FHD264-S

FHD264-R

FHD264

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Contents

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FCC RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been designed to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are intended to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1.0 Introduction

1.1 General

The FHD264 series is a family of HDMI over LAN Senders (encoders) and Receivers (decoders) that utilizes advanced H.264 video encoding to distribute multiple Full HD video signals on a Gigabit local area network (LAN). The devices also extend bi-directional RS-232 communication, and IR control. Other features include a built-in WebGUI, Fail-Safe video routing, audio de-embedding, and Serial Over IP (SoIP). Senders are available as either a standalone unit (-S), or a single-gang Decora style Wallplate (-WP).

An important feature of the system is its ability to switch Receivers on the fly to show the video of any Sender on the network using Hall Research's DVM (*Dynamic Virtual Matrix™*) technology. Switching is accomplished by using:

- Front Panel Buttons
- IR Remote Controller
- Built-in Webpage (WebGUI) in each unit (accessible from any browser)
- Telnet Commands (ideal for third-party control of switching)
- Windows™ PC running DVM Manager Tool software (free download)
- CNT-IP-264 (A standalone networking module designed to manage Models FHD264 and HHD264)

FHD264 system applications include: digital signage, meeting rooms, classrooms, bus & metro stations, airports, home theater, and more. All models can be powered via PoE (PD), and come with a power supply in case PoE is not available over the network.
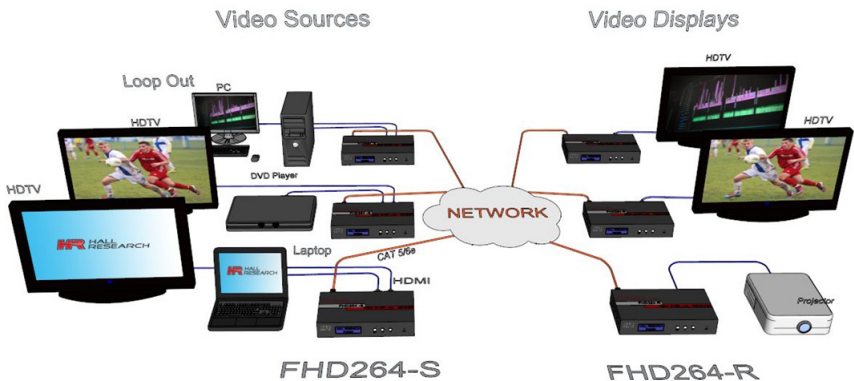

Figure 1 - Block Diagram

1.2 Features

- Supports SD, HD and Full-HD (1080p@60 Hz) resolutions
- HDCP 1.4 compliant
- Sender HDMI loop output for local monitor
- Fail-Safe video routing to create automatic AV system redundancy
- User selectable streaming bit rate (2 to 18 Mbps depending on resolution).
- Video Scaler in Sender to manage bandwidth
- Bi-directional RS-232 extension from sender to all receivers in same group
- IR (infrared) extension from receivers to paired sender
- Serial Over IP(SoIP) to control companion serial devices
- IR Remote Control for pass through and local control
- HDMI audio extraction at both Sender and Receiver end
- Front Panel with LCD and buttons to display device information and change IP configuration
- Easy to use WebGUI in each unit, accessible from any browser
- Free Windows™ DVM Manager Tool software (for system-wide configuration and video switching from one GUI)
- Units can be powered over the network using PoE.
- Each device can have a user-definable name (e.g. Lobby Display, Projector)
- Low power consumption (less than 3 W)

2.0 Package Contents

(1) Model FHD264 (-S, -R, or -WP)
(1) 5V DC Power Supply with universal plug adapter kit and locking DC connector (-S and -R. -WP power supply sold separately)
(1) IR Emitter Cable with Senders
(1) IR Detector Cable with Receivers
(1) IR Remote Controller with Receivers
(1) Set of L-bracket mounting hardware (-S and -R)
(1) Decora Cover Plate (-WP)
(1) User's Manual

3.0 Installation

For installations having multiple Senders and Receivers, a dedicated Gigabit (1000 BaseT) network (multi-port routers) is recommended. The H.264 encoding scheme allows user-definable bit rates to give users control over bandwidth used for each video stream.

3.1 Configuration

FHD264 systems support several modes of operation: point-to-point (one Sender connected to one Receiver with no LAN infrastructure), point-to-many (one Sender to many Receivers like a video splitter), and many-to-many (matrix operation). They support CAT5e/6 cable distances of up to 394 ft (120 meters).

3.1.1 Point-to-Point

When connecting point-to-point, there is no need for any IP configuration for the TX and RX. The only requirement is that the TX and RX need to be in the same group.
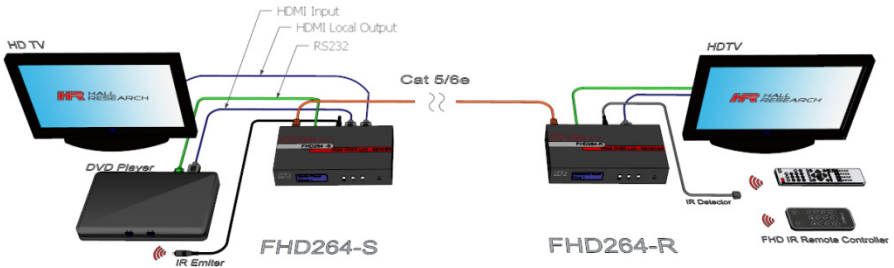

Figure 2 - Example: Point-to-Point

3.1.2 Point-to-Many (Splitter) and Many-to-Many (Matrix)

Start by setting a **unique** IP address (if not using DHCP) and Multicast Group channel for each of the Senders (see the front panel operation in Section 4.2.) Duplicate IP addresses or Groups will cause conflicts. Receivers must also all have unique IP addresses, but can point to the same Group channel.

For installations where video routing is permanent (static) and video is not expected to be switched after installation, simply use the front panel to change the Multicast Group numbers on each device. Remember, each Sender must have a unique Group number and IP address. All Receivers with the same group number as a Sender will show the video from that Sender, and RS-232 and IR are routed between them. To use a broadcast TV analogy, Multicast Group numbers are like TV channel numbers. Only one station can broadcast on any particular channel, but many Receivers can be tuned to that same channel.

As shipped, each device is configured for DHCP. In this mode, when powered up each box gets its IP address from the DHCP server on the network. Alternately, the IP addresses can be assigned manually and set to Static from the front panel. To change IP address using the

PC-GUI, connect a Windows™ PC or laptop to the network and run the free DVM Manager Tool.
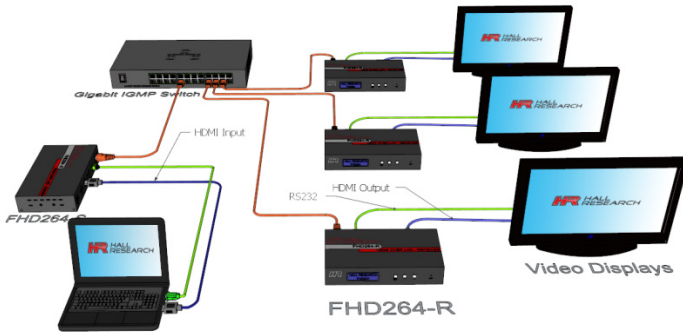
Figure 3 - Example: Point-to-Many

| NOTE | *A Gigabit Router or Switch with DHCP server is recommended. When there is more than one Sender on the network in a matrix configuration (multipoint-to-multipoint) the Ethernet Switch MUST support: Gigabit Ethernet, DHCP Server, and IGMP. Hall Research recommends using the Cisco SG300 Series of gigabit Ethernet Switches.* |

3.1.3 Setup

1. To get started, use a Gigabit Router or Switch with DHCP server (Recommended)
2. If the switch does not support PoE, use the power supply included in the package (-S and -R) to power the FHD.
3. By default, DHCP is **enabled** in both Senders and Receivers. The default IP address of the Senders is **192.168.1.11** and Receivers is **192.168.1.12.** (See Section 5.11 Factory Defaults for more details.)
4. If the switch supports DHCP, connect the Senders(s) using CAT5e/6 cable.
5. If the switch does not support DHCP, connect the Sender(s) (one at a time) using CAT5e/6 cable and configure a unique static IP address by turning OFF DHCP. (See Section 4.2.1 Changing IP address from Front panel.)
6. Repeat the above steps for all the Sender(s).
7. Make sure each Sender has a unique Group ID. Note that, two Senders cannot have the same Group ID. This will cause conflicts.
8. Connect HDMI source(s) to the HDMI input of the Senders(s).
9. Connect the HDMI loop output of the Sender(s) to local HDMI display(s) if desired.
10. If the switch supports DHCP, connect the Receiver(s) using CAT5e/6 cable.
11. If the switch does not support DHCP, connect the Receiver(s) (one at a time) to the switch/router using CAT5e/6 cable and configure a unique static IP address by turning OFF DHCP. (See Section 4.2.1 Changing IP address from Front panel.)
12. Repeat the above steps for all the Receiver(s).

13. Connect the HDMI display(s) to the Receiver(s) output and change the Group ID of the Receiver(s) as required. To receive the video, both Sender and Receiver must be in the same group. (If there is any problem with the video, see FAQ Q2: No picture on the display.)

14. If using IR, connect the IR emitter cable into "IR OUT" port of the Sender, and connect the IR detector cable into "IR IN" port of the Receiver.

15. If using RS-232, connect an RS-232 cable from the PC or automation system to the supplied phoenix connector, and then connect it to the RS-232 port on the Sender. Repeat the same process between the Receiver and the device to be controlled. Note that the baud rate is selectable, and should be the same at both Sender and Receiver end. (See Section 4.1 Front Panel Operation for more details.)

16. Once the Senders and Receivers are configured properly on the network, they will be discoverable by Hall Research's DVM Manager Tool. Simply plug a laptop or PC into the same router/switch and run the free Windows™ DVM Manager Tool. You can easily assign user-friendly names to each device and change the Group routings.

17. To use the DVM Manager Tool to control video routing, first scan for the devices. Note that if the switch does not support DHCP, then the IP address of the PC also needs to be changed to static (See FAQ Q3: How to Change the IP address of the PC?)

18. To access the internal WebGUI in a particular FHD264, type the IP address into the address bar of any standard browser. By default, as shipped from the factory, no login is required to access the internal WebGUI. If login is enabled, the default user name/password is *admin/admin.*

4.0 Front and Rear panel

Figure 4 - Sender Front and Rear Panels

Figure 5- Receiver Front and Rear Panel

▤ **MENU:** To view or change the system Configuration

▲▼ **NAV Keys:** Navigation keys

RESET (RST): Press and release to reboot (same as power cycle). Press and hold for 10 seconds to restore factory defaults.

5V DC: Plug the supplied 5V DC power supply to the unit, if PoE is unavailable.

HDMI OUT: This is a local HDMI loop out for a local display.

HDMI IN: Connect to the HDMI source such as a DVD or Blu-ray player.

IR OUT: Connect to the supplied IR emitter cable.

AUDIO OUT: HDMI audio extraction

RS-232: Connect to PC/Serial Controller or displays with phoenix adaptor

1000BT: Connect to a gigabit network router/switch or a Receiver using CAT5e/6 cable. The green LINK LED illuminates to show the link from Receiver is established.

IR IN: Connect the supplied IR detector

4.1 Font Panel Operation

Use the front panel to change the Group ID, IP Configuration and RS-232 Baud Rate. By default, after the FHD264 gets initialized, it shows the home screen with Device ID and Group ID. To see the system configuration, click the MENU Button and use the NAVIGATION (NAV) keys to view various settings. To change the settings, hold the MENU button until the setting name starts blinking. Use NAV keys to change the parameters of the setting and click MENU to apply setting or Hold MENU to discard setting. Follow the messages on the LCD for further instructions.
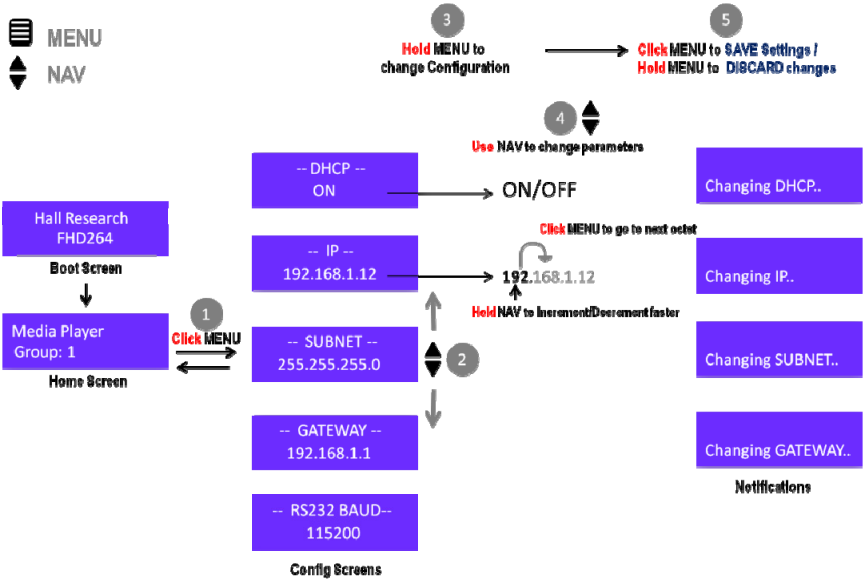

Figure 6 - Front panel operation

4.1.1 Changing IP address from Front panel

To change the IP address from the front panel, make sure DHCP is turned OFF. The steps are as follows

- From Home Screen push MENU
- NAV to IP configuration ("-- IP--")
- Hold MENU until setting name ("--IP--") starts blinking
- By default, the first octet in the IP address starts blinking
- Use NAV keys to change the octet parameter or click MENU to move to the next octet
- After the reaching the 4th octet, click MENU to change the IP address.
- At any point time, if the setting name is blinking, hold MENU to discard the changes

4.2 WebGUI

The WebGUI can be used to change the following configuration settings:

- Device Info -- Device ID, Group ID
- Password -- Enable Login, Change Password
- RS-232 Baud Rate
- Firmware Upgrade
- Network Settings
- Scaler Settings (only for Sender)
- Encoder Settings (only for Sender)
- System Settings (only for Receiver) -- Fail-Safe, OSD, Debug (for troubleshooting)

Both encoders and decoders can be password protected with a User Login, which is enabled from the WebGUI.

Figure 7 – FHD264 Login Page

Default Username is **admin** and password is **admin**

Figure 8 - Sender WebGUI

Note: Changing IP configuration settings via WebGUI requires a Reboot in order to take effect.
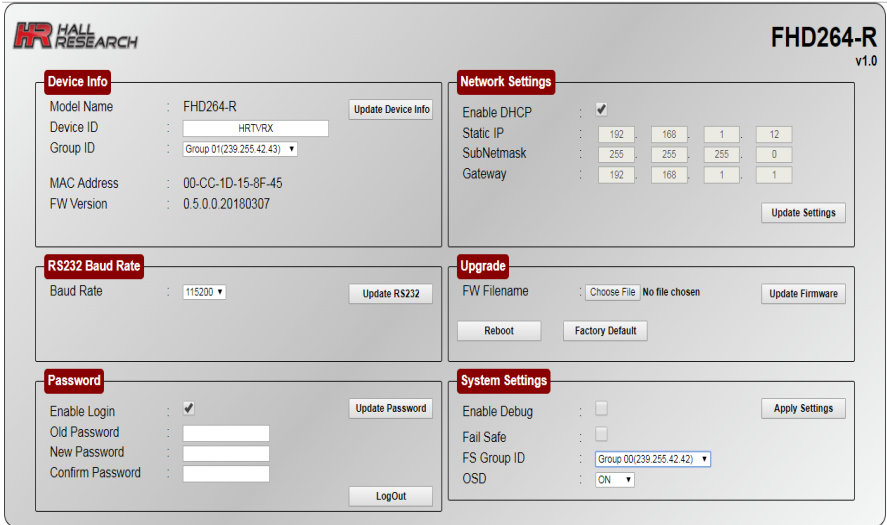
Figure 9 - Receiver WebGUI

4.3 Telnet Control

FHD264 offers an extensive telnet control instruction set to provide full control of the system. The default telnet port is **9999**. When connected, the following prompt will be displayed on the terminal:
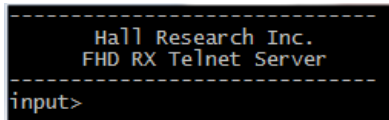

Figure 10 - Telnet terminal message

Note:
- Commands are case sensitive - use lowercase characters as shown.
- Invalid commands result in "Unknown Input Command".
- The "list <CR>" command displays the list of available commands.

All Commands are Terminated by <CR><LF> (or Hex 0D 0A)	Response	Function
set_group_id n where n=0-1023	OK – Success Error – Fail	Set Group ID
get_group_id	n where 'n" returns the group ID	Query the current group ID status
set_dhcp	OK – Success Error – Fail	Set to DHCP mode
get_dhcp	On – DHCP Off – No DHCP	Query the DHCP status
Set_uart_baudrate n	OK – Success	Set the baud rate for the RS-232

All Commands are Terminated by <CR><LF> (or Hex 0D 0A)	Response	Function
Where n = 2400, 4800, 9600, 19200, 28800, 28400, 57600, 115200	Error – Fail	on the unit
get_uart_baudrate	n where n = baud rate	Query the current baud rate setting in the unit
set_static_ip ip [ip(n.n.n.n)] netmask [ip(n.n.n.n)] gateway [ip(n.n.n.n)] Where: ip [ip(n.n.n.n)] =IP xxx. xxx. xxx. xxx netmask[ip(n.n.n.n)]=netmask 255.255.xxx.xxx gateway [ip(n.n.n.n)] = gateway xxx. xxx. xxx. xxx	OK – Success Error – Fail	Set the static IP configuration for the unit
get_static_ip	IP: 192.168.1.xx Netmask: 255.255.0.0 Gateway: 192.168.1.1	Returns the current static IP configuration
get_mac_address	XX: XX:XX:XX:XX:XX	Query the MAC address of the unit
get_lan_status	Link_Up/Link_Down	Query LAN Status whether device is UP and connected to the switch
get_ip_config	IP: XXX.XXX.XXX.XXX Netmask: XXX.XXX.XXX.XXX Gateway: XXX.XXX.XXX.XXX	Shows IP Configuration settings
get_hdcp_status	On/Off Where On - Input Video with HDCP Off- Input Video without HDCP	Query the HDCP status of the video input
get_video_lock	Lock Unlock Where Lock – Stable Input Signal Unlock - No input video or unstable	Query the video stability status
set_session_key [0xhhhh(1~32)]	OK-Success Error-Fail Where [0xhhhhh(1~32)]=0x000000~0xffff	Set session key for encryption
set_screen off|on (Receiver ONLY) Where off=blank on=unblank	OK – Success Error – Fail	Set video blank/unblank the screen
get_screen (Receiver ONLY)	on off	Query the device output status
set_page_login [string(off|on)] where off = Disable login for the web page session (default) on= Enable login for theweb page.	OK – Success Error – Fail	Set the login page for the WebGUI
get_page_login	on off	Query the webpage" login enable" status
set_video_bitrate (Sender ONLY) [string(fhd|hd|sd)][n(2000~18000)] Where: string(fhd|hd|sd)][n(100~25000)] can be fhd, hd, sd and 12000 For example: set_video_bitrate fhd 12000	OK – Success Error – Fail	Set the max bit rate for the TX to sender over the network. Limits apply see Section 10
get_video_bitrate [string(fhd|hd|sd)] (Sender ONLY)	xxxx	Query the bit rate for the TX

All Commands are Terminated by <CR><LF> (or Hex 0D 0A)	Response	Function
set_downscale_mode string(fhd|hd|sd)] to string(fhd|hd|sd)]	OK – Success Error – Fail	Scale down the input video to lower resolution
get_downscale_mode string(fhd|hd|sd)] (Sender ONLY)	string(fhd|hd|sd)]	Get the downscale mode status
set_video_out_mode string(both_on|loopthrough|network|both_off)] (Sender ONLY)	OK – Success Error – Fail	Enable the HDMI output and network output
get_video_out_mode (Sender ONLY)	string(both_on|loopthrough|network|both_off)]	Query the Loop and network output status
set_osd [string(auto|on|off)] Auto= OSD will turn off when there is an input signal detected. On or Off – OSD Stays on or off forever	OK – Success Error – Fail	Set OSD mode of the system
get_osd	Auto On Off	Query the OSD mode status
set_device_name [string (1~30)] Where string can be 30 characters long	OK – Success Error – Fail	Set the device name
get_device_name	[string (1~30)]	Query the device name
get_fw_version	Tx/Rx Firmware : x.x.x.x.xxxxxxxx Returns the firwmare version	Query the firmware version
factory_reset	Processing factory reset! System will reboot after few sec!	Factory reset the device
Reboot	System will reboot after few sec!	To reboot the unit
get_company_id	xxx	Query the company ID
set_streaming_mode [string(unicast|multicast)]	OK – Success Error – Fail	Set the streaming mode of the device
get_streaming_mode [string(unicast|multicast)]	[string(unicast|multicast)] where unicast means one-one configuration and multicast means one to many and many-to-many configuration	Query streaming mode status
master_get	xxx.xxx.xxx.xxx (IP Address) [Blank]	Return the IP address of registered 3rd party controller for SoIP
master_set [string(xxx.xxx.xxx.xxx)]	Master Set	Registers the IP address as 3rd party controller. All the responses from the serial device connected to RS-232 port will be sent to the server on port #5050 at this IP address
rs_out [string(up to 100 char)]	SoIP Sent	Outputs the string the string via RS-232
get_failsafe (Receiver ONLY)	on off	Returns the fail safe status
set_failsafe [string(on|off)] (Receiver ONLY)	Ok -- Successes Error -- Fail	Set the fail safe status
set_fs_group n where n = 0 to 63 (Receiver ONLY)	Ok -- Successes Error -- Fail	Set the fail safe group number
get_fs_group (Receiver ONLY)	Number in range 0 to 63	Returns the fail safe group number

All Commands are Terminated by <CR><LF> (or Hex 0D 0A)	Response	Function
Exit		Exits the telnet session

4.4 Dynamic Virtual Matrix Manager Tool

- The free Hall Research Windows™ Dynamic Virtual Matrix Manager Tool can locate all the FHD264 devices on the network.
- It will list all the devices found by User-defined names, IP addresses, and Multicast Group channels.
- Columns can be sorted (for example you can sort by device name). Senders are listed on the left and Receivers on the right.
- Click the "Update" button after making any changes.
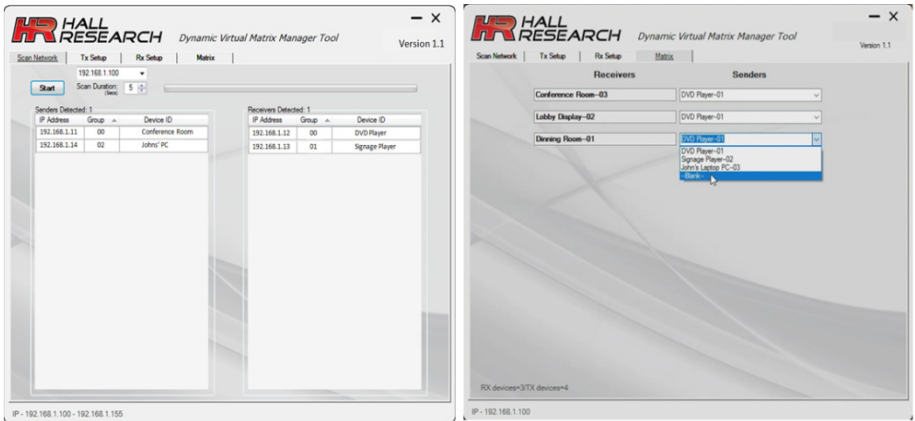- Click the "Reboot" button to reboot the device.

Figure 11 - PC GUI

4.5 CNT-IP-264

The CNT-IP-264 is a powerful networking module designed to manage Models FHD264 and HHD264 - HDMI over LAN Senders and Receivers. Users can access the web application using any computing device (PC, Smart phone or Tablet) that runs a standard browser. CNT-IP-264 has following features:

- Embedded WEB Server with Graphical User Interface
- Monitors FHD264/HHD264 video routing and status
- Controls External Devices over Serial (SoIP), Telnet or TCP
- Create custom control for external devices
- Real time event scheduling with Real‑Time clock
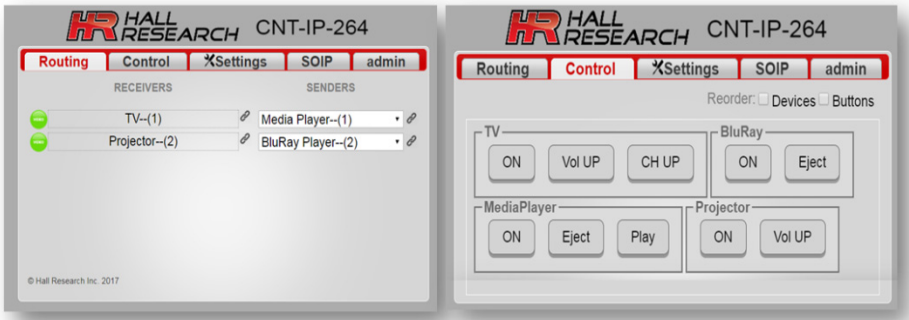- Compatible with Hall Research Device Finder utility
- Supports DHCP

Figure 12 - CNT-IP-264

5.0 Features

5.1 Device ID

Each FHD264 Sender and Receiver can store a custom name of up to **31** alphanumeric characters. Naming the device is very useful in managing large installations. The Device ID will be displayed on the front panel home screen, OSD, WebGUI and FHD software applications. The default Sender name is **HRTVTX** and Receiver is **HRTVRX.**

5.2 Group ID

A Group ID is a number range from 0 to 63, which the Sender uses to multicast its video and data to a group of Receivers on the network. Each group ID is linked to a multicast IP address. You can have a maximum of 64 sources (Senders) in the network. Note that there is no limitation on the number of Receivers that can connect to a Group if they have a different IP address.

5.3 OSD Menu

Figure 13 - OSD (Receiver ONLY)

The FHD264 Receiver shows the following information as an On Screen Display (OSD). The OSD can be configured as Auto (Default), ON, OFF.

RX Name	This is Receiver's user defined name
RX IP	This is Receiver's IP address
TX Name	This is Sender's user-defined name to which the receiver is connected
TX IP	This is Sender's IP address
Group ID	This is Receiver's multicast group
Status	"**Waiting for connection ...**" -- if there is no TX available in its group "**Connected**" -- TX found and receiving video If the Receiver is connected and there is no HDMI source at the Sender end, the following video will be generated by the Sender by default.

5.4 RS-232

RS-232 communication in the FHD264 is bi-directional. The controller or the controlled device can be either at the Sender's or the Receiver's end. The baud rate for the TX and RX can be configured from Front Panel, WebGUI, or the Windows™ GUI. Note that the Sender and Receiver should have matching baud rate for pass-through communication.
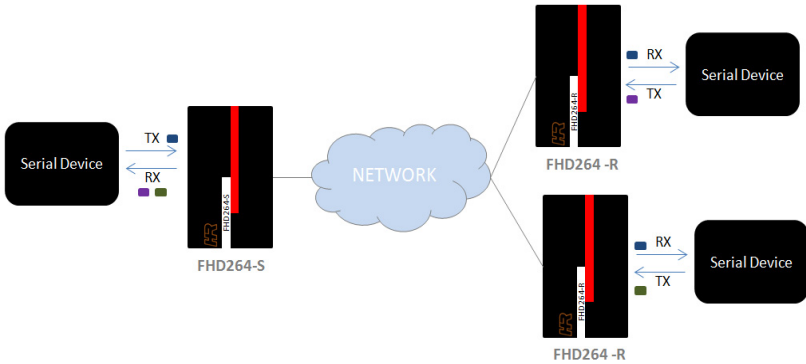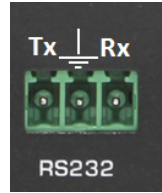

Figure 14 - RS-232 Communication

When a serial device connected to a sender transmits data, it is received by all the receivers in the group. If a serial device connected to the Receiver transmits data, it will be received only by the Sender in the group. When receiving data from multiple Receivers, the Sender receives the data on a first come, first served basis.

5.5 Serial Over IP (SoIP)

Serial devices connected to the RS-232 port on FHD264 units can be controlled over the network. SoIP commands can be issued via Telnet, which is simplex (See the telnet command "**rs_out**" in telnet control). For bi-directional communication, each FHD264 has a dedicated TCP server and client. The **CNT-IP-264** (standalone controller) can manage SoIP with multiple Senders and Receivers.
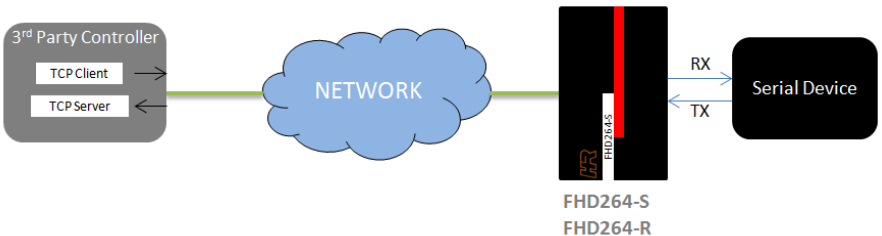

Figure 15 - Serial Over IP

5.5.1 FHD SoIP Protocol

To perform a full Duplex SoIP with FHD, the 3rd party controller requires the following Client and server architecture.

- ▪ <u>UDP Client:</u> To send commands to FHD264 UDP port #**9002** for registration. The controller should register its IP address with the FHD264 to receive the response on the TCP server. The FHD sends the serial device response to only one registered controller. We recommend repeating this process at regular intervals (one Minute). In case of a reboot or power failure, the FHD264 will not remember the controller's IP address. Registration can also be done using telnet command "**master_set**". The registration message format (31 bytes) using UDP is as follows:

Controller IP Address
↓

HRTV_CMD\xx\xx\xx\xx*t\00\ce\00\0b\t\00\00\00\00\00\00\00\00\00\00\00

48 52 54 56 5f 43 4d 44 xx xx xx xx 23 2a 74 00 ce 00 0b 09 00 00 00 00 00 00 00 00 00 00 00

- ▪ <u>TCP Client:</u> To send commands to FHD264 TCP port #**7000**. Maximum command length is **100 bytes**
- ▪ <u>TCP Server:</u> Listen on port #**5050** to receive the response from serial device. Maximum command length is **100 bytes**
- ▪ <u>Ping Protocol:</u> FHD264 uses ping to verify the controller's presence

See the FHD SoIP application notes for more details and examples.

5.6 Fail-Safe (FS) Video Routing

Fail-Safe is a recovery system for the Receiver in case of a loss of video at the Sender end. When FS is activated, the Receiver can switch to the assigned backup source (FS Group ID) if video is lost in the current group. The Receiver switches back to its original group when the video signal is restored. This powerful feature provides a layer of protection for systems that need built-in video redundancy.
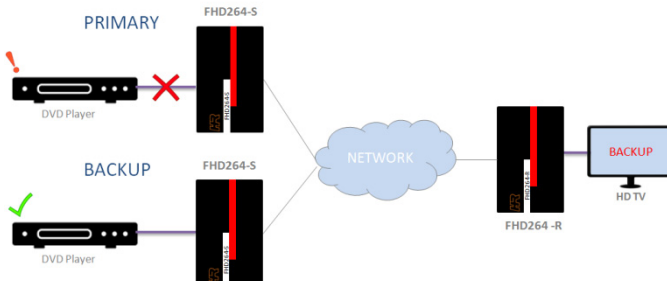

Figure 16 – Fail-Safe

Fail-Safe in the Receiver can be configured using the WebGUI or Telnet. If the Receiver is displaying video from its Fail-Safe group, the following messages will be displayed on the front panel LCD, OSD, and WebGUI.
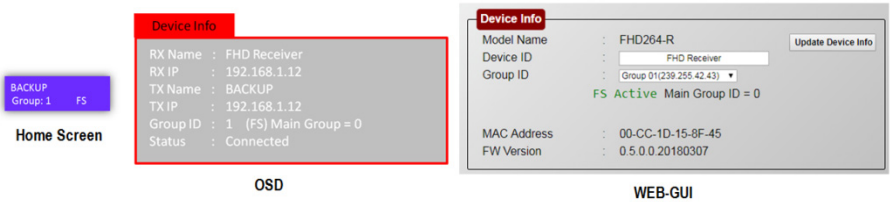

Figure 17 -Fail safe notifications

Note: The **FS Group ID** cannot be same as the **Main Group ID** of the Receiver. If they are the same, then Fail-Safe will be disabled automatically.

5.7 IR

FHD264 Supports both **IR pass through** and **IR Control** using a single wideband IR detector. Any IR signal received in the range of 32-56 KHz at the Receiver will be sent to the Sender in the group. The Sender can receive IR signals from multiple receivers on a first come, first served basis. This allows the user to control the IR devices at the Sender end from multiple Receiver locations. Note that to send an IR signal to a device at the Sender end, the Receiver must be in the same group as the Sender.
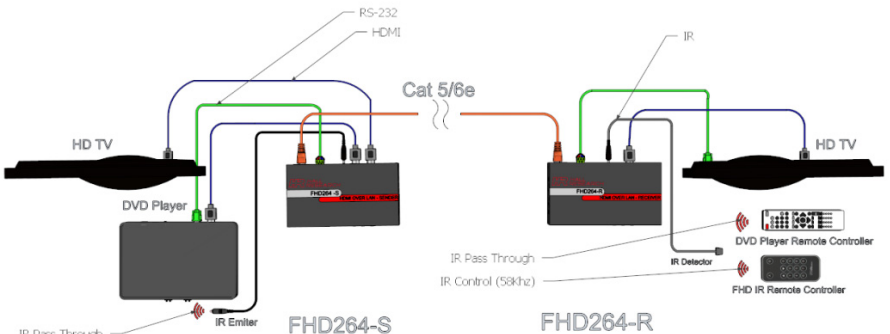

Figure 18 – IR

Additionally, each FHD264-R comes with an IR Remote control that works at a frequency of 56 KHz. The IR Remote can be used to quickly change Receiver groups:

- Use ▲▼NAV keys to increment or decrement the group by one
- Use NUM pad to go to any group in the range of 0 to 63
- Keys A and B are reserved for future use

5.8 Video Scaling and Bit Rate Control

The FHD264-S (Sender) has internal video scaling capabilities. The user can control the bit rate and scaling feature depending on the network bandwidth. The user can change the settings in three ways – WebGUI, Telnet, or PC GUI. Please consider the following if you decide to change settings from default:

- The input of the sender is the source video fed into the sender.

- The output of the sender is the network stream.

- Reducing the bit rate will decrease the occupied bandwidth on the network.

- By default, these settings are optimized for the best image possible without undue burden on the network.

5.8.1 Scaler and Encoder Settings

If you are using a source with 1080p resolution, then use *"Scale Full HD to :"* option to either transmit the video at the same resolution on the network, or to first downscale the video from Full HD to HD (or SD) and then transmit the lower resolution image on the network. By doing so you will force the unit to use the bit rate for HD instead of Full-HD, which is typically much lower. This lowers the resolution for each Receiver from 1080p/60 to 720p/60. But, if the video has a lot of motion and action, there will be less compression, resulting in a clearer overall picture, while using less bandwidth.

However, if you have a Full HD (1080p) source video where the amount of motion on the screen image is limited (such as a slide show), you can skip scaling it down and just reduce the bit rate for Full HD. That way you are not sacrificing any resolution of the original image.

If you are using a 720p source resolution, the use "Scale HD to:" option to downscale the video to Standard Definition (SD) to transmit in the network. Click "Update Scaler" to confirm the settings.

Once the Scaling Settings are confirmed, select the Full HD, HD and SD bit rate in the Encoder Settings section and click "Update Encoder".

Resolution	Bit Rate – Range (Kbps)
1080p (FHD)	10000-18000
720p, 1080i (HD)	8000-16000
480p, 480i, 576p, 576i (SD)	2000-8000

5.9 EDID

The FHD264 offers EDID management. The user can program a custom EDID table into the HDMI input of the Sender, FHD264-S. Hall Research's EMX-HD-AUD Audio Extractor and EDID Manager are recommended for this task.

NOTE   *Factory resetting the FHD264 will restore the default Hall Research EDID to the device. The user must confirm the action and take all necessary precautions to prevent loss of data. Hall Research is not responsible for any damage that may occur from the user attempting to modify the EDID*

5.10 Firmware Upgrade

The firmware upgrade on FHD264 can be completed using the **WebGUI.** Contact Hall Research for more details.

5.11 Factory Default

Factory default will reset all the parameters (including network settings). There are 4 ways to set factory default:

1. Press the RESET button on the unit for 10 seconds.
2. Use telnet command "factory reset<CR>"
3. Factory Default is available on the Software GUI. Wait for 10 seconds for the device to reboot and activate.
4. The WebGUI also offers factory resetting the device.

Setting Name	Value
Device ID	HRTVTX -- Sender
	HRTVRX -- Receiver
Group ID	0 (239.254.42.42)
(Receiver ONLY) Fail-Safe FS Group ID OSD	 Disabled 0 Auto
Login Username Password	Disabled admin admin
DHCP IP Subnet Gateway	Enabled 192.168.1.11 -- Sender 192.168.1.12-- Receiver 255.255.255.0 192.168.1.1
Baud Rate	115200

5.12 Power over Ethernet (PoE)

FHD264 Senders and Receivers utilize Power Over Ethernet (PoE), eliminating the need to connect a power supply to the unit. The device gets its power from the PSE (Power Sourcing Equipment) port in the Gigabit PoE switch. An external power supply is included with each FHD264 if PoE is not available.

6 FAQ & Troubleshooting

There are no field serviceable parts or circuits in the device. If you think the device is malfunctioning (or you have no video output), please try to use the following methods to obtain a picture.

Q1. What is "Stream Not Found"?

A "Stream Not Found" message is shown on a remote display if there is no video source detected at the Sender end. This video is generated by the Sender in the absence of a source.


Q2. No picture on the display

- Verify the Cat 5e/6 cables are connected to the FHD264 and the gigabit switch/router
- Verify the display is ON.
- Verify no two Senders are broadcasting in the same group.
- Verify the Receiver is set to the correct Sender group.
- Turn ON the OSD to check whether the Receiver is **connected** to the Sender.
- Verify all FHD units and computers in the network have unique IP addresses.
- In a large installation, verify IGMP and JUMBO frames are enabled in your network switch. We recommend *Cisco SG300 Series* switches.
- Quickly press the RESET button on the unit's panel to reboot, or power cycle the device.
- If still there is no video, try factory resetting both the Sender and Receiver by holding the RESET button on the panel for 10 seconds, or reset from the WebGUI. All settings will be erased and set to factory default.
- In a large installation, isolate the Receiver units from the network, and connect them point-to-point with a Sender to check for possible hardware problems.
- If the video works in a point-to-point configuration, then there is a network problem. Check the network and IP configuration of all the units.
- In a one-to-many and many-to-many configuration, if there are displays with different native resolutions, then it is highly recommended to use the "Scaler Settings" in the TX's WebGUI to the highest common denominator.
- For example, if a 1080p HDMI source is connected to the Sender and one of the Receivers is connected to an HD 720p display, change the settings of the Scaler to "Full HD to HD" in the Sender WebGUI so that all the monitors get a resolution of HD 720p video.

Q3. How to Change the IP address of the PC?

In Windows™, it is typically located under Start ➔ Control Panel ➔ Network Sharing center ➔ Change adapter settings ➔ Properties ➔ Internet Protocol Version4 (TCP/IPv4).

For example, change the IP address field to 192.168.1.100 (0-255, except 11 or 12) and press "OK" to save the configuration.
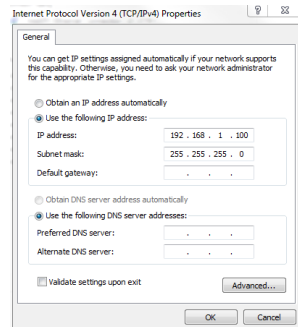
6.1 Contacting Hall Research

If you determine that your FHD264 is malfunctioning, do not attempt to repair the unit. Instead, contact Hall Research Technical Support at 714-641-6607. To return the unit to Hall Research you must first get a Return Authorization (RMA) number. Package the unit carefully when returning. We recommend that you use the original container.

7.0 Specifications

Input Resolution	VGA or 480p thru Full HD 1080p@60
Video Encoding	H.264
Streaming Protocol	RTP/MPEG-TS/UDP
Casting	Unicast/Multicast
Control Interface	Telnet, Embedded Web Server
Video Latency	250-400 mS, dependant on Bit Rate and network congestion
Sender	
Input Ports	1 x HDMI
Output Ports	1 x RJ45, 1 x HDMI, 1 x IR, 1 x L/R AUDIO,1 x RS-232
Wall Plate	
Input Ports	1 x HDMI
Output Ports	1 x RJ45, 1 x IR, 1 x L/R AUDIO,1 x RS-232
Receiver	
Input Ports	1 x RJ45, 1 x IR
Output Ports	1 x HDMI, 1 x L/R AUDIO, 1 x RS-232
RS-232 Baud Rate	Bidirectional, pass thru: 2400 – 115200 bps
Audio	HDMI Stereo 2-channel Supports LPCM 2, 5.1, 7.1 Channel up to 48 KHZ
IR Frequency	38 -56 KHZ pass-thru modulated 56 KHZ (IR Remote Controller)
Video Sources	Up to 64
Video Displays	Up to 250+
Recommended Network Switch/Router	Gigabit LAN IGMPv2, Jumbo Frame and DHCP support
Operating Temp	+32 to +113°F (0 to +45 ℃) 20%~90%, non-condensing
Power consumption	Max. 3 W
Mounting Option Dimensions	Mounting Brackets (included) 5.40"(137 mm) W x 3.14"(80.0 mm) D x 1.38" (35 mm) H
Net Weight	TX (Unit) : 0.75 lbs (0.34 KG) RX (Unit): 0.75 lbs (0.34 KG)

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