

HT Pro Series

HDBaseT Supercharged

*HDMI 4K60 4:4:4 Uncompressed
HDBaseT CAT Extenders*



SAFETY INSTRUCTIONS

Please review the following safety precautions. If this is the first time using this model, then read this manual before installing or using the product. If the product is not functioning properly, please contact your local dealer or Aurora for further instructions.



The lightning symbol in the triangle is used to alert you to the presence of dangerous voltage inside the product that may be sufficient to constitute a risk of electric shock to anyone opening the case. It is also used to indicate improper installation or handling of the product that could damage the electrical system in the product or in other equipment attached to the product.



The exclamation point in the triangle is used to alert you to important operating and maintenance instructions. Failure to follow these instructions could result in injury to you or damage to the product.



Be careful with electricity:

- **Power Outlet:** To prevent electric shock, be sure the electrical plug used on the product power cord matches the electrical outlet used to supply power to the Aurora product. Use the power adapter and power connection cables designed for this unit.
- **Power Cord:** Be sure the power cord is routed so that it will not be stepped on or pinched by heavy items.
- **Lightning:** For protection from lightning or when the product is left unattended for a long period, disconnect it from the power source.



Also follow these precautions:

- **Ventilation:** Do not block ventilation slots, if applicable, on the product, or place any heavy object on top of it. Blocking airflow could cause damage. Arrange components so that air can flow freely. Ensure that there is adequate ventilation if the product is placed in a stand or cabinet. Put the product in a properly ventilated area, away from direct sunlight or any source of heat.
- **Overheating:** Avoid stacking the Aurora product on top of a hot component, such as a power amplifier.
- **Risk of Fire:** Do not place unit on top of any easily combustible material, such as carpet or fabric.
- **Proper Connections:** Be sure all cables and equipment are connected to the unit as described in this manual.
- **Object Entry:** To avoid electric shock, never stick anything in the slots on the case, or remove the cover.
- **Water Exposure:** To reduce the risk of fire or electric shock, do not expose to rain or moisture.
- **Cleaning:** Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- **ESD:** Handle this unit with proper ESD care. Failure to do so can result in failure.

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two (2) conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



Trademarks

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PACKAGE CONTENTS

Please make sure the following items are included within your package. Contact your dealer if any items are missing or damaged.

HT-TC1

- HT-TC1 x 1
- Wall/Desk Mount Ears with Screws x 4

HT-TX1-WP2

- HT-TX1-WP2 x 1 (-W for white, -B for black)

Note: Some 2 gang electrical boxes or mud rings have curved or beveled corners that may prevent the HT-TX1-WP2 from properly fitting. Make certain to use a brand that fits the full dimensions listed in the specification section.

OPTIONAL ACCESSORIES

- **PS0081-1**
(48V 24 Watt PoE Injector)
Available in -US, -AU, -EU, and -UK worldwide models



- **PS0094-3**
(48V 25 Watt Wall Supply)
Comes with US, AU, EU, and UK interchangeable blades

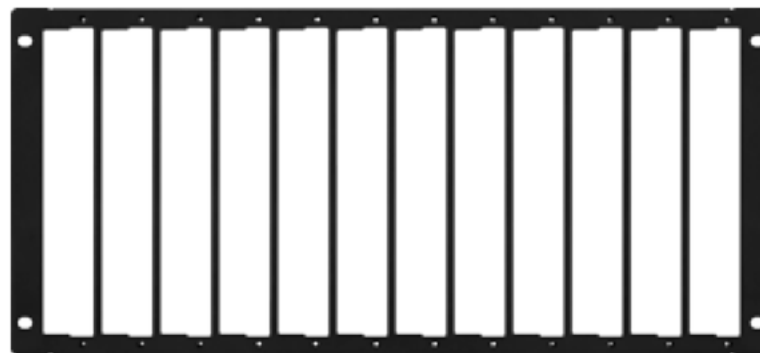


***Note: Go to www.auroramm.com for latest manual and firmware.**

- **RK2-1-K**
(1RU Rack Mount Holds 2 Units)
Includes 4 rails and 1 blank



- **RK2-5-K**
(5RU Rack Mount Holds 12 Units)
Includes 24 rails and 4 blanks



- **RK2-BP-K**
(Blank Plate for Rack Mounts)



- **RK2-RL-K**
(For VLX-TC1 Use in Rack Mounts)



- **IPE-DTE-1**
(Dante® Option Card)



- **IPX-ReAX-1**
(IPX-TC3 ReAX Control System Option Card)



- **IR Receiver CA0026-1**



- **IR Emitter CA0061-1**



- **RS-232 Adaptor CA0052-F2T3R**
(3.5mm TRS to FEMALE DB89 2-TX 3-RX)
RS-232 Adaptor CA0052-F3T2R
(3.5mm TRS to FEMALE DB89 3-TX 3-RX)
RS-232 Adaptor CA0052-M2T3R
(3.5mm TRS to MALE DB9 2-TX 3-RX)
RS-232 Adaptor CA0052-M3T2R
(3.5mm TRS to MALE DB9 3-TX 2-RX)



- **LVR-2G Gang Electrical Ring**



- **DXB-8 & DXB-8i**
(8 Button Wall Plate)



INTRODUCTION

About

Aurora Multimedia redefines HDBaseT with many new capabilities including the ability for uncompressed 4K60 4:4:4 as a transceiver. Aurora has eliminated the need for RX & TX as the unit can be set to the direction required for both wall plates and box units. This will end stock disproportions, make servicing easier, and add new capabilities as in seconds the units can reverse direction. The new HT Pro Series even has Dante® option for 2 or 8 channels. We even went a step further by implementing ARC (Audio Return Channel) and allowing it to be fed to Dante or to the local line output making it a first. Two new HDBaseT 3.0 products comprised of the HT-TC1-WP2 two gang transmitter Decora wall plate available in white or black and the HT-TC1 transceiver box unit will change the way HDBaseT is utilized. The HT Pro Series can transmit uncompressed 4K60 4:4:4 18Gbps HDMI 2.0/HDCP2.2 100m (330ft) over a single unshielded CAT cable with no quality compromise and with zero frame latency. In addition, all products have an integrated web server for remote IP control, 480Mbps USB 2.0 with directional control, 1Gbps LAN, and the world's first Dante option for 2 or 8 channel Dante. Aurora is the first ever to implement a bi-directional Patent Pending PoH for remote powering. Currently all HDBaseT products on the market which use the PoH standard are limited to one direction. The HT Pro Series allows a user to choose which side to power from and in a nonproprietary way so it will work with any HDBaseT PoH compliant device. To further simplify the installation, the HT Pro Series can power both connected units from a single port of a PoE Switch eliminating external power supplies. The HT Pro Series also supports the new ReAX™ IP Control engine option (IPE-REAX-1) based on JavaScript™. ReAX allows full IP control automation throughout the network without the need of an external proprietary control engine. The new Aurora third generation HDBaseT products will further enhance the capabilities of HDBaseT and simplify installations especially with point-to-point installations.

Features

- 4K60 4:4:4 18Gbps Uncompressed
- HDR (high Dynamic Range)
- HDCP 1.4/2.2
- 100m (330ft) with Unshielded Cable
- Four HDMI® 2.0/HDCP 2.2
- Audio DSP & Dante™/AES67 Options 2 or 8 Channel
- ARC Audio Return Channel and ARC into Dante/AES67 Industry First!
- Operate & Power both TX & RX from a single PoE Switch Port
- Auto Switching
- Two HDMI® Inputs Input (HT-TX1-WP2)
- Four HDMI® Inputs (HT-TC1)
- One HDMI® Output (HT-TC1)
- 1G Local LAN Ports and 1G over the HDBaseT Connection
- USB 2.0 Device/Host 480Mbps with Selectable Direction
- IP Port Expansion Control, RS-232 & IR Control
- ReAX Control Option
-

****Note: Refer to Technical Specifications section.***

Warning: Do not plug RJ-45 HDBaseT output to non-HDBaseT complaint devices or damage may occur to either product.

HT-TC1 Front & Rear



Front LED Indicators

- **POWER:** Lights green when power is present.
- **STATUS:** Will blink steady if unit is working properly.
- **HDBT:** Lights when HDBaseT RJ-45 has proper connection between an RX/TX pair. Blinks when in sleep mode.
- **HDMI:** Will light solid if HDMI is plugged in on both RX/TX and HDCP is present. If no HDCP, LED will blink.
- **TX:** RS-232 Transmit. Blinking rate and intensity will vary with baud rate.
- **RX:** RS-232 Receive. Blinking rate and intensity will vary with baud rate.
- **IR TX:** Blinks when emitting IR to device from IR Out Port.
- **IR RX:** Blinks when receiving IR from IR RX port.
- **USB Host:** When lit the rear Type-C USB port should be used and connected to the PC.
- **USB Device:** When lit the Front Dual USB ports should be used and connected to the peripherals like keyboard, mouse, memory stick, camera, etc.

Front Buttons

- **Menu Button:** Press and hold for 5 seconds switch between encode and decode mode. Also, cycles through the OLED Menu.
- **Enter Button:** Selects the current menu option.
- **Up Button:** Select next input source.
- **Down Button:** Select previous input.
- **Up/Down Button:** Press and hold for 5 seconds to output IP info at 9600 baud rate on RS-232 port.

Front Connections

- **Dual Type-A USB 2.0:** USB 2.0 connectors. Units USB Device LED must be lit for it to function properly with remote end. Can also be used to charge devices.
- **IR OUT:** Plug the IR emitter into this port and affix onto the device where its IR window is located.
- **IR IN:** Plug the IR receiver into this port. The front built in IR receiver will no longer work once the external receiver is plugged in. Note this port should be used with Aurora IR receiver model as other brands may not follow the correct pinout or voltage.
- **IR:** IR receiver capable of 32KHz to 60KHz range.

Rear Connections

- **48V DC:** Power connector for 25-watt 48VDC power supply (PS0094-3-S).

Note: Only 1 supply is required to power both units. Either side can send power to the other unit.

Note: If LAN PoE+ is utilized the 48VDC supply is not required.

- **RS-232:** Connect RS-232 device up to 115k baud.
- **LAN1/2:** 1Gbps LAN connection. LAN1 can use PoE or PoE+ from a PoE switch to power both the RX and TX units. PoE+ is highly recommended if Dante or USB is utilized.
- **HDBaseT:** Connect CAT 5e/6/7 cable. Shielded cable is not necessary unless the environment has a lot of electrically noise.
- **HDMI Input 1-4:** Plug HDMI cable from source device like a Blu-ray player. Source can be selected from RS-232, Ethernet, Auto Sense Mode, or front buttons.
- **HDMI Output:** Plug HDMI cable from device like a LCD monitor.
Note: The HDMI cable should be rated for the bandwidth you are using.
- **Audio Line In/Out:** Euro Style connector for stereo line in and line out.
- **USB 2.0 Host:** Type-C USB 2.0 Connector for connection to PC. Unit must be set for Host mode for it to properly operate.

***Note: Some POE switches do not supply the full 15.4watts per port. Verify the total power rating of the switch. It should be at least 15.4W x (number of ports) and ideally 25.4W (PoE+) per port if USB peripherals are to be utilized and/or Dante option card.**

Option Port

Inside the unit there is an option card connector for the Dante 2ch or 8ch option or the ReAX control system option. Only one of the cards can be installed into a unit. To access the port, power off unit and the 4 screws (2 on each side) must be removed. Take the cover off and insert the card in the proper orientation as indicated on the circuit board. Put cover back on and apply power. Don't forget to note the MAC address of the card to identify which unit it is in.

HT-TX1-WP2 Front & Rear



Front Left Side

- **In1/2 Button:** The blue backlit button will select HDMI 1 or 2 input.
- **HDMI Connectors:** Use with HDMI 2.0 or DVI sources like Blu-ray players, laptops, etc.
- **Dual USB 2.0 Connectors:** USB 2.0 480Mbps and supplies up to 1A of power between both ports. Great for charging port of USB devices like phones and certain tablets. When in USB Host Mode the bottom port is for PC (Type A to Type A cable is supplied) and upper port is charging only. When in Device mode both ports work on a hub for mouse, keyboard, camera, memory stick, etc.

Front Right Side

- **Vent:** Allows the unit to run cooler and should be kept free of dust.

Rear Connections

- **48V DC:** Power connector for 48V DC power supply. If remote device can supply power over HDBaseT then the local power is not required. Currently all receiver types from Aurora supply power over the HDBaseT.
- **HDBaseT:** Connect CAT 5e/6/7 cable. Shielded cable is not necessary unless the environment has a lot of electrically noise.
- **RS-232:** Connect RS-232 device up to 115k baud. Note there is a 5v line as it is designed to power the DXB-8 8 button wall plate.

Note: Some 2 gang electrical boxes or mud rings have curved or beveled corners that may

prevent the HT-TX1-WP2 from properly fitting. Make certain to use a brand that fits the full dimensions listed in the specification section.

Note: Only 1 supply or PoE is required to power both units from RX which can send power to the wall unit.

Note: If LAN POE is utilized at the RX the 48VDC supply is not required.

Option Port

On the rear of the unit there is an option card connector for the Dante/AES67 2ch or 8ch option or the ReAX control system option. Only one of the cards can be installed into a unit. To access the port, power off unit and the 2 screws (1 on each side) must be removed. Take the cover off and insert the card in the proper orientation as indicated on the circuit board. Put cover back on and apply power. Don't forget to note the MAC address of the card to identify which unit it is in.

OPERATION

Source Selection

The HT Series can change between the various sources via front buttons, RS-232, LAN, and Auto-Sense. Once a source is selected the display will lock within a few seconds. The time to lock depends on the display but typical time can be from 3-5 seconds. Keep in mind the HT-TX1-WP2 series does not scale so what comes in is what will go back out for the HDMI. Most modern displays have scalars and the HT Series can handle resolutions up to 4K60 4:4:4.

Auto Sense

The HT Series has Auto-Sense capability. Auto-Sense will automatically switch to the last HDMI input connected provided a hot-plug is provided from the source device. The HT-TX1-WP2 factory default is enabled but can be disabled and saved in non-volatile memory via RS-232 command. In addition, the front button selection or RS-232 control will allow the HT Series to switch away until another new input is detected. For example, if a user has a laptop plugged into the HDMI 1 port and then connects a Blu-ray® player to the HDMI 2 port, the HT-TX1-WP2 will automatically switch to the HDMI 2 input. If after that the laptop is disconnected or signal is removed with function keys and reconnected the HT-TX1-WP2 will switch back to the laptop. If an RS-232 command is received to switch to the opposite input the unit will do so as well. Whenever a source is changed the LED on the button will follow and the RS-232 ports will send a response string to let a remote device know that a change has occurred.

EDID Handling

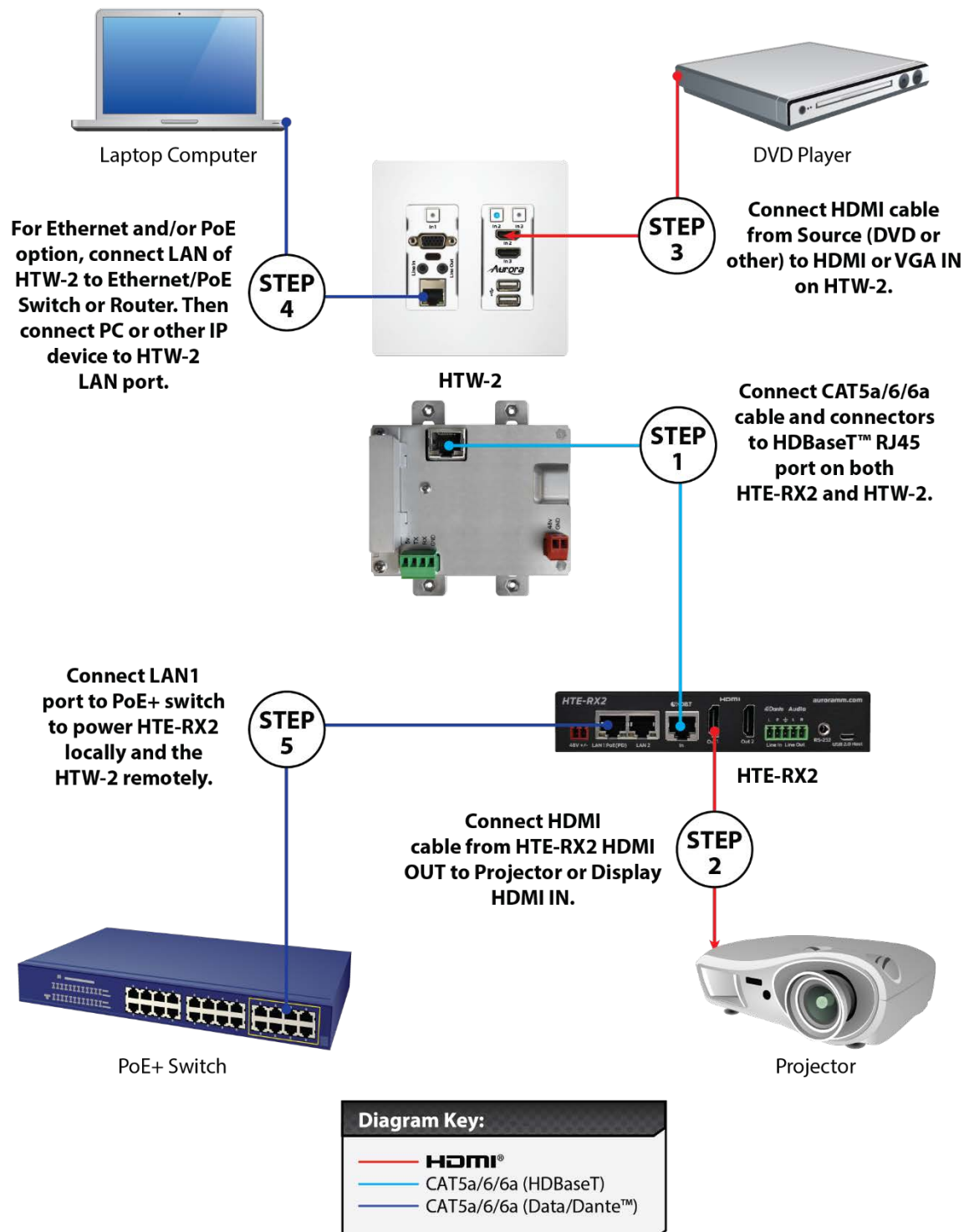
The HDMI port will retrieve the EDID from the destination device (ex. Projector, LCD, Matrix, etc.) via the HDBaseT connection to the receiver unit.

Factory Reset

Holding both buttons for 5 seconds will restore factory defaults. This will be confirmed by both buttons turning cyan. Keep in mind all stored settings into the non-volatile memory will revert to the factory defaults of each function accordingly.

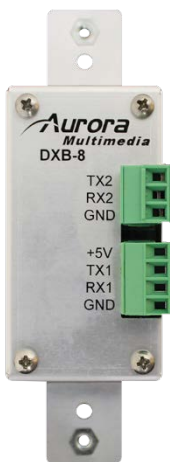
APPLICATIONS

Example 1 Typical HT-TX1-WP2 Transmitter to HT-TC1 Receiver



Example 2 DXB-8 Button Wall Control to HT-TX1-WP2

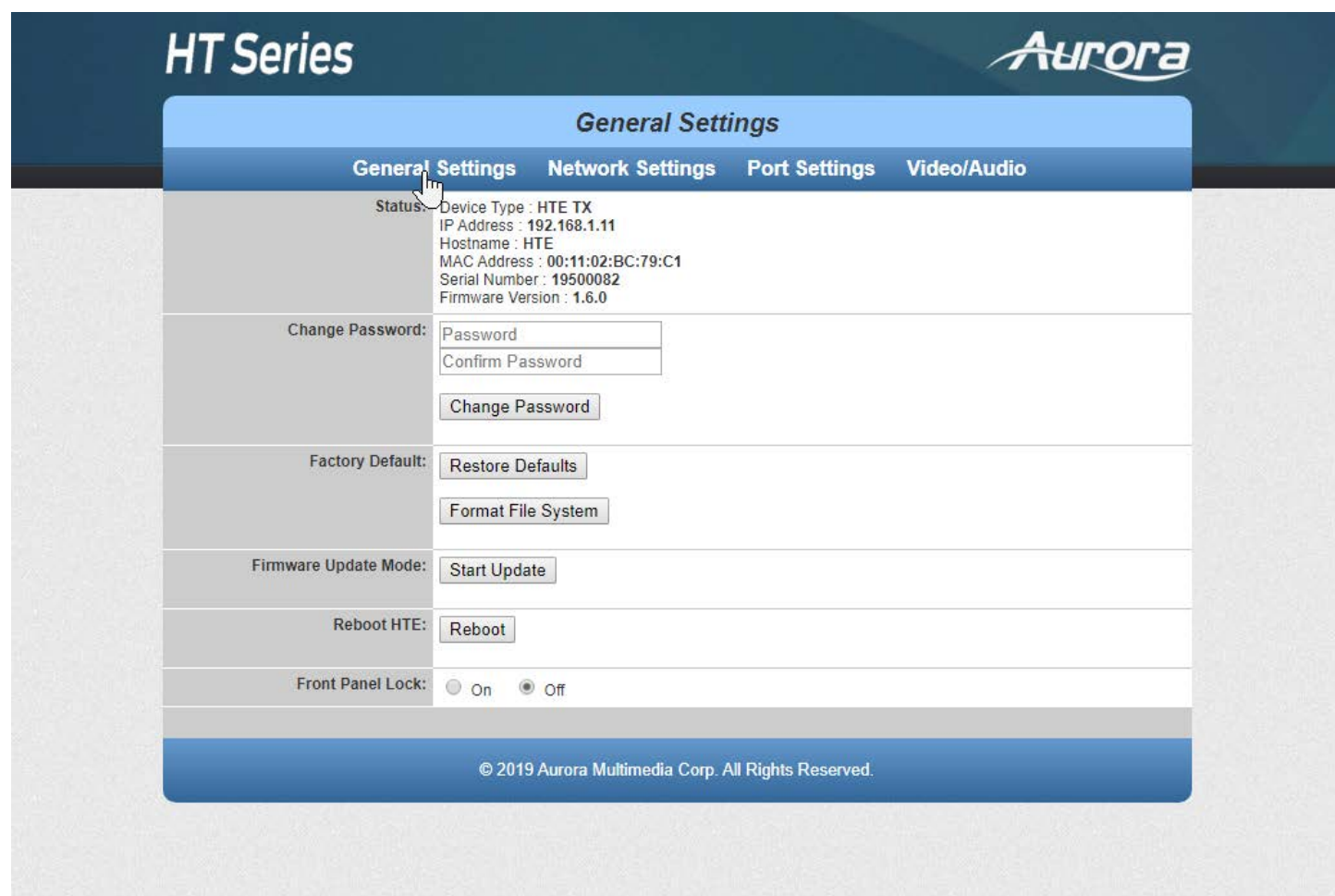
DXB-8 wall controller connected to the HT-TX1-WP2 Series. The DXB-8 serial port will connect and draw power from the HT-TX1-WP2 via the 4 pin RS-232 connection. Any serial command can be programmed into the DXB-8 at any baud rate and sent through the HT-TX1-WP2 to the HT-TC1 set as a receiver. This allows not only the switching of the HT-TX1-WP2 to be controlled but the remote display device as well. Make certain the baud rates are set the same on the HT-TX1-WP2 and the DXB-8. More information on the DXB-8 can be found on the Aurora website www.auroramm.com




WEB PAGE SETUP

Factory default is DHCP/Auto IP but for static the default will be 192.168.1.10

General Settings



HT Series



General Settings

[General Settings](#)
[Network Settings](#)
[Port Settings](#)
[Video/Audio](#)

Status: Device Type : HTE TX
 IP Address : 192.168.1.11
 Hostname : HTE
 MAC Address : 00:11:02:BC:79:C1
 Serial Number : 19500082
 Firmware Version : 1.6.0

Change Password:

Change Password

Factory Default:

Restore Defaults

Format File System

Firmware Update Mode:

Start Update

Reboot HTE:

Reboot

Front Panel Lock:

☐ On
 ☒ Off

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Network Settings

HT Series

Aurora

Network Settings

General Settings

Network Settings

Port Settings

Video/Audio

Current Network Settings:

IP Address : 192.168.1.11

Subnet Mask : 255.255.255.0

Gateway : 192.168.1.1

MAC Address : 00:11:02:BC:79:C1

Network Configuration:

Mode

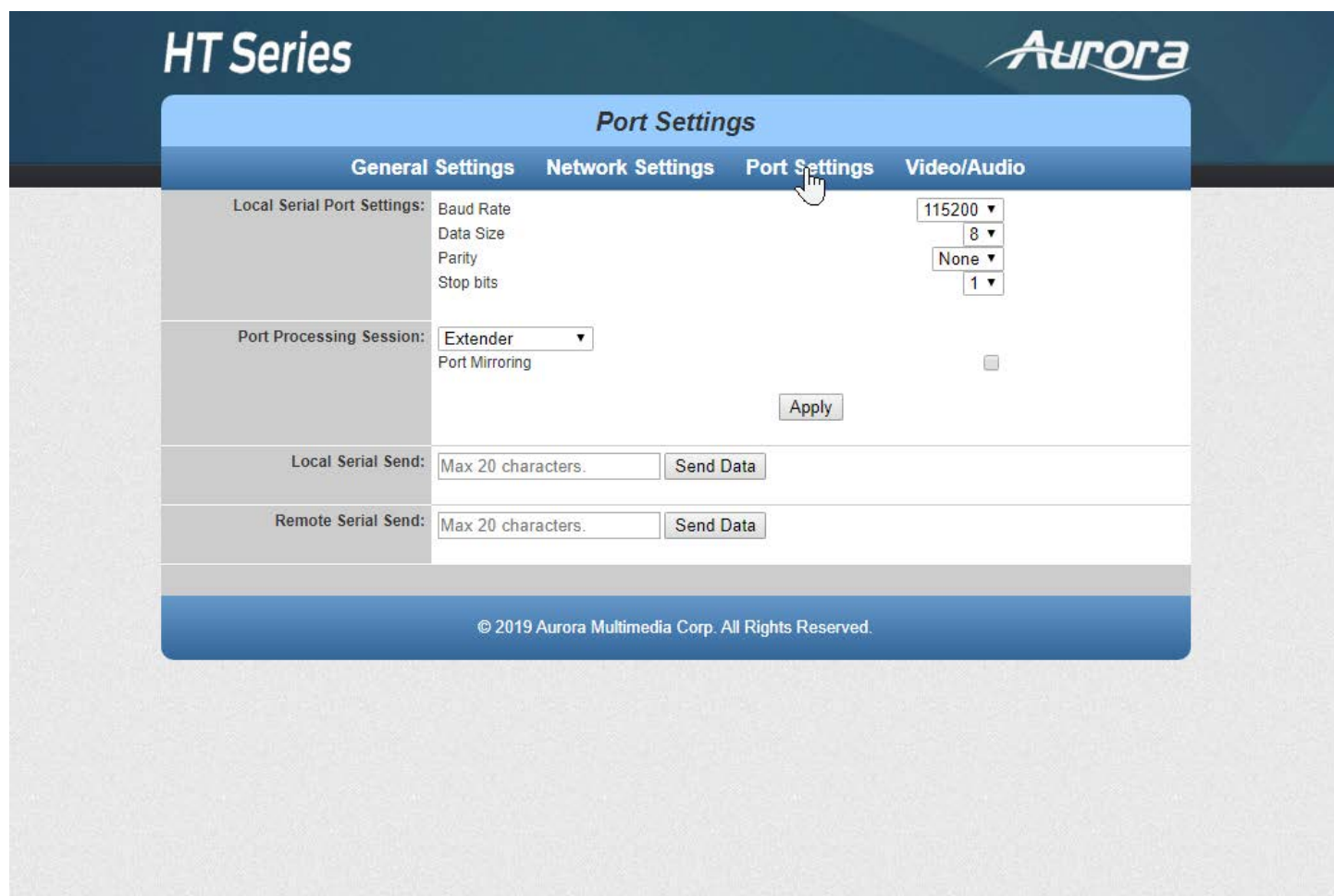
☒ Static
 ☐ DHCP
 ☐ Auto-IP

Static IP Address	192	168	1	11
Subnet Mask	255	255	255	0
Gateway	192	168	1	1

Apply Changes

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Port Settings



Note: Port Processing Session when set to Port Mirroring will allow the baud rates from one end to pass-through to the other. This feature is useful when combining with a DXB-8 or simply looking for a basic pass-through. The HT Series allows full control otherwise of all the pathway baud rates depending on the modes utilized.

Video/Audio Settings

HT Series

Aurora

Video/Audio Settings

General Settings

Network Settings

Port Settings

Video/Audio

Video Input

☐ IN1
 ☐ IN2
 ☒ IN3

Auto Sense

☒ Off
 ☐ On

Apply

Audio Settings

LineOut Source:

None

Dante Source:

None

Stream Source:

HDMI

Remote Audio Source:

None

Apply

LineIN Volume

100

Mute

LineOut Volume

92

Mute

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CONTROL PROTOCOLS

RS-232 Commands

! - Command, ? - Query, ~ Response

<CR> = 0x0D Hex / 13 Decimal

The serial command can be issued by the user via the local serial port of the device. !** is the command header used to specify the device. If !** is given as !20, then the command is intended for the TX/HTW devices. If the header !** is given as !30, then the command is intended for !30.

These commands are mainly used to control/configure the device. To query the device status/ configuration, refer Serial Query Commands.

If both TX and RX devices are connected, then the user can send serial commands from TX to RX by providing the serial header as !30. The TX will ignore the command and send it to the remote device. The remote RX will process the command and send the response back to the TX. The TX will output this response to the user. Similar is the case when !20 commands are issued to RX.

Note: By default, the configuration of the local serial port is Baud = 115200, Data bits = 8, Parity = None, Stop bits = 1.

Serial Command	String Format	Information
Reboot	!**REBOOT	Reboots the i.mx RT processor. Response: ~**REBOOT
Bootloader Update	!**BOOTUPDATE	Enable the bootloader update. Response: ~**BOOTUPDATE
Firmware Update.	!**WSUPDATE	Enter firmware update mode. Response: ~**WSUPDATE
Set Web Server IP Address	!**IPxxx:xxx:xxx:xxx<cr>	xxx = 000 – 255 Example: !**IP192.168.001.150<cr> Response: ~**IP192.168.001.150<cr>
Set Web Server Gateway	!**GWxxx:xxx:xxx:xxx<cr>	xxx = 000 – 255 Example: !**GW192.168.001.001<cr> Response: ~**GW192.168.001.001<cr>
Set Web Server Subnet	!**SMxxx:xxx:xxx:xxx<cr>	xxx = 000 – 255 Example: !**SM255.255.255.000<cr> Response: ~**SM255.255.255.000<cr>

Mask		
Debug Web Server Processor	!**DEBUGWSx<cr>	<p>X = 0 or 1 0 = Off 1 = On</p> <p>Example: !**DEBUGWS1 Response: ~**DEBUGWS1<cr></p>
Debug Web Video Processor	!**DEBUGMPx<cr>	<p>X = 0 or 1 0 = Off 1 = On</p> <p>Example: !**DEBUGMP1 Response: ~**DEBUGMP1<cr></p>
Serial Port Settings for external port	!**SP1,b,d,p,s<cr>	<p>b = Baud Rate 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 d = Data Size 7 or 8 p = Parity N, E, O (None, Even, Odd) s = Stop Bits 1 or 2</p> <p>Example: !**SP1,115200,8,N,1<cr> Response: ~**SP1,115200,8,N,1<cr></p>
Front Panel Lock	!**LOCKx<cr>	<p>X = 0 or 1 0 = Lock is disabled. 1 = Lock is enabled(Front buttons do not work).</p> <p>Example: !**LOCK1<cr> Response: ~**LOCK1<cr></p>
IP mode change.	!**DHCPx<cr>	<p>X = 0,1 or 2. 0 - DHCP mode. 1 - Static IP mode. 2 - AutoIP mode.</p> <p>Example: !**DHCP1<cr> Response: ~**DHCP1<cr></p>
Audio Routing	!**AUD<route_from>,<route_to><cr>	<p>These settings will be saved against the video source that is currently in selection.</p> <p>Route From</p> <p>Linein – 1, Dante – 2, Selected HDMI – 3, RemoteAudio - 4, ARC - 5, None - 0</p> <p>Route To</p>

		<p>Lineout - 1, Dante - 2, Stream Audio - 3, Remote Audio-4</p> <p>Example usages</p> <p>Linein to Lineout !**AUD1,1</p> <p>Linein to Dante !**AUD1,2</p> <p>Linein to Stream Audio !**AUD1,3</p> <p>Note: Need to enable the audio insertion to work this routing.</p> <p>Linein to Remote Audio !**AUD1,4</p>
Audio insertion enable/disable	!**AUD_INSERT<src>,<state><cr>	<p>src: Video source number 1, 2, 3, 4</p> <p>state: 0 or 1</p> <p>0 - disable 1- enable</p> <p>Eg:</p> <p>Enable audio insertion on source 1</p> <p>!**AUD_INSERT1,1<cr></p> <p>Response: ~**AUD_INSERT1,1<cr></p>
Video Routing	!**VID_SRCx<cr>	<p>X = 1 or 2 or 3 or 4</p> <p>Example: !**VID_SRC1<cr></p> <p>Response: ~**VID_SRC1<cr></p>
Auto sense enable/disable	!**AUTO_SENSE<1/0><cr>	<p>1 - enable 0 - disable</p> <p>Eg:</p> <p>!**AUTO_SENSE1<cr></p> <p>Response: ~**AUTO_SENSE1<cr></p> <p>Note: Only for HT-TC1 TX board.</p>

Set video source priority	<p>!**VID_SRC_PRIO<src>,<prio><cr></p>	<p>src: 1 or 2 or 3 or 4</p> <p>prio: 1 or 2 or 3 or 4</p> <p>1 has highest priority</p> <p>Eg:</p> <p>!**VID_SRC_PRIO1,1<cr></p> <p>Response:</p> <p>~**VID_SRC_PRIO1,1<cr></p> <p>Note: Only for HT-TC1 TX board.</p>
Factory default.	<p>!**WPROC_DFLT<cr></p>	<p>Factory defaults the HT-TC1 to default configuration.</p> <p>The default configuration is:</p> <p><i>IP mode = Auto-IP</i></p> <p><i>Static ip = 192.168.1.10</i></p> <p><i>Static netmask = 255.255.255.0</i></p> <p><i>Static gw = 192.168.1.1</i></p> <p><i>Serial conf = 115200-8n1</i></p> <p><i>Password = admin</i></p> <p><i>Button Lock = Disabled</i></p> <p><i>Port Processing mode = Extender mode</i></p> <p><i>USB mode (TX) = Host</i></p> <p><i>USB mode (RX) = Device</i></p> <p>Example: !**WPROC_DFLT<cr></p> <p>Response: ~**WPROC_DFLT<cr></p>
USB mode change.	<p>!**USBx<cr></p>	<p>Change USB mode.</p> <p>X = 0 or 1.</p> <p>0 - Host.</p> <p>1 - Device.</p> <p>Example: !**USB1<cr></p> <p>Response: ~**USB1<cr></p> <p>Note:</p> <p><i>If a video stream is in progress, then it will be stopped for a moment.</i></p> <p>Note:</p> <p><i>Whenever the USB mode is changed, there will be a</i></p>

		'0x00' character in the UART.
Line in volume	!**LINEIN_VOL<0-100><cr>	~**LINEIN_VOL<0-100><cr> Eg: !**LINEIN_VOL88<cr>
Line Out volume	!**LINEOUT_VOL<0-100><cr>	~**LINEOUT_VOL<0-100><cr> Eg: !**LINEOUT_VOL88<cr> Response: ~**LINEOUT_VOL88<cr>
Linein Mute	!**LINEIN_MUTE<0/ 1><cr>	1 = Mutes the Linein 0 = Unmute the Linein Eg; !**LINEIN_MUTE0<cr> Response: ~**AUD_MUTE0<cr>
Lineout Mute	!**LINEOUT_MUTE<0/ 1><cr>	1 = Mutes the Line out 0 = Unmute the Line out Eg; !**LINEOUT_MUTE0<cr> Response: ~**AUD_MUTE0<cr>
Wake OLED from sleep	!**OLED_WAKE<cr>	Response: ~**OLED_WAKE

Adjust OLED sleep time	!**OLED_SLEEP<sleep><cr>	<p>sleep: 0 - 10 minutes</p> <p>Sleep time is the time after which the OLED goes to screen saver mode if there is no update in OLED menu.</p> <p>0 - OLED doesn't go to screen saver</p> <p>Eg:</p> <p>!**OLED_SLEEP<1><cr></p> <p>Response:</p> <p>~**OLED_SLEEP1<cr></p>
Set the OLED menu brightness	!**OLED_SET_MAX<val><cr>	<p>val: 0 - 10 (max)</p> <p>Eg:</p> <p>!**OLED_SET_MAX<10><cr></p> <p>Response:</p> <p>~**OLED_SET_MAX10<cr></p>
Set the OLED screen saver brightness	!**OLED_SET_MIN<val><cr>	<p>val: 0 - 10 (max)</p> <p>Eg:</p> <p>!**OLED_SET_MIN<0><cr></p> <p>Response:</p> <p>~**OLED_SET_MIN0<cr></p>

Table 1. Serial commands

Serial Query Commands

These serial commands are used to query the device status/configuration. The headers used are the same as that in Serial commands.

Serial Query Command	String Format	Information
Web Server IP Address	?**IP<cr>	X = 000 - 255 Response: ~**IPxxx:xxx:xxx:xxx<cr>
Web Server Subnet Mask	?**SM<cr>	X = 000 - 255 Response: ~**SMxxx:xxx:xxx:xxx<cr>
Web Server Gateway	?**GW<cr>	X = 000 - 255 Response: ~**GWxxx:xxx:xxx:xxx<cr>
Web Server MAC Address	?**WSMAC<cr>	x = web server MAC (xx:xx:xx:xx:xx:xx) Response: ~**WSMAC:x<cr>
Serial Port Settings	?**SP1<cr>	Response: ~**SP1,b,d,p,s<cr> b = Baud Rate 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 d = Data Size 7 or 8 p = Parity N, E, O (None, Even, Odd) s = Stop Bits 1 or 2
USB Mode	?**USBx<cr>	x = 0 or 1 (0 = Host TX, 1 = Device) Response: ~**USBx<cr>
Debug Web Server Processor	?**DEBUGWS<cr>	X = 0 or 1 0 - Off 1 - On Response: ~**DEBUGWS<cr>
IP mode query	?**DHCP<cr>	Response: ~**DHCPx<cr> x = 0, 1 or 2 0 - DHCP 1 - Static 2 - AutoIP
Front panel lock query	?**LOCK<cr>	Response: ~**LOCKx<cr> X = 0 or 1 0 - Unlocked. 1 - Locked.

Application version	?**VER1<cr>	Response: ~**VER1:a.b.c<cr> Version is 'a.b.c'.
Protocol API version	?**VER2<cr>	Response: ~**VER2:a.b.c<cr> Version is 'a.b.c'. For current document, it will be 1.0.0.
VGA processor version	?**VER3<cr>	Response: ~**VER3:a<cr> Version is 'a'. Note: Only for HT-TC1 W board.
Bootloader presence	?**BOOTAVAIL<cr>	Response: ~**BOOTAVAILx<cr> x = 0 or 1 0 - Absent 1 – Present
Video source	?**VID_SRC<cr>	Response: ~**VID_SRCx<cr> x = 1 or 2 or 3 or 4
Video source priority	?**VID_SRC_Prio<src><cr> r>	src: 1 or 2 or 3 or 4 Response: ~**VID_SRC_Prio<src><prio><cr> prio: 1 or 2 or 3 or 4 Note: Only for HT-TC1 TX board.
HDCP status	?**HDCP<cr>	Response: ~***HDCP<0/1><cr> 0 - disable 1- enable Note: Only for HT-TC1 TX board.
Audio routing	?**AUD<cr>	~**AUD-Line_Out-none,Dante- none,Stream_Source- video_src_audio,Remote_Audio-line_in,Line_in_vol- 100,Line_out_vol-92,Line_in_mute- 0,Line_out_mute-0,Audio_insert1- disable,Audio_insert2-disable,Audio_insert3-

		disable, Audio_insert4-disable
Static IP	?**STATICIP<cr>	<p>Returns the static ip of the device</p> <p>Eg:</p> <p>?**STATICIP<cr></p> <p>Response:</p> <p>~20STATICIP<ip>,NM<netmask></p> <p>ip: ip address</p> <p>netmask : netmask</p>
Auto sense	?**AUTO_SENSE<cr>	<p>Get the status of auto sense</p> <p>Applicable only in TX</p> <p>Eg:</p> <p>?**AUTO_SENSE<cr></p> <p>Response</p> <p>~**AUTO_SENSE<x><cr></p> <p>x: 0 (Disable) 1(Enable)</p> <p>Note: Only for HT-TC1 TX board</p>

Table 2. Serial Query Commands

ReAX Commands

The device parameters can be controlled by ReAX commands. A Tcp server is running at the port 6970 which listens for the ReAX command and responds in JSON format accordingly.

ReAX Command	String Format	Information
set_audio_route	set_audio_route <route_from> <route_to>	<p>Modify or set the audio routing.</p> <p><u>Route From:</u></p> <p>none, linein, dante, hdmi, remote_audio, arc</p> <p><u>Route To</u></p> <p>Lineout, dante, stream_audio, remote_audio</p> <p>Eg:</p> <pre>set_audio_route linein lineout set_audio_route linein stream_audio</pre>
aud_insert	aud_insert <video_port> <enable/disable>	<p>Enable or disable the audio insertion for each video port</p> <p>Video_port: in1, in2, in3, in4, stream(only for decoder)</p> <p>Eg:</p> <pre>aud_insert in1 enable</pre>
set_volume	Set_volume <audio_port> <volume_level>	<p>Controls the linein and lineout volume.</p> <p>Audio_port: linein, lineout</p> <p>Volume_level: 0-100, mute, unmute</p> <pre>set_volume linein mute set_volume lineout 85</pre>
set_ip	set_ip <ip_mode> <ip_addr> <subnet> <gateway>	<p>Configure the IP address of the device</p> <p>Ip_mode: DHCP, static, auto_ip</p> <p>Eg: set_ip static 192.168.1.101 255.255.0.0 192.168.1.1</p>

		<code>set_ip auto_ip</code> <code>set_ip DHCP</code>
get_audio_route	<code>get_audio_route</code>	<p>Displays the full info of the Audio routing in the device of the current selected source</p> <p>Eg: <code>get_audio_route</code></p>
get_aud_insert	<code>get_aud_insert <video_port></code>	<p>Returns the audio insert state for the video port</p> <p>Video_port: in1, in2, in3, in4, stream(only for decoder)</p> <p>Eg:</p> <p><code>get_aud_insert in1</code></p>
get_volume	<code>get_volume <audio_port></code>	<p>Returns the Volume of the Linein audio or Lineout audio.</p> <p>Audio_port : linein, lineout</p> <p>Eg: <code>get_volume linein</code></p>
config_rs232	<code>config_rs232 <port_no.></code> <code><baud_rate> <data_bit></code> <code><stop_bit> <parity></code> <code><hand_shaking></code> <code><signal_level></code>	<p>Baud Rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200</p> <p>Port Number: 1</p> <p>baud_rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200</p> <p>Data_bit: 7, 8</p> <p>Parity: n,o,e</p> <p>Handshaking: none, software</p> <p>signal_level: RS232</p> <p>Example:</p> <p><code>config_rs232 1 115200 8 1 n none RS232</code></p>
set_video_source	<code>set_video_source <video_port></code>	<p>Video_port: in1, in2, in3, in4, stream (only in decoder)</p> <p>Eg:</p> <p><code>set_video_source in1</code></p> <p><code>set_video_source in3</code></p>
get_video_source	<code>get_video_source</code>	Returns the current video source that is being

		streamed. Eg: <code>get_video_source</code>
get_ip	<code>get_ip</code>	Returns the Current ip of the device Eg: <code>get_ip</code>
get_ip_static	<code>get_ip_static</code>	Returns the last saved static ip address Eg: <code>get_ip_static</code>
get_mac	<code>get_mac</code>	Returns the mac id of the device Eg: <code>get_mac</code>
get_rs232	<code>get_rs232 <port_num></code>	Returns the rs232 configuration values port_num: 1 Eg: <code>get_rs232 1</code>
get_auto_sense	<code>get_auto_sense</code>	Returns the auto sense status Eg: <code>get_auto_sense</code>
set_auto_sense	<code>set_auto_sense <enable/disable></code>	Control auto sense feature Eg: <code>set_auto_sense enable</code>
set_video_src_prio	<code>set_video_src_prio <video_port> <val></code>	Set the video port priority for auto sense Video_port: in1, in2, in3, in4, stream(only for decoder) Val: 1, 2, 3, 4 1 has the highest priority Eg:

		set_video_src_prio in1 1
get_video_src_prio	get_video_src_prio <video_port>	Returns the auto sense priority for the video port Video_port: in1, in2, in3, in4, stream(only for decoder) Eg: get_video_src_prio in1
set_hdcp	set_hdcp <enable/disable>	Enable or Disable HDCP support Eg: set_hdcp enable
get_hdcp	get_hdcp	Returns the HDCP state of the system Eg: get_hdcp
reboot	reboot	Reboots the device Eg: reboot
update_bootloader	update_bootloader	Enters the tftp mode to receive the bootloader firmware via tftp Eg: update_bootloader
update_firmware	update_firmware	Enters the bootloader mode to receive the new firmware via tftp. After timeout if no firmware is received the previous firmware is loaded. Eg: update_firmware
button_lock	button_lock <enable/disable>	Controls the button lock Eg: button_lock disable

set_ip DHCP	set_ip DHCP	<p>Sets the device in to DHCP Mode</p> <p>Eg:</p> <pre>set_ip DHCP</pre>
set_ip auto_ip	set_ip auto_ip	<p>Eg:</p> <pre>set_ip auto_ip</pre>
filesystem_default	filesystem_default	<p>Defaults the file system. After defaulting, the device will reboot with /IR and /wwwpub directories present.</p> <p>Eg:</p> <pre>filesystem_default</pre>
factory_default	factory_default	<p>Factory defaults the HT-TC1 to default configuration.</p> <p>The default configuration is:</p> <p><i>IP mode = Auto-IP</i></p> <p><i>Static ip = 192.168.1.10</i></p> <p><i>Static netmask = 255.255.255.0</i></p> <p><i>Static gw = 192.168.1.1</i></p> <p><i>Serial conf = 115200-8n1</i></p> <p><i>Password = admin</i></p> <p><i>Button Lock = Disabled</i></p> <p><i>IR Carrier removal = Disabled</i></p> <p><i>IR Carrier reversal = Disabled</i></p> <p><i>Port Processing mode = Extender mode</i></p> <p><i>USB mode (TX/HTW) = Host</i></p> <p><i>USB mode (RX) = Device</i></p> <p>Eg:</p> <pre>factory_default</pre>
set_usb_mode	set_usb_mode <host/device>	<p>Sets the USB mode</p> <p>Note: <i>If a video stream is in progress, then it will be stopped for a moment.</i></p> <p>Note: <i>Whenever the USB mode is changed, there will be a '0x00' character in the UART.</i></p> <p>Eg:</p> <pre>set_usb_mode host</pre>
get_usb_mode	get_usb_mode	Returns the current usb mode

		Eg: get_usb_mode
get_serial_number	get_serial_number	Returns the serial number of device Eg: get_serial_number
get_button_lock	get_button_lock	Returns the button lock status Eg: get_button_lock
get_fw_version	get_fw_version	Returns the firmware version Eg: get_fw_version
get_api_version	get_api_version	Returns the command api version Eg: get_api_version
get_sil8784_fw_version	get_sil8784_fw_version	Returns the silicon device firmware Eg: get_sil8784_fw_version
get_bootloader_presence	get_bootloader_presence	show whether bootloader is present Eg: get_bootloader_presence
serial_send	serial_send <port> <string>	Send the serial string via the serial port in the command The string should be enclosed in quotes serial_send 1 "abcd"
oled_set	oled_set <property> <value>	Property: sleep, menu_bright, sleep_bright Value: 0 - 10

		<p>Eg:</p> <p>Change OLED sleep time to 1 min</p> <pre>oled_set sleep 1</pre> <p>Change OLED menu brightness to 10</p> <pre>oled_set menu_bright 10</pre> <p>Change OLED screen saver brightness to 1</p> <pre>oled_set sleep_bright 1</pre>
oled_wake	oled_wake	Wake OLED from sleep
get_oled_setting	get_oled_setting	<p>Returns the current OLED settings</p> <p>Eg:</p> <pre>get_oled_setting</pre>

IR EXTENDERS

IR Connections

- **IR Blaster/Emitter.** Plug in an IR blaster to emit all IR command signals received from the IR receiver to control the associated devices with built-in IR sensor.
- **IR Receiver.** Plug in an IR receiver to receive all IR command signals from the IR remote controls of the associated devices.

**Note: If you are not using an approved Aurora branded receiver, make certain you do not exceed the 5v signal level limitation as some devices use 12v. Also, IR Receiver must be 30K-60KHz inverted 5V signal. Failure to do so will result in damage.*

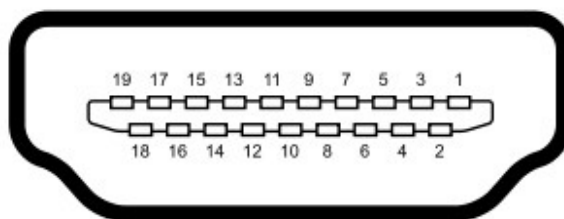
IR Jack Pinout



**Note: Emitters must be mono or have ring and sleeve tied to ground. Receivers must be stereo plug. Ring is 5v power. If using another brand receiver, note carrier frequency must be present, IR signal inverted, and IR signal cannot exceed 5v or damage to port may occur.*

CONNECTOR PIN DEFINITION

HDMI












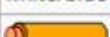
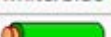
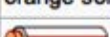
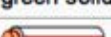
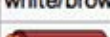
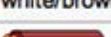


Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	Pin 8	TMDS Data0 Shield	Pin 15	SCL
Pin 2	TMDS Data2 Shield	Pin 9	TMDS Data0–	Pin 16	SDA
Pin 3	TMDS Data2–	Pin 10	TMDS Clock+	Pin 17	DDC/CEC Ground
Pin 4	TMDS Data1+	Pin 11	TMDS Clock Shield	Pin 18	+5 V Power
Pin 5	TMDS Data1 Shield	Pin 12	TMDS Clock–	Pin 19	Hot Plug Detect
Pin 6	TMDS Data1–	Pin 13	CEC		
Pin 7	TMDS Data0+	Pin 14	Reserved (N.C. on device)		

CAT5e/6/7

T568A and T568B Wiring

Pin	T568A Pair	T568B Pair	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	tip	 white/green stripe	 white/orange stripe	 Pin Position 8 7 6 5 4 3 2 1
2	3	2	ring	 green solid	 orange solid	
3	2	3	tip	 white/orange stripe	 white/green stripe	
4	1	1	ring	 blue solid	 blue solid	
5	1	1	tip	 white/blue stripe	 white/blue stripe	
6	2	3	ring	 orange solid	 green solid	
7	4	4	tip	 white/brown stripe	 white/brown stripe	
8	4	4	ring	 brown solid	 brown solid	

APPENDIX 1

Troubleshooting

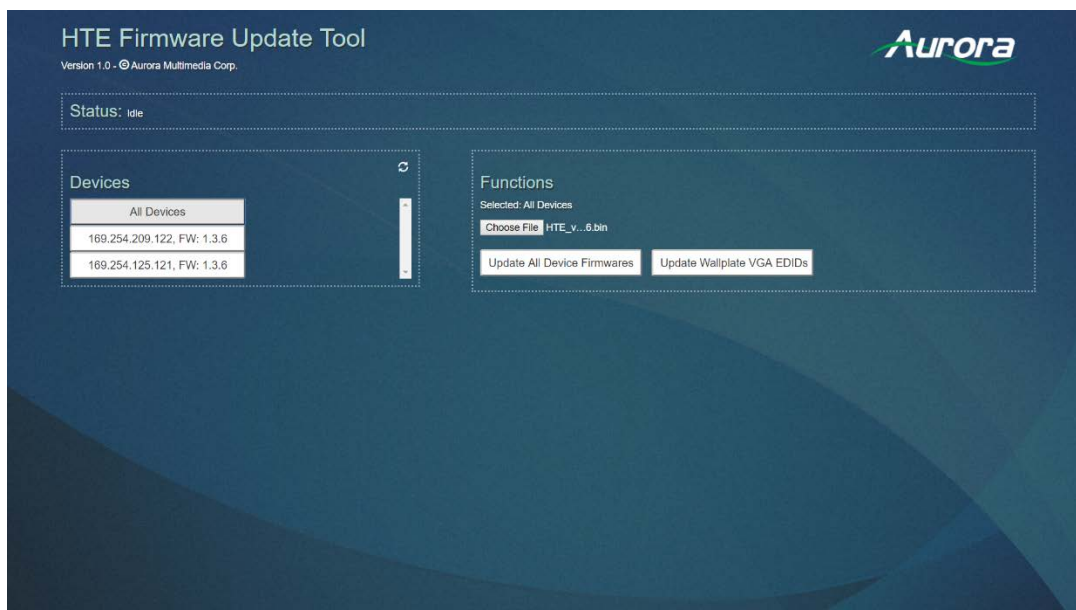
Problem	Solution
1. No Video Signal.	a. Check that the power plug is properly inserted into a functioning power outlet. Keep in mind the HT Series can be powered locally or remotely via HDBaseT PoH. b. Make certain source is on. c. Verify pin-out of connector at each end.
2. LED is not lit	a. Check 48v power supply is plugged in locally or at the far end receiver unit. b. Check to see if Wall supply is plugged into wall outlet. c. Make certain wall outlet has power.
3. LAN Not Working	a. Verify receiver unit is capable of LAN.
4. IR not working	a. Verify using proper emitter at receiver unit. Use Aurora branded accessories for best results.
5. USB not charging	a. Total power between the 2 ports is 5 watts. If exceeded the current protection will kick in until within specification. Try connecting one device at a time to make certain it works before plugging in 2 devices.
6. USB not working	a. Make certain proper power supply wattage is being used to power both HT-TX1-WP2 and the receiver. Refer to technical specifications for more info on power consumption.
7. Unit not working	a. Check if remote receiver is supplying power. b. Make certain proper power supply wattage is being used to power both HT-TX1-WP2 and the receiver. Refer to technical specifications for more info on power consumption.
8. Certain functions listed in manual do not function	a. Make certain unit has latest firmware
9. 720p or 1080p is too big for screen (Over scanned)	a. The HT Series does not scale. Check the display's settings for over-scan mode. Displays cannot tell the difference between a video source and a PC source. In turn they usually have a setting in the menus to deal with this. Check under Aspect Ratio settings, PC / Video mode, etc. Note if you plug the VGA directly into display and compare to input of HT-TX1-WP2 it is not a proper test. The HT-TX1-WP2 is connected through the HDMI input not VGA of the display. The display will handle the signal different as the display will know not to over scan a VGA signal. HDMI is treated as a video source first and as a PC source secondary when dealing with video resolutions.

- All transmission distances are measured using West Penn cable as per Appendix 3. The transmission distance is defined as the distance between the video source and the display.
- To reduce the interference among the unshielded twisted pairs of wires in UTP cable, you can use shielded STP cables to improve EMI problems, which is worsen in long transmission.

APPENDIX 2 Firmware Update

HT Series Firmware Update Tool

HT Update Tool can be downloaded from the Aurora portal on www.auoramm.com. Once downloaded, extract and run the "htfwtool.exe" file. It'll open a window and tell you to go to 127.0.0.1:3002 on your browser (port 3002). You will be able to update all units or individually.



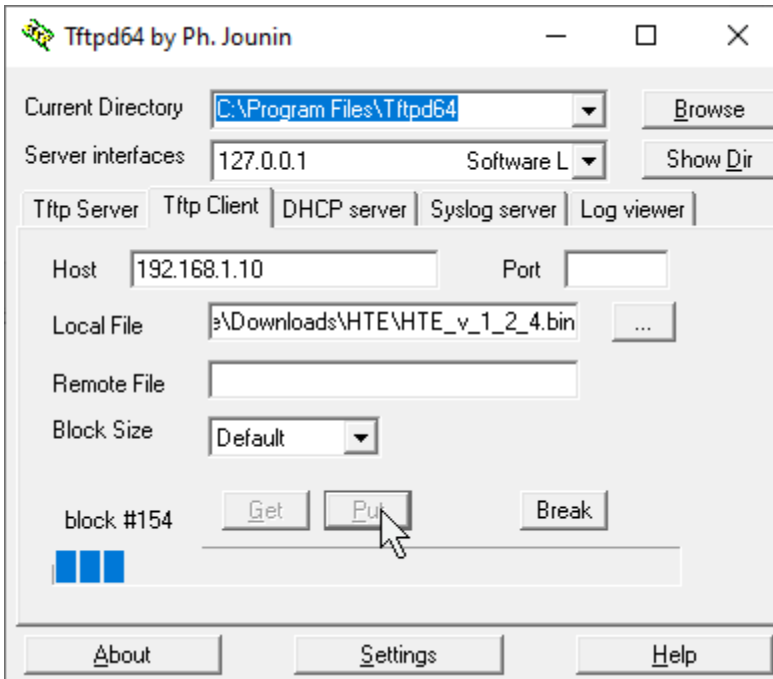
Important! Make sure not to close the console window or browser in the middle of updating. For a large number of devices, it may take several minutes to complete.

TFTP Tool Method

The HT Series device can be put to bootloader mode in one of the following ways:

- Press and hold the FUNC button when the board is powered on.
- Issue !**WSUPDATE<cr> command via serial port. !** is !20 for TX /HTW and !30 for RX.
- Select 'Start Update' from the device's webpage.
- Issue the 'EnterUpdateMode' RPC command.

Once in update mode, TFTP the firmware



Enter the IP address of the unit into the 'Host' field and select the firmware file (HT_v_#_#_#.bin) from the 'Local File' field in the 'Tftp Client' tab of TFTPd. Please wait about 10 seconds after entering firmware update mode before clicking 'Put'. If the update does not start immediately, click 'Break' and then 'Put' again. If you do not know the IP address of the unit, plug in a serial cable and the IP address will appear in your terminal at baud rate 115200 upon entering firmware update mode.

Link to TFTPd program: <https://bitbucket.org/phjounin/tftpd64/downloads/Tftpd64-4.64-setup.exe>

APPENDIX 3

Technical Specifications

Model Name	HT Series
Technical	HT-TC1
Distance	CAT 6a will achieve 230ft 70m for pixel clock >225MHz CAT 7 will achieve 328ft 100m for pixel clock >225MHz
Max Resolution	4K60 4:4:4
Color Depth	24bit 5e/6/6a/7, 36bit 5e/6, 48bit 5e/6/6a/7
RS-232	300 – 115kbps
IR without LXC	30K-60KHz
LAN	2 – 1Gbps local, 10/100/1000 over HDBaseT Link
LAN POE+	Port 1 PoE+
HDMI	HDMI 2.0 HDCP 2.2 Compliant
Front LED Status	Power, Status
Front Selections	Menu, Select, Up, Down
OLED	80x64 White on black
LAN Connectors	Dual RJ-45 8P8C with 2 LED indicators each
HDBaseT Connector	RJ-45 WE/SS 8P8C Blue
RS-232 Connector	5 pin Euro TX, RX, GND
IR Connector	Receiver: 3.5mm TRS Signal- TIP, 5V- Ring, GND- Sleeve Transmitter: 5pin Euro Single and Gnd
HDMI Connector	Four Type A 19 pin Input and 1 Output
Audio Connectors	5 Pin 3.81mm Euro Line In/Line Out
Power Connector	2 pin 3.81mm Euro
Option Slot	Internal Dante/AES67 Option: IPE-DTE-1 (2 Ch), IPE-DTE-2 (8 Ch) ReAX Option: IPE-ReAX-1
Mechanical	HT-TC1 Unit
Housing	Black Aluminum Enclosure
Dimensions [L x W x H]	177mm x 104.2mm x 26.4mm [6.969" x 4.102" x 1.039"]
Weight	1lbs [.453kg]
Mounting	Wall-mounting and Rack Mounting
Power Supply	48VDC (Only 1 required on either TX or RX)

Power Consumption	12.9 Watts with USB [max]
Operation Temperature	0~40°C [32~104°F]
Storage Temperature	-20~60°C [-4~140°F]
Relative Humidity	20~90% RH [no condensation]
Package Contents	1x HT-TC1 2 x Wall / Desk Mount Ears with Screws IR Receiver 30K-60KHz (CA0062-1)
Options	IR Emitter (CA0061-1) PS0094-3 48v DC 25 Watt Power Supply PS0081-1 48V PoE+ 25 Watt Power Supply IPE-DTE-1 Dante/AES67 2 Channel IPE-DTE-2 Dante/AES67 8 Channel IPE-ReAX-1 ReAX IP Control Card

**Note: Specifications subject to change without notice.*

Model Name	HT-TX1-WP2
Technical	HT-TX1-WP2 Wall Plate
Video Distance (HDBaseT)	CAT 6a will achieve 230ft 70m for pixel clock >225MHz CAT 7 will achieve 328ft 100m for pixel clock >225MHz
Max Resolution	4k x 2k @ 60Hz 4:4:4 Uncompressed
Color Depth	24bit 5e/6/6a/7, 36bit 5e/6, 48bit 5e/6/6a/7
RS-232	300 - 115kbps
IR Window	30kHz-60Khz
LAN	10/100
HDMI	HDMI 2.0 HDCP 2.2 Compliant
Front Selections	2 Backlit Buttons (Red, Green, Blue)
HDBaseT Connector	Rear RJ-45 WE/SS 8P8C
RS-232 Connector	4 pin 3.81mm Euro Rear
HDMI Connector	Two Type A 19 pin
Audio Connectors	3.5mm Line In/Line Out
Power Connector	2 pin 3.81mm Euro
Option Slot	Dante/AES67 Option: IPE-DTE-1 (2 Ch) ReAX Option: IPE-ReAX-1
Mechanical	HT-TX1-WP2
Housing	Aluminum front with aluminum rear enclosure
Dimensions [L x W x D]	3.728" x 2.83" (4.331" with tabs) x 1.404"
Weight	1.13g [2.5lbs]
Mounting	Wall-mounting Decora® 2 Gang

Power supply	48V DC
Power consumption	8 Watts without USB 12.9 Watts with USB
Operation temperature	0~40°C [32~104°F]
Storage temperature	-20~60°C [-4~140°F]
Relative humidity	20~90% RH [no condensation]
Package Contents	1x HT-TX1-WP2 1x Paintable White Wall Plate 1x User Manual
Options	PS0094-3 48v DC 25 Watt Power Supply PS0081-1 48V PoE+ 25 Watt Power Supply IPE-DTE-1 Dante/AES67 2 Channel IPE-ReAX-1 ReAX IP Control Card

Specifications subject to change without notice.

APPENDIX 4

Cabling

Aurora extender products have been tested utilizing shielded cabling. Although our products will work fine without shielded cable it is highly recommended for environmental reasons as the signals are high frequency and can radiate as well as be susceptible to external frequencies and possibly cause noise or disruption in the image. Unshielded cabling will work fine in a conduit as it will provide the shielding. We have found not all cable is created equal even though they appear similar. This can affect distance and overall performance. Below is a list of cables that have been officially tested with our products by the manufacturer of the cable.

West Penn Wire

CAT 6 Shielded - HDBaseT Certified - Only in Black
4246F – CMR, 254246F – CMP (Plenum)

CAT 6a Shielded HDBaseT Certified - Only in Black
4246AF – CMR, 254246AF – CMP (Plenum)

Both CAT 6 and CAT 6a Shielded Cables utilized a Modular Plug Kit:
90170-BI - Includes: 100 Connectors, 100 Boots, Crimp Tool, External round Crimp Tool, Strip Tool

APPENDIX 5

Warranty

Limited 5 Year Warranty

Aurora Multimedia Corporation ("Manufacturer") warrants that this product is free of defects in both materials and workmanship for a period of 5 years as defined herein for parts and labor from date of purchase. This Limited Warranty covers products purchased in the year of 2019 and after. Motorized mechanical parts (Hard Drives, DVD, etc.), mechanical parts (buttons, doors, etc.), remotes and cables are covered for a period of 1 year. Touch screen displays are covered for 1 year; touch screen overlay components are covered for 90 days. Supplied batteries are not covered by this warranty. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with same or similar model) at our option without charge for parts or labor for the specified product lifetime warranty period.

This warranty shall not apply if any of the following:

- A. The product has been damaged by negligence, accident, lightning, water, act-of-God or mishandling; or,
- B. The product has not been operated in accordance with procedures specified in operating instructions; or,
- C. The product has been repaired and or altered by other than manufacturer or authorized service center; or,
- D. The product's original serial number has been modified or removed; or,
- E. External equipment other than supplied by manufacturer, in determination of manufacturer, shall have affected the performance, safety or reliability of the product; or,
- F. Part(s) are no longer available for product.

In the event that the product needs repair or replacement during the specified warranty period, product should be shipped back to Manufacturer at Purchaser's expense. Repaired or replaced product shall be returned to Purchaser by standard shipping methods at Manufacturer's discretion. Express shipping will be at the expense of the Purchaser. If Purchaser resides outside the contiguous US, return shipping shall be at Purchaser's expense.

No other warranty, express or implied other than Manufacturer's shall apply.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to a malfunction of the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period. This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage. This product warranty extends to the original purchaser only and will be null and void upon any assignment or transfer.



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