unit. Press the **Off** button to power-off the unit.

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 server, will also change to reflect the current muting state.

Specifications

Video

Video	
Signal	Input - HDMI Output - HDMI
Copy Protection	HDCP 2.2
Pixel Clock	600 MHz
UHD/HD/SD	4096×2160 @ 24/25/30/50/60 Hz, 3840×2160 @ 24/25/30/50/60 Hz, 2048x1080p, 1920x1080p @ 23.98/24/25/29.97/30/50/59.94/60 Hz, 1920x1080i @ 50/59.94/60 Hz, 1280x720p @ 50/59.94/60 Hz, 720x576p @ 50 Hz 720x576i @ 25/50 Hz 720x480p @ 60 Hz 640x480p @ 60 Hz 640x480i @ 60 Hz
VESA All resolutions are 60 Hz	2560×2048 2560×1600 2048×1536 1920×1200 1680×1050 1600×1200 1600×900 1440×900 1400×1050 1366×768 1360×768 1280×1024 1280×800 1280×768 1152×768 1024×768 800×600 640×480
Color Space	YUV, RGB
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0[1]
Color Depth	8-bit, 10-bit, 12-bit
HDR	HDR10, Hybrid-Log Gamma (HLG), and Dolby® Vision™ @ 60 Hz

Audio

Audio			
HDMI Pass-Through Formats	LPCM 2.0 LPCM 5.1 LPCM 7.1	Dolby® Digital Dolby Digital Plus™ Dolby TrueHD Dolby Atmos®	DTS® Digital Surround™ DTS-HD Master Audio™ DTS:X®
Bit Depth	Up to 24 bits		
Sample Rate	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz		

Ethernet

Ethernet	
Port	1 x RJ45
Standards and Protocols	HTTP, Telnet
Speeds	10/100 Mbps
Addressing	DHCP, Static – selectable through built-in web server and Telnet commands

RS-232

RS-232	
Port	1 x 5-pin captive screw
Use	Unit and external device control and configuration
Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Data Flow	Bidirectional

IR	
Port	1 x 5-pin captive screw
Use	Unit and external device control and configuration
Carrier Frequency Range	30 kHz - 60 kHz
Data Flow	Bidirectional

Resolution / Distance	4K/UHD - Feet / Meters		1080p - Feet / Meters	
HDMI IN/OUT	15	5	30	10

Buttons and Indicators	
Buttons: POWER, INPUT	2 x momentary, tact-type
Indicators: POWER INPUT 1 - INPUT 4,	1 x LED, blue 4 x LED, blue

Connectors	
HDMI IN	4 x Type A, 19-pin female
HDMI OUT	1 x Type A, 19-pin female
LAN	1 x RJ45
OPTICAL	1 x TOSLink™
RS-232 / IR	1 x 5-pin captive screw
FW	1 x mini-USB
DC 5V	1 x Barrel connector, 5.5 mm, locking

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

Power	
Consumption	6.6 W
Idle Consumption	5.9 W
BTU/h	22.5
External Power Supply	100 - 240 V AC, 50/60 Hz Output: 5 V / 4 A DC

Dimensions (H x W x D)	Inches	Millimeters
Unit	1.34 x 8.19 x 4.41	34 x 208 x 112
Power Supply (AT-PS-54-C)	1.22 x 1.97 x 3.17	31 x 50 x 81

Weight	Pounds	Kilograms
Device	1.82	0.82

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

Warranty		
Device	3 years	

Compliance		
NDAA-889	Yes	
TAA	Yes	

Footnotes

(1) 4096x2160@50/60Hz and 3840x2160@50/60Hz supports 8-bit 4:2:0 chroma subsampling, only.