

## XTENDEX® Series

# ST-IPFOHD-LC-ULC

## Low-Cost HDMI Extender Over IP via One LC Singlemode/Multimode Fiber Optic Cable

### Installation and Operation Manual

---



ST-IPFOHD-LC-ULC Local and Remote Units

**TRADEMARK**

XTENDEX and the NTI logo are registered trademarks of Network Technologies Inc in the U.S. and other countries. All other brand names and trademarks or registered trademarks are the property of their respective owners.

**COPYRIGHT**

Copyright © 2021-2022 by Network Technologies Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written consent of Network Technologies Inc, 1275 Danner Drive, Aurora, Ohio 44202.

**CHANGES**

The material in this guide is for information only and is subject to change without notice. Network Technologies Inc reserves the right to make changes in the product design without reservation and without notification to its users.

## TABLE OF CONTENTS

Introduction.....	1
Materials.....	2
Connectors and LEDs .....	3
Connection .....	5
Transceiver Installation.....	6
IR Control.....	8
One to Many Connection .....	9
Many-to Many Connection.....	9
Cascading Switches .....	10
Technical Specifications.....	11
Warranty Information.....	12

## INTRODUCTION

### INTRODUCTION

The XTENDEX® HDMI Extender Over IP via Fiber Optic Cable transmits HDMI video, embedded audio, and IR signals up to 24.8 miles (40 kilometers) away from an HDMI source using a single LC singlemode fiber optic strand or 984 feet (300 meters) using OM3 LC multimode fiber optic cable.

Each HDMI Extender Over IP consists of a local unit that connects to an HDMI source and provides a buffered HDMI input loop-through, 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 Fiber Optic Cable or a Point-to-Many connection via a network switch. Support for multiple transmitters requires a managed network switch.

- Signal transmission via single-strand LC fiber optic cable.
  - Using singlemode 9-micron cable, extend to 24.8 miles (40 km).
  - Using 50-micron OM3 (or better) multimode cable, extend to 984 feet (300 meters).
- Supports HDTV resolutions to 1080p.
- Cascade network switches to extend the length longer distances.
  - Up to three switches can be cascaded.
- HDMI features supported:
  - HDMI 1.3
  - 36-bit Deep Color
  - RGB, YCbCr 4:4:4, and YCbCr 4:2:2
  - LPCM
  - Bandwidth up to 4.46Gbps
- HDCP 1.4 compliant.
- Full Infrared Remote (IR) control of HDMI source from remote HDTV using existing source remote control.
- For a point-to-many connection, a standalone network with an unmanaged SFP network switch, hub, or router can be used instead of a managed SFP network switch.
  - Easily expandable. Add remote units as you add monitors.
    - Up to 253 receivers supported.
  - It is not recommended to use any other network devices on this standalone network as it may cause degradation in performance.
- Support for multiple transmitters (many-to-many connection) requires a managed SFP switch with VLAN support. Standard LAN switches can only support one transmitter.
  - The managed SFP 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.
- Plug-and-Play installation allows receivers to find the transmitters automatically on the same subnet.
- Local and remote units must be in the same LAN. The units do not support WAN connections.
- Built-in default EDID table.
- Cables can be installed in conduit prior to extender installation.
- Integrated mounting brackets for easy surface/wall mounting.

## MATERIALS

### Materials supplied with this kit:

- 1- ST-IPFOHD-L-LC-ULC Transmitter
- 1- ST-IPFOHD-R-LC-ULC Receiver
- 2- 100-240VAC @50/60Hz ; 5VDC 2A Output (for US) / 5VDC/3A (for EU, UK and AUS)
- 1- T1550/R1310nm 1000 Base-T Gigabit SFP module
- 1- T1310/R1550nm 1000 Base-T Gigabit SFP module
- 1- IR Emitter Extension Cable
- 1- IR Receiver Extension Cable
- URL Slip with path to this manual

### Requirements:

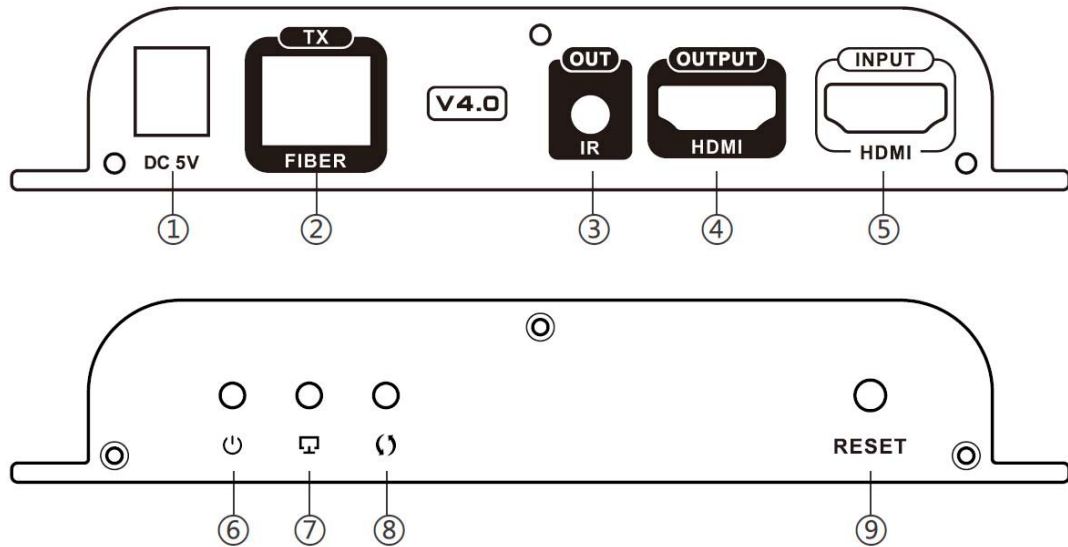
- Source device with HDMI output port (computer graphics card,DVD, PS3, HD monitor equipment etc.)
- Display device with HDMI input port (HDTV, projector).
- HDMI cable and LC optical fiber cable.

### Cables

- Use a simplex LC singlemode 9-micron fiber optic cable to extend the receiver from the transmitter up to 24.8 miles (40 km).
  - Use FIBER-AD-SS-SCFLCM to convert a male simplex SC singlemode connector to a male simplex LC singlemode connector.
- Use a simplex LC multimode 50-micron OM3 (or better)fiber optic cable to extend the receiver from the transmitter up to 984 feet (300 meters).
- Use HD-xx-MM cables to connect an HDMI source or display up to 50 feet.
- Use DP-HD-xx-MM cables to connect a DisplayPort source up to 15 feet.
- Use DVI-HD-xM-MM cables to connect a DVI source up to 5 meters.
- Use USB3C-HD4K-xx-MM to connect a USB-C or Thunderbolt 3 device up to 10 feet.
- **Cables are not included.**

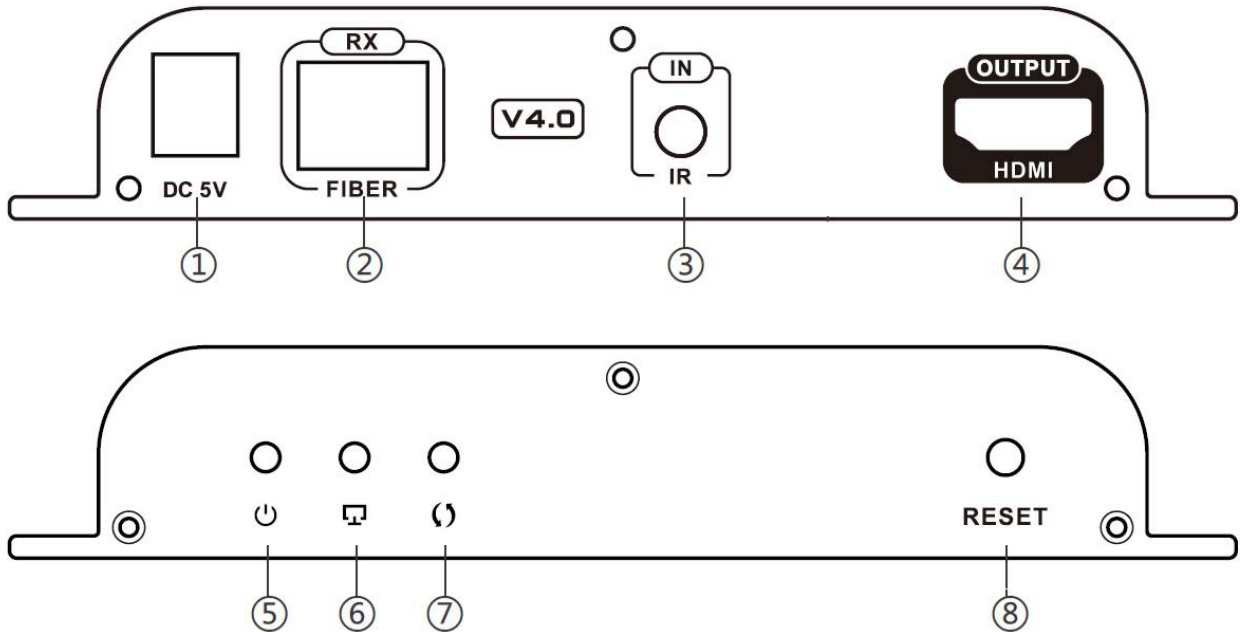
**CONNECTORS AND LEDS**

**ST-IPFOHD-L-LC-ULC  
Transmitter (Local Unit)**



#	LABEL	CONNECTOR/LED	DESCRIPTION
1	DC 5V	2.1x5.5mm Power Jack	for connection of power supply
2	TX- FIBER	SFP Socket	For insertion of the T1310/R1550nm Transceiver (To connect the LC fiber cable from the Receiver)
3	IR OUT	3.5mm Female Jack	For connection of the IR Blaster cable
4	HDMI OUTPUT	Female HDMI Connector	For the HDMI cable from a local display
5	HDMI INPUT	Female HDMI Connector	For the HDMI cable from the video source
6	Power Symbol	Blue LED	Indicates the Transmitter is powered ON
7	Display Symbol	Green LED	Flashes to indicate a connection with the Receiver
8	Arrows	Green LED	Illuminates steady ON when there is data transmission between the Transmitter and Receiver
9	Reset	Button	Press to restart the Transmitter

**ST-IPFOHD-R-LC-ULC**  
**Receiver (Remote Unit)**



#	LABEL	CONNECTOR/LED	DESCRIPTION
1	DC 5V	2.1x5.5mm Power Jack	for connection of power supply
2	RX- FIBER	SFP Socket	For insertion of the T1550/R1310 Transceiver (To connect the LC fiber cable from the Transmitter)
3	IR OUT	3.5mm Female Jack	For connection of the IR Receiver cable
4	HDMI OUTPUT	Female HDMI Connector	For the HDMI cable from an extended display
5	Power Symbol	Blue LED	Indicates the Receiver is powered ON
6	Display Symbol	Green LED	Flashes to indicate a connection with the Receiver
7	Arrows	Green LED	Illuminates steady ON when there is data transmission between the Transmitter and Receiver
8	Reset	Button	Press to restart the Receiver

## CONNECTION

1. Connect an HD-xx-MM cable (xx = 3,6,10,15,20,30 and 50 feet- sold separately) between the Transmitter "HDMI IN" port and the Video Source (Computer, Camera, DVD player, etc.) and another between the Receiver "HDMI OUT" port and the HDMI- display device.

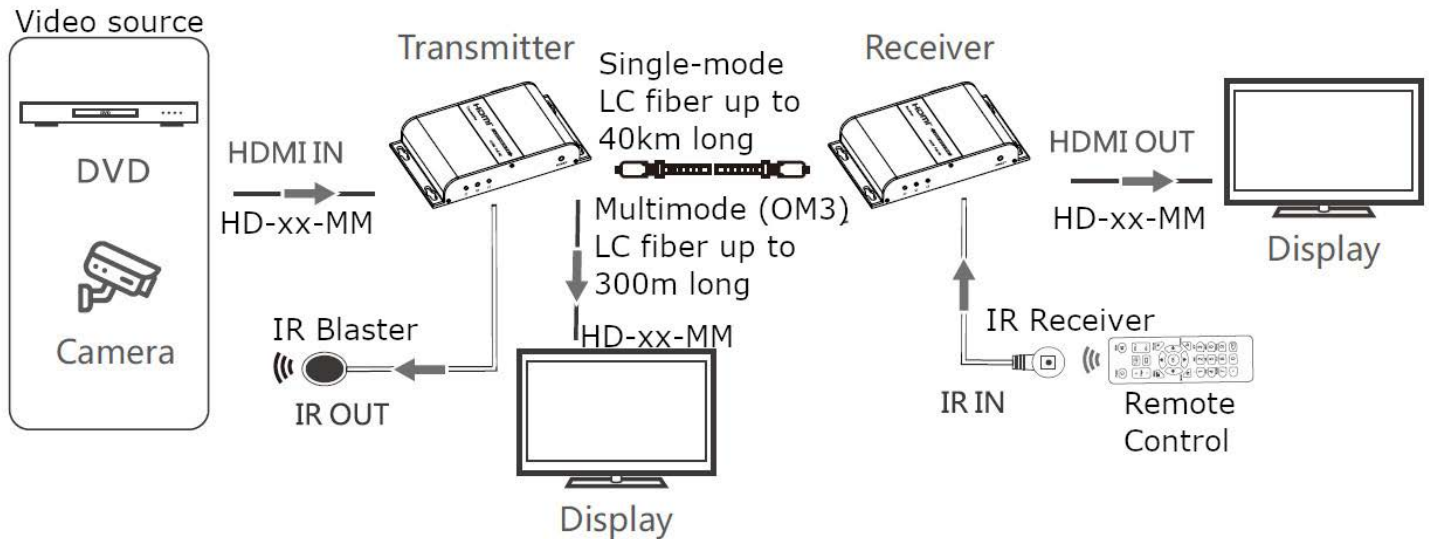
Optionally, connect a third HD-xx-MM cable between a local display and the "HDMI OUT" port on the Transmitter.

2. Plug the T1310/R1550 Transceiver into the "Fiber-TX" port on the ST-IPFOHD-L-LC-ULC Transmitter.

3. Plug the T1550/R1310 Transceiver into the "Fiber-RX" port on the ST-IPFOHD-R-LC-ULC Receiver.

4. Connect a simplex single-mode LC fiber optic cable up to 40km in length (or multimode (OM3) cable up to 300m in length) between the Transmitter SFP transceiver and the Receiver SFP transceiver.

5. Plug the 5VDC power supplies into the "DC 5V" jacks on the Transmitter and Receiver and connect them to power.



If an SFP Optical Transceiver should ever need replacement, use a universal transceiver with a transmission rate of 1.25 Gbps. Contact an NTI Sales Associate for assistance at 330-562-7070.



## Transceiver Installation

The transceivers need to be fully inserted in order to function. Follow these steps for proper installation.

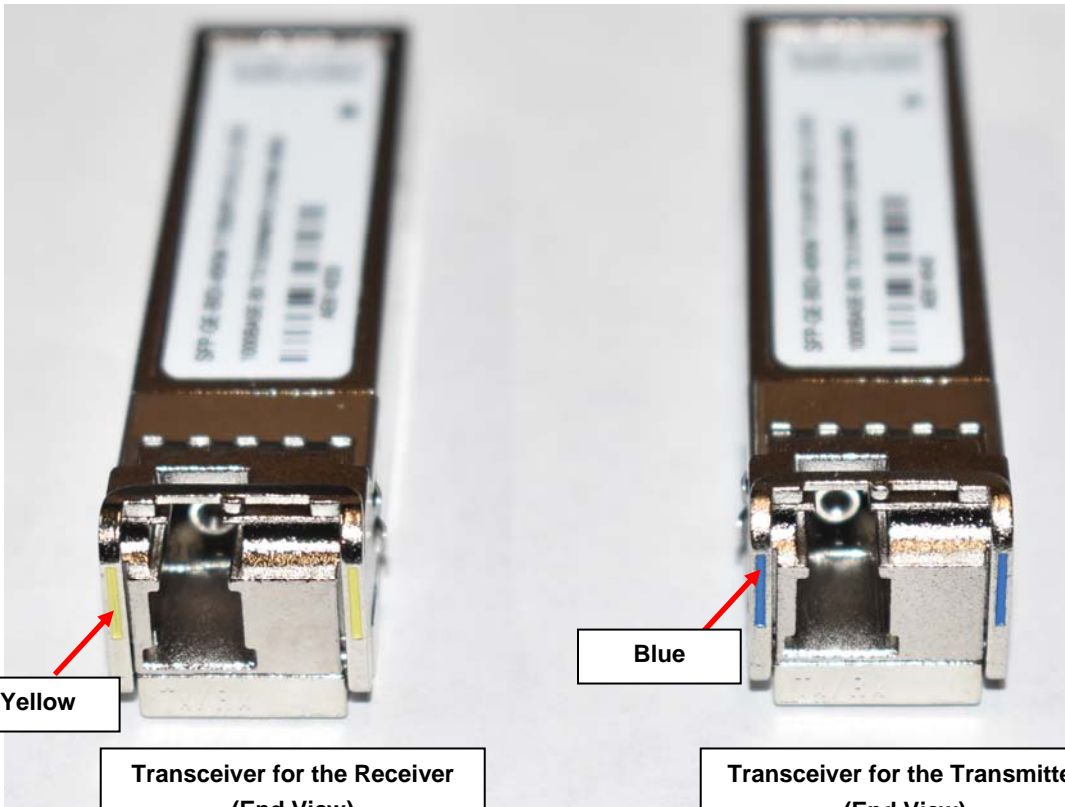
1. Identify which transceiver is being installed. The T1310/R1550 (blue) transceiver goes in the Transmitter. The T1550/R1310 (yellow) transceiver goes in the Receiver.



Transceiver for the Transmitter (Top View)



Transceiver for the Receiver (Top View)



Yellow

Blue

Transceiver for the Receiver (End View)

Transceiver for the Transmitter (End View)

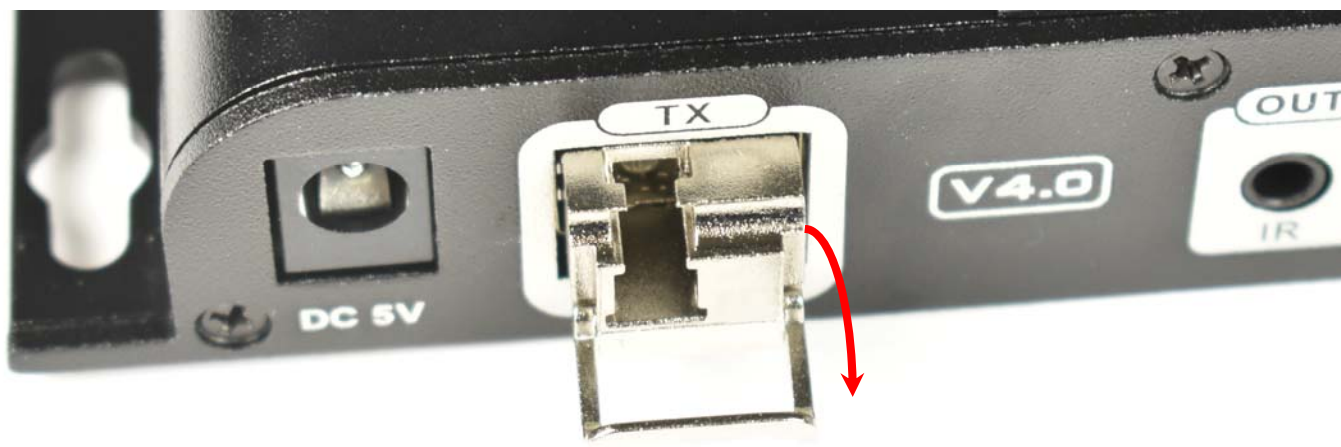
2. Remove the dust cover from the Transceiver and set to the side.



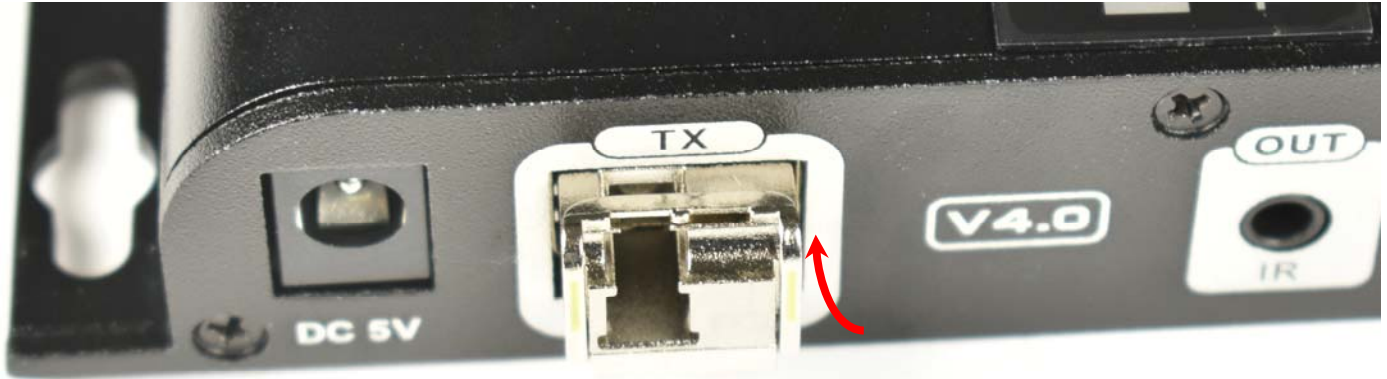
3. Insert the Transceiver part way into the SFP opening in the extender.



4. Fold the latch down and press the Transceiver into the opening until fully seated.



5. Rotate the latch back up to lock the Transceiver into position.



6. If not installing the fiber optic cable, return the dust cover to the Transceiver.



## IR Control

To make use of a video source that can be operated with a remote control, connect the IR blaster and Receiver cables as follows:

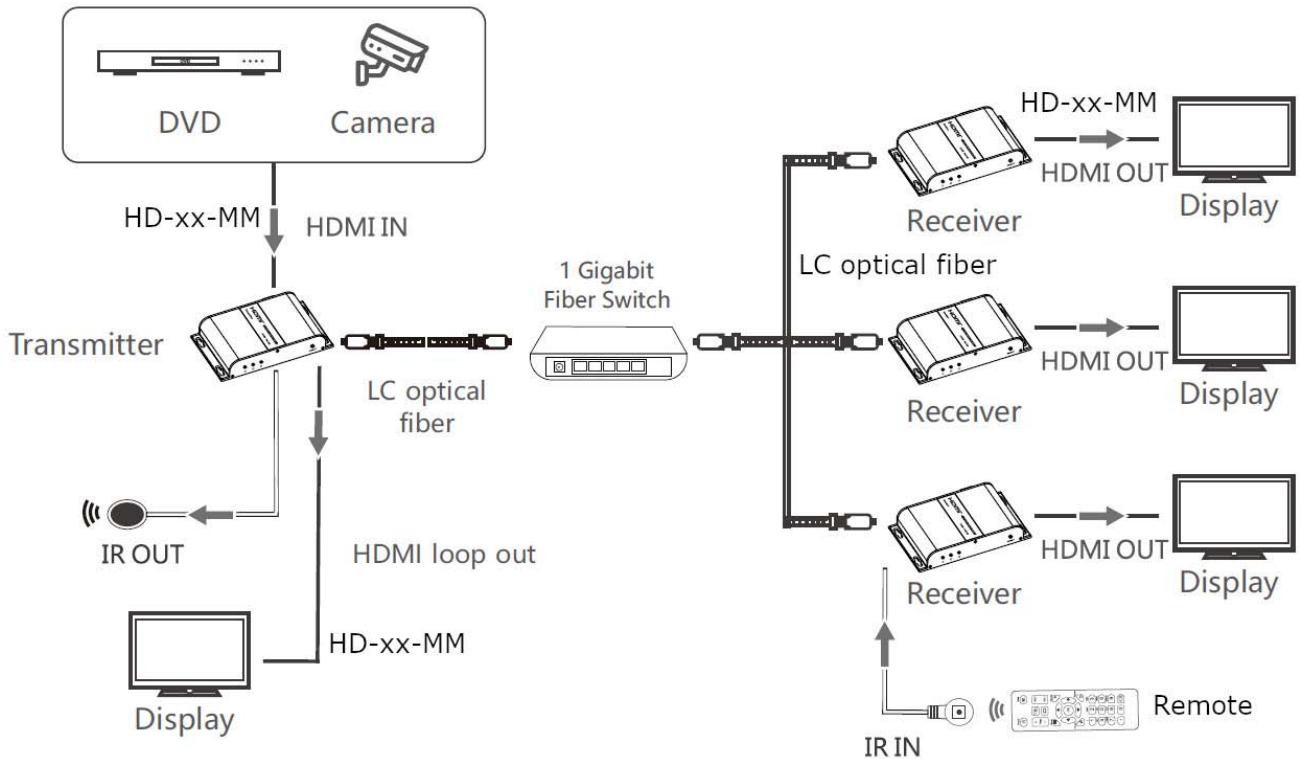
1. Connect the IR Receiver to the "IR IN" port on the ST-IPFOHD-R-LC-ULC Receiver. Locate the receiver such that you can see it when using the remote control.
2. Connect the IR Blaster to the "IR OUT" port on the ST-IPFOHD-L-LC-ULC Transmitter. Locate the blaster as close to the IR Input window as practical on the video source.

## One to Many Connection

A Transmitter can be connected to a 1 Gigabit Fiber Optic SFP Switch for a connection to multiple Receivers. Each connected Receiver will receive the same video signal from the Transmitter. The Transmitter and Receivers must be connected to the same VLAN group in order for this to work. You can have only one Transmitter in a VLAN group.

To use an SFP switch, a T1550/R1310 Transceiver (sold separately) will need to be installed in the SFP Switch where the Transmitter connects to it. A T1310/R1550 Transceiver (sold separately) will need to be installed in the SFP Switch where each Receiver connects to it. For additional Transceivers, contact an NTI Sales Associate at 330-562-7070.

Each simplex single-mode LC fiber cable used to connect to the switch can be up to 40km in length.



## Many-to Many Connection

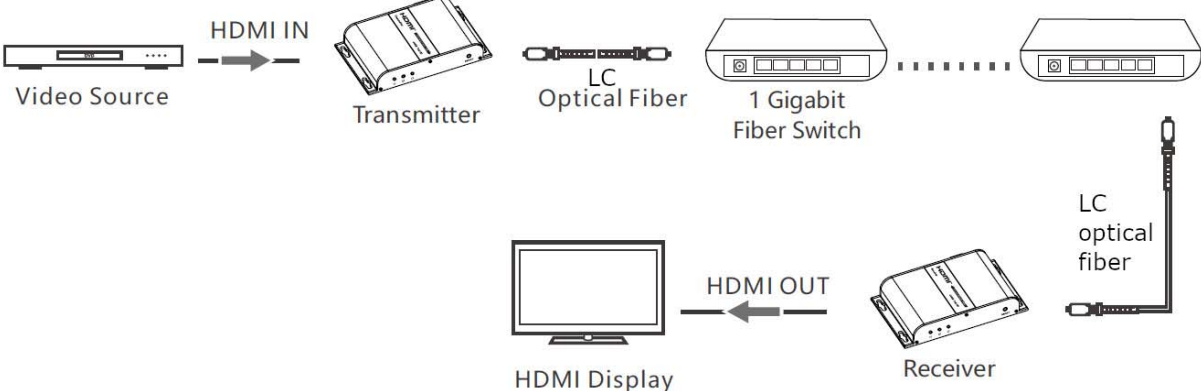
Support for multiple transmitters requires a managed network switch with VLAN support. Standard LAN switches can only support one Transmitter.

The managed network 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.

### Cascading Switches

Ethernet switches can be cascaded, but no more than 3 switches per application.



## TECHNICAL SPECIFICATIONS

HDMI Version	HDMI 1.3
HDCP supported	HDCP 1.4
Supported Resolutions	640x480@59/60Hz (480p), 720x480@59/60Hz (480p), 720x576@50/59/60Hz (576p), 800x600@60Hz, 1024x768@60Hz, 1280x720@50/59/60Hz (720p), 1280x960@60Hz, 1280x1024@60Hz, 1366x768@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1680x1050@60Hz, 1920x1080@23/24/25/29/30/50/59/60Hz (1080i/1080p)
DDC signal voltage	5Vp-p (TTL)
Audio format	LPCM
Center wavelength	1310/1550nm
Fiber Connector Type	LC
Local Unit Ports	<ul style="list-style-type: none"> <li>• One female HDMI connector for source connection.</li> <li>• One female HDMI connector for local monitor. <ul style="list-style-type: none"> <li>◦ Supports HDTV resolutions to 1080p @60Hz.</li> </ul> </li> <li>• One 3.5mm port for IR emitter (included).</li> <li>• One simplex LC fiber optic port for sending/receiving video/audio and IR signals.</li> </ul>
Remote Unit Ports	<ul style="list-style-type: none"> <li>• One female HDMI connector for monitor. <ul style="list-style-type: none"> <li>◦ Supports HDTV resolutions to 1080p @60Hz.</li> </ul> </li> <li>• One 3.5mm port for IR receiver (included).</li> <li>• One simplex LC fiber optic port for sending/receiving video/audio and IR signals.</li> <li>• Encoding delay: 100 ms latency</li> </ul>
Transmission rate	1,25Gbps
Output light power	±3dB
Input light power	±3dB
Receive sensitivity	≤-3dBm
Return loss	12dBm
IR Remote Control	Frequency range: 20~60KHz
Protection Level	Implementation of the standard: IEC61000-4-2 <ul style="list-style-type: none"> <li>• 1a Contact discharge level 4 (8KV)</li> <li>• 1b Air discharge level 4 (15KV)</li> </ul>
Operating temperature	-4 to 140°F (-20°C ~ 60°C)
Storage temperature	-22 to 158°F (-30°C ~ 70°C)
Relative humidity	0~90%RH Non-condensing
Max. Distance	<ul style="list-style-type: none"> <li>• 24.8 miles (40 km) over 9µm singlemode LC fiber optic cable.</li> <li>• 984 feet (300 meters) over 50µm OM3 (or better) multimode LC fiber optic cable.</li> </ul>
Chassis material	Aluminum alloy
Power Supply- Local and Remote Unit	Input: 100-240VAC @50/60Hz ; Output: 5VDC 2A (US) / 5VDC 3A (UK, EU, AUS)
Size WxDxH	5.43 x 3.21 x 0.94 in (138.00 x 82 x 24.00 mm)
Approvals	CE, RoHS, FCC

## 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.

MAN414 Rev. 10/4/22