User Manual

4KPROIP-FOC-EN 4KPROIP-FOC-DE

4KPROIP-FOC-EN-U 4KPROIP-FOC-DE-U

4K AV Over IP Solution

Version: 4KPROIP-FOC_2019V.1.6.1

CONTENT

1 Introduction

The 4KPROIP-FOC Series provides one of the most advanced IP Steaming solutions on the Pro AV market utilizing SDVoE technology, which synergizes various IP/AV standard to work together as One. It is the first industry 4K2K 4:4:4 transceiver with Zero latencies bases on Blue River NT platform. by using the Encoder (TX) and Decoder (RX).

Audio, video, data and control can be sent securely to one or many units by using 10G Ethernet switch with Fiber Port. Seamless switching of the source further enhances the presentation. The USB 2.0 option is also flexible working as KVM and or a high-speed data transfer(480Mbps) for memory sticks, each USB port can also be set as a host or device.

For Fiber device, the 1G Ethernet port allows full bandwidth end-to-end over the 10G Ethernet Switch hub on fiber or copper port.

2 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.

⚠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 aegis product. Use only the power adapter and power connection cables designed for this unit.
- **Power Adaptor:** Be sure the power adaptor is 12V3A, please matching the rating of the power voltage.
- **Lightning:** For protection from lightning or when the product is left unattended for a long period, disconnect it from the power source.

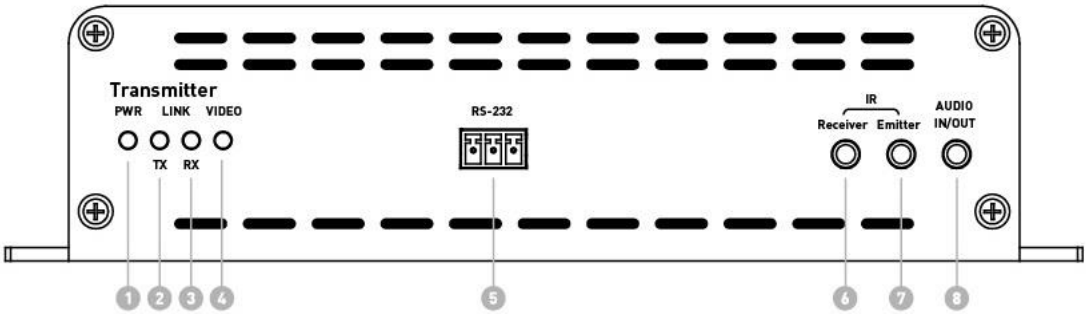
⚠ Also, follow these precautions:

- **Ventilation:** Do not block the ventilation slots if applicable on the product or place any heavy object on top of it. Blocking the 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 product on top of a hot component such as a power amplifier.
- **Risk of Fire:** Do not place the 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.
- **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.

3 Product

4KPROIP-FOC-EN (Fiber Encoder)

TRANSMITTER FRONT PANEL LAYOUT



PANEL DESCRIPTION

1. Power Led

Power/Status Power show in greenlighting when the unit is connected.
The status will blink during regular operation.
The Status will not blink means the firmware is not loaded correctly.

2. Link TX Led

Greenlight will blink when data is being transmitted or received for copper version.

3. Link RX Led

Greenlight will blink when data is being transmitted or received for copper version.

4. Video Led

Greenlight will blink when the active video is being processed.

5. RS232 Connector Port

RS232 Control port for sending and receiving side-band serial traffic to/from encoders.
Communication: up to 115.2K baud rate.

6. IR Receiver

IR receiver is to pass the commands to decoders

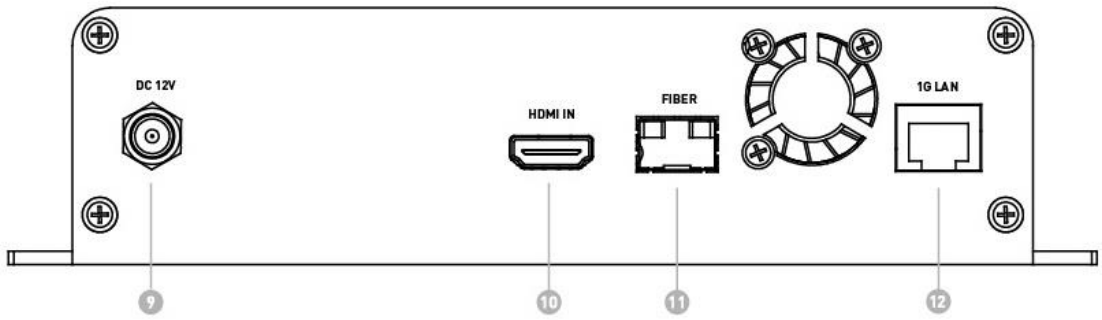
7. IR Emitter

IR emitter is to pass back commands from decoders. (30kHz-60kHz.)

8. Audio In / Out

Audio input/output for the line level stereo audio on 3.5mm.

TRANSMITTER REAR PANEL LAYOUT



PANEL DESCRIPTION

9. DC Power Input

Connect 12Volt DC Power supply to the power port.

10. HDMI Port In

Connect HDMI cable between this port and display device. (Max. 5 Meter)

11. FIBER Port

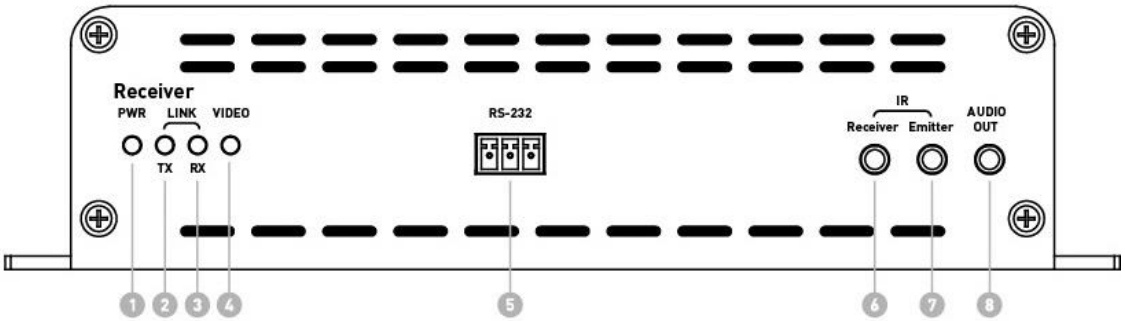
Connect fiber optical between this port and 10G Network hub.

12. 1G LAN Port

Used for general purpose device attachment to network or to the API Box.

4KPROIP-FOC-DE (Fiber Decoder)

RECEIVER FRONT PANEL LAYOUT



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Greenlight will blink when data is being transmitted or received for copper version.

3. Link RX Led

Greenlight will blink when data is being transmitted or received for copper version.

4. Video Led

Greenlight will blink when active video is being processed.

5. RS232 Connector Port

RS232 Control port for sending and receiving side-band serial traffic to/from encoders.
Communication: up to 115.2K baud rate.

6. IR Receiver

IR receiver is to pass the commands to decoders

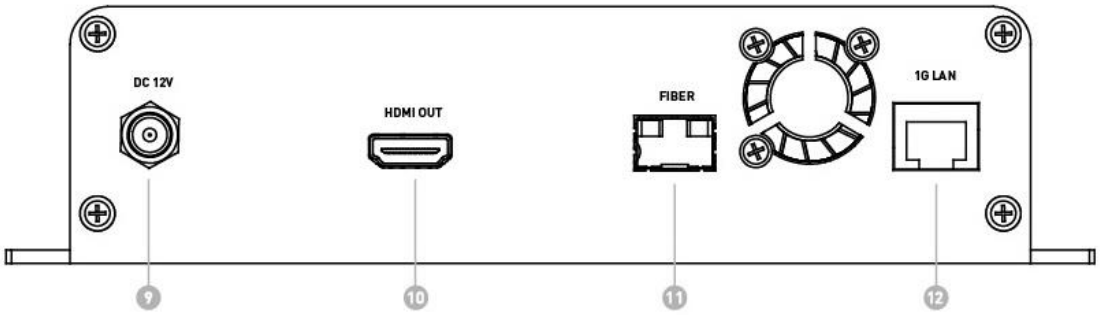
7. IR Emitter

IR emitter is to pass back commands from decoders. (30kHz-60kHz.)

8. Audio In / Out

Audio input/output for the line level stereo audio on 3.5mm.

RECEIVER REAR PANEL LAYOUT



PANEL DESCRIPTION

9. DC Power Input

Connect 12Volt DC Power supply to the power port.

10. HDMI Port In

Connect HDMI cable between this port and display device. (Max. 5 Meter)

11. Fiber Port

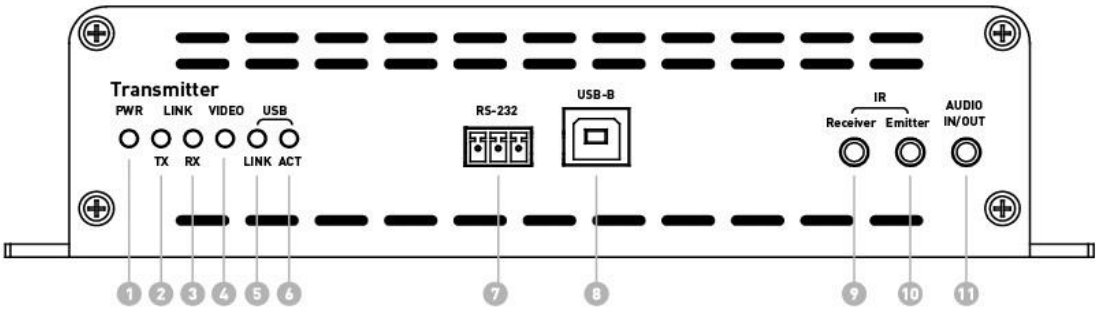
Connect fiber optical between this port and 10G Network hub.

12. 1G LAN Port

Used for general purpose device attachment to network or to the API Box.

4KPROIP-FOC-EN-U (Fiber Encoder with USB)

TRANSMITTER FRONT PANEL LAYOUT



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Greenlight will blink when data is being transmitted or received for copper version.

4. Video Led

Greenlight will blink when the active video is being processed.

5. USB Link Led

For USB function, Host will be blink when the PC is been connect to the USB,
Device will be blink if the peripherals like keyboard or mouse are connected.

6. USB Act Led

For USB function, Host will be blink when the PC is been connect to the USB,
Device will be blink if the peripherals like keyboard or mouse are connected.

7. RS232 Connector Port

RS232 Control port for sending and receiving side-band serial traffic to/ from encoders. Communication: up to 115.2K baud rate.

8. USB B Port

USB – 480Mbps USB 2.0 Type B (female) are to be connected to a host (PC) or device (Ex. Mouse, Keyboard, Etc...)

9. IR Receiver

IR receiver is to pass the commands to decoders

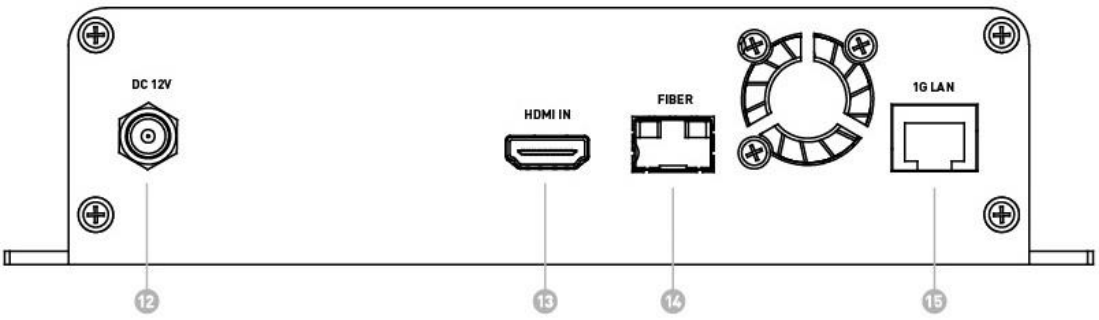
10. IR Emitter

IR receiver is to pass the commands to decoders. IR emitter is to pass back commands from decoders. (30kHz-60kHz.)

11. Audio In / Out

Audio input/output for the line level stereo audio on 3.5mm.

TRANSMITTER REAR PANEL LAYOUT



PANEL DESCRIPTION

12. DC Power Input

Connect 12Volt DC Power supply to the power port.

13. HDMI Port In

Connect HDMI cable between this port and display device. (Max. 5 Meter)

14. Fiber Port

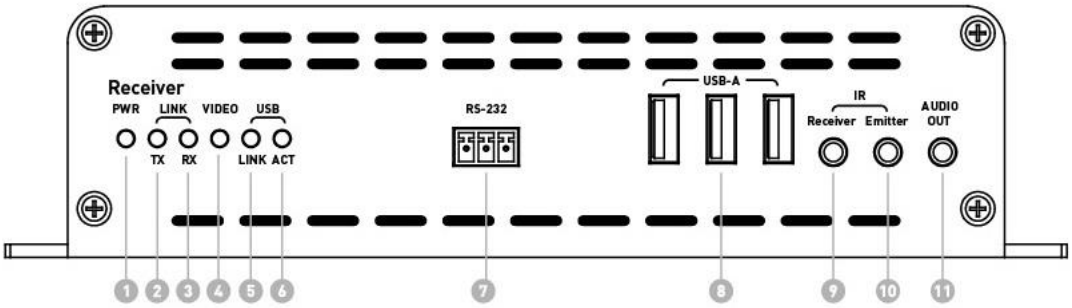
Connect fiber optical between this port and 10G Network hub.

15. 1G Lan Port

Used for general purpose device attachment to network or to the API Box.

4KPROIP-FOC-DE-U (Fiber Decoder with USB)

RECEIVER FRONT PANEL LAYOUT



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For USB function, Host will be blink when the PC is been connect to the USB, Device will be blink if the peripherals like keyboard or mouse are connected.

7. RS232 Connector Port

RS232 Control port for sending and receiving side-band serial traffic to/ from encoders.
Communication: up to 115.2K baud rate.

8. USB B Port

USB – 480Mbps USB 2.0 Type A are to be connected to a host (PC) or device (Ex. Mouse, Keyboard, Etc...)

9. IR Receiver

IR receiver is to pass the commands to decoders

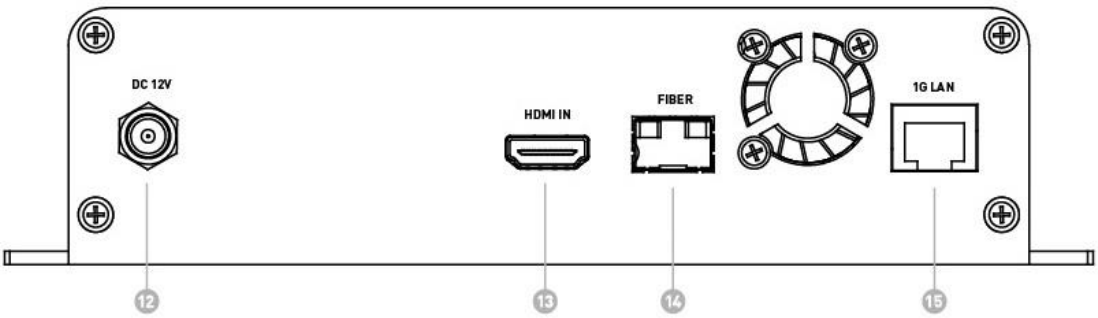
10. IR Emitter

IR receiver is to pass the commands to decoders. IR emitter is to pass back commands from decoders. (30kHz-60kHz.)

11. Audio In / Out

Audio input/output for the line level stereo audio on 3.5mm.

RECEIVER REAR PANEL LAYOUT



PANEL DESCRIPTION

12. DC Power Input

Connect 12Volt DC Power supply to the power port.

13. HDMI Port In

Connect HDMI cable between this port and display device. (Max. 5 Meter)

14. Fiber Port

Connect fiber optical between this port and 10G Network hub.

15. 1G Lan Port

Used for general purpose device attachment to network or to the API Box.

4KPROIP-CBS

Management Platform

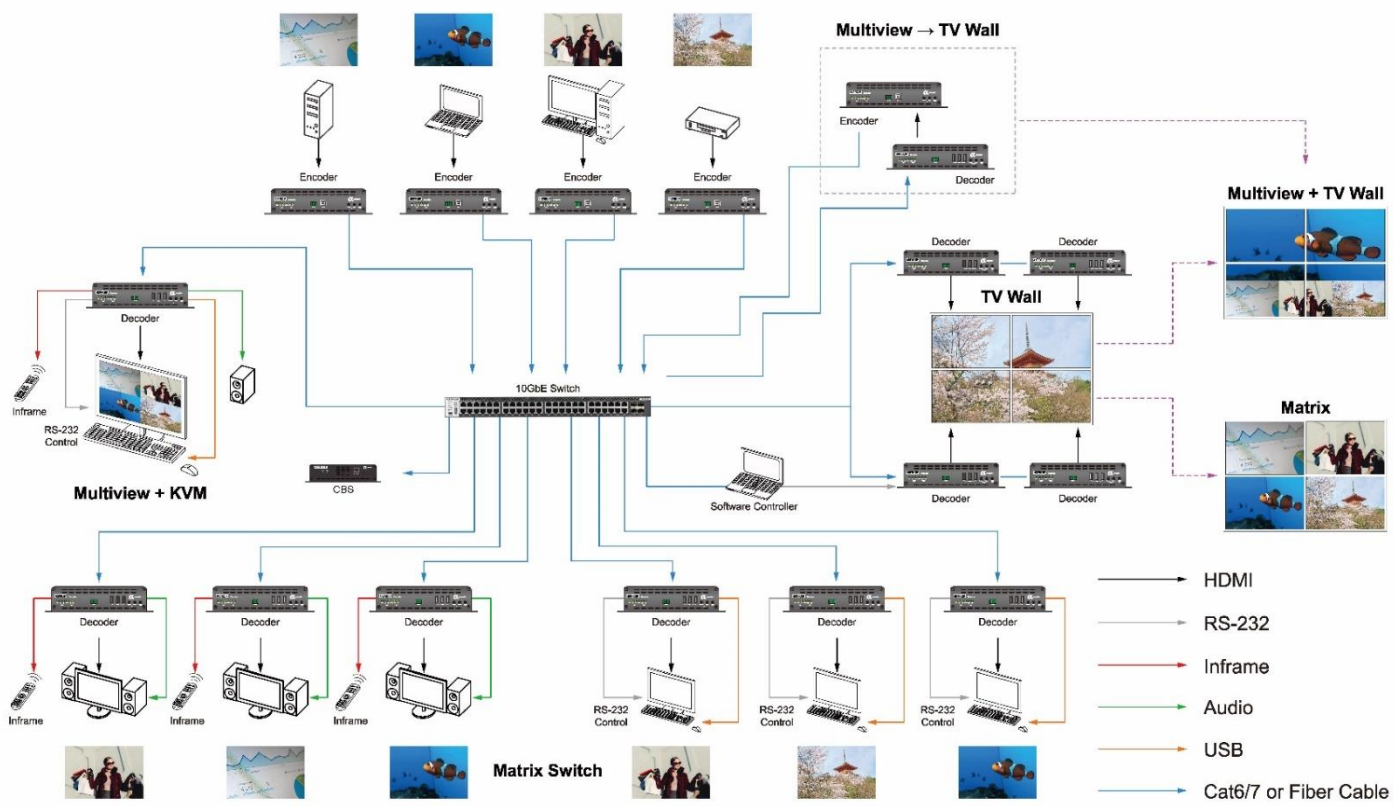
The most installation will require a 4KPROIP-CBS Management Platform. This device controls the operation and manages the connectivity between decoder and encoder. The management platform is a hardened controller node that must reside on the same logical network. The application presents an API to potential third-party management platforms.

Feature

- Simple user-friendly
- Web UI shows the connection status of Encoder (TX) and Decoder (RX)
- Remotely away operational KVM, USB, IR Switching to selective P/C or DVD or TV source.
- Centralizes control and manage via the web interface of the aegis control software box.
- The web interface shows the connection status included all the transmitter and receiver.
- Matrix switching
- Video Wall set up and control
- Multi-view set up and control
- IR (Infrared) Remote Control Routing
- USB Routing

Note: For the full detail of the 4KPROIP-CBS Management Platform, please consult the quickly setting guide for the function.

4 Product Application



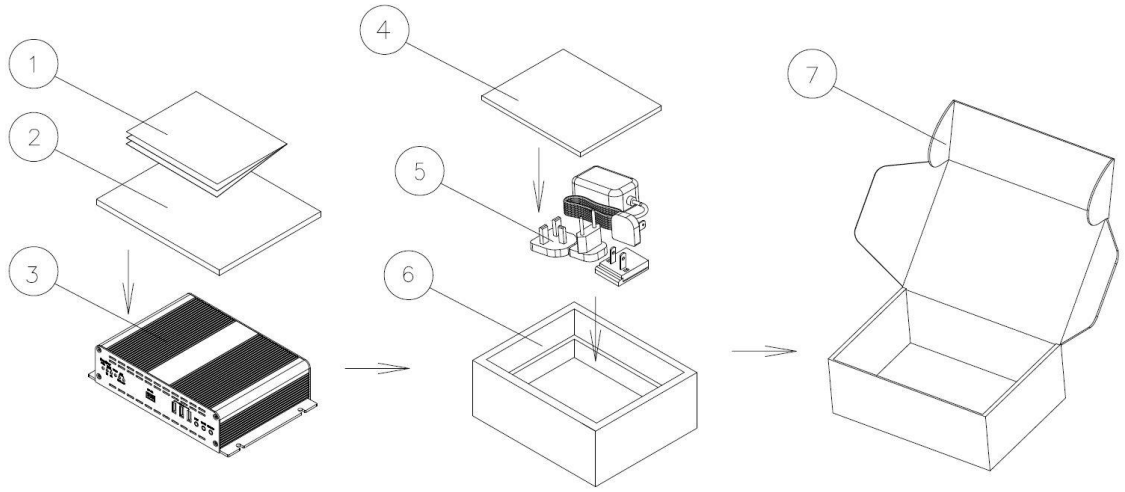
Here is the diagram of the Full function of the Product

- One to Many
- Many to One
- Many to Many
- TV Wall

Note: for the full detail of the setup, Please consult the Quickly setting guide for additional details on each function.

5 Package Contents

Please Kindly make sure the following items are included in your package.
Please kindly contact us if there are any items are missing.



4KPROIP-FOC-EN **4KPROIP-FOC-EN-U**

1x Pcs User Manual
1x Pcs EPE Top cover
1x Pcs of single 4KPROIP-FOC Encoder
1x Pcs EPE cover
1x Set Multi-Blade Adaptor (US / UK / AUS / EU)
1x Pcs of Power adaptor 12V3A
1x Pcs of EPE Inner
1x Pcs White Box
1x Pcs of IR Emitter Cable
1x Pcs of IR Receiver Cable

4KPROIP-FOC-DE **4KPROIP-FOC-DE-U**

1x Pcs User Manual
1x Pcs EPE Top cover
1x Pcs of single 4KPROIP-FOC Decoder
1x Pcs EPE cover
1x Set Multi-Blade Adaptor (US / UK / AUS / EU)
1x Pcs of Power adaptor 12V3A
1x Pcs of EPE Inner
1x Pcs White Box
1x Pcs of User Manual
1x Pcs of IR Emitter Cable
1x Pcs of IR Receiver Cable

****** RS232 Adaptor is option product we can sell separately***

6 Technical specifications

4KPROIP-FOC Series	
Power supply	Input: 100-240VAC 50-60Hz Output:12V / 3A
Inputs	EN: HDMI x1, IR x2, Audio x1, 1G RJ45 x1, RS232 x1, USB B x1(female) DE: 10G Fiber SFP+ Port x1
Outputs	EN: 10G Fiber SFP+ Port x1 DE: HDMI x1, IR x2, Audio x1, 1G RJ45 x1, RS232 x1, USB A x3
USB A	480Mbps USB 2.0
USB B	480Mbps USB 2.0
HDMI	HDMI 2.0 with HDP
HDCP	HDCP 2.2 Compliant
RS232	pass-through (115Baud Rate)
IR	Bi-directional (30kHz-60kHz)
Compression	Uncompressed
Latency	Zero
Resolution	4K/60Hz 4:4:4
10G Copper Distance	Support up to 100M with Cat 6 or Cat.6a
Weight	Encoder:1420g Decoder:1420g
Operation Temperature	-20°C to +55°C (-68°F to 131°F)
Storage Temperature	-30°C to +70°C (-86° F to 158° F)
Humidity	10% to 90%
Dimension	Encoder: 204X133X48mm (L x W x H) Decoder: 204x133x48mm (Lx W x H)
Raw Material	Aluminum Enclosure

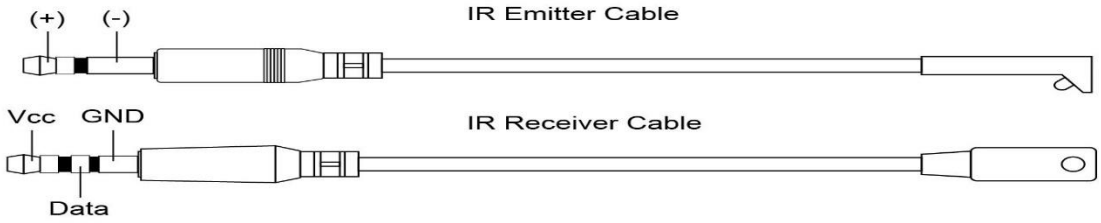
7 Recommend Cable

4KPROIP-FOC Series of AV Over IP was developed to work with the most basic HDMI and fiber infrastructure. Although the 4KPROIP-FOC Series will work with most cables. aegis has recommended Cables are cables that have been tested in a Recognized Testing facility and have met the requirements set by the HDMI and fiber cable. The goal of Recommended Cables is to assist installers, integrators, and consumers in selecting HDMI cables that meet the requirements, and as such provide optimal performance with 4KPROIP-FOC Series devices.

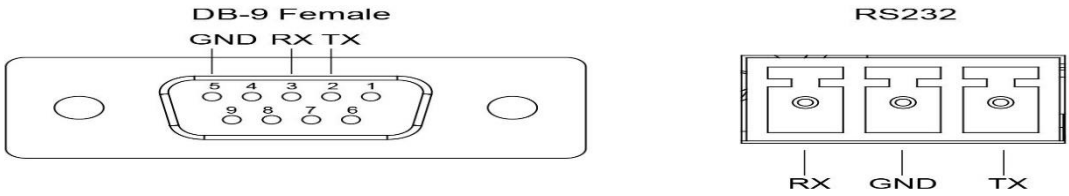
HDMI
Please, Kindly use of “Premium High-Speed HDMI” cables is highly recommended.

Fiber
Please, Kindly use Multi-mode or single mode SFP+ fiber cable is highly recommended.

IR Cable
IR Pin Assignment



RS232
RS232 Protocol.



8 Recommend Network Switch

The AV Over IP Series will work with most non-blocking, IGMP 10G network switch. Layer 3 will allow more control; however, Layer 2 will work as well. It is highly recommended to communicate with the representative of the desired network switch brand to confirm configuration and capabilities. Below are some models that have been tested with the 4KPROIP-FOC Series.

Switch Speed

The 4KPROIP-FOC Series requires the switch to be a 10GbE.

4KPROIP-FOC Series technology is used to transmit uncompressed video up to 4K along with other AV signals such as audio, USB and control signals. For video alone, it means the raw bandwidth of about 4 Gb/sec for HD and 8 Gb/sec for 4K mean a bandwidth of around 6 GB/s, and that just for video. It is therefore easy to understand why the 4KPROIP-FOC series requires 10GbE network switches.

Packets Routing

To enable the transmission of a source to multiple destinations, 4KPROIP-FOC series devices make use of Multicast. The default behavior of layer 2 Ethernet switch is to broadcast those packets which mean that every packet will be transmitted to all possible destinations. Therefore, any network switch used with 4KPROIP-FOC Series must support IGMP Snooping. 4KPROIP-FOC series endpoints use IGMP protocol to assign the endpoints into multicast groups and the router uses IGMP snooping to efficiently route multicast packets only to receivers that want to receive them.

Many switches have the IGMP Snooping feature disabled by default and manual configuration is required. Often, a simple checkmark near “Enable IGMP Snooping” is the only thing needed to enable IGMP Snooping.

However, the implementation of IGMP Snooping is vendor specific and additional configuration is often needed.

An Ethernet switch can be informed that a device wants to leave a multicast channel by sending it an IGMP LEAVE GROUP packet. Once received, the time it takes for the switch to apply the new configuration may vary from one switch to the other. Most switches implement and include FASTLEAVE configuration option. When enabled, it takes much less time for a particular port to leave a multicast group to assign the port to a different multicast group. The

end results are a noticeably shorter video switching time. We recommend to always enable the FASTLEAVE option when available. With the FASTLEAVE option, seamless switching is possible for 4K video sources. Without FASTLEAVE option, 'seamless' switching is limited to 1080P 60 Hz video signals.

Ethernet Switch Configuration

The following list includes all network switch configuration options that aegis Engineers have come across so far. Look for these or similar options when configuring your switch.

1. Enable IGMP Snooping
   a. Must be enabled
2. Enable IGMP Snooping on VLAN 1
   a. Must be enabled when all ports default to VLAN1
3. Filter/Drop unregistered Multicast traffic
   a. If not applied, the behavior of the switch will be to broadcast multicast packets if the switch has no known destination for that packet.
   b. Must be enabled if found
4. Unregistered Multicast Flooding
   a. Must be disabled if found
5. Filter Unregistered Multicast (different wording than number 4 above)
   a. Must be enabled if found
6. Enable IGMP Query
7. Enable IGMP Query on VLAN1
8. Set IGMP Version to IGMP V2
   a. Must be set if found
9. Enable FASTLEAVE on port X
   a. This is optional. Should be enabled, if found
10. Enable FASTLEAVE for VLAN1
    a. This is optional. Should be enabled if found

9 Declaration of ROHS / FCC

We declare that its product is compliance to the EU Directives.

- EU Directives 2011/65/EU.
- EU Directives 2003/11/EC.

The following restricted material is **Not Used** and does not exceed the legal limited.

RoHS Restricted Substance	Allowable Limit
Cadmium and its compounds	100 ppm (0.01 weight %)
Mercury and its compounds	1000 ppm (0.1 weight %)
Hexavalent chromium and its compounds	1000 ppm (0.1 weight %)
Lead and its compounds	1000 ppm (0.1 weight %)
Polybrominated biphenyls (PBB)	1000 ppm (0.1 weight %)
Polybrominated diphenyl ethers (PBDE)	1000 ppm (0.1 weight %)
Bis(2-ethylhexyl) phthalate (DEHP)	1000 ppm (0.1 weight %)
Butyl benzyl phthalate (BBP)	1000 ppm (0.1 weight %)
Dibutyl phthalate (DBP)	1000 ppm (0.1 weight %)
Diisobutyl phthalate (DIBP)	1000 ppm (0.1 weight %)

For definitions and exemptions, please see the RoHS Directive 2011/65/EU

FCC Compliance Statement

The Av over IP Fiber/Copper series of the device has been tested and found to comply with the limits for Class B digital Device pursuant to Part 15 of the FCC rules. The operation is to subject to the following conditions.

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