

4K HDR HDMI over 100 M HDBaseT™ TX/RX with Ethernet, Control, PoE, and Return Audio

AT-HDR-EX-100CEA-KIT



The Atlona **AT-HDR-EX-100CEA-KIT** is an HDBaseT transmitter/receiver kit for high dynamic range (HDR) formats. The kit 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 HDR-EX-100CEA-KIT provides transmission of HDMI, Ethernet pass-through, and bidirectional IR and RS-232 control signals up to 330 feet (100 meters) over CAT6a/7 cable. This extender kit features visually lossless compression with no latency to enable HDR and 4K/60 4:4:4 video signal extension over HDBaseT. For additional integration convenience, the transmitter remotely powers the receiver through Power over Ethernet (PoE). The HDR-EX-100CEA-KIT can transmit digital audio from a television back to an AV receiver, via a dedicated audio pathway.

The HDR-EX-100CEA-KIT is ideal for residential and commercial 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 2.0b specification, plus the ability to pass metadata for HDR content. The HDR-EX-100CEA-KIT includes Atlona's award-winning 10 year limited product warranty and customer support services, so that integrators can specify, purchase, and install with confidence.

Package Contents

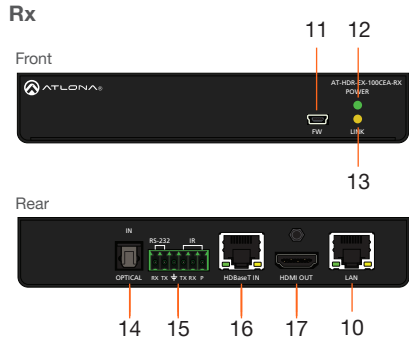
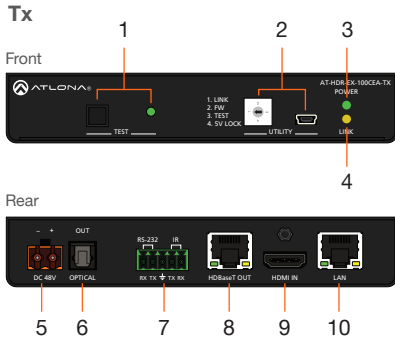
- | | |
|-------------------------|-----------------------------------|
| 1 x AT-HDR-EX-100CEA-TX | 1 x 5-pin captive screw connector |
| 1 x AT-HDR-EX-100CEA-RX | 1 x 6-pin captive screw connector |
| 4 x Mounting brackets | 1 x Installation Guide |
| 8 x Mounting screws | |
| 1 x 48V DC power supply | |
| 1 x IR emitter | |



IMPORTANT: Visit <http://www.atlona.com/product/AT-HDR-EX-100CEA-KIT> for the latest firmware updates and Installation Guide.



Panel Descriptions



- 1 TEST**
Press this button to test the integrity of the HDBaseT cable. Refer to [Testing HDBaseT Signal Integrity \(page 8\)](#) for more information.
- 2 UTILITY**
Connect a mini-USB to USB-A cable from this port to a computer. Refer to [Utility Switch \(page 9\)](#) for more information on this feature.
- 3 POWER**
This LED indicator glows solid green when the unit is powered. Refer to [LED Indicators \(page 7\)](#) for more information.
- 4 LINK**
This LED indicator glows solid amber when a solid link is established between the transmitter and receiver. Refer to [LED Indicators \(page 7\)](#) for more information.
- 5 DC 48V**
Connect the included 48V DC power supply to this power receptacle.
- 6 OPTICAL OUT**
Connect a digital audio cable from this TOSLINK™ port to an AV receiver. Outputs audio as part of the Audio Return Channel (ARC).
- 7 RS-232 / IR**
Connect the included 5-pin captive screw block to this receptacle. Refer to [RS-232 / IR Wiring \(page 3\)](#) for more information.
- 8 HDBaseT OUT**
Connect an Ethernet cable from this port to the **HDBaseT IN** port on the receiver.
- 9 HDMI IN**
Connect an HDMI cable from this port to a UHD/ HD source.

- 10 LAN**
Connect an Ethernet cable from this port, on either the transmitter or receiver, to the network. Do not connect both LAN ports to the same network.
- 11 FW**
Connect a mini-USB cable from this port to update the firmware. Refer to [Updating the Firmware \(page 10\)](#) for more information.
- 12 POWER**
This LED indicator glows solid green when the unit is powered.
- 13 LINK**
This LED indicator glows solid amber when a solid link is established between the transmitter and receiver. Refer to [LED Indicators \(page 7\)](#) for more information.
- 14 OPTICAL IN**
Connect a digital audio cable from the TOSLINK™ port on the display to this port. This port serves as the input for the Audio Return Channel (ARC), receiving audio from the display and sending it to the transmitter.
- 15 RS-232 / IR**
Connect the included 6-pin captive screw block to this receptacle. Refer to [RS-232 / IR Wiring \(page 3\)](#) for more information.
- 16 HDBaseT IN**
Connect an Ethernet cable from this port to the **HDBaseT OUT** port on the transmitter.
- 17 HDMI OUT**
Connect an HDMI cable from this port to an UHD/HD display.

RS-232 / IR Wiring

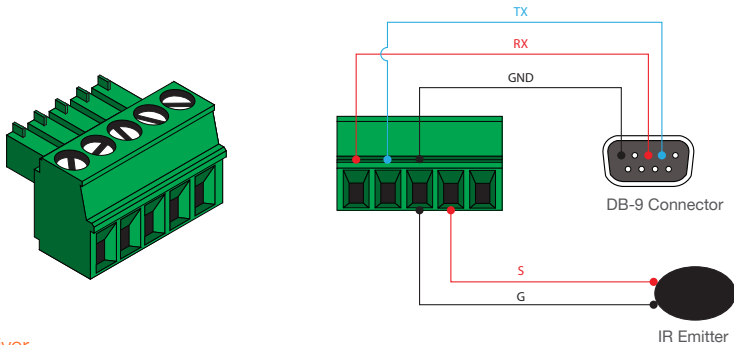
The AT-HDR-EX-100CE-KIT provides both an **RS-232** and **IR** port. RS-232 pass-through is supported, allowing a control system to be connected to either the transmitter or receiver. Connect the included IR emitter to the transmitter and an IR extender (not included) to the receiver. Both IR and RS-232 connections are optional.



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. Also note, that IR is bidirectional, allowing the IR emitter or IR receiver to be connected to either the transmitter or receiver.

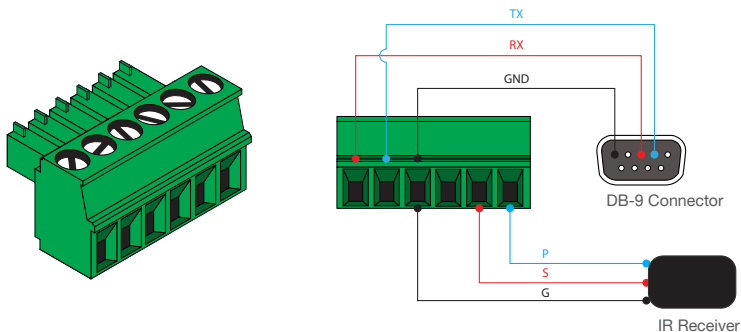
Transmitter

1. Use wire strippers to remove at least 3/16" (5 mm) of the cable jacket for both the RS-232 and IR emitter.
2. Insert the wires as shown into the included 5-pin captive screw connector.



Receiver

1. Use wire strippers to remove at least 3/16" (5 mm) of the cable jacket for both the RS-232 and IR emitter.
2. Insert the wires as shown into the included 6-pin captive screw connector.



Mounting Instructions

The AT-HDR-EX-100CEA-KIT includes two mounting brackets and four mounting screws each, which can be used to attach the units to any flat surface.

1. 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.
2. Use the enclosure screws to secure the mounting bracket to the enclosure.
3. Repeat the above steps to attach the second mounting bracket to the opposite side of the unit.



4. Mount the unit 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.



Installation

1. Connect a UHD/HD source to the **HDMI IN** port on the transmitter.
2. Connect a UHD/HD display to the **HDMI OUT** port on the receiver.
3. Connect an Ethernet cable, from the **HDBaseT OUT** port on the transmitter, to the **HDBaseT IN** port on the receiver.
4. Connect an Ethernet cable from the **LAN** port, on either the transmitter or receiver, to the Local Area Network.
5. OPTIONAL: Connect a digital audio cable from the TOSLINK™ (digital out) connector on the display device to the **OPTICAL IN** port on the receiver. This port is part of the Audio Return Channel (ARC), which sends audio back to the transmitter.
6. OPTIONAL: Connect a digital audio cable from the **OPTICAL OUT** port on the transmitter to the TOSLINK™ (digital in) port on an AV receiver.
7. OPTIONAL: Connect a control system to the transmitter. Connect the device being controlled to the receiver. Refer to [RS-232 / IR Wiring \(page 3\)](#) for more information.
8. OPTIONAL: Connect an IR emitter to the transmitter. Connect an IR receiver to the receiver. Refer to [RS-232 / IR Wiring \(page 3\)](#) for wiring information using the included captive screw terminal blocks.
9. Connect the included 48 V DC power supply to the **DC 48V** power receptacle on the transmitter.
10. Connect the power supply to an available AC outlet.

Cable Recommendation Guidelines

Refer to the tables below for recommended cabling when using Altona products with HDBaseT. The green bars indicate the signal quality when using each type of cable. Higher-quality signals are represented by more bars.

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

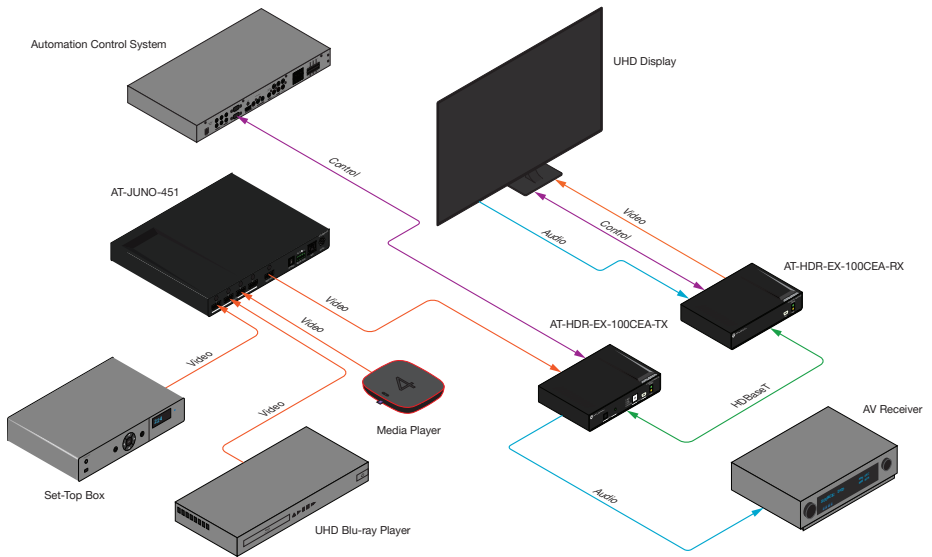


IMPORTANT: Stranded or patch cables are not recommended due to performance issues.

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

*Atlona recommends TIA/EIA 568-B termination for optimal performance.

Connection Diagram



LED Indicators

The **POWER** and **LINK** LED indicator on the transmitter and receiver unit provides basic information on the current status of the AT-HDR-EX-100CEA-KIT. The information in the table below applies to both the transmitter and receiver unit.

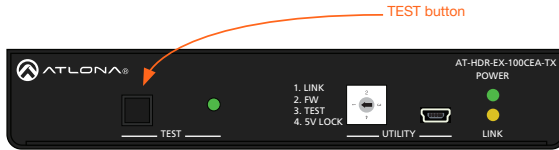
POWER	Description
Solid green	Unit is powered.
Off	Unit is not powered. <ul style="list-style-type: none"> Verify that the locking connector is securely fastened to the power receptacle. Make sure that the power supply is connected to an active AC outlet.

LINK	Description
Solid yellow	The link integrity between the transmitter and the receiver is good.
Blinking yellow	Poor signal integrity between the transmitter and the receiver. <ul style="list-style-type: none"> Make sure that the Ethernet connection between the HDBaseT IN port on the transmitter and the HDBaseT OUT port on the receiver is secure. The Ethernet cable may be compromised. Try using a different Ethernet cable. Make sure that the cable is solid core. Stranded or patch cables are not recommended.
Off	The link integrity between the transmitter and the receiver is compromised. <ul style="list-style-type: none"> Check the Ethernet cable between the HDBaseT IN port on the transmitter and the HDBaseT OUT port on the receiver.

For information on the **TEST** LED indicator, refer to the next page.

Testing HDBaseT Signal Integrity

The AT-HDR-EX-100CEA-KIT has the ability to test the HDBaseT signal integrity through the front panel. Press and release the **TEST** button, on the front panel of the transmitter, to begin the test.



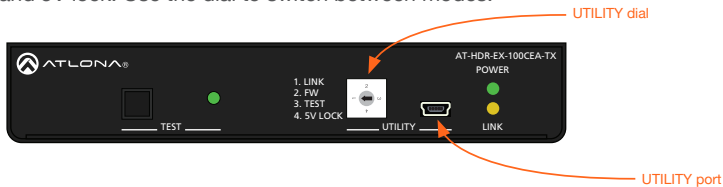
Once the test has been initiated, both the **TEST** button and LED indicator will display the current status.

TEST Button	Description
Blinking Blue	Cable test is running properly.
Solid Red	No cable is detected. <ul style="list-style-type: none"> Connect an Ethernet cable between the HDBaseT OUT and HDBaseT IN ports. Verify that an Ethernet cable is connected between the HDBaseT OUT and the HDBaseT IN ports. Check that the Ethernet cable is not physically damaged.

TEST LED	Description
Solid Green	Cable integrity is good.
Blinking Green	The HDBaseT signal is not clear. <ul style="list-style-type: none"> Verify that the Ethernet cable forms a solid connection between the HDBaseT OUT and the HDBaseT IN ports. Check for possible physical damage or stress to the cable.
Solid Yellow	One or two twisted pairs are not transmitting a clear signal. <ul style="list-style-type: none"> Re-terminate the cable and repeat the test. Replace the cable.
Solid Red	Multiple twisted pairs are not transmitting a clear signal. <ul style="list-style-type: none"> Re-terminate the cable and repeat the test. If the result is the same, then replace the cable.
Off	No Ethernet cable is connected between the HDBaseT OUT and HDBaseT IN ports. <ul style="list-style-type: none"> Connect an Ethernet cable between the HDBaseT OUT and HDBaseT IN ports.

Utility Switch

The **UTILITY** port and dial are used for updating firmware, HDBaseT cable testing/debugging, and 5V lock. Use the dial to switch between modes.



1. LINK

This is the default position. Make sure that the dial is set to the **LINK** position for normal operation.

2. FW

This mode sets the transmitter to firmware update mode. Refer to [Updating the Firmware \(page 10\)](#) for more information.

3. TEST

This mode sets the transmitter to HDBaseT testing and debug mode. The TEST mode works in conjunction with the Atlona Analyzer. This software is free and is available from <http://www.atlona.com/products/AT-HDR-EX-100CEA-KIT>.

HDBaseT Testing

1. Launch the Analyzer software.
2. Make sure the system is powered and the transmitter and receiver are connected using the **HDBaseT OUT** and **HDBaseT IN** ports.
3. Connect an active source to the transmitter and an active display to the receiver. Set the source to the highest resolution.
4. Set the **UTILITY** dial to **3**.
5. Connect a mini-USB to USB-A cable from the **UTILITY** port, on the transmitter, to a computer.
6. Select the COM port in the Analyzer software and press the **Connect** button.



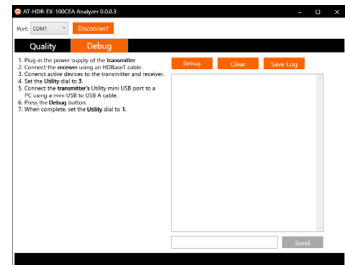
7. Click **Quality** on the menu bar.
8. Once connected, press the **Start** button. The link information and cable pairing test results will display. Follow the instructions on the Analyzer software for any pair failures.
9. When complete, set the **UTILITY** dial back to **1** to resume normal operation.

Debugging

1. Launch the Analyzer software.
2. Set the **UTILITY** dial to **3**.
3. Connect a mini-USB to USB-A cable from the **UTILITY** port, on the transmitter, to a computer.
4. Select the COM port and press the **Connect** button.
5. Click **Debug** on the menu bar.



6. The debug process will begin and any debug data will be logged in the text box.
7. Click the **Save Log** button to save the data to a file on the computer or click the **Clear** button to erase the data in the text box.
8. Once the debug process is complete, set the **UTILITY** dial to **1** to resume normal operation.



4. 5V LOCK

This mode sets both the HPD pin on the transmitter and the +5V pin on the receiver to “high”. This allows both the source and display to have a consistent connection, even if there are issues with the source and / or display signals.



Manually Updating the Firmware

The following procedure covers manually updating the firmware. This method will be required if not using the Atlona Analyzer.

1. Download the firmware .zip file from the firmware tab located at <http://www.atlona.com/AT-HDR-EX-100CEA-KIT>.
2. Extract the firmware, from the archive file, to the Windows desktop or other folder.
3. Make sure the included 48 V DC power supply is connected to the transmitter and that an Ethernet cable is connected between the **HDBaseT OUT** and **HDBaseT IN** ports on the transmitter and receiver, respectively.

Transmitter only:

- a. Set the **UTILITY** dial to **2**.
- b. Disconnect the 48 V DC power supply from the transmitter.
- c. Connect a mini-USB to USB-A cable from the **UTILITY** port, on the transmitter, to the computer with the firmware file.
- d. Reconnect the power supply to the transmitter. The USB Drive folder should be displayed after a few seconds. If the folder is not displayed select the USB drive from Windows Explorer.
- e. Go to step 4.

Receiver only:

- a. Disconnect the Ethernet cable from the **HDBaseT IN** port on the receiver.
 - b. Connect a mini-USB to USB-A cable from the **FW** port on the receiver, to the computer with the firmware file.
 - c. Reconnect the Ethernet cable to the **HDBaseT IN** port on the receiver. The USB Drive folder should be displayed after a few seconds. If the folder is not displayed select the USB drive from Windows Explorer.
 - d. Go to step 4.
4. Delete all files from the USB Drive folder, if any are present.
 5. Drag and drop the firmware file to the drive. While the firmware loads to the unit, the green power LED on the front panel will flash.
 6. Once the LED is solid green, disconnect the unit from the computer.

Transmitter only:

- f. Set the **UTILITY** dial to **1** to resume normal operation.
7. The firmware update process is complete.



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