4x1 4K HDR Switcher and Receiver
with HDMI and HDBaseT Inputs

AT-OPUS-RX41 | Atlona Manuals
Switchers

Version Information

Version	Release Date	Notes
4	Jun 2024	Updated to new color format

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Operating Notes

IMPORTANT: Visit https://atlona.com/product/at-opus-rx41/ for the latest firmware updates and User Manual.

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.

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Introduction

The Atlona **AT-OPUS-RX41** is a 4×1 switcher and receiver for 4K high dynamic range (HDR) formats. It features three HDMI inputs, plus an HDBaseT input for receiving video, embedded audio, control signals, power, and Ethernet over distances of up to 330 feet (100 meters). Supporting 4K/UHD @ 60 Hz with 4:4:4 chroma sampling, as well as HDMI data rates up to 18 Gbps, the OPUS-RX41 is the perfect complement to an Atlona Opus™ Series matrix switcher in whole-house AV applications allowing display of 4K HDR content from either the matrix or one of the connected local sources.

The OPUS-RX41 includes a number of key features to help simplify residential deployments. Extension of CEC, IR, and RS-232 signals over HDBaseT allows a control system connected to the OPUS-RX41 to select inputs on the matrix or control its sources, and allows the matrix to control the local room display. A handheld IR remote control is included for power and input selection on the OPUS-RX41. Advanced HDMI Audio Return Channel (ARC) routes audio from a smart TV to both the local TOSLINK connection as well as HDBaseT. EDID management, selectable 4K to 1080p downscaling, and HDCP 2.2 support with selectable down-conversion to HDCP 1.4 ensures compatibility with legacy displays. Remote power allows the device to be powered by an Opus matrix switcher, for installation flexibility at a display or projector.

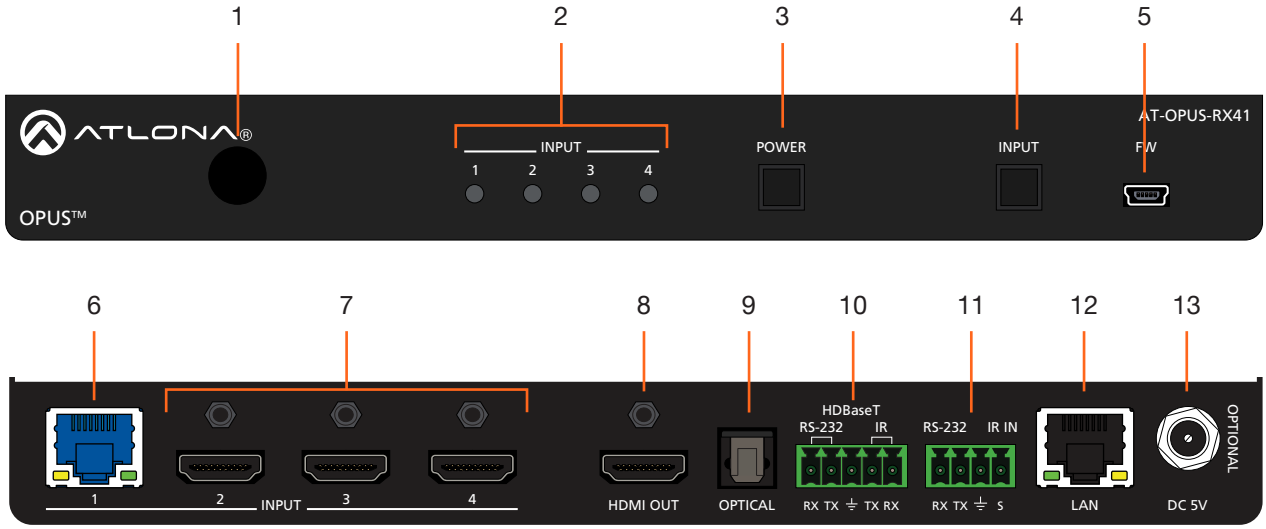
Features

- 4×1 switcher with three HDMI inputs and one HDBaseT input
- HDBaseT input receives 4K HDR, control, and Ethernet up to 330 feet (100 meters) with Category 6/6a/7 cable
- 4K/UHD capability @ 60 Hz with 4:4:4 chroma sampling
- HDMI inputs are compatible with 4K HDR10 and Dolby® Vision™ @ 60 Hz, as well as HLG (Hybrid Log-Gamma) for 60p HDR broadcast services and the HDBaseT input supports Dolby Vision @ 30 Hz
- HDCP 2.2 compliant
- Automatic input selection using hot plug detect and video detection technology
- TCP/IP, RS-232, and IR control for compatibility with Atlona Velocity™ and third-party control systems
- Advanced HDMI ARC
- HDBaseT Control Extension
- Remote power
- Downscaling

Package Contents

1 x AT-OPUS-RX41
1 x 4-pin captive screw connector
1 x 5-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
Displays the active input. The active input will be indicated with a solid blue light.

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 four inputs. Each LED indicator corresponds to each of the numbered inputs on the rear panel of the unit. The INPUT LED indicators will indicate the active input with a solid blue light.

5 FW
Connect a USB to mini-USB cable from this port to a computer to updated the firmware. USB cable not included. Refer to Updating the Firmware (page 40) for more information.

6 INPUT (HDBaseT)
Connect a category cable (CAT-5e or better) from this port to a compatible HDBaseT transmitter. This category cable provides both data transfer and can be used to power the AT-OPUS-RX41.

7 INPUT (HDMI)
Connect an HDMI cable from each of these ports to an UHD/HD source.

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 HDBaseT RS-232 / IR
Connect a controller to this port to control a headend matrix (transmitter) over HDBaseT. Refer to RS-232 Control (page 10) and IR Control (page 10) for wiring information.

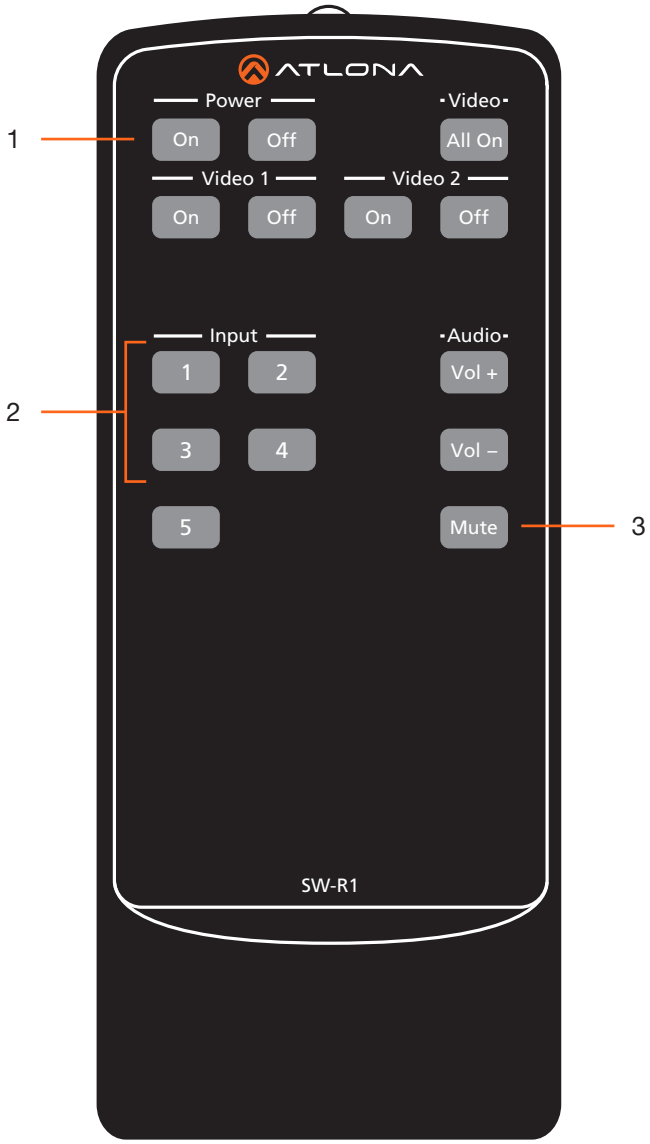
11 RS-232 / IR IN
Connect a controller or PC to control the AT-OPUS-RX41 through RS-232 or IR. Refer to RS-232 Control (page 10) and IR Control (page 10) for wiring information.

12 LAN
Connect an Ethernet cable to this port to control the AT-OPUS-RX41 using the built-in web server or to control a sink device using pass-through IP control.

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

IR Remote Control

The AT-OPUS-RX41 includes an IR remote control unit, allowing the control of the AT-OPUS-RX41 from a remote location. Always make sure that the IR remote control and the IR window on the AT-OPUS-RX41 have a clear line of sight.



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

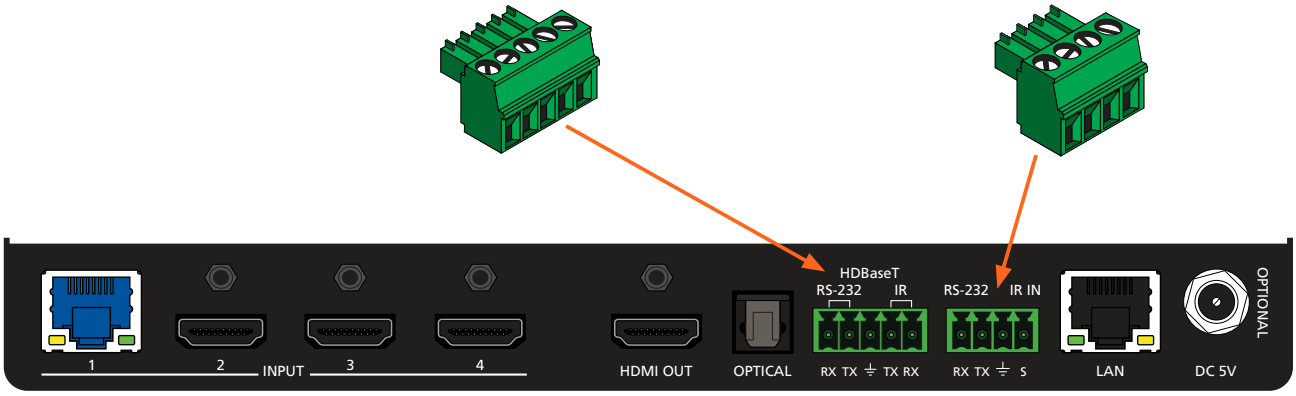
2 Input
Press these buttons (**1** - **4**) to select the desired input.

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 be updated to reflect the current muting state. Refer to A/V Settings page (page 32) for more information.

Installation

RS-232 Control

The 5-pin **HDBaseT RS-232/IR** port provides bidirectional RS-232 control of a headend matrix (transmitter) over HDBaseT. The 4-pin **RS-232/IR IN** port allows RS-232 control of the AT-OPUS-RX41.



1. Locate the required captive screw connector (included in the box).
2. Use wire strippers to remove a portion of the cable jacket.
3. Remove at least 3/16" (5 mm) of insulation from each of the wires.
4. Insert the wires into correct terminal. Refer to *Figure 1.1* or *Figure 1.2*, below.
5. Connect the captive screw block to the proper port.

NOTE: Typical DB9 connectors use pin 2 for TX, pin 3 for RX, and pin 5 for ground. On some devices functions of pins 2 and 3 are reversed. Note that the signal (S) pin for the IR is labeled as "TX" on the port.

Figure 1.1 - Wiring the 5-pin HDBaseT RS-232/IR captive screw block for RS-232 control of a source device connected to headend matrix.

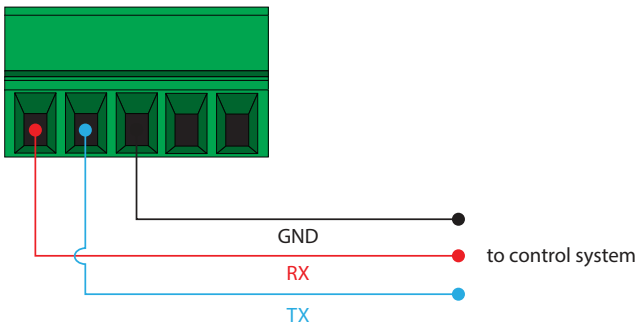
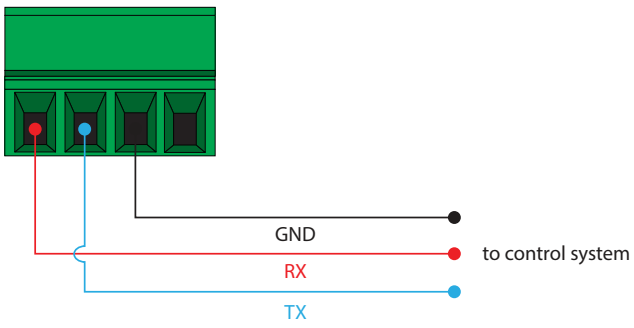
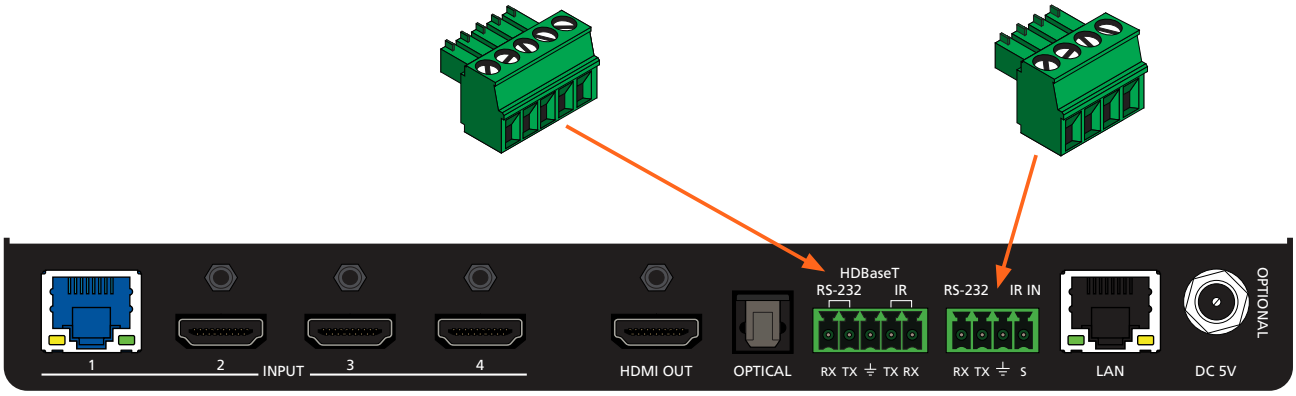


Figure 1.2 - Wiring the 4-pin RS-232/IR IN captive screw block for RS-232 control of the AT-OPUS-RX41.



IR Control

The 5-pin **HDBaseT RS-232/IR** port provides bidirectional RS-232 control of a headend matrix (transmitter) over HDBaseT. The 4-pin **RS-232/IR IN** port allows RS-232 control of the AT-OPUS-RX41.



1. Locate the required captive screw connector (included in the box).
2. Use wire strippers to remove a portion of the cable jacket.
3. Remove at least 3/16" (5 mm) of insulation from each of the wires.
4. Insert the wires into correct terminal. Refer to *Figure 1.1*, *Figure 2.2*, or *Figure 1.2*, below.
5. Connect the captive screw block to the proper port.

Figure 2.1 - Wiring the 5-pin HDBaseT RS-232/IR captive screw block to have a controller at the viewing location send IR commands over HDBaseT to an IR emitter

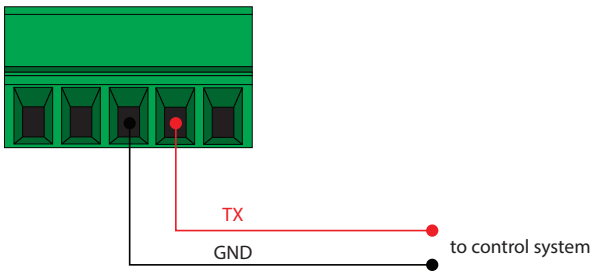


Figure 2.2 - Wiring the 5-pin HDBaseT RS-232/IR captive screw block to send IR commands over an IR emitter, from a control system, placed remotely at the transmitter side.

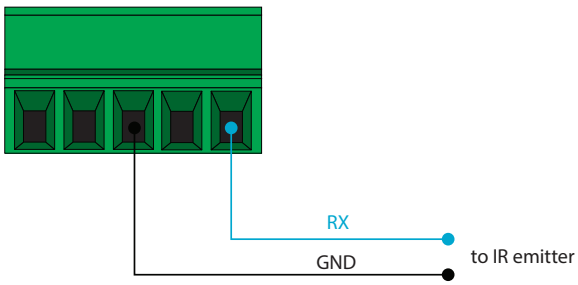
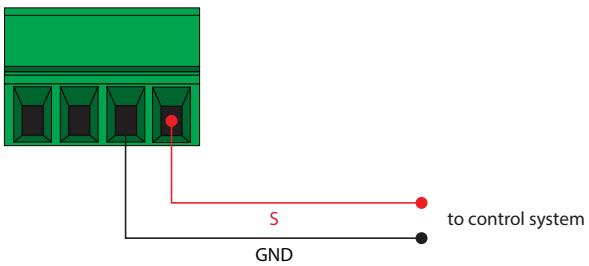


Figure 2.3 - Wiring the 4-pin HDBaseT RS-232/IR IN captive screw block to control the AT-OPUS-RX41 over IR.



Connection Instructions

1. Connect an HD/UHD source to each of the three HDMI inputs (**INPUT 2** - **INPUT 4**).
2. Connect a compatible transmitter to the HDBaseT (**INPUT 1**) port on the AT-OPUS-RX41.

   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.*

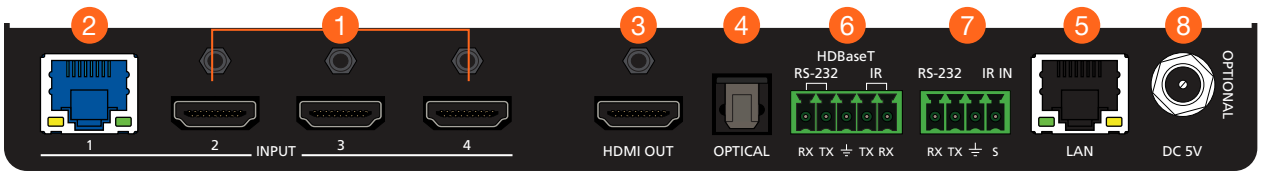
IMPORTANT: For HDR and 4K/60 4:4:4 content (HDMI data rates exceeding 10 Gbps), the AT-OPUS-RX41 is not compatible with transmitters for the AT-HDR-EX-70-2PS, AT-HDR-EX-70C-KIT, or AT-HDR-EX-100CEA-KIT.

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

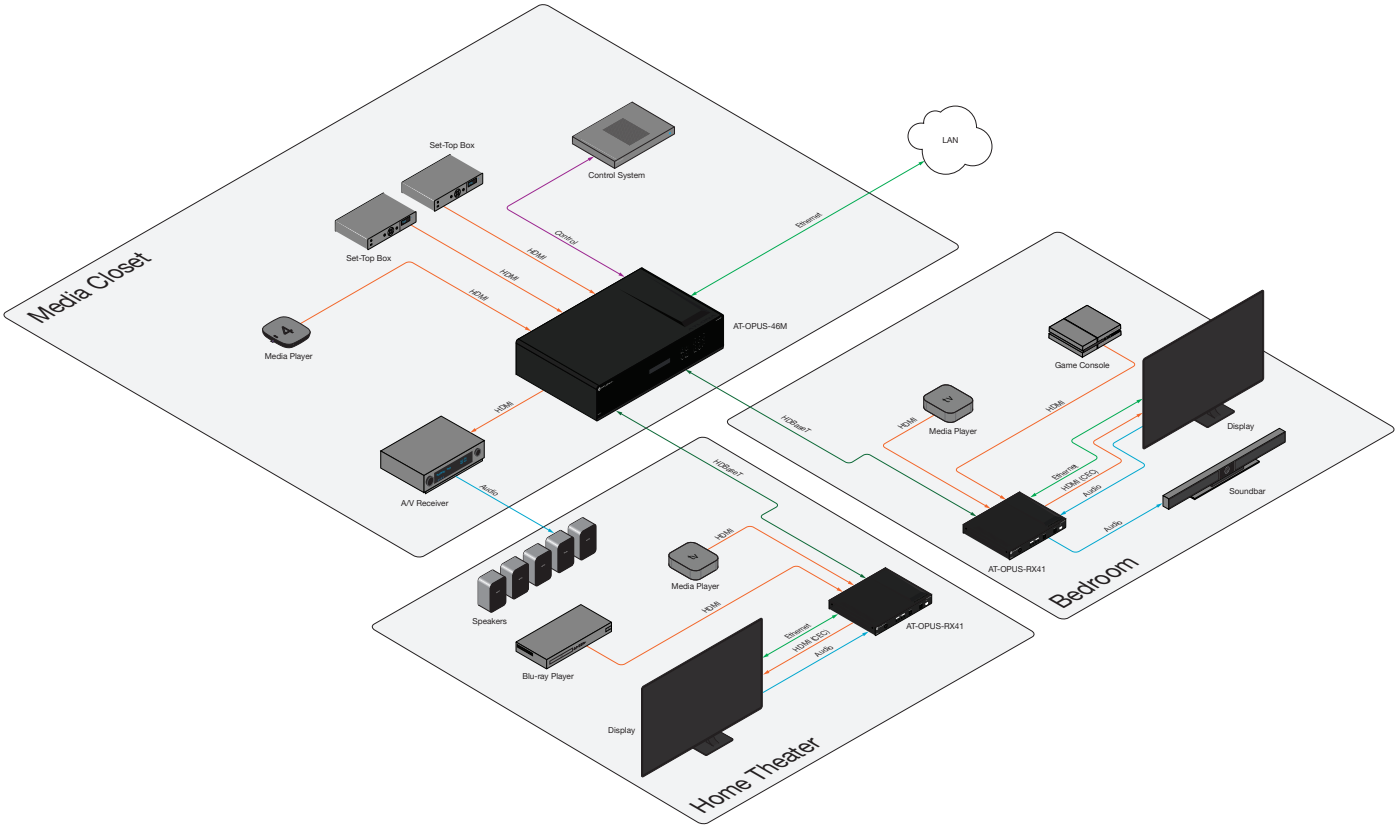
Cable	Max. Distance @ 4K	Max. Distance @ 1080p
CAT5e / CAT6	295 feet (90 meters)	330 feet (100 meters)
CAT6a / CAT7	330 feet (100 meters)	330 feet (100 meters)

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

3. Connect an HDMI cable from the **HDMI OUT** port to a UHD/HD display.
4. Connect an optical audio cable from the **OPTICAL** port to a sound bar or other audio output device.
5. Connect an Ethernet cable from the **LAN** port to the Local Area Network (LAN). Ethernet cables should use EIA/TIA-568B termination.
6. OPTIONAL: Connect the included four-pin captive screw block to the **RS-232 / IR IN** port. Refer to RS-232 Control (page 9) and IR Control (page 10) for wiring information, if necessary.
7. OPTIONAL: Connect the included five-pin captive screw block to the **HDBaseT RS-232 / IR IN** port. Refer to RS-232 Control (page 9) and IR Control (page 10) for wiring information, if necessary.
8. Connect the included 5 V DC power supply to the **DC 5V** power receptacle.
9. Connect the power supply to an available electrical outlet.



Connection Diagram



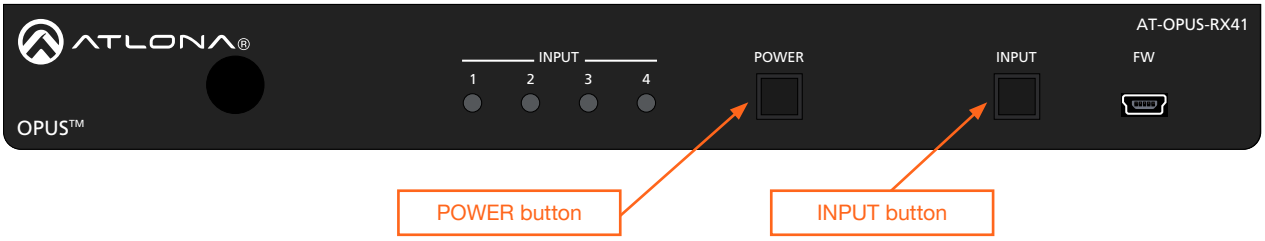
IP Configuration

The AT-OPUS-RX41 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-OPUS-RX41 is 192.168.1.254.

If the AT-OPUS-RX41 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-OPUS-RX41 is powered.
2. Connect an Ethernet cable between the LAN port of the AT-OPUS-RX41 and the Local Area Network (LAN).



3. Press and hold the **INPUT** button on the front panel for approximately 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-OPUS-RX41 using RS-232 or Telnet.
  2. At the command line, execute the IPDHCP command using the off argument, as shown.

     IPDHCP off

3. Execute the IPStatic command. This command requires three arguments: the desired IP address of the AT-OPUS-RX41, 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-OPUS-RX41 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).

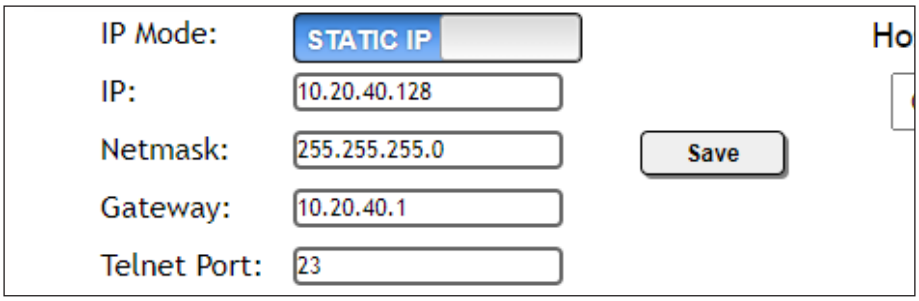
Setting the IP Address using The Web Server

The System page (page 37), in the Web Server, allows the AT-OPUS-RX41 to use either DHCP or static IP mode. In order to access the Web Server, the IP address of the AT-OPUS-RX41 must be known. Refer to Web Server Login (page 17) for more information.

1. Open the desired web browser and enter the IP address of the AT-OPUS-RX41.
2. Log in, using the required credentials. The factory-default username and password are listed below:

   Username: admin
   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.

Device Operation

LED Indicators

The LED indicators on both the front of the unit provide basic information on the current status of the AT-OPUS-RX41.

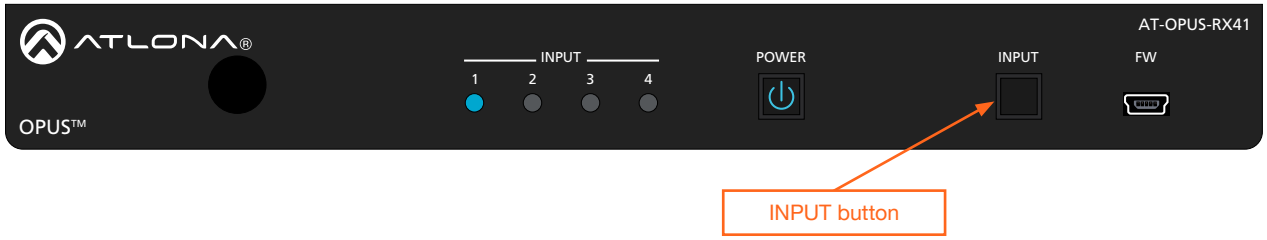
LED		Description
POWER	Blue	• Unit is receiving power.
	Off	• Unit is not powered. • Press the POWER button to power the unit. • Check the power supply and make sure it is securely fastened to the locking connector on the rear of the unit. • Make sure that the power supply is connected to an available electrical outlet and that the outlet is “live” (some outlets are controlled by a wall switch).
	Blue flashing backlight (4x)	Flashes four times to indicate that the unit is set to DHCP mode. Refer to IP Configuration (page 13) for more information.
	Blue flashing backlight (2x)	Flashes two times to indicate that the unit is set to static IP mode. Refer to IP Configuration (page 13) for more information.
INPUT	Blue	• The input is the currently selected (active) input.
	Off	• The input is not active.

Input Switching

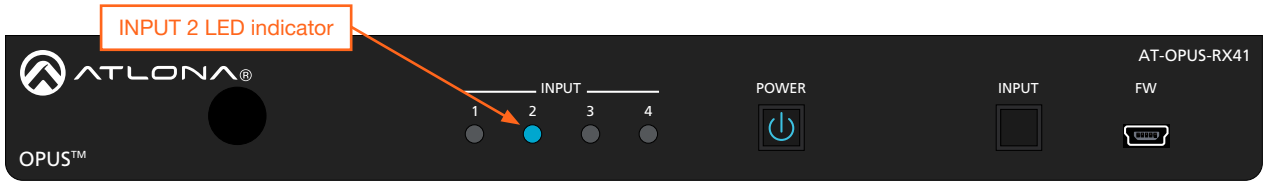
Switching between any of the four input ports can be performed either manually or automatically. The following section covers both methods.

Manual Switching

1. Press and release the **INPUT** button on the front panel to cycle between **INPUT 1 (HDBaseT)**, **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 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 AT-OPUS-RX41 Application Programming Interface document for more information.

NOTE: The AT-OPUS-RX41 retains the currently selected input, even after the unit is powered-off then powered-on.

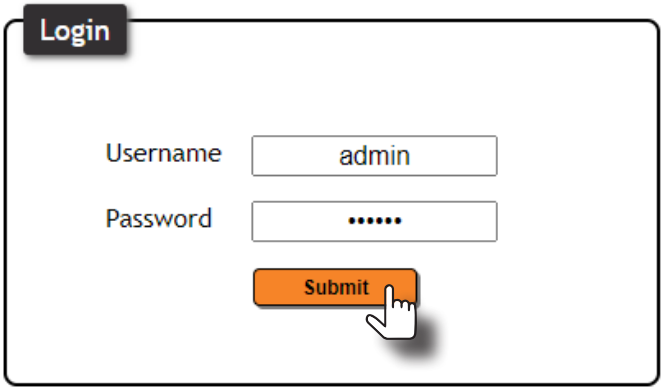
Web Server Login

The AT-OPUS-RX41 includes a built-in web GUI. Atlona recommends that the Web Server be used to set up the AT-OPUS-RX41, as it provides intuitive management of all features.

The AT-OPUS-RX41 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-OPUS-RX41. If a static IP address is desired, refer to IP Configuration (page 13). The default static IP address of the AT-OPUS-RX41 is 192.168.1.254.

1. Launch a web browser.
2. In the address bar, type the IP address of the AT-OPUS-RX41.
3. The **Login** page will be displayed.

4. Type `admin`, 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.



Auto Switching

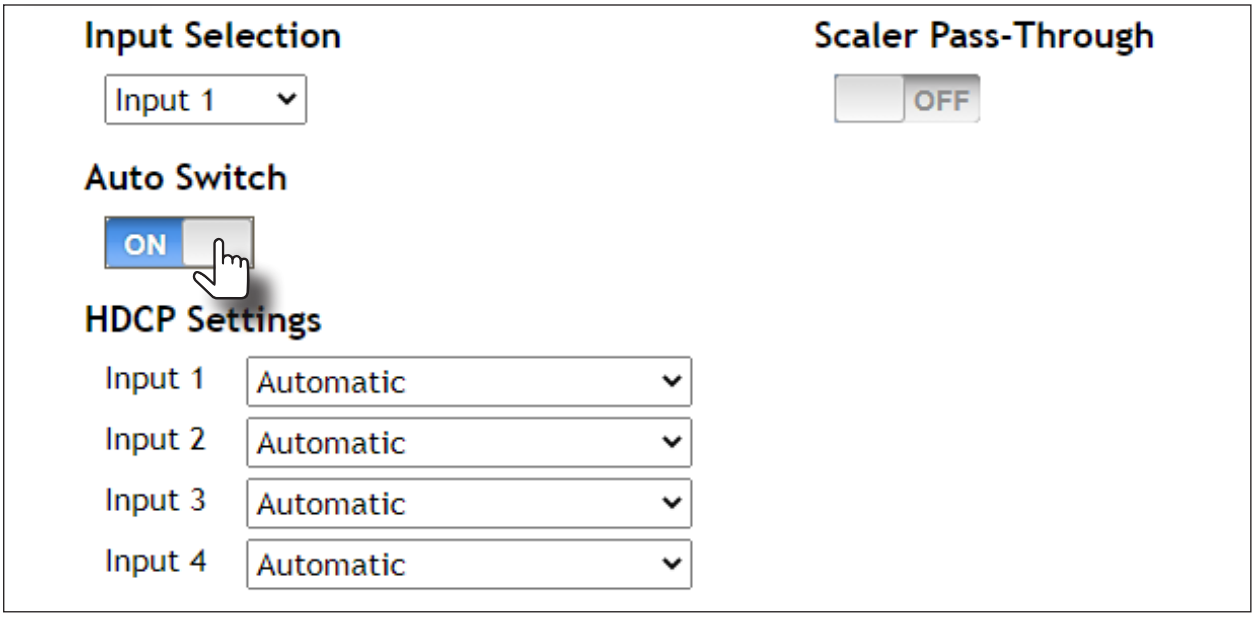
Auto-switching can also be used to automatically select an input. Auto-switch is enabled by default and must be enabled for this feature to work. When auto-switching is enabled, the AT-OPUS-RX41 will automatically switch inputs, based on the presence of an input signal. Enable auto-switching by using one of the following methods.

Using the Web Server

1. Login to the Web Server and access the A/V Settings page (page 32).
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: `admin`
   Password: `Atlona`

3. Click the **Auto Switch** toggle switch to the **ON** position (if not already in the ON position). This is the default setting.



Physical Input Switching

1. Connect a source to any of the four input ports on the rear panel. The AT-OPUS-RX41 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-OPUS-RX41 will fallback to a port with an active source.
   - If all sources are disconnected, then the AT-OPUS-RX41 will retain the port of the last-connected source.

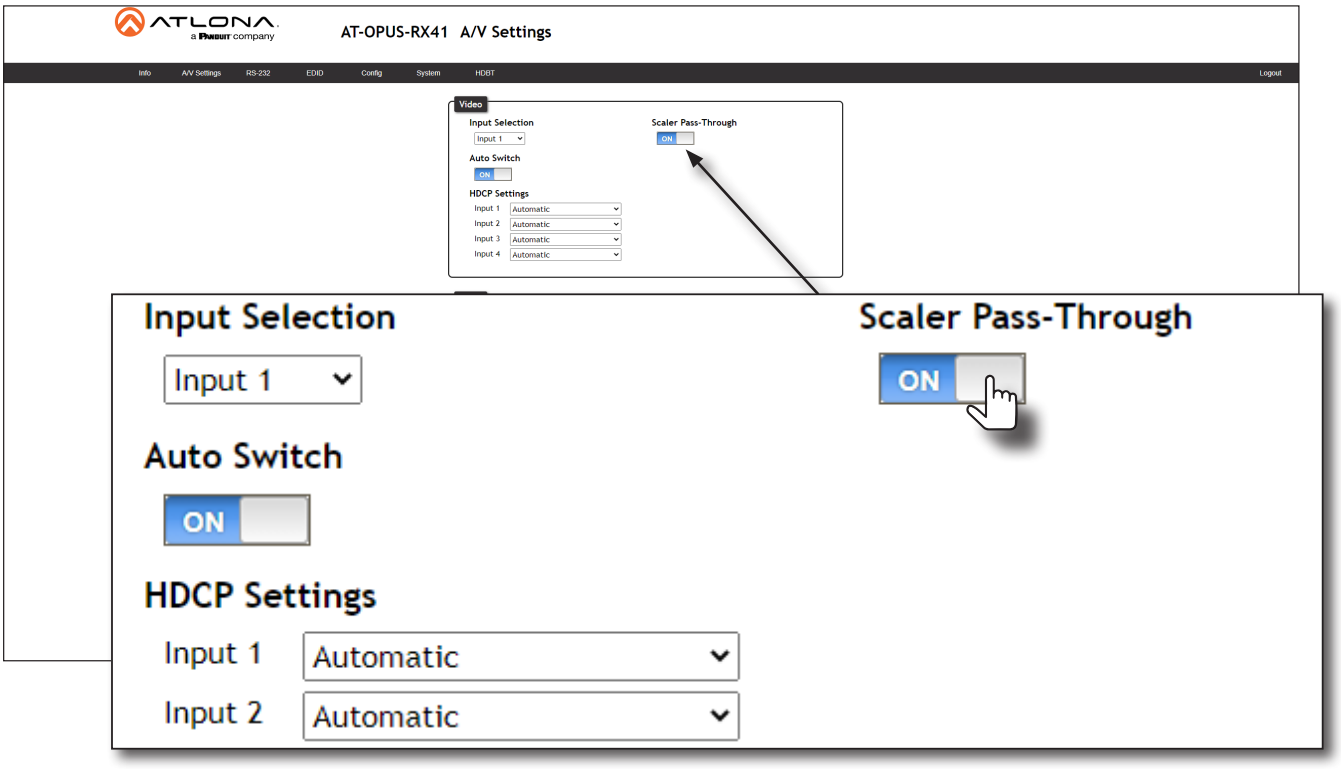
NOTE: The AT-OPUS-RX41 retains the currently selected input, even after the unit is powered-off then powered-on.

Scaler Pass-Through

Click this toggle switch to enable or disable the scaler pass-through feature. When set to the **OFF** position, 4K content will be down-scaled to 1080p. When set to the **ON** position, the output resolution / timing will be the same as the input source. The default setting is **OFF**.

IMPORTANT: The scaler will only downscale the image resolution and does not support frame rate scaling/conversion such as 60 Hz to 30 Hz. The frame rate of the source must be supported by the display device.

1. Login to the web server. Refer to Web Server Login (page 17) for more information.
2. Click **A/V Settings** in the menu bar.
3. Click the **Scaler Pass-Through** toggle switch to the **ON** position to maintain the same resolution on the output, as the source.



4. Click the toggle switch again, to return the **Scaler** toggle to the **OFF** (default) position, and allow downscaling of 4K content.

   Refer to the next page for more information on scaling.

Notes on Scaling

The following section provides important information about how the AT-OPUS-RX41 processes 4K (UHD) video signals.

- The HDMI **OUTPUT** port supports up to 4K @ 60 Hz, 12-bit, with HDR.
- If the source is 4K, and the HDMI **OUTPUT** port is connected to a 1080p (not 4K-capable) display, then the output will be down-scaled as follows:

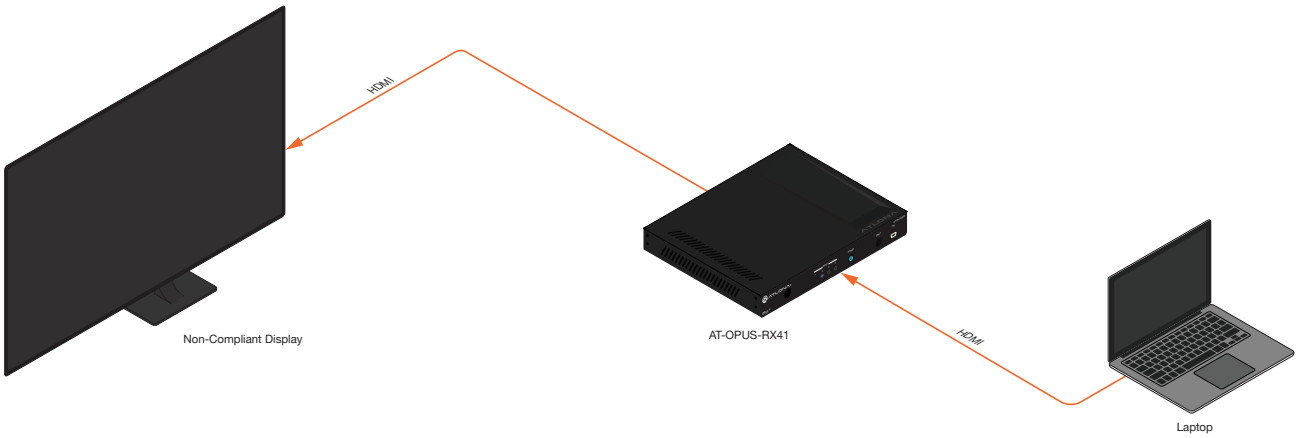
Input	Output
4K @ 24 Hz	1080p @ 24 Hz
4K @ 30 Hz	1080p @ 30 Hz
4K @ 60 Hz, 4:2:0	1080p @ 60 Hz, YUV/RGB 4:4:4

- HDR / Dolby Vision / HLG formats cannot be down-scaled to 1080p. If the source content has HDR, then the color saturation on the video output my appear “washed out”.
- The internal scaler will be bypassed if the connected display supports the resolution and timing information from the source device.

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-OPUS-RX41. A non-compliant display is connected to the AT-OPUS-RX41 using an HDMI cable.

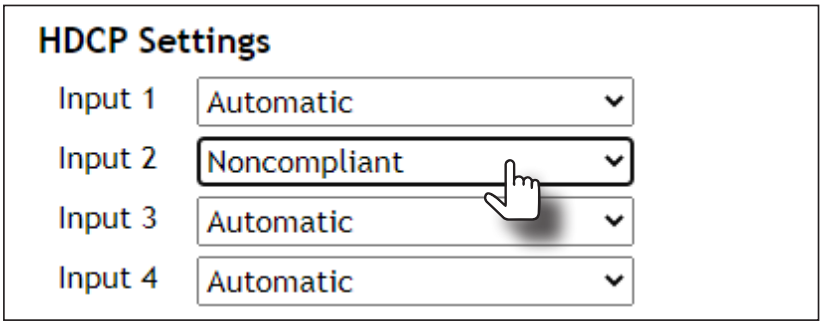


By default, the laptop may transmit HDCP content. However, when connected to a display that does not support HDCP, the laptop must be instructed to send non-HDCP content, in order for the content to be displayed.

1. Open the desired web browser and enter the IP address of the AT-OPUS-RX41.
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: `admin`
   Password: `Atlona`

3. Click **A/V Settings** in the menu bar.
4. Click the drop-down list, next to the HDMI input that is connected to the source, and set it to the **Noncompliant**. This will instruct the source device to send non-HDCP content, if possible. In the example below, the source is connected to **Input 2** and the connected display does not support HDCP content.



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

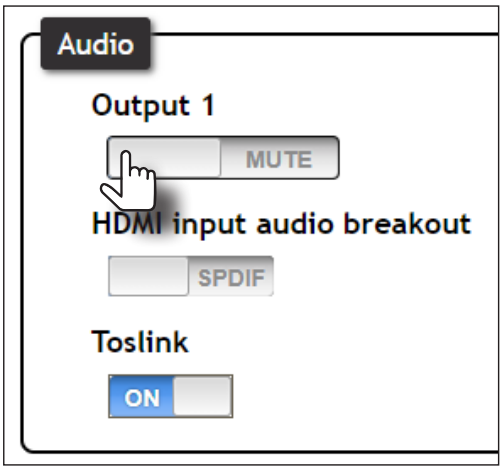
The AT-OPUS-RX41 provides complete control over audio muting for both the **HDMI OUT** and **OPTICAL** outputs.

HDMI Output Muting

1. Open the desired web browser and enter the IP address of the AT-OPUS-RX41.
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: `admin`
   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 **MUTE** position. When set to the **MUTE** 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 **UNMUTE** position.



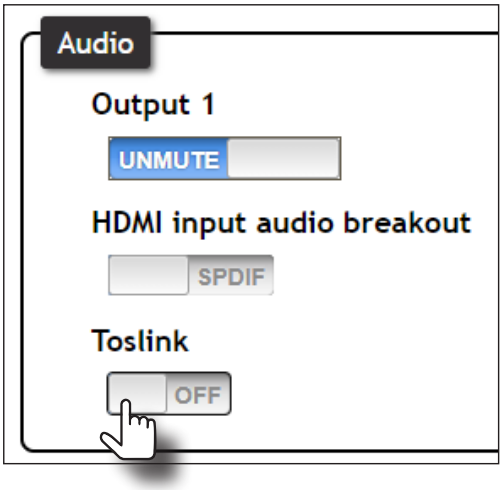
Optical Output Muting

1. Open the desired web browser and enter the IP address of the AT-OPUS-RX41.
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: `admin`
   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.

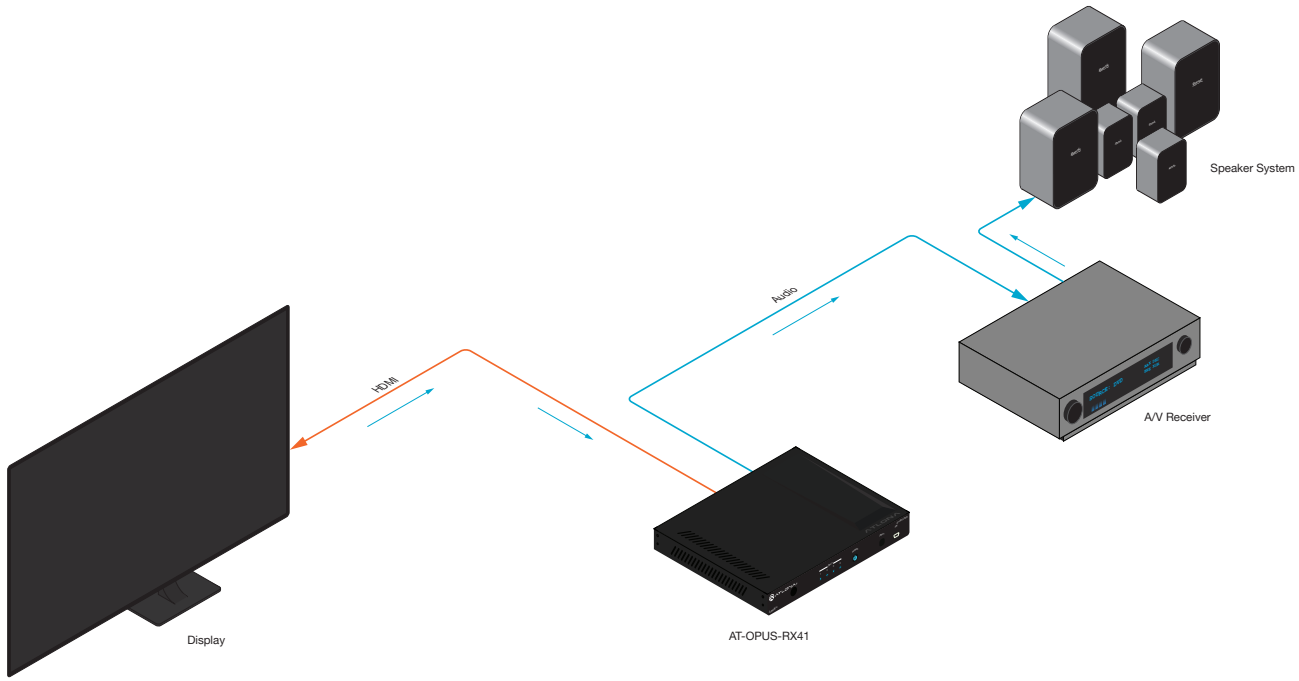


Using the Audio Return Channel (ARC)

The Audio Return Channel (ARC) allows audio to be sent upstream, from the display device, to the AT-OPUS-RX41 over an HDMI cable. The audio can then be output over the OPTICAL port or sent over HDBaseT, back to the matrix. This technique can be used to send audio from a Smart TV, in case the content originator is the TV, 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.

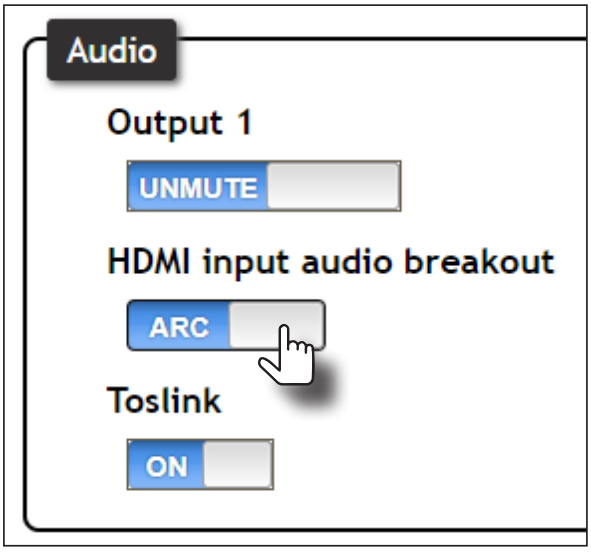
NOTE: Some displays limit ARC to 2-channel audio. Refer to the documentation that came with your display for more information. When ARC is enabled, the HDMI inputs will be disabled. To re-activate the HDMI inputs, ARC must be disabled. Refer to Switching between ARC and HDMI inputs (page 25) for more information.



1. Connect an HDMI cable from the **HDMI OUT** port on the AT-OPUS-RX41 to the HDMI input port on the display. This cable is used to carry the audio from the display to the AT-OPUS-RX41.
2. Connect an optical cable from the **OPTICAL OUT** port on the AT-OPUS-RX41 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-OPUS-RX41.
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: `admin`
   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 the **Toslink** toggle switch to the ON position and the **Output 1** toggle switch to the **UNMUTE** 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-OPUS-RX41. 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-OPUS-RX41 can be accomplished through either IP or RS-232.
   - If using RS-232, refer to RS-232 / IR Control (page 24) for more information.
   - If controlling over IP, connect an Ethernet cable from the control system to the LAN port on the AT-OPUS-RX41. Refer to the control system user manual for any necessary configuration details.

2. Send the AudioSRC command to set the desired operation:

   `AudioSRC ARC` // enables ARC; only audio from the downstream display is output to the **OPTICAL OUT** port.

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

   Refer to the AT-OPUS-RX41 API manual for a complete listing of commands.

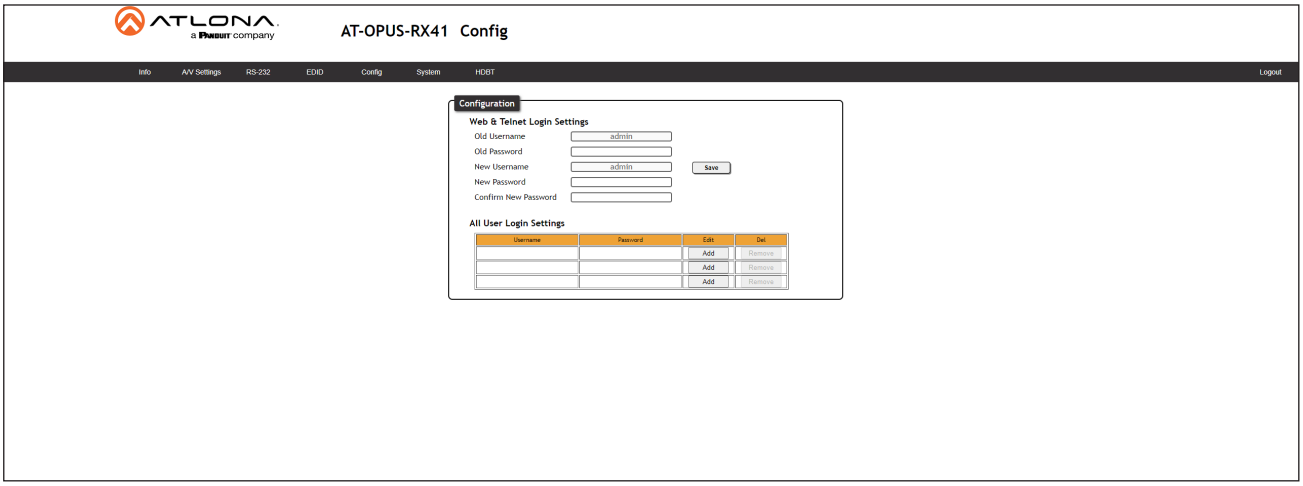
Managing Users

The AT-OPUS-RX41 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-OPUS-RX41. However, only the admin user is allowed to manage other users. Up to three additional users can be created.

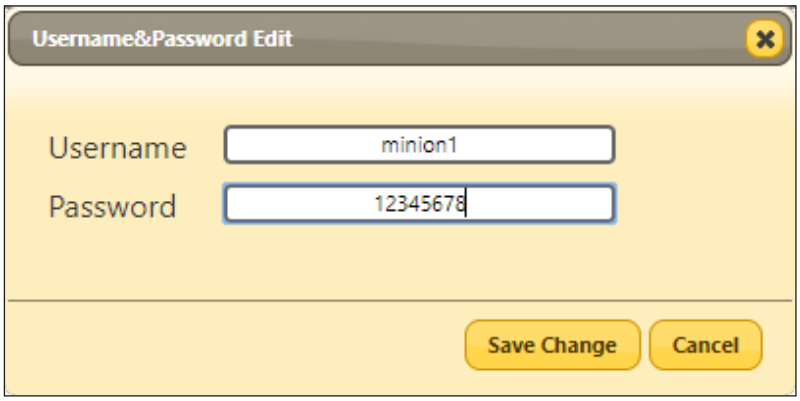
Adding Users

1. Open the desired web browser and enter the IP address of the AT-OPUS-RX41.
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: `admin`
   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.

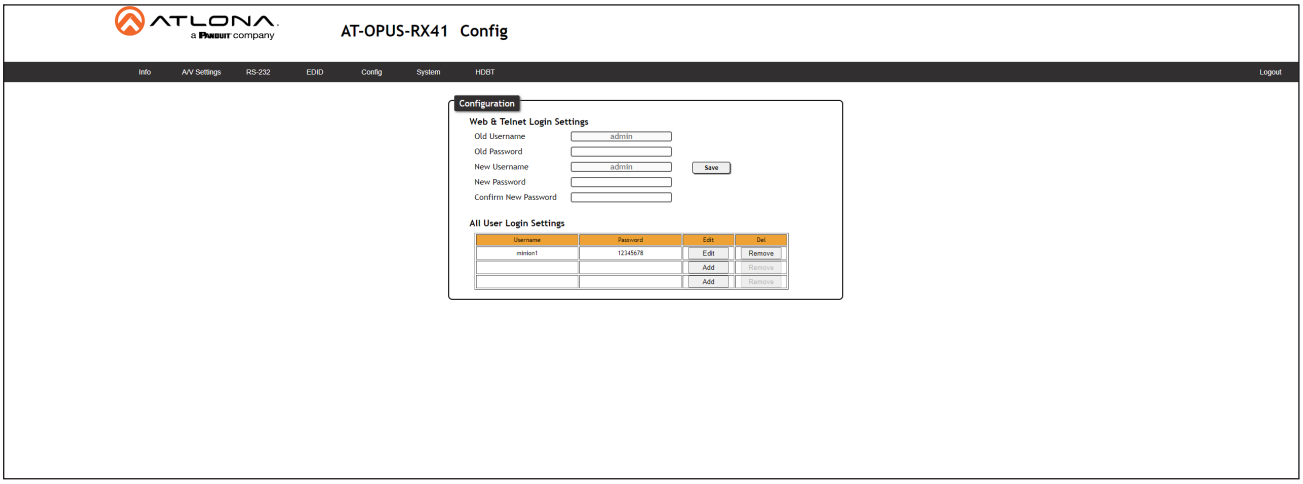
   Once created, the new user and the associated password will appear under the **All User Login Settings** section. To login with the new username, click **Logout** in the upper-right corner of the screen, then enter the login credentials for the user on the **Login** page.

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-OPUS-RX41.
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: `admin`
   Password: `Atlona`



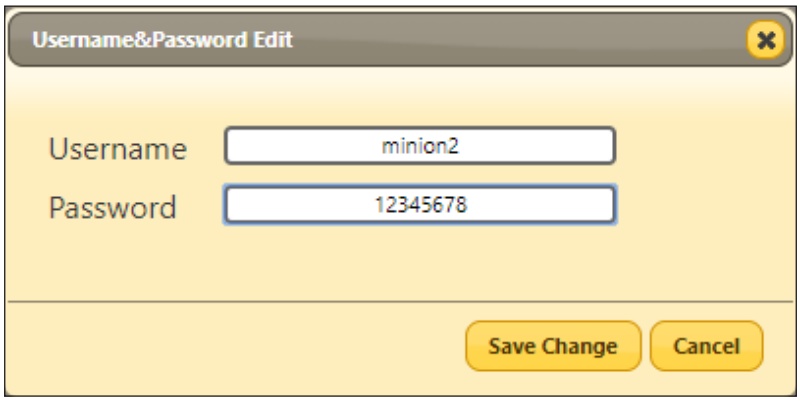
Editing Users

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

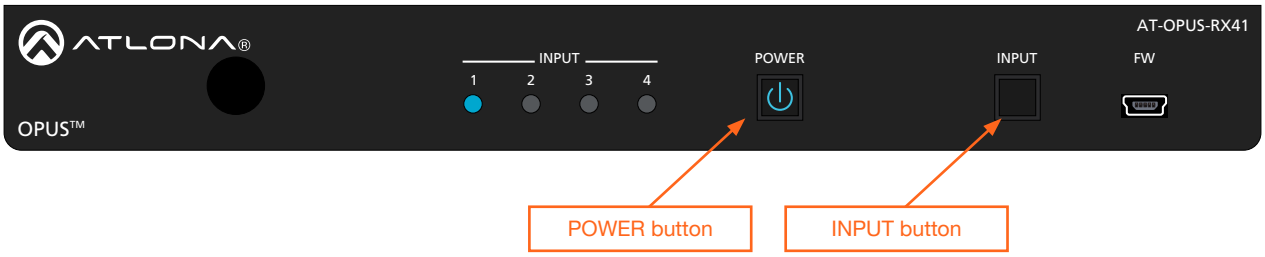
a. Click the **Remove** button next to the user to be deleted.

Resetting to Factory Defaults

The following procedure will reset the AT-OPUS-RX41 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.

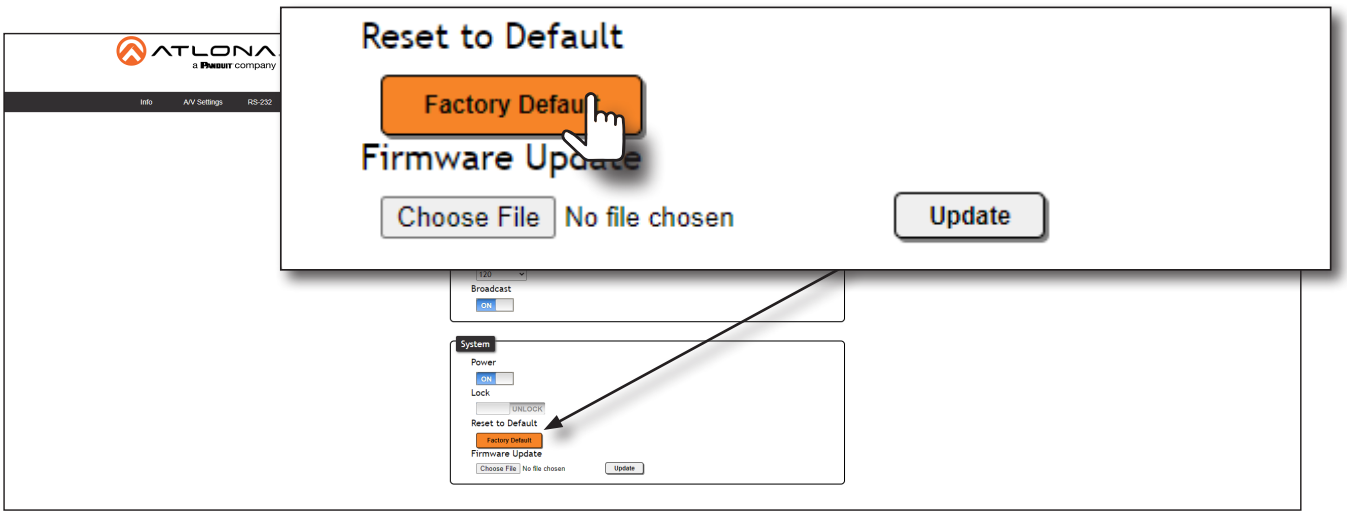


Using the Web Server

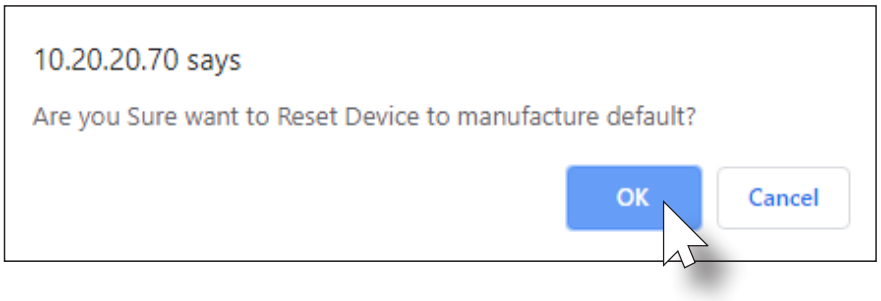
1. Open the desired web browser and enter the IP address of the AT-OPUS-RX41.
2. Log in as the **admin** user with the required credentials. The factory-default username and password for the admin user are listed below:

   Username: `admin`
   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.

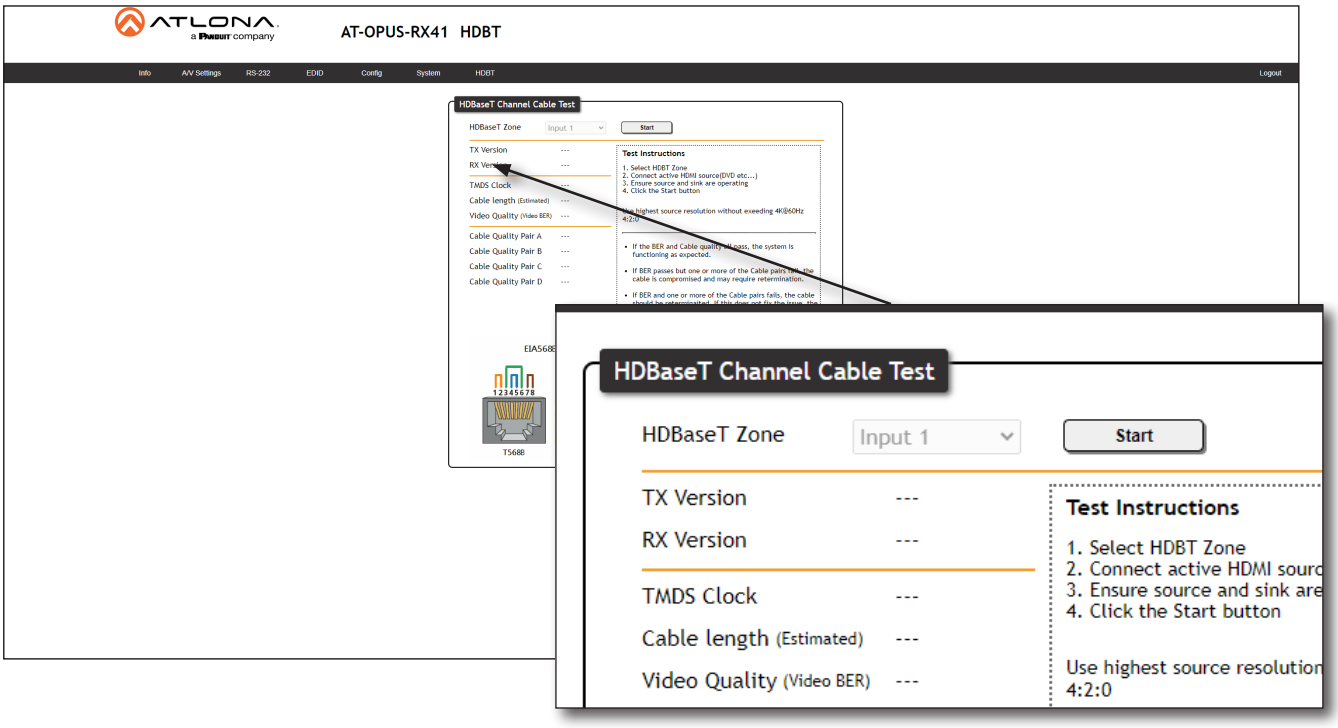


6. Once the factory-default process is complete, the Web Server **Login** screen will be displayed.
7. The factory-reset process is complete.

HDBaseT Testing

The web server of the AT-OPUS-RX41 provides a tool for testing the signal integrity of HDBaseT cables. This tool is useful for troubleshooting and identifying defective or damaged category cables which are connected from the HDBaseT transmitter and the HDBaseT port on the AT-OPUS-RX41.

1. Login to the web server. Refer to Web Server Login (page 17) for more information, if necessary.
2. Click **HDBT** in the top menu bar.
3. Make sure that a category cable (CAT-5e or better) is connected between the **INPUT 1** (HDBaseT) port and a compatible transmitter.

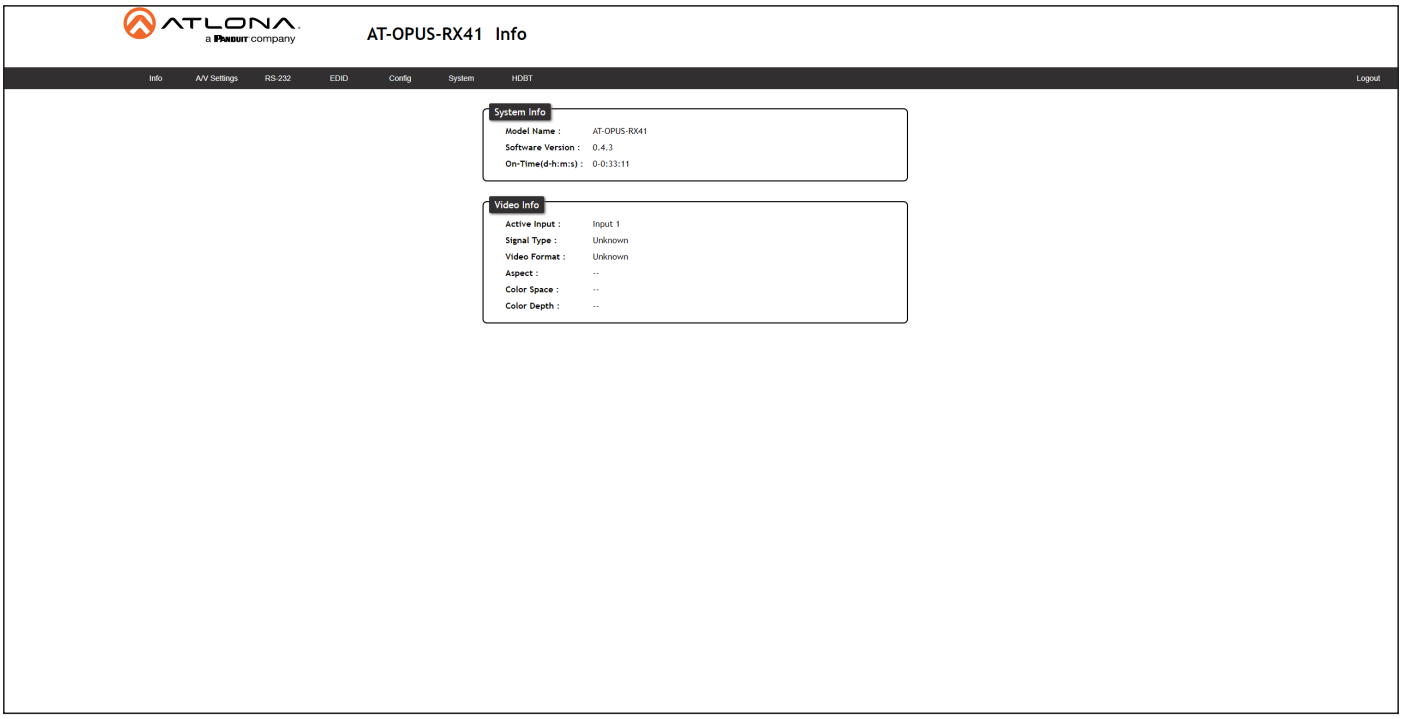


4. Click the **Start** button to begin testing the selected channel.

   - If the HDBaseT link integrity is good, then all tests will display as “Pass”.
   - If any part of the HDBaseT cable fails, then a numerical value, in decibels, will be displayed next to the associated pair, under the **Signal Quality** section. These values can be reported to Atlona Technical Support Engineers to help resolve possible issues.

Configuration and Management Interfaces

Info page



Model Name
The model SKU of this product.

Software Version
The version of firmware that the AT-OPUS-RX41 is running. Always make sure to check the AT-OPUS-RX41 product page, on the Atlona web site, for the latest version of firmware.

On-Time (d-h:m:s)
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.

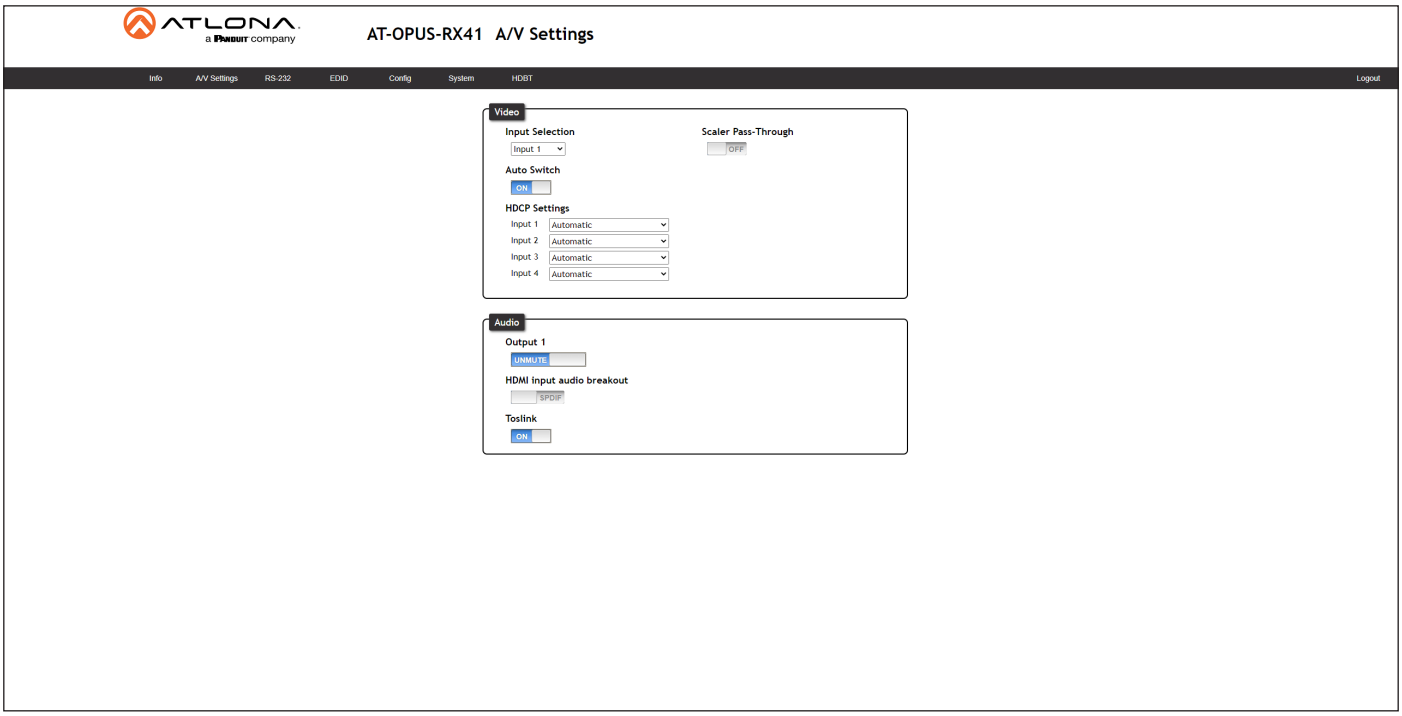
Video Format
Displays the video format.

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. Input 1 is the **HDBaseT IN** port.

Setting	Port
Input 1	INPUT 1
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-OPUS-RX41 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

Scaler Pass-Through
Click this toggle switch to enable or disable the scaler pass-through feature. When set to the **ON** position, no scaler processing is used and the output resolution / timing will be the same as the input source. When disabled (**OFF**), 4K content will be down-scaled to 1080p. By default, this feature is set to the **OFF** position, which provides scaling capability. Frame rate conversion is *not* supported.

Audio

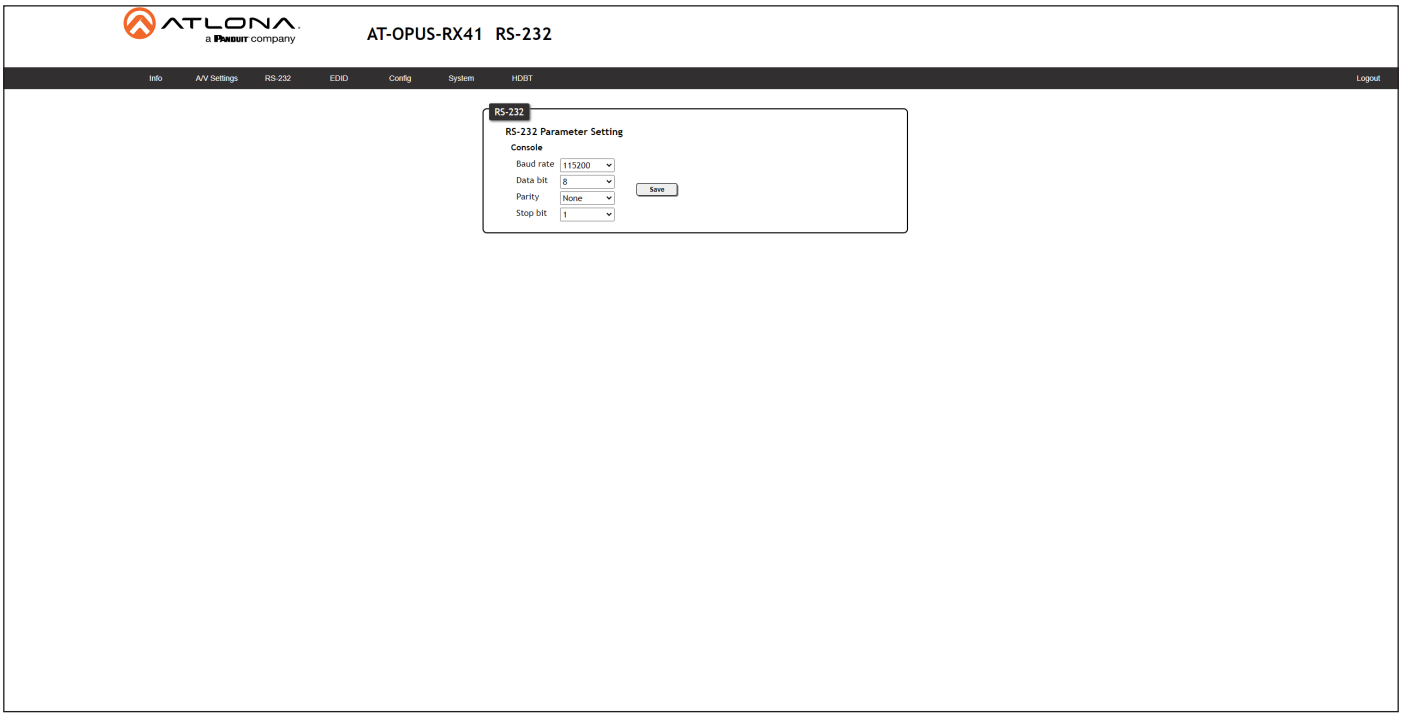
Output 1
Mutes or un-mutes the HDMI audio output. Set the **Output** toggle to **MUTE** to disable HDMI audio on the output. The default setting is **UNMMUTE**.

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-OPUS-RX41. 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

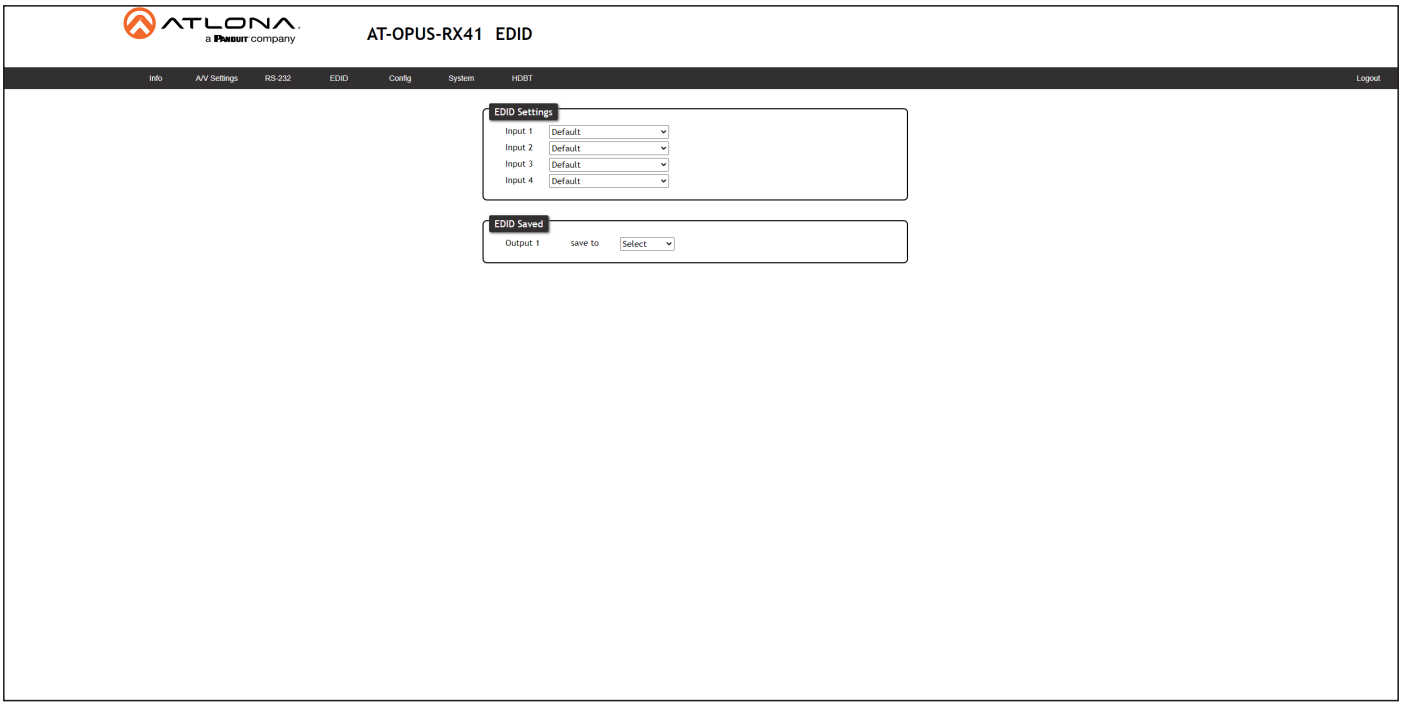


RS-232 Parameter Setting

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

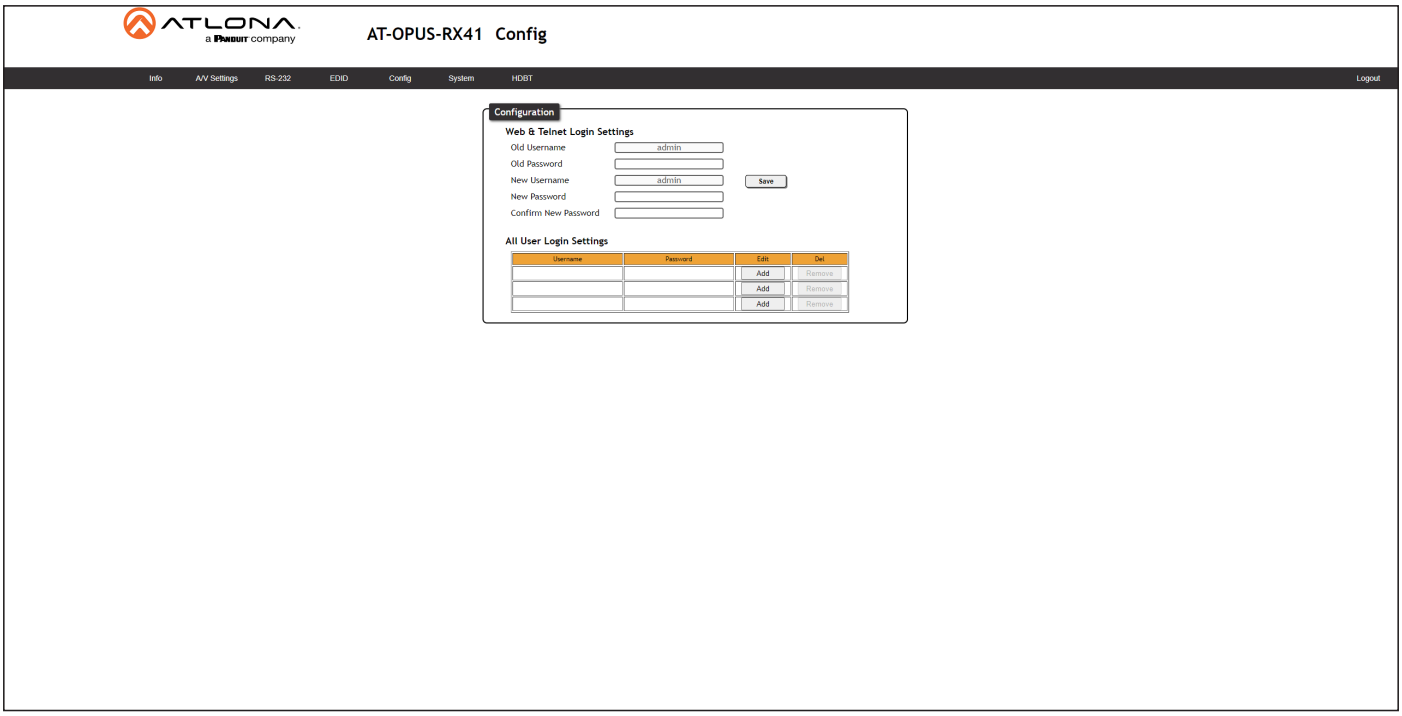
Input 1 - Input 4
Click these drop-down lists to select the desired EDID to be used for each input. Input 1 = INPUT 1, Input 2 = INPUT 2, Input 3 = INPUT 3, Input 4 = INPUT 4. The source device will use the information in the EDID, before sending A/V data to the sink device.

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

EDID Saved

Output
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



Configuration

Old Username
This field cannot be changed. “admin” is the administrator user.

Old Password
Enter the current password for the “admin” 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 “admin” username in this field.

Confirm New Password
Verify the new password by retyping it in this field.

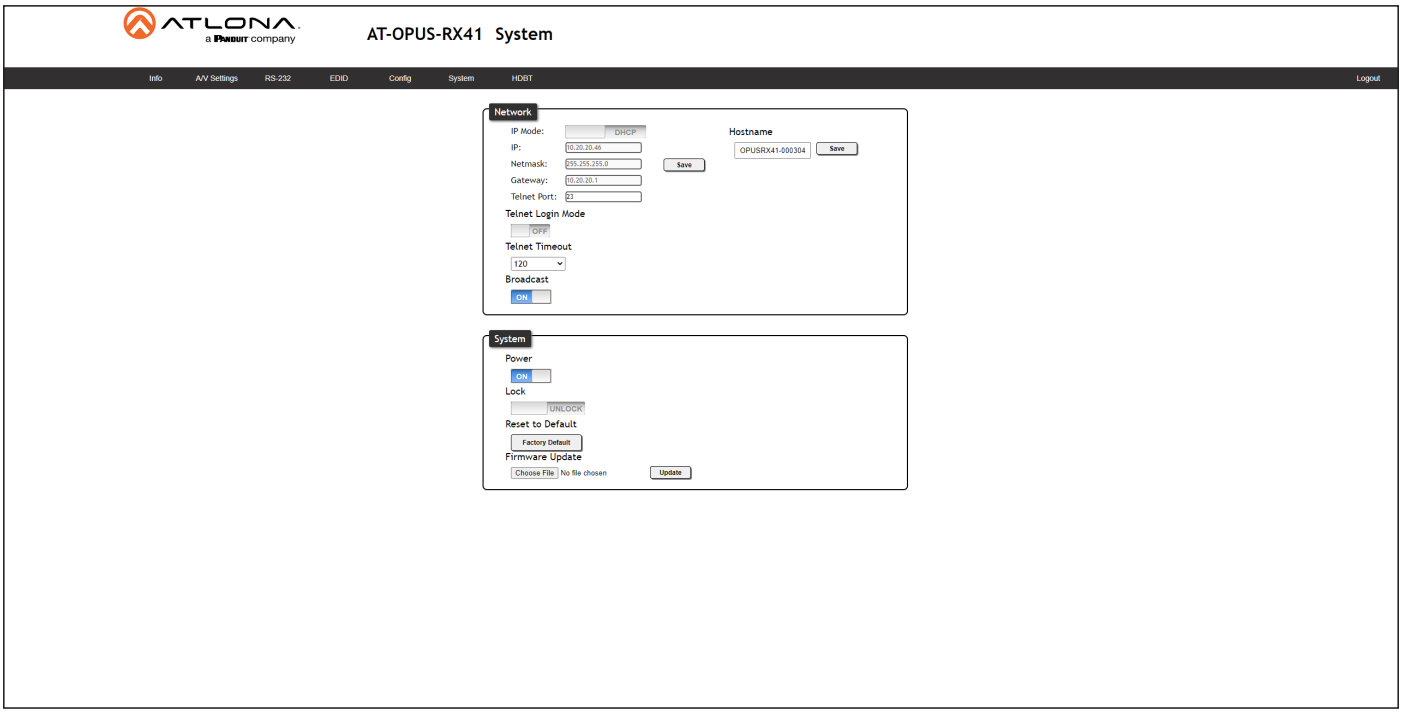
Username
Displays the username.

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-OPUS-RX41. The default setting is DHCP. Available settings: **STATIC IP**, **DHCP**.

IP
Enter the IP address of the AT-OPUS-RX41 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-OPUS-RX41 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

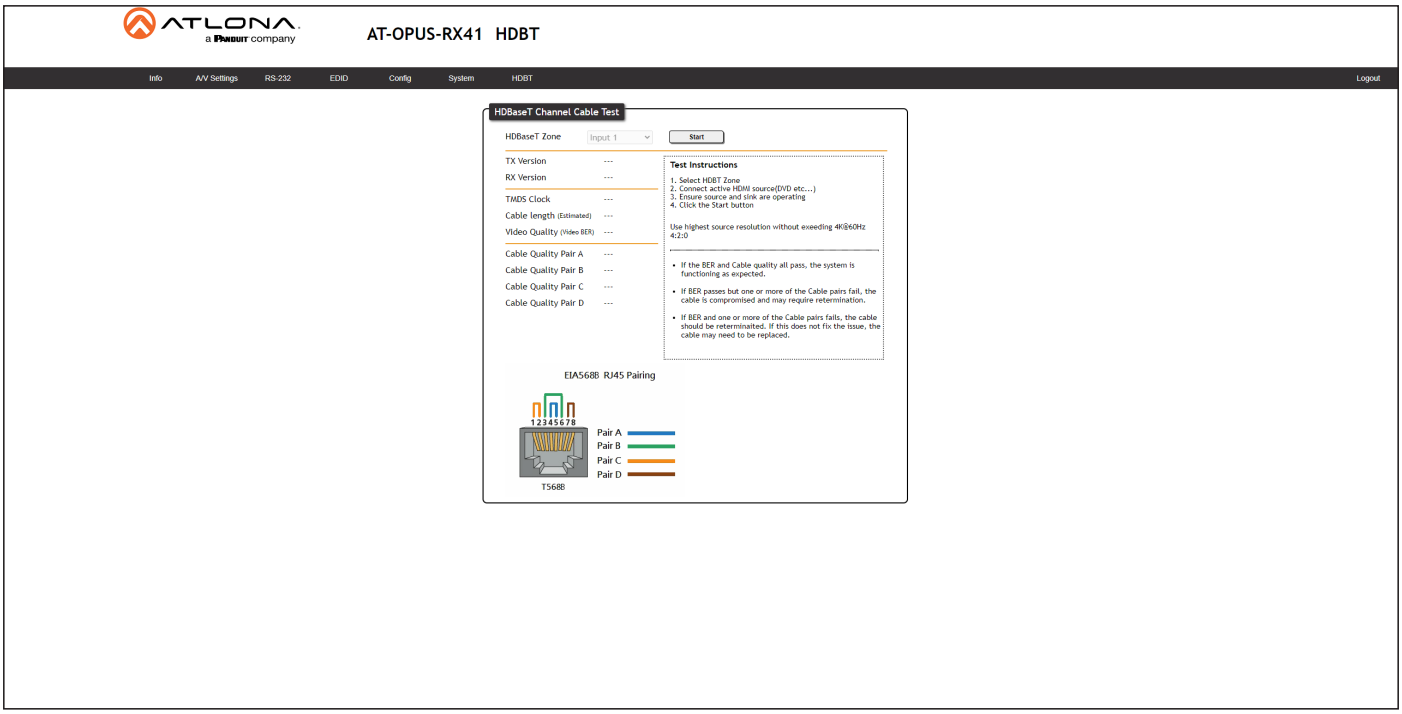
Power
Under normal operation conditions, this toggle is set to **ON**. Click this toggle to **OFF**, to turn the AT-OPUS-RX41 “off”. When “off”, the **POWER** LED indicator on the front panel will turn red. The PWOFF and PWON commands can also be used to control the power state.

Lock
Set this toggle to the **LOCK** position to prevent the AT-OPUS-RX41 from being powered-off, if the **POWER** button is accidentally pressed. By default, this is set to **UNLOCK**.

Reset to Default
Click the **Factory Default** button to set the AT-OPUS-RX41 to factory-default settings.

Firmware Update
Click the **Choose File** button to select the firmware file, when upgrading the firmware on the AT-OPUS-RX41. Once the firmware file is selected, click the **Update** button. Refer to Updating the Firmware (page 40) for more information.

HDBT page



HDBaseT Zone
The AT-OPUS-RX41 has only a single HDBaseT input. 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 Bit Error Rate (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-OPUS-RX41 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

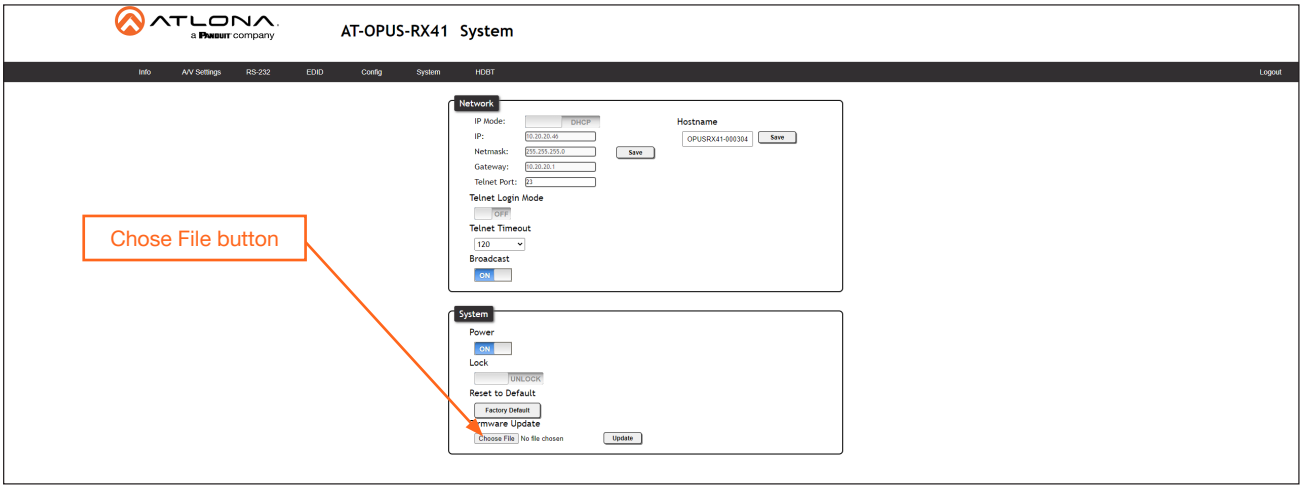
Updating the firmware can be completed using either the USB interface or the web server. Atlona recommends using the web server for updating the firmware. However, if a network connection is not available, the AT-OPUS-RX41 firmware can be updated using a USB-A to USB mini-B cable.

Using the Web Server

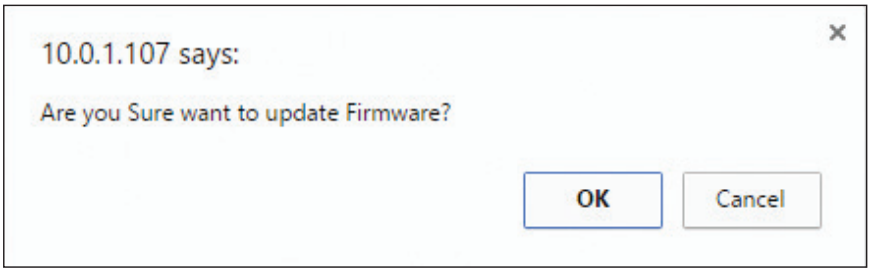
Requirements:

- AT-OPUS-RX41
- Firmware file
- Computer running Microsoft Windows

1. Connect an Ethernet cable from the computer, containing the firmware, to the same network where the AT-OPUS-RX41 is connected.
2. Go to the System page (page 37) in the Web Server.



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.

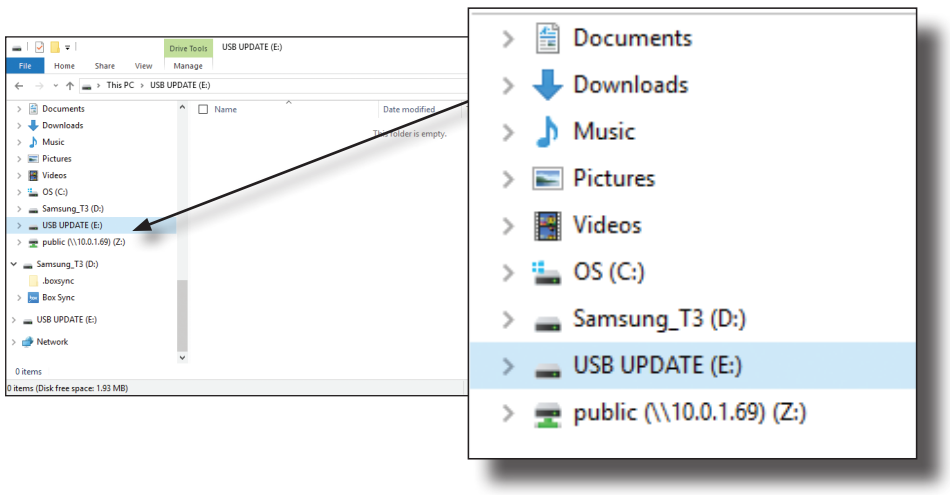
Using USB

Requirements:

- AT-OPUS-RX41
- Firmware file
- Computer running Microsoft Windows
- USB-A to USB mini-B cable

1. Disconnect power from the AT-OPUS-RX41.
2. Press and hold the **INPUT** button while connecting power to the AT-OPUS-RX41.
3. Release the INPUT button. The **POWER** button will glow solid red, indicating that the AT-OPUS-RX41 is in update mode.
4. Connect the USB-A to USB mini-B cable between the PC and the firmware port on the AT-OPUS-RX41. 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.

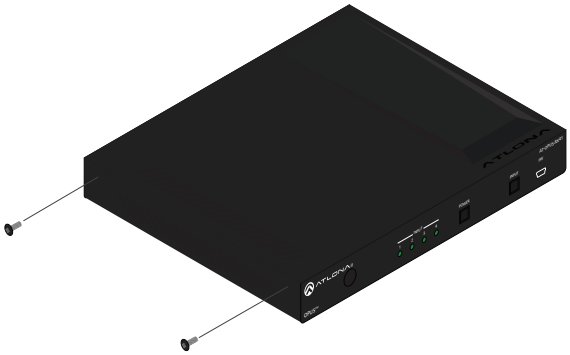


7. Delete all files from the USB UPDATE drive, if any are present.
8. Drag-and-drop the firmware file to the drive. During the firmware update procedure, the **POWER** button will flash.
9. After the file has been copied, disconnect the USB cable from both the computer and the AT-OPUS-RX41.
10. The firmware update process is complete.

Mounting Instructions

The AT-OPUS-RX41 includes two mounting brackets, which can be used to attach the unit to any flat surface. Use the two enclosure screws, on the sides of the unit, to attach the mounting brackets.

1. Using a small Phillips screwdriver, remove the two screws from the left side of the enclosure.



2. Position one of the mounting brackets, as shown below, aligning the holes on the side of the enclosure with one set of holes on the mounting bracket. Use the screws from Step 1 to attach the mounting bracket.
3. Repeat steps 1 and 2 to attach the second mounting bracket to the opposite side of the unit.

4. Mount the unit to a flat surface using the oval-shaped holes, on each mounting bracket. If using a drywall surface, a #6 drywall screw is recommended.

NOTE: Mounting brackets can also be inverted to mount the unit under a table or other flat surface.

Specifications

Video		
Signal	HDMI w/ARC(1)	
Copy Protection	HDCP 2.2	
Pixel Clock	600MHz	
UHD/HD/SD	4096x2160@60/50/30/25/24Hz 3840×2160@60/50/30/25/24Hz 1080p@60/59.9/50/30/29.97/25/24/23.98Hz 1080i@30/29.97/25Hz	720p@60/59.94/50Hz 576p@50Hz 576i@25Hz 480p@60/59.96Hz 480i@30Hz
VESA All resolutions are 60Hz	2560×1600 2048×1536 1920×1200 1680×1050 1600×1200 1440×900 1400×1050 1280×1024	1280×800 1366×768 1360×768 1152×864 1024×768 800×600 640×480
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, HLG, and Dolby® Vision™ @ 60 Hz(2)	

Audio			
HDMI / HDBaseT IN	PCM 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®
TOSLINK™	PCM 2Ch, Dolby® Digital, DTS® Digital Surround™		
Bit Depth	up to 24-bit		
Sample Rate	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz		

Resolution / Distance	4K/UHD - Feet / Meters		1080p - Feet / Meters	
HDMI IN/OUT	15	5	30	10
CAT5e	295	90	330	100
CAT6/6a/7	330	100	330	100

Ethernet	
Port	1 x RJ45
Standards and Protocols	HTTPS, Telnet, mDNS, SSL
Speeds	10/100/1000 Mbps
Addressing	DHCP, Static – selectable through rear panel, IP & RS-232 commands, and built-in web server

RS-232	
Port	1 x 4-pin captive screw (local), 1 5-pin captive screw (HDBaseT)
Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Data flow	Bidirectional

Appendix

IR	
Port	1 x 4-pin captive screw (local), 1 x 5-pin captive screw (HDBaseT)
Frequency Range	30 kHz to 60 kHz

CEC	
Port	HDMI, Type A, 19-pin female
Triggering	Through IP, RS-232, and built-in web server

Buttons and Indicators	
POWER button	1 - momentary, tact-type
INPUT button	1 - momentary, tact-type
Input Indicators	4 - LED, blue

Connectors	
HDMI IN	3 - Type A, 19-pin female
HDBaseT IN	1 - RJ45, female
HDMI OUT	1 - Type A, 19-pin female
OPTICAL	1 - TOSLINK™
HDBaseT RS-232 / IR	1 - 5-pin captive screw
RS-232 / IR IN	1 - 4-pin captive screw
LAN	1 - RJ45, female
FW	1 - Micro-A USB
PWR	1 - Barrel connector, locking

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

Power	
Consumption	6.6 W
Idle Consumption	5.9 W
BTU/h	22.5 (normal) / 20.1 (idle)
Supply	Input: AC100~240V 50/60Hz Output: DC 5V

Dimensions (H x W x D)	Inches	Millimeters
Unit	1.0 x 8.6 x 5.9	26 x 219 x 152
Power Supply (AT-PS-54-L)	1.22 x 1.97 x 3.17	31 x 50 x 80.6

Weight	Pounds	Kilograms
Device	1.82	0.82

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

Compliance	
NDAA-889	Yes
TAA	Yes

Warranty		
3 years	View the full warranty information here: https://atlona.com/warranty	

Footnotes

(1) Some displays limit ARC to 2-channel. Refer to the documentation that came with your display for more information.

(2) Dolby Vision @ 30 Hz for HDBaseT input.