XTENDEX® Series

ST-IPHD-POELC-V4

Low-Cost HDMI Over Gigabit IP Extender with IR and Power over Ethernet (POE)

Installation and Operation Manual

ST-IPHD-L-POELC-V4
(Local Unit)

ST-IPHD-R-POELC-V4
(Remote Unit)

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CHANGES

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INTRODUCTION

The XTENDEX® Low-Cost HDMI Over Gigabit IP Extender with IR and POE multicasts digital video and audio signals to one or more receivers up to 394 feet away over a 1000 Base-T Gigabit Network connected with CAT6/6a/7 cable.

Each Low-Cost HDMI Over Gigabit IP Extender with IR and POE consists of a local unit that connects to an HDMI source, and a remote unit that connects to an HDMI display. The local and remote units can be connected together for a Point-to-Point connection via CATx or a Point-to-Many connection via a network switch. Support for multiple transmitters requires a managed network switch.

Features

- Supports HDTV resolutions to 1080p.
  - Extend up to 394 feet (120 meters) with CAT6/6a/7 cable.
  - Extend up to 328 feet (100 meters) with CAT5e cable.
- Cascade network switches to extend the length long distances.
  - Up to three switches can be cascaded.
  - The max cable length between the first switch/transmitter and the last switch/receiver is 1,575 feet (480 meters) for CAT6/6a/7 or 1,312 feet (400 meters) for CAT5e cables.
  - The max cable lengths between switches is switch dependent, but 394 feet (120 meters) is typical with CAT6/6a/7 cable.
- Power over Ethernet (PoE) – power supply not required at the local or remote unit.
- Ideal solution for digital signage applications.
- Broadcast real-time HDMI video and audio signals to multiple display locations with a managed or unmanaged (also known as non-managed) network switch.
- Transmits an HDMI signal over one CATx cable.
- Full Infrared Remote (IR) control of HDMI source from remote HDTV using existing source remote control.
- Plug-and-Play installation allows receivers to find the transmitters automatically on the same subnet. (Network configuration may be required for managed network switch.)
- Easily expandable. Add remote units as you add monitors.
- Inexpensive CATx cable replaces bulky video cables.
- Supports 1000 Base-T Ethernet connection.
- Built in default EDID table.
- HDMI 1.4 and HDCP 1.4 compliant.
- Support for multiple transmitters requires a managed network switch with VLAN support. Standard LAN switches can only support one transmitter.
  - The managed switch must support port-based IEEE 802.1Q VLAN.
  - Each VLAN acts as a separate HDMI Over IP Channel on the network.
    - Each VLAN channel supports one transmitter.
  - Number of local and remote units that can be used is dependent on the backplane bandwidth of the switch.
- For a point-to-many connection, a standalone network with an unmanaged network switch, hub, or router can be used instead of a managed network switch.
  - Up to 253 receivers supported.
  - It is not recommended to use any other network devices on this standalone network as it may cause a degradation in performance.
- Local and remote units must be in the same LAN. The units do not support WAN connections.

NOTE: ST-IPHD-POELC-V4 models are NOT compatible with ST-IPHD-POELC(-CLR) models due to different chipsets being used.

MATERIALS

Materials supplied with this kit:

- NTI XTENDEX ST-IPHD-POELC-V4 Local and Remote Unit
- URL slip with path to this manual
- IR-EMITTER with 42.5" (1080mm) cable
- IR-RECEIVER with 40" (1015mm) cable

-OR-

- NTI XTENDEX ST-IPHD-**R**-POELC-V4 Remote Unit only
- URL slip with path to this manual
- IR-RECEIVER with 40" (1015mm) cable

**Additional materials may be required but are <u>not supplied</u>:**

- CAT5e solid/stranded UTP ; 6/6a solid UTP; CAT7 solid STP (CATx) twisted-pair cables for TIA/EIA-568B wiring terminated with standard RJ45 connectors wired straight thru- pin 1 to pin 1, etc.

- HDMI male-male cable to connect a HDMI source or display (Order NTI # HD-xx-MM where xx=3, 6,10,15,25,30 and 50 foot cable).

- Use HD-ACT-xx-MM 4K HDMI Active Cables to connect an HDMI source or display up to 100 feet. (xx- 20,25,30,40,50,60,75 and 100 Feet)

- Use DP-HD-xx-MM cables to connect a DisplayPort source up to 15 feet away from the transmitter. (xx= 3,6,10 and 15 Feet)

- Use DVI-HD-xx-MM cable to connect a DVI source up to 5 meters. (xx- 1,2,3 and 5 meters)

Optional

PWR-SPLY-IPHDPOELCV4 110-240VAC, 50 or 60Hz-5VDC/3A AC Adapter with Line cord, country-specific

Cables and power supply can be purchased from Network Technologies Inc by calling **(800) 742-8324** *(800-RGB-TECH) in the US and Canada or* **(330) 562-7070** *(worldwide).*

CONNECTORS AND LEDS
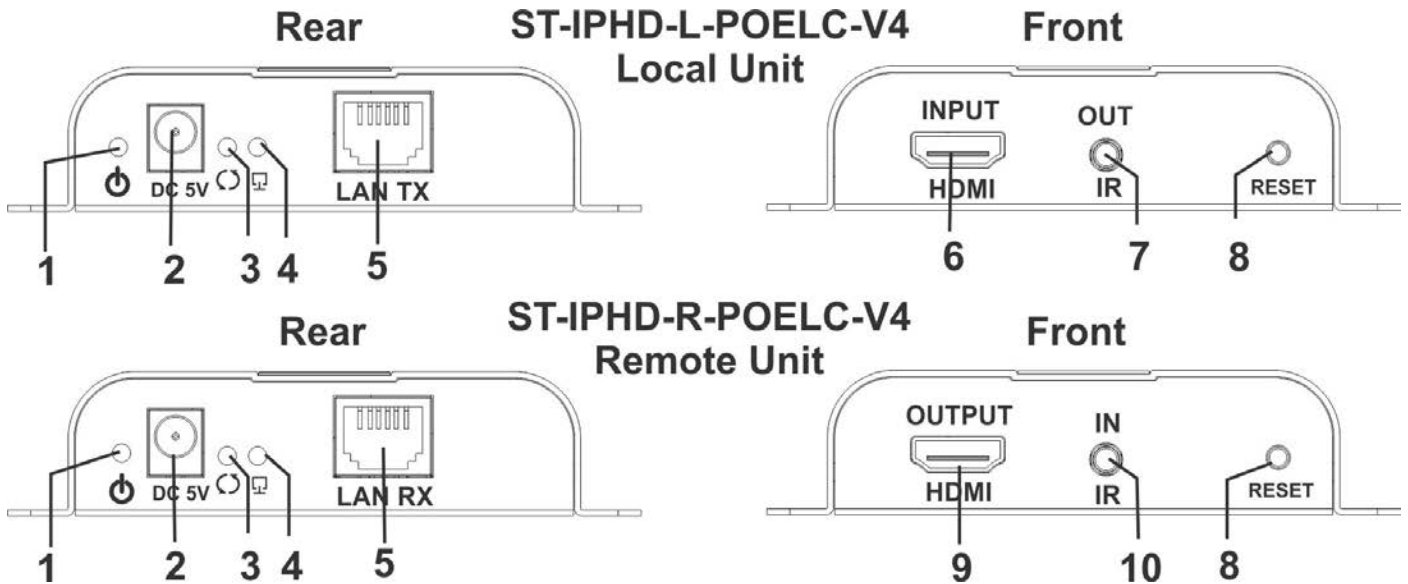
#	LABEL	CONNECTOR/LED	DESCRIPTION
1	PWR	Blue LED	Illuminates to indicate proper power to the unit and normal operation
2	5V DC	2.1x5.5mm Power Jack	for connection of power supply
3	Arrows	Yellow LED	Indicates data transmission- flashes with network connectivity
4	Display	Green LED	Indicates connection to the network
5	LAN TX/RX	RJ45 Female connector	For connection of CATx cable between the Local and Remote Unit or between the Local/Remote unit and a router.
6	HDMI INPUT	HDMI Female	For connecting the video source
7	IR OUT	3.5mm Jack	For connecting the IR Emitter
8	RESET	Button	Press to refresh connection
9	HDMI OUTPUT	HDMI Female	For connecting the extended display
10	IR IN	3.5mm Jack	For connecting the IR Receiver

INSTALLATION

Point to Point Connection

The Local and Remote Units can be connected directly to each other with CAT5e cable up to 328 feet (100 meters) long or with CAT6/6a/7 cable up to 394 feet (120 meters long).   When connected in this manner (without a POE-enabled switch between them), a PWR-SPLY-IPHDPOELCV4 will be required at each end to provide power (sold separately).

If the IR feature will be used, connect the IR Receiver to the Remote Unit, and the IR Emitter to the Local Unit

Connect the video source and display to the Local and Remote Units using HD-xx-MM cables for best performance.
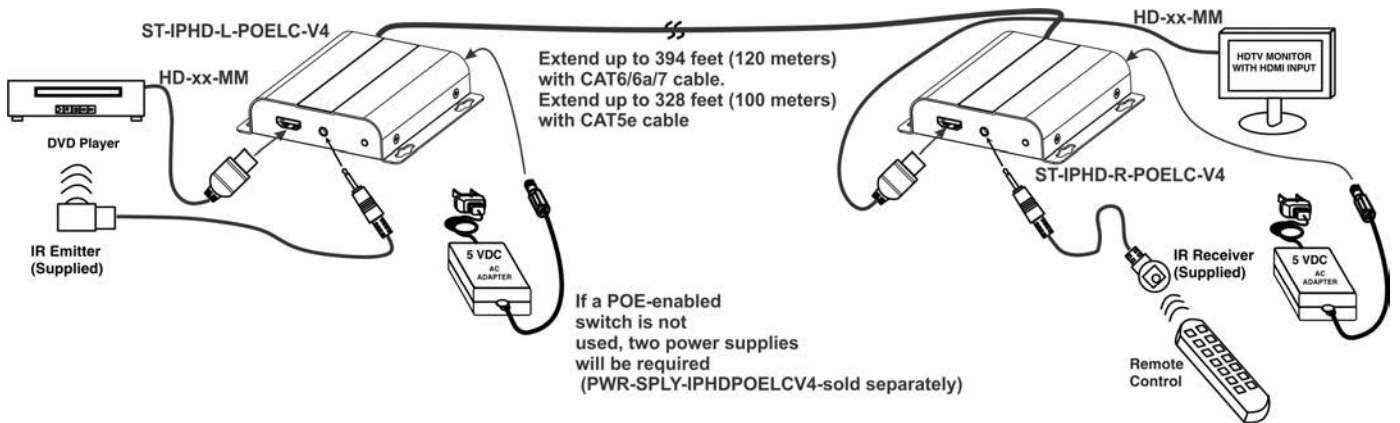
Figure 1-Point to point connection- directly

When connected through a POE-Enabled switch, the collective CATx cable can be twice as long and no power supplies will be needed.
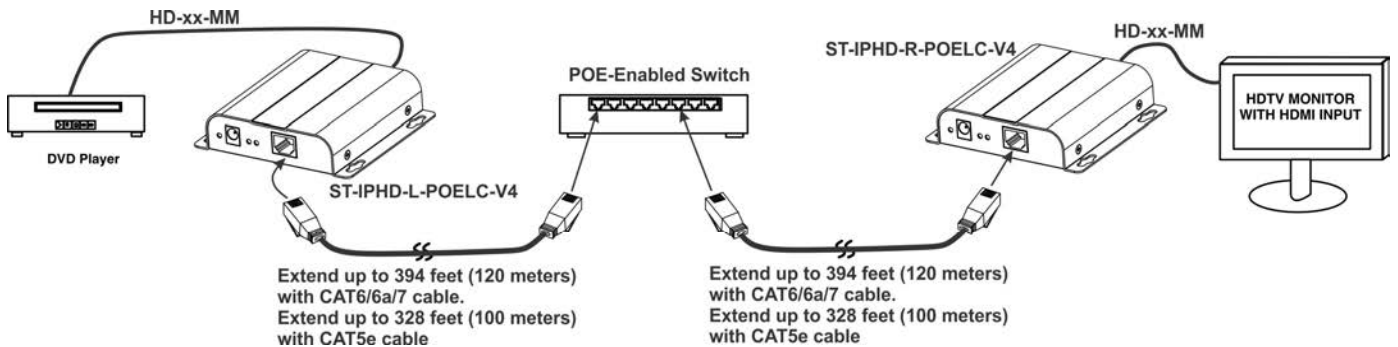

Figure 2-Point to point connection-through switch

Note: Only use a PWR-SPLY-IPHDPOELCV4 when the extender is <u>NOT</u> connected to a POE-enabled switch.

Daisy-Chained Switches

For even greater extended distances, daisy-chain multiple POE-enabled switches.   Each can have up to 328 feet (100 meters) of CAT5e cable between them or up to 394 feet (120 meters long) of CAT6/6a/7 cable.
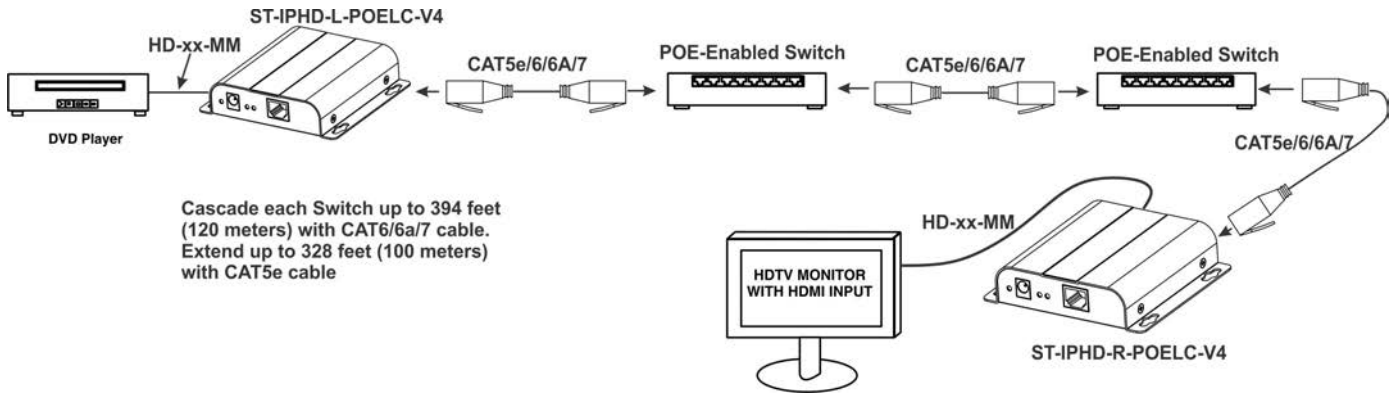

Figure 3-Daisy-Chained Switches

Point to Many Connection

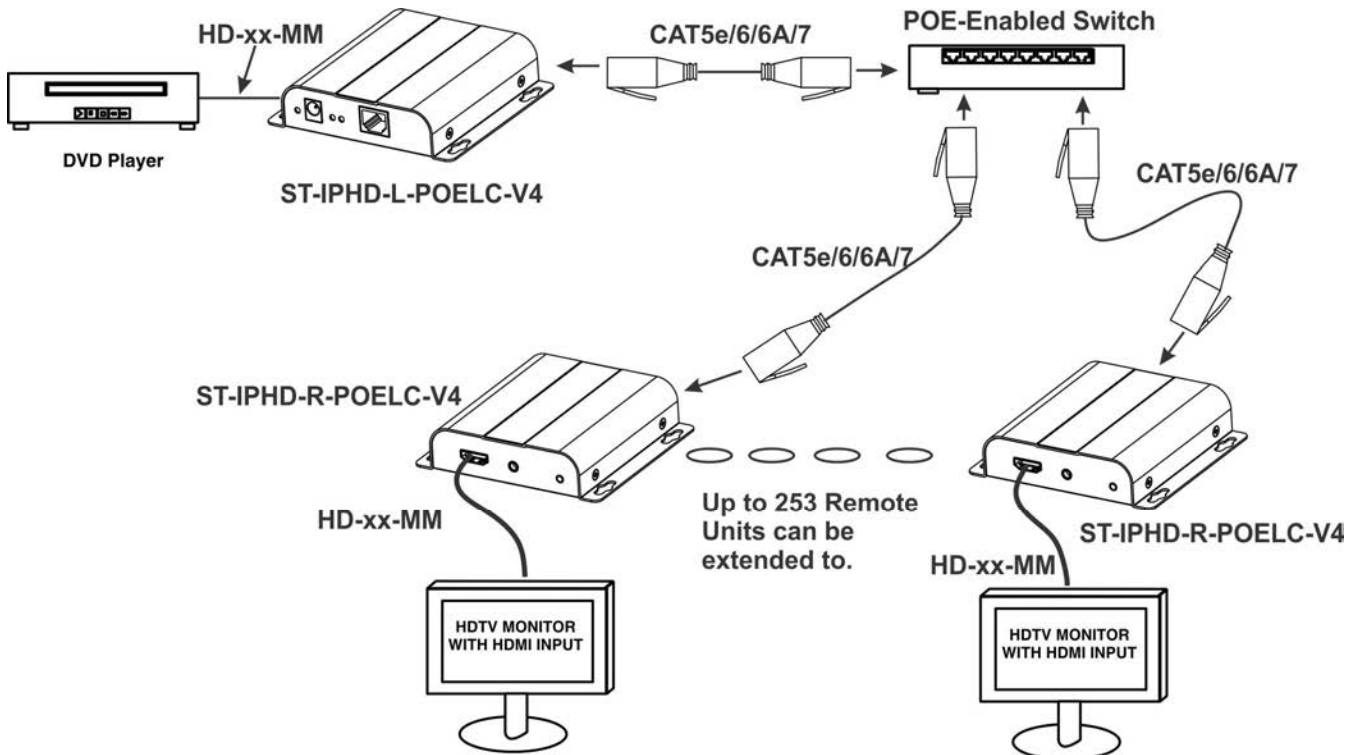Up to 253 Remote Units can be paired to a Local Unit.

Figure 4-Point to many connection

Many to Many Connection

When more than one Local Unit needs to be able to installed in a network to communicate with multiple Remote Units, a Managed Network Switch with POE support will be required. The managed switch must support port-based IEEE 802.1Q VLAN. Each VLAN acts as a separate HDMI Over IP Channel on the network and each VLAN channel supports one transmitter. .
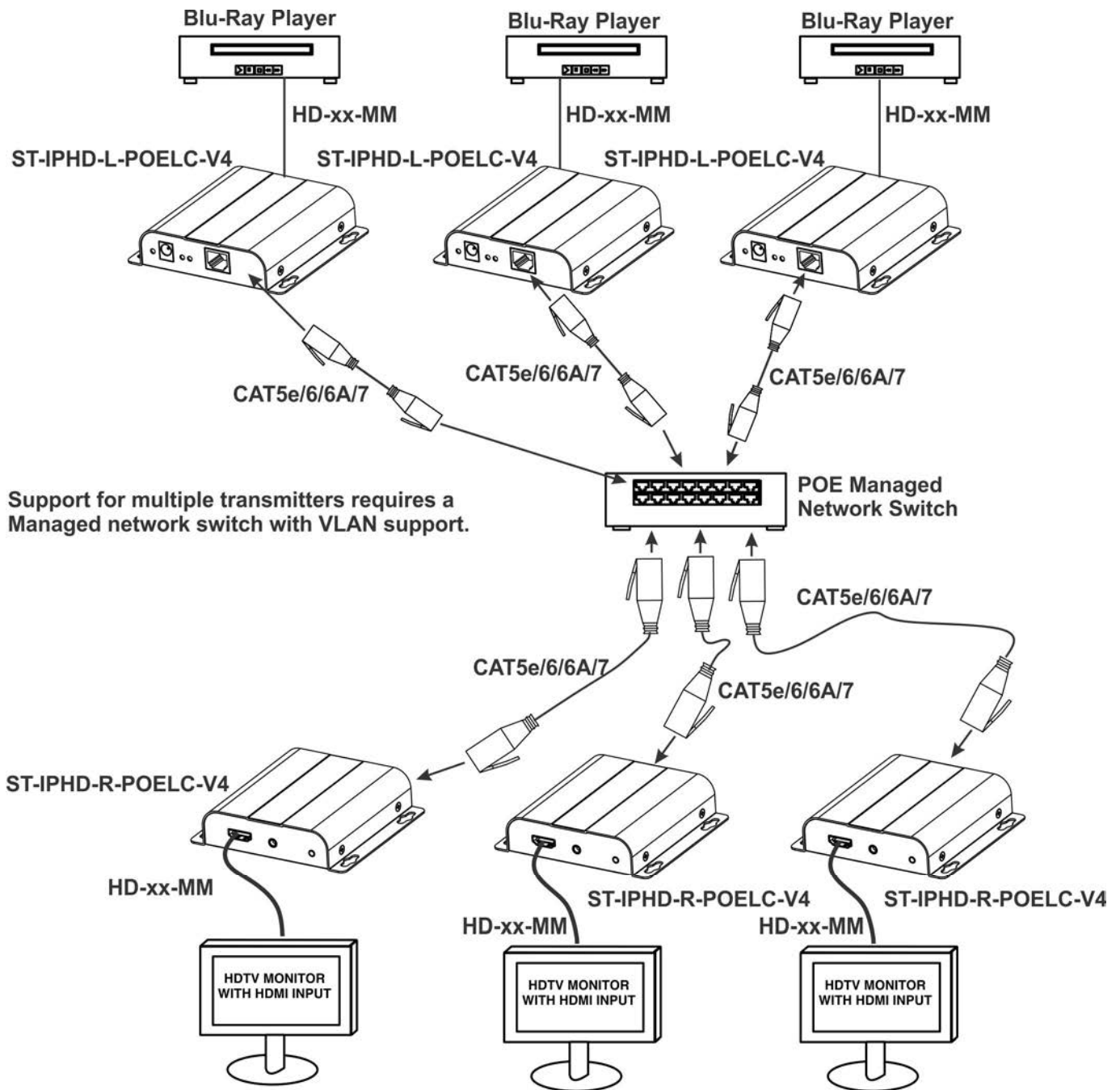

Figure 5-Many to many connection

Many-to-Many Configuration of ST-IPHD-POELC-V4 Extenders

A Many-to-Many configuration of the ST-IPHD-POELC-V4 extender allows multiple senders and multiple receivers to be connected to a single managed network switch wherein the switch can provide the routing of signals from senders to receivers. Through the assignment of VLAN groups, a sender can send video to multiple receivers within the same-named group.

Note: Only one sender can be connected per group.

Be sure to take note of which ports belong to each group assigned.   Once the group is created, simply plug the sender and the receivers for the displays that are intended to receive video from the video source connected to the sender.   The following procedures provide examples of just such a configuration.

Procedure to create a VLAN group for Cisco SG350 Series.

1. Connect an Ethernet cable between the PC and OOB port on the Cisco switch. The OOB port is the rightmost port on the front panel of the Cisco switch with an "OOB" label. (If your managed Cisco switch does not have an OOB port, just connect the PC to any Ethernet port on the switch.)

2. Change the PC's IP to be in the 192.168.1.x subnet.

3. Log into the web interface of the Cisco switch by visiting **http://192.168.1.254** (the default IP of the switch).

4. Select "**VLAN Management**" on the leftmost list of the webpage.

5. In "**VLAN Settings**", click "**Add..**" to create a new VLAN group. (You could repeat this step to create multiple VLAN Groups.)

   a. In the pop-up window, type a number between 2 and 4094 as the "**VLAN ID**" of the group. You could use any name you want for the "**VLAN Name**".

   b. Click "**Apply**" to finish adding a new VLAN group.

6. Under "**VLAN Management**", click "**Interface Settings**".

   a. If you see that the "**Interface VLAN Mode**" of the ports that you want to set up for your video extender are already set to "**Access**", you could skip this step and go to step 7.

      If you see that they are set to "**Trunk**", continue to step 6(b).

   b. Choose a port you want to use, then click "**Edit**" on the bottom of the table.

   c. In the pop-up window, change the "**Interface VLAN Mode**" from "**Trunk**" to "**Access**". Click "**Apply**".

   d. Repeat step 6(b) and 6(c) to finish setting up all ports that you want to use.

7. Under "**VLAN Management**", click "**Port VLAN Membership**"

   a. Select a port you want to use, then click "**Join VLAN**.." at the bottom of the table.

   b. In the pop-up window, assign the "**Access VLAN ID**" of the desired VLAN group ID number for this port to be part of. Click "**Apply**".

   c. Repeat step 7(a)-(b) to set up all ports that will be part of that group.

8. Repeat steps 5-7 for all VLAN groups that you want to create.

Now your VLAN groups should be configured correctly and ready for use.

Procedure to configure VLAN groups for a Netgear Managed Network Switch.

1. Connect an Ethernet cable between the PC and any Ethernet port on the Netgear switch. If your Netgear switch has a management port, use the management port instead.

2. Change the PC's IP to be in the 192.168.0.x subnet.

3. Log in to the web interface of the Netgear switch. (The switch we used has a default IP of **http://192.168.0.239**.)

4. Click the "Switching" Tab, and then go to "VLAN", "Advanced", and "VLAN Configuration".
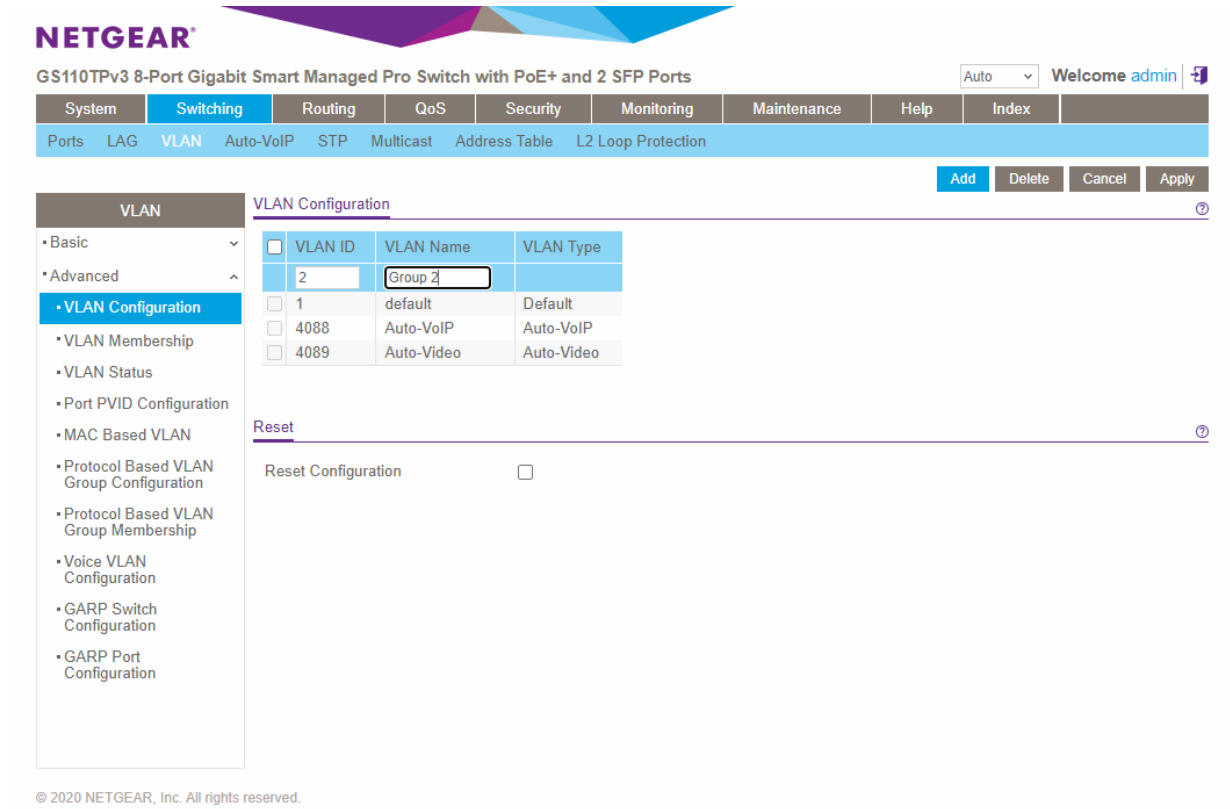
5. Under "VLAN Configuration", enter a VLAN ID (an integer between 2 and 4087) and a VLAN Name (whatever is preferable) in the textboxes as shown in the picture above. Click "Add" and then "Apply". You should see the page like shown in the picture on the next page. A new VLAN group is added.

6. Under "Advanced" in the left menu, click "VLAN Membership". Under "VLAN Membership", choose the VLAN ID created in step 5. Under "Unit 1", click the ports that are in the selected VLAN group twice. Make sure the marking on the port is "U" (untagged), not "T" (trunk).Click "Apply". You should see a page similar to the picture shown below.

7. Under "Advanced", click "Port PVID Configuration". Check the ports designated in step 6. In the textboxes at the top of the table, enter the VLAN group ID to the "PVID" and the "VLAN member" fields. Click "Apply".

8. Now you should see a page as shown in the picture below, with PVID and VLAN member fields updated for g5, g6 and g7.

9. Repeat steps 5-8 for other VLAN groups that you want to create. Now your VLAN groups should be configured correctly and ready for use.

TECHNICAL SPECIFICATIONS

Local Unit	
Ports	1- HDMI-A Female (Video source)
	1- RJ45 Female, 1000Mbps (CATx connection)
	1- 3.5mm Female (IR Emitter)
Encoding Delay	80 ms latency
Remote Unit	
Ports	1- HDMI-A Female (Display)
	1- RJ45 Female, 1000Mbps (CATx connection)
	1- 3.5mm Female (IR Receiver)
Audio Supported	Embedded Digital Audio through HDMI compatible TVs or audio receivers.
HDCP Supported	V1.4
General	
Operating Temperature	32 to 140°F (0 to 60°C)
Storage Temperature	-4 to 158°F (-20 to 70°C)
Operating and storage relative humidity	0 to 95% non-condensing RH
Resolutions Supported	480i@60Hz, 480p@60Hz, 576i@50Hz, 576p@50Hz, 720p@50/60Hz, 1080i@50/60Hz, 1080p@50/60Hz
IR Frequency Range	20 to 60 kHz
HDCP Supported	V1.4
HDMI Supported	V1.4
CATx cable supported	CATx solid or stranded straight through cable for TIA/EIA-568B wiring terminated with standard RJ45 connectors. • 394 feet (120 meters) over CAT6/6a/7 cable • 328 feet (100 meters) over CAT5e cable.
Cascading supported	Up to 3 switches- max cable length between the first switch/transmitter and the last switch/receiver is 1,575 feet (480 meters) for CAT6/6a/7 or 1,312 feet (400 meters) for CAT5e cables
Multiple Transmitter supported	Requires managed network switch with VLAN support. Managed switch must support port-based IEEE 802.1Q VLAN. Local and Remote Units must be on same LAN. WAN not supported.
Ethernet connection	1000 Base-T
EDID	Built-in Table
Power Supply	Power over Ethernet: With a switch that supports Power over Ethernet (Local: 4.5W, Remote: 3.5W) OR PWR-SPLY-IPHDPOELCV4: Output: 5VDC, 3.0A
Size (WxDxH)	4.44x3.71x0.94 In. (113x94x24 mm)
Approvals	CE, FCC, RoHS

TROUBLESHOOTING

Problem: Display indicates "Waiting for connection"

Solution: Verify the extender Local and Remote are both connected to either POE enabled switch or to a connected power supply,   and if power supplies, check that the DC plugs are fully inserted.

Problem: Display indicates" Please check the TX input signal"

Solution: Verify that the video source cable is well connected at each end and that the video source is powered ON.

Solution: Try connecting the video source directly to the display and verify there is a signal from the source and that the source and display settings are correct.

Problem: Display not stable

Solution: Make sure the cables are properly connected and that the CATx cable is the correct type and within the specified range.

Solution: Press the "reset" button on the Local and/or Remote Unit front panels.   Allow units to reset and reconnect.

WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years from the date of purchase. Please contact Network Technologies Inc at **(800) 742-8324** (800-RGB-TECH) or **(330) 562-7070** or visit our website at http://www.networktechinc.com for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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