



XTENDEX® Series

ST-IPFO4K18GB-LC

4K 18GBPS HDMI EXTENDER OVER IP VIA ONE LC SINGLEMODE/MULTIMODE FIBER OPTIC CABLE

Installation and Operation Manual



ST-IPFO4K18GB-LC (Local and Remote Units)

TRADEMARK

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CHANGES

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TABLE OF CONTENTS

Introduction.....	1
Materials.....	2
Features and Functions.....	3
Connections.....	5
Point-to-Point Connection.....	5
Point-to-Many Connection.....	6
Cascading Switches Connection.....	6
IR User Guide.....	7
RS-232 User Guide.....	7
Control instruction.....	7
Technical Specifications.....	8
Frequently Asked Questions.....	9
Warranty Information.....	10

INTRODUCTION

The XTENDEX® 4K 18Gbps HDMI Extender Over IP via Fiber Optic Cable locates an Ultra-HD 4Kx2K 60Hz 4:4:4 HDMI display, audio, IR, and RS232 up to 24.8 miles (40 kilometers) away from an HDMI source using a single LC singlemode fiber optic strand or 1,640 feet (500 meters) using LC multimode fiber optic cable.

Each 4K 18Gbps HDMI Extender Over IP consists of a local unit that connects to an HDMI source and a local display via the HDMI loop output, 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 10G SFP network switch. Support for multiple transmitters requires a managed 10G SFP 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 OM2 (or better) multimode cable, extend to 1,640 feet (500 meters).
 - Zero latency.
- Supports Ultra-HD 4Kx2K resolutions to 3840x2160 and 4096x2160 @60Hz YUV 4:4:4, HDTV resolutions to 1080p @60Hz, and up to 1920x1200 (WUXGA).
- Cascade network switches to extend the length longer distances.
 - Up to 12 switches can be cascaded.
- HDMI features supported:
 - HDMI 2.0
 - 8-bit, 10-bit, and 12-bit Deep Color
 - Dolby TrueHD, DTS-HD Master Audio, Dolby Digital, Dolby Digital+, Dolby Atmos, LPCM 7.1CH, DTS 5.1, and DTS:X
 - RGB, YCbCr 4:4:4, YCbCr 4:2:2, and YCbCr 4:2:0
 - Bandwidth up to 600 Mhz (18Gbps)
 - 3D (1080p @60Hz)
 - Support for CEC (consumer electronic control) compatible devices.
 - HDR10
 - ARC
- HDCP 2.2 and 1.4 compliant.
- Supports local and remote HDMI displays.
- For a point-to-many connection, a standalone network with an unmanaged 10G 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 255 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 10G SFP network switch with IGMP support and Jumbo frame support. Standard LAN switches can only support one transmitter.
 - The managed 10G SFP 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.
 - The 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.
- Supports full-duplex RS232 up to 115200 baud.
- Bi-directional IR control from input and output locations.
- Supports HDMI embedded digital audio and ARC audio extraction via Toslink connection.
- Built-in surge and ESD protection.
- Mounting brackets included for easy surface/wall mounting.

MATERIALS

Materials supplied with this kit:

- One NTI XTENDEX transmitter unit
- One NTI XTENDEX receiver unit
- One T1270/R1330nm 10G Base-T SFP module (for transmitter)
- One T1330/R1270nm 10G Base-T SFP module (for receiver)
- One IR emitter
- One IR receiver
- Two power supplies-100 to 240 VAC at 50 or 60Hz via AC adapter; 5VDC 2A (Domestic) / 3A (International)
- Two 3-terminal blocks for RS232 cable connection
- Mounting brackets
- URL slip with path to this manual

Materials *Not* supplied but **REQUIRED**:

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.

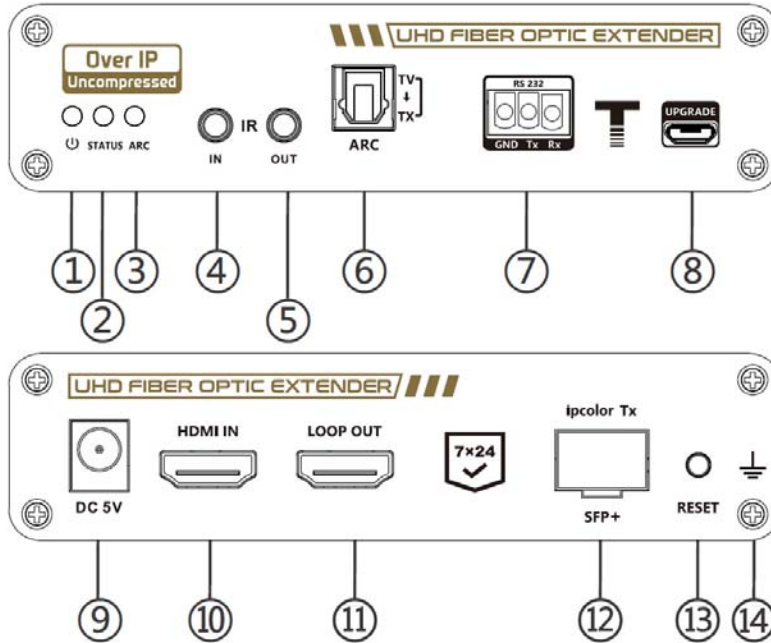
Use a simplex LC multimode 50-micron OM2 (or better) fiber optic cable to extend the receiver from the transmitter up to 1,640 feet (500 meters).

Cables 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).

For a Point-to-Many connection, a managed 10G SFP network switch will be required.

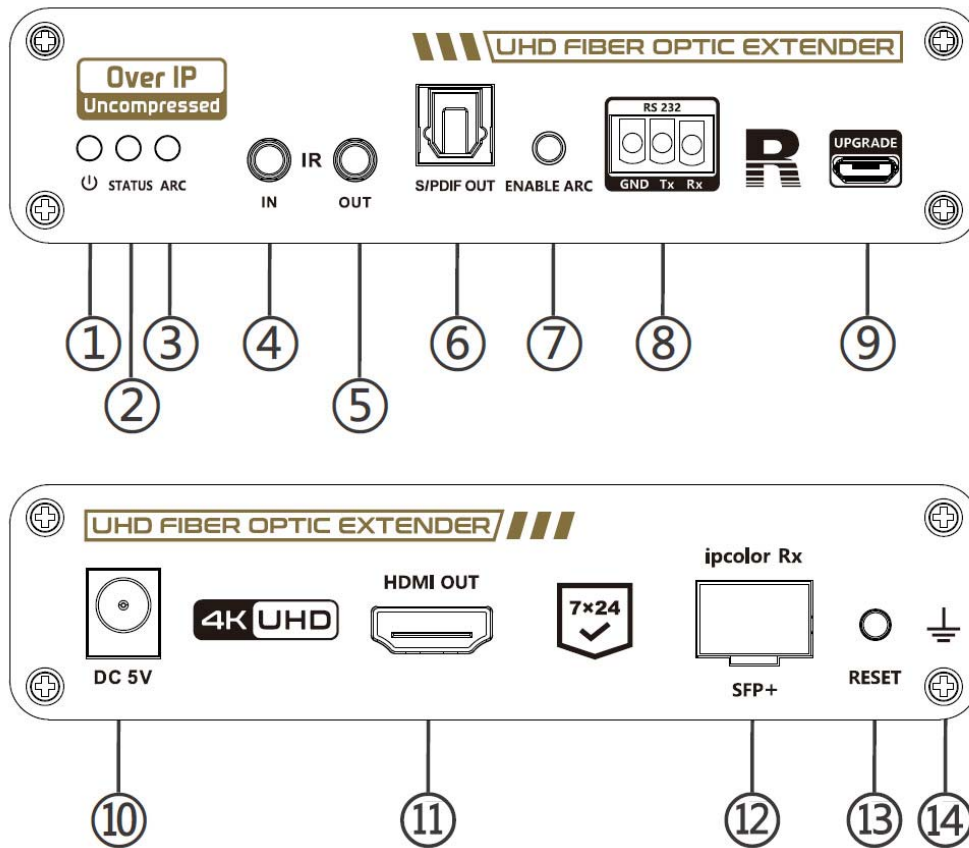
FEATURES AND FUNCTIONS

ST-IPFO4K18GB-L-LC (Transmitter)



Item	Type	Description
1	Power LED	LED will illuminate blue when power is ON
2	Status LED	OFF: No connection between Transmitter and Receiver Slowly flashing (every 1 second): Transmitter and Receiver are connected but no video data Quick flash (every 200ms): The video signal is connecting Steady ON: The video data is transmitting
3	ARC LED	OFF: ARC is OFF Slowly flashing (every 1 second): The ARC between the TX and RX is connected. Quick flash(every 200mx): The ARC between the TV and the extender is connected Steady ON: The ARC data is transmitting
4	IR IN	For connection of the IR receiver
5	IR OUT	For connection of the IR emitter
6	ARC Output	Connect the fiber optic audio signal from the TV's HDMI ARC port
7	RS232	Connect for RS232 passthrough and command control
8	Upgrade	Used for device firmware upgrade
9	DC 5V	Connect 5V DC AC Adapter
10	HDMI IN	Connect HDMI cable from HDMI source device
11	LOOP OUT	Connect HDMI cable going to local HDMI monitor
12	SFP+	Insert the SFP+ optical module
13	RESET	Press momentarily to restart the device; press for 5 seconds to restore device factory settings
14	GND	Earth Grounding point; connect earth ground wire here if desired.

ST-IPFO4K18GB-R-LC (Receiver)



Item	Type	Description
1	Power LED	LED will illuminate blue when power is ON
2	Status LED	OFF: No connection between Transmitter and Receiver Slowly flashing (every 1 second): Transmitter and Receiver are connected but no video data Quick flash (every 200ms): The video signal is connecting Steady ON: The video data is transmitting
3	ARC LED	OFF: ARC is OFF Slowly flashing (every 1 second): The ARC between the TX and RX is connected. Quick flash(every 200mx): The ARC between the TV and the extender is connected Steady ON: The ARC data is transmitting
4	IR IN	For connection of the IR receiver
5	IR OUT	For connection of the IR emitter
6	S/PDIF OUT	Connect the digital audio speakers
7	Enable ARC	Turn ON/OFF HDMI ARC
8	RS232	Connect for RS232 passthrough and command control
9	Upgrade	Used for device firmware upgrade
10	DC 5V	Connect 5V DC AC Adapter
11	HDMI OUT	Connect HDMI cable going to local HDMI monitor
12	SFP+	Insert the SFP+ optical module
13	RESET	Press momentarily to restart the device; press for 5 seconds to restore device factory settings
14	GND	Earth Grounding point; connect earth ground wire here if desired.

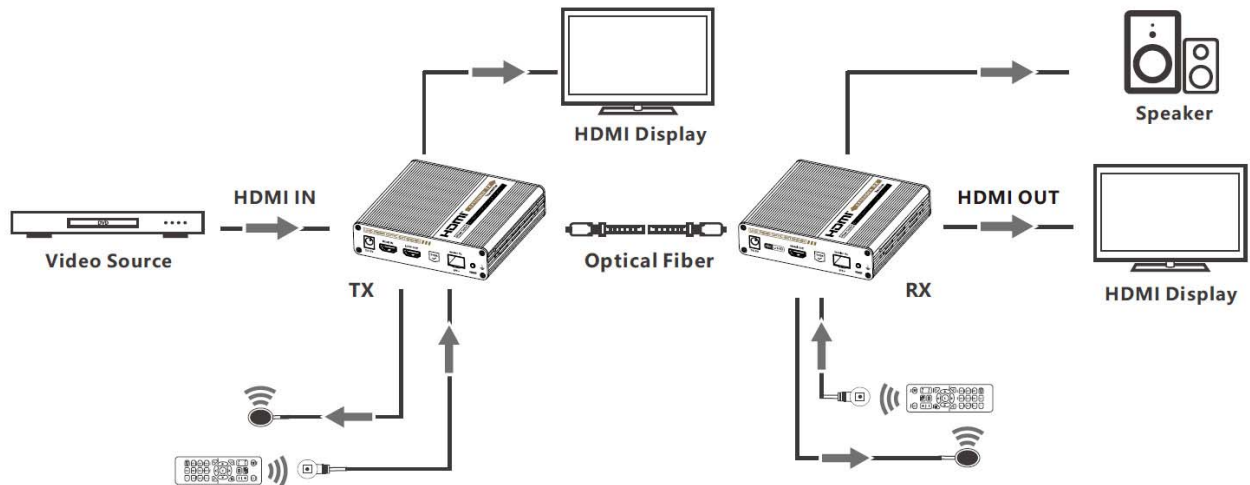
CONNECTIONS

Install the SFP+ Modules

First insert the included SFP+ optical modules into the transmitter and receiver "SFP+" ports.

- The T1270/R1330nm 10G Base-T SFP module – goes in the transmitter
- The T1330/R1270nm 10G Base-T SFP module – goes in the receiver

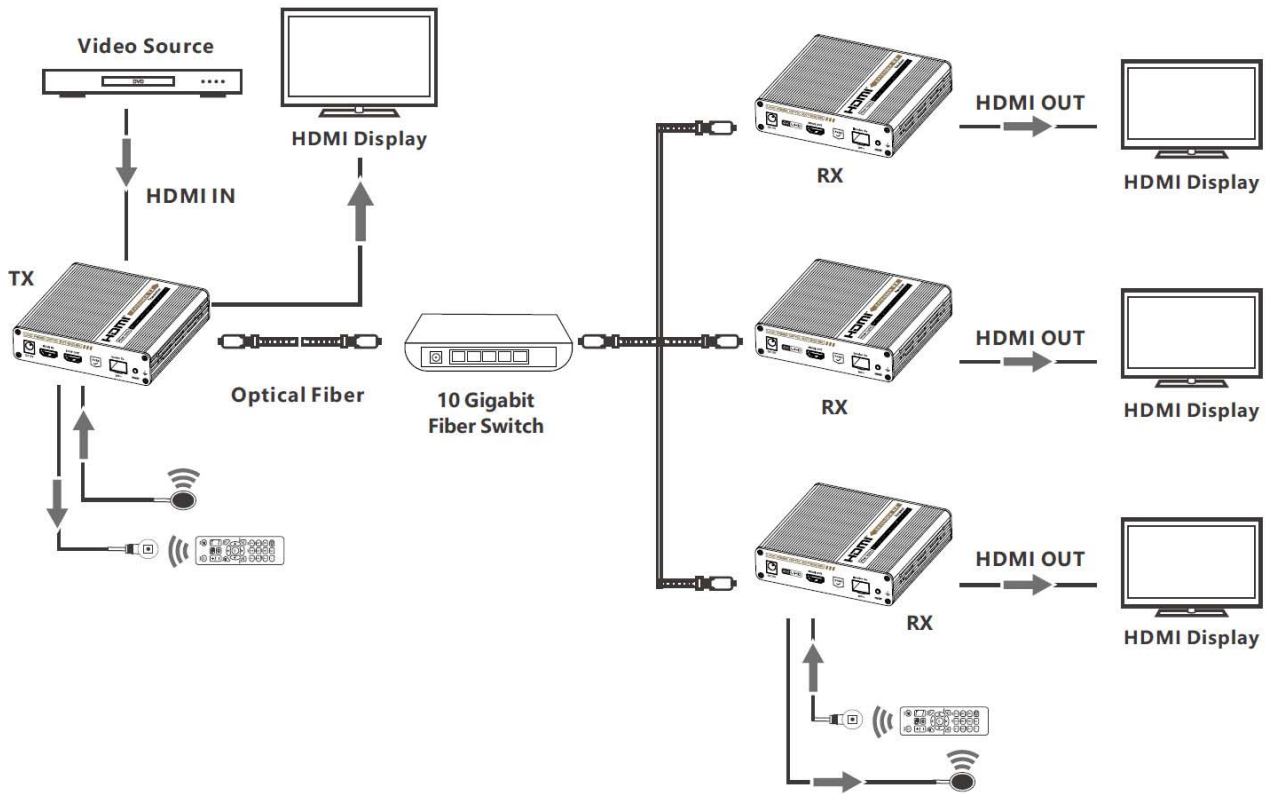
Point-to-Point Connection



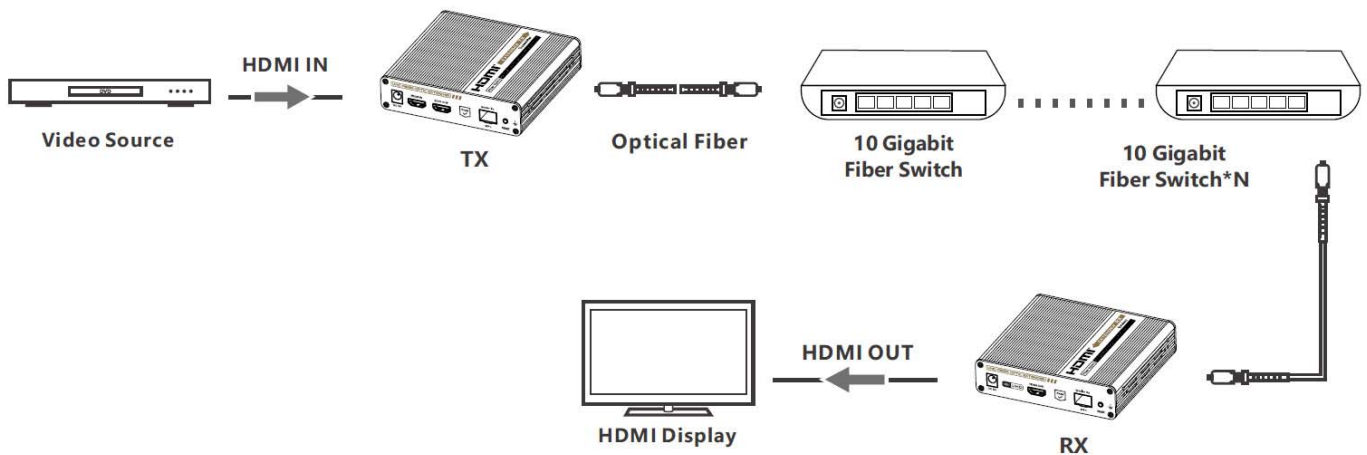
Cable Connections

- 1) Connect the source device to the "HDMI IN" port of the transmitter with an HDMI cable, and connect the "HDMI OUT" port of the receiver to the display device with another HDMI cable.
- 2) For a point-to-point connection, Use a fiber optic cable to connect the "SFP+" port of the transmitter(TX) and receiver(RX).
If it is point-to-many connection, then use the 10 Gigabit switch as a bridge to connect the transmitter and the receivers with the fiber optic cables respectively.
- 3) If using HDMI loop out, connect a display device to the "HDMI OUT" port of the transmitter.
- 4) If using IR passback, the IR blaster extension cable should plug in the "IR OUT" port of the transmitter and receiver, the IR receiver extension cable should plug in the "IR IN" port of the transmitter and receiver.
- 5) If using HDMI ARC, connect the ARC interface of the transmitter to the speaker with optical fiber cable. If you need additional source audio from the receiver, connect the "S/PDIF OUT" interface of the receiver to the audio device with optical fiber cable.
- 6) If using the RS-232 function, install the supplied 3-terminal block to the "RS-232" port of the transmitter or receiver and connect a 3-wire cable to an external device.
- 7) If using the IR control, connect the IR receiver to the Transmitter/Receiver at the location the remote control will be used. Connect the IR emitter at the location the device to be controlled is located.
- 8) Plug the power supply into the devices to get started.

Point-to-Many Connection



Cascading Switches Connection



Using multiple managed fiber switches in a cascaded configuration, you can connect up to 255 receivers to the transmitter.

IR User Guide

- 1) IR blaster extension cable should plug in the IR OUT port of the transmitter or receiver, IR receiver extension cable should plug in the IR IN port of the transmitter or receiver.
- 2) The emitter of the IR blaster extension cable should be as close as possible to the IR receiving window of the source device.
- 3) Point the remote control at the receiving head of the IR receiver extension cable to operate.

RS-232 User Guide

This product can passthrough RS-232 commands and use commands to control the transmitter or receiver.

The default configuration is as follows:

Baud rate: 115200
 Data bits: 8
 Stop bits: 1
 Parity: none

Control instruction

Function	Control Code
Restore factory default settings	BA A5 11 00 00 11 33
Restart device	BA A5 10 00 00 10 30
Open CEC	BA A5 15 01 00 01 17 58
Close CEC	BA A5 15 01 00 00 16 57
Get CEC status	BA A5 15 00 00 15 3F Receive: (CEC_ON) BA A5 15 01 00 01 17 58 Receive: (CEC_OFF) BA A5 15 01 00 00 16 57
Set baud rate of the device	Set the baud rate to 2400 BA A5 13 04 00 00 00 09 60 80 0F
	Set the baud rate to 2400 BA A5 13 04 00 00 00 09 60 80 0F
	Set the baud rate to 9600 BA A5 13 04 00 00 00 25 80 BC 67
	Set the baud rate to 19200 BA A5 13 04 00 00 00 4B 00 62 33
	Set the baud rate to 38400 BA A5 13 04 00 00 00 96 00 AD C9
	Set the baud rate to 57600 BA A5 13 04 00 00 00 E1 00 F8 5F
	Set the baud rate to 115200 BA A5 13 04 00 00 01 C2 00 DA 24
	Set the baud rate to 230400 BA A5 13 04 00 00 03 84 00 9E AE

Note: If the RS-232 control instruction succeeds, it will return the control instruction code; if it fails, it will return the error code: BA A5 02 01 00 01 04 0C

TECHNICAL SPECIFICATIONS

Local Unit (Transmitter)	
Source Connection	One female HDMI connector
Display Connection	One female HDMI connector Supports Ultra-HD 4Kx2K resolutions to 3840x2160 and 4096x2160 @60Hz YUV 4:4:4, HDTV resolutions to 1080p @60Hz, and up to 1920x1200 (WUXGA). Supports embedded digital audio.
IR	Two 3.5mm ports connecting an IR emitter and receiver (included). Supports IR frequency range: 20 to 60 kHz.
RS232	3-pin screw terminal Supports full-duplex RS232 up to 115200 baud.
Audio	One TOSLINK optical port for HDMI ARC audio extraction..
Fiber	One simplex LC fiber optic port for sending/receiving video/audio, IR, and RS232 signals.
USB	One female USB Micro Type B connector for firmware updates.
HDCP Supported	HDCP 2.2 and 1.4.
Remote Unit (Receiver)	
Display Connection	One female HDMI connector for display. Supports Ultra-HD 4Kx2K resolutions to 3840x2160 and 4096x2160 @60Hz YUV 4:4:4, HDTV resolutions to 1080p@60Hz, and up to 1920x1200 (WUXGA). Supports embedded digital audio.
IR	Two 3.5mm ports connecting an IR emitter and receiver (included). IR frequency range: 20 to 60 kHz.
RS232	3-pin screw terminal for RS232. Supports full-duplex RS232 up to 115200 baud.
Audio	One TOSLINK optical port for SPDIF digital audio.
Fiber	One simplex LC fiber optic port for sending/receiving video/audio, IR, and RS232 signals.
USB	One female USB Micro Type B connector for firmware updates
HDCP Supported	HDCP 2.2 and 1.4.
Operating environment temperatures and RH	Operating temperature: -4 to 140°F (-20 to 60°C). Storage temperature: -22 to 158°F (-30 to 70°C). Operating relative humidity: 0 to 90% non-condensing RH.
Maximum Distance	24.8 miles (40 km) over 9µm singlemode LC fiber optic cable. 1,640 feet (500 meters) over 50µm OM2 (or better) multimode LC fiber optic cable.
General	
Power Supply (Local and Remote)	Input: 100 to 240 VAC at 50 or 60Hz via AC adapter. (Country-specific power supplies included.) Output: US power supply: 5VDC, 2A UK, EU, AUS power supplies: 5VDC, 3A
Power consumption:	Local unit: 4.6W Remote unit: 4.1W
Dimensions (In.) WxDxH	4.88x4.54x1.18 (124x115x30 mm)
Approvals	CE, FCC, RoHS

Cables (not included)

- Interface cables between the source/display and the transmitter/receiver are required for proper operation.
 - Supports cable lengths to 20 feet for 4K resolutions and lengths to 50 feet for 1080p@60Hz using passive HDMI cables.
- Use HD-xx-MM cable to connect an HDMI source or display.
- Use HD-ACT-xx-MM 4K HDMI Active Cables to connect an HDMI computer up to 50 feet.
- Use USB3C-HD4K-xx-MM to connect a 4K computer with USB Type C connector up to 10 feet.
- Use DVI-HD-xM-MM to connect a DVI computer up to 5 meters.
 - Supports resolutions to 1080p.
- 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 OM2 (or better) fiber optic cable to extend the receiver from the transmitter up to 1,640 feet (500 meters).

FREQUENTLY ASKED QUESTIONS

Q: Why is the power indicator LED ON but the status LED is OFF?

- A: 1) Verify that the fiber optic cable is properly seated at both ends.
2) Use a different fiber-optic cable.

Q: Why is the status indicator LED flashing slowly:

- A: 1) Check whether there is HDMI signal input for the TX.
2) Try to connect the signal source directly to the display device, or try to change the signal source and HDMI cable and re-test.

Q: Why am I seeing "Search ipcolor Tx.." on the display?

- A: The transmitter and the receiver are not connected or they are connected but there is no data transmission. Refer to the above two questions for a solution.

Q: Why is the output image unstable?

- A: 1) Check whether the length of the fiber-optic cable connected from the TX to the RX is within 40 kilometers if using 9 micron or within 500 meters if using 50 micron OM2 cable. .
2) The length of HDMI cable is recommended to be no more than 5 meters.
3) Press the "Reset" button on the TX and RX units to restart and reconnect.

Q: Why is the HDMI ARC not working?

- A: 1) Check whether the HDMI port connected to the receiver supports ARC function.
2) Make sure that the HDMI ARC of the TV is turned ON.
3) Press the ARC button on the receiver to enable ARC.

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.

MAN432 Rev. 5/31/23