# **USER MANUAL**

**MCXG2 SERIES** 

# MCX G2 ENCODERS AND DECODERS

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT BLACKBOX.COM





### TABLE OF CONTENTS



11 INTRODUCTION       5         12 APPLICATIONS       5         13 PACKAGE CONTENTS.       5         14 SYSTEM REQUIREMENTS       6         14 SYSTEM REQUIREMENTS       6         15 FEATURES.       7         16 OPERATION CONTROLS AND FUNCTIONS       8         16.1FRONT PANEL       8         16.2 REAR PANEL       9         16.3 R CABLE PINOUTS       11         16.4 Sex 232 PINOUT AND DEFAULTS       11         16.5 OSD MENU       12         16 A Basic AV Extension       21         16 A Basic AV Extension       21         16 A Vanced AV Extension       22         17 CONNECTION DIAGRAMS       27         21 NTRODUCTION       35         22 APUCATIONS       35         23 PACKAGE CONTENTS       35         23 PACKAGE CONTENTS       35         24 SYSTEM REQUIREMENTS       36         25 FEATURES       36         26 OPERATION CONTROLS AND FUNCTIONS       38         26 OPERATION CONTROLS AND FUNCTIONS       38         26 A SP-232 FORMA and Defaults       41         26 OPERATION CONTROLS AND FUNCTIONS       38         26 A SP-232 FORMA and Defaults       42         26
1.3 PACKAGE CONTENTS51.4 SYSTEM REQUIREMENTS61.5 FEATURES716 OPERATION CONTROLS AND FUNCTIONS816 I-FRONT PANEL816 C2 REAR PANEL916 3 IR CABLE PINOUTS1116 ARS 232 PINOUT AND DEFAULTS1116 SOB MENU1216 50 Baic NU1216 7 Advanced AV Extension2116 7 Advanced AV Extension2217 CONNECTION DIAGRAMS2718 SPECIFICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6 IPRATION CONTROLS AND FUNCTIONS382.6 JE RAIL392.6 OPERATION CONTROLS AND FUNCTIONS382.6 JE RAIL392.6 OPERATION CONTROLS AND FUNCTIONS382.6 JE RAIL392.6 OPERATION CONTROLS AND FUNCTIONS382.6 JE REAR PANEL392.6 A REAR EQUIREMENTS362.6 JE REAR PANEL392.6 A REAR PANEL392.6 A REAR PANEL392.6 A REAR CONTROLS AND FUNCTIONS382.6 A REAR PANEL392.6 A REAR PANEL492.7 CONNECTION DIAGRAMS542.8
1.4 SYSTEM REQUIREMENTS.61.5 FEATURES.71.6 OPERATION CONTROLS AND FUNCTIONS81.6 IFRONT PANEL.81.6 IFRONT PANEL.91.6.3 IR CABLE PINOUTS.111.6.4 RS-232 PINOUT AND DEFAULTS.111.6.5 DS MENU.121.6.6 Basic AV Extension.211.6.7 Advanced AV Extension.211.6.7 Advanced AV Extension.211.7 CONNECTION DIAGRAMS.271.8 SPECIFICATIONS.292.1 INTRODUCTION.352.2 APPLICATIONS.352.3 PACKAGE CONTENTS.362.4 SYSTEM REQUIREMENTS.362.5 FFATURES.372.6 OPERATION CONTROLS AND FUNCTIONS.382.6 JE RADIE PINOUTS.362.6 AV Extension.372.6 OPERATION CONTROLS AND FUNCTIONS.382.6 JE RATION CONTROLS AND FUNCTIONS.382.6 OPERATION CONTROLS AND FUNCTIONS.382.6 JE RATION CONTROLS AND FUNCTIONS.392.6 OPERATION CONTROLS AND FUNCTIONS.382.6 JE RATION CONTROLS AND FUNCTIONS.382.6 JE RATION CONTROLS AND FUNCTIONS.392.6 JE RATION CONTROLS AND FUNCTIONS.392.6 A RAS-232 Pinout and Defaults.422.6 S OSD Menu.432.6 A RASICA WEXTENSION.442.6 A RASICA WEXTENSION.442.6 A RASICA WEXTENSION.422.7 CONNECTION DIAGRAMS.542.8 APPLICATIONS.542.8 APPLICATIONS.542.9 APPLICATIONS<
1.5 FEATURES71.6 OPERATION CONTROLS AND FUNCTIONS81.6.1 FRONT PANEL81.6.2 REAR PANEL91.6.3 IR CABLE PINOUTS111.6.4 RS-322 PINOUT AND DEFAULTS111.6.5 OSD MENU121.6.6 ABsci AV Extension211.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.1 Front Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 DO MENU432.6.7 Advanced AV Extension432.6.7 Advanced AV Extension432.6.8 Basic AV Extension432.6.7 Basic AV Extension442.6.7 Basic AV Extension442.6.7 Basic AV Extension432.6.7 Advanced AV Extension442.6.7 Advanced AV Extension442.6.7 Advanced AV Extension442.7 CONNECTION DIAGRAMS563.1 INTRODUCTION623.2 APPLICATIONS563.1 INTRODUCTION623.4 SYSTEM REQUIREMENTS623.4 SYSTEM REQUIREMENTS623.4 SYSTEM REQUIREMENTS643.6 OPERATION CONTROLS AND FUNCTIONS65
1.6 OPERATION CONTROLS AND FUNCTIONS81.6 IFRONT PANEL81.6.2 REAR PANEL91.6.3 IR CABLE PINOUTS111.6.4 RS-232 PINOUT AND DEFAULTS111.6.4 RS-232 PINOUT AND DEFAULTS121.6.6 Basic AV Extension211.6.7 CONNECTION DIAGRAMS211.6.7 CONNECTION DIAGRAMS221.7 CONNECTION DIAGRAMS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS362.5 FEATURES362.6 TERATION CONTROLS AND FUNCTIONS382.6 IFRONT PANEL312.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 FRONT PANEL312.6 OPERATION CONTROLS AND FUNCTIONS382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6 A RS-232 Pinout and Defaults422.6 S DOB Menu432.6 CONTERTION CONTROLS563.1 INTRODUCTION492.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS563.3 PACKAGE CONTENTS563.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS623.4 SYSTEM REQUIREMENTS623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS623.6 OPERATION CONTROLS AND FUNCTIONS65
1.61FRONT PANEL81.62 REAR PANEL91.63 IR CABLE PINOUTS111.64 RS-232 PINOUT AND DEFAULTS111.65 OSD MENU121.66 Basic AV Extension211.67 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6 AV Extension412.6 AV Extension432.6 AV Extension432.6 AV Extension442.6 AV Extension442.7 CONNECTION DIAGRAMS563.8 SPECIFICATIONS563.4 SYSTEM REQUIREMENTS623.5 FEATURES623.6 OPERATION CONTROLS AND FUNCTIONS623.6 OPERATION CONTROLS AND FUNCTIONS623.6 OPERATION CONTROLS AND FUNCTIONS65
1.6.2 REAR PANEL91.6.3 IR CABLE PINOUTS111.6.4 RS-232 PINOUT AND DEFAULTS111.6.5 OSD MENU121.6.6 Dasic AV Extension211.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.7 CONNECTION DIAGRAMS432.6.8 LAV Extension442.6.7 CONNECTION DIAGRAMS542.7 CONNECTION DIAGRAMS542.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 APACKAGE CONTENTS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
1.6.3 IR CABLE PINOUTS.111.6.4 RS-232 PINOUT AND DEFAULTS.111.6.5 OSD MENU121.6.6 Basic AV Extension211.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS.221.8 SPECIFICATIONS.292.1 INTRODUCTION352.2 APPLICATIONS.292.1 INTRODUCTION.352.3 PACKAGE CONTENTS.352.4 SYSTEM REQUIREMENTS362.5 FEATURES.372.6 OPERATION CONTROLS AND FUNCTIONS.382.6.3 IR Cable Pinouts.412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu.432.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu.432.6.7 CONNECTION DIAGRAMS.542.7 CONNECTION DIAGRAMS.542.8 SPECIFICATIONS.542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 AVEXtension.492.7 CONNECTION DIAGRAMS.542.8 SPECIFICATIONS563.1 INTRODUCTION563.1 INTRODUCTION623.2 APPLICATIONS.623.3 PACKAGE CONTENTS.623.3 PACKAGE CONTENTS.623.3 PACKAGE CONTENTS.623.3 PACKAGE CONTENTS.623.3 PACKAGE CONTENTS.623.4 SYSTEM REQUIREMENTS.623.5 FEATURES.633.6 OPERATION CONTROLS AND FUNCTIONS.623.6 OPERATION CONTROLS AND FUNCTIONS.633.6 OPERATION CONTROLS AND FUNCTIONS.
1.6 4 RS-232 PINOUT AND DEFAULTS111.6.5 OSD MENU121.6.6 Basic AV Extension211.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.7 Advanced AV Extension482.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS563.1 INTRODUCTION623.2 APPLICATIONS643.5 FEATURES623.5 AVARGE CONTENTS623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
165 OSD MENU121.6.6 Basic AV Extension211.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.7 CONNECTION DIAGRAMS542.7 CONNECTION DIAGRAMS563.1 INTRODUCTION563.1 INTRODUCTION563.3 PACKAGE CONTENTS563.4 SYSTEM REQUIREMENTS663.5 TEATURES623.5 TEATURES623.5 TEATURES643.6 OPERATION CONTROLS AND FUNCTIONS623.5 TEATURES643.6 OPERATION CONTROLS AND FUNCTIONS62
1.6.6 Basic AV Extension211.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.7 Advanced AV Extension482.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS542.8 SPECIFICATIONS563.1 INTRODUCTION563.5 FEATURES563.5 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS563.5 FEATURES613.5 STEM REQUIREMENTS623.6 OPERATION CONTROLS AND FUNCTIONS623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
1.6.7 Advanced AV Extension221.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION523.2 APPLICATIONS563.3 PACKAGE CONTENTS563.4 SYSTEM REQUIREMENTS563.5 FEATURES563.5 FEATURES623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS623.5 FEATURES643.6 OPERATION DIAGRAMS623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS62
1.7 CONNECTION DIAGRAMS271.8 SPECIFICATIONS.292.1 INTRODUCTION352.2 APPLICATIONS.352.3 PACKAGE CONTENTS.352.4 SYSTEM REQUIREMENTS362.5 FEATURES.372.6 OPERATION CONTROLS AND FUNCTIONS.382.6.1Front Panel.382.6.2 Rear Panel.392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu.432.6.6 Basic AV Extension.482.7 Advanced AV Extension.492.7 CONNECTION DIAGRAMS.542.8 SPECIFICATIONS.563.1 INTRODUCTIONS.623.2 APPLICATIONS.623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS.623.5 FEATURES.633.5 FEATURES.643.6 OPERATION CONTROLS AND FUNCTIONS.65
1.8 SPECIFICATIONS292.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.6 Basic AV Extension482.6.7 Advanced AV Extension492.7 CONNECTIONS563.1 INTRODUCTION563.1 INTRODUCTIONS563.2 APPLICATIONS563.3 PACKAGE CONTENTS523.4 SYSTEM REQUIREMENTS523.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS55
2.1 INTRODUCTION352.2 APPLICATIONS352.3 PACKAGE CONTENTS352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.6 Basic AV Extension482.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS623.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.2 APPLICATIONS.352.3 PACKAGE CONTENTS.352.4 SYSTEM REQUIREMENTS.362.5 FEATURES.372.6 OPERATION CONTROLS AND FUNCTIONS.382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu432.6.6 Basic AV Extension482.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.3 PACKAGE CONTENTS.352.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1 Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.6 Basic AV Extension482.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.4 SYSTEM REQUIREMENTS362.5 FEATURES372.6 OPERATION CONTROLS AND FUNCTIONS382.6.1Front Panel382.6.2 Rear Panel392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.6 Basic AV Extension482.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS55
2.5 FEATURES.372.6 OPERATION CONTROLS AND FUNCTIONS.382.6.1Front Panel.382.6.2 Rear Panel.392.6.3 IR Cable Pinouts.412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu.432.6.6 Basic AV Extension482.6.7 Advanced AV Extension.492.7 CONNECTION DIAGRAMS.542.8. SPECIFICATIONS563.1 INTRODUCTION.623.2 APPLICATIONS.623.3 PACKAGE CONTENTS.623.4 SYSTEM REQUIREMENTS.633.5 FEATURES.643.6 OPERATION CONTROLS AND FUNCTIONS.55
2.6 OPERATION CONTROLS AND FUNCTIONS.382.6.1Front Panel.382.6.2 Rear Panel.392.6.3 IR Cable Pinouts.412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu.432.6.6 Basic AV Extension.482.6.7 Advanced AV Extension.492.7 CONNECTION DIAGRAMS.542.8. SPECIFICATIONS.563.1 INTRODUCTION.623.2 APPLICATIONS.623.3 PACKAGE CONTENTS.623.4 SYSTEM REQUIREMENTS.633.5 FEATURES.643.6 OPERATION CONTROLS AND FUNCTIONS.65
2.6.1Front Panel.382.6.2 Rear Panel.392.6.3 IR Cable Pinouts412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu.432.6.6 Basic AV Extension432.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.6.2 Rear Panel392.6.3 IR Cable Pinouts.412.6.4 RS-232 Pinout and Defaults.422.6.5 OSD Menu432.6.6 Basic AV Extension.432.6.7 Advanced AV Extension.492.7 CONNECTION DIAGRAMS.542.8 SPECIFICATIONS.563.1 INTRODUCTION.623.2 APPLICATIONS.623.3 PACKAGE CONTENTS.623.4 SYSTEM REQUIREMENTS.633.5 FEATURES.643.6 OPERATION CONTROLS AND FUNCTIONS.65
2.6.3 IR Cable Pinouts
2.6.4 RS-232 Pinout and Defaults422.6.5 OSD Menu432.6.6 Basic AV Extension482.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS.563.1 INTRODUCTION.623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS.633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.6.5 OSD Menu
2.6.6 Basic AV Extension482.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8 SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.6.7 Advanced AV Extension492.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.7 CONNECTION DIAGRAMS542.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
2.8. SPECIFICATIONS563.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
3.1 INTRODUCTION623.2 APPLICATIONS623.3 PACKAGE CONTENTS623.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
3.2 APPLICATIONS.623.3 PACKAGE CONTENTS.623.4 SYSTEM REQUIREMENTS633.5 FEATURES.643.6 OPERATION CONTROLS AND FUNCTIONS65
3.3 PACKAGE CONTENTS.623.4 SYSTEM REQUIREMENTS633.5 FEATURES.643.6 OPERATION CONTROLS AND FUNCTIONS65
3.4 SYSTEM REQUIREMENTS633.5 FEATURES643.6 OPERATION CONTROLS AND FUNCTIONS65
3.5 FEATURES    64      3.6 OPERATION CONTROLS AND FUNCTIONS    65
3.6 OPERATION CONTROLS AND FUNCTIONS
3.6.1Front Panel
3.6.2 Rear Panel
3.6.3 IR Cable Pinouts
3.6.3 IR Cable Pinouts
3.6.4 RS-232 Pinout and Defaults





### **TABLE OF CONTENTS**



.7 CONNECTION DIAGRAMS	4
8.8. SPECIFICATIONS	5
A.1 ACRONYMS	9
9°	1
9°	1
9°	1
3.4 NOM STATEMENT	2
03.1 DISCLAIMER	3
2.2 TRADEMARKS USED IN THIS MANUAL	3





#### SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- The mounting holes are intended for desktop mounting and can't be used for wall mounting.
- The power cord must be connected to a socket outlet with Earth Ground.





#### **1.1 INTRODUCTION**

This Encoder is designed for high-quality, IP routable, AV extension with virtually zero latency. The unit is capable of transmitting AV and other data for long extension, enhancing the flexibility of any installation. By using a sophisticated ultra-light compression scheme (lossless for most content) it is a great solution for extending 4K audio/video streams (HDMI or Type C) and data. Advanced HDMI content, such as HDR (High Dynamic Range), 10-bit color and multi-channel HD Bitstream audio, can be transmitted in pass-through mode.

For the copper encoder, the use of high-quality, 10-Gbps Ethernet ports and Cat.6A or better cable allows for point-to-point transmission of the video signal up to 100m.

For the fiber encoder, the use of interchangeable, field replaceable, SFP+ modules allows for transmission distances of up to 30km. (Maximum transmission distance depends on the SFP+ modules used.)

Multiple control and data signals may also be transmitted along with the audio and video, including IR, RS-232, and Ethernet.

When combined with the optional MCX Gen2 Controller, or control software, the functionality of the Encoder expands exponentially. Multiple encoders/decoders may be combined with one or more 10-Gigabit fiber Ethernet switches. The units can be used together to form a distributed video matrix, a multi-viewer system, or a video wall system. This AV network capability provides flexibility in large event installations.

The integrated USB hub of each decoder can be configured to be in USB Host or Device Mode. It can function as a simple point-topoint KVM extension, freely routed between any two endpoints, or it can be configured into a special "Simultaneous" mode, allowing up to 7 Host Mode units to extend their USB ports to a single Device Mode unit. This type of USB KVM routing flexibility enables a wide range of multi-user, control room, or on-demand installation scenarios.

The built-in EDID and HDCP management functionality enables the unit to fit into every video distribution situation. Basic configuration of the unit can be achieved via front panel buttons with an OSD (On-Screen Display). Advanced control requires the optional MCX Gen2 controller, or control software, and a LAN connection.

#### **1.2 APPLICATIONS**

- Video, Audio, LAN, IR, and USB over copper cable or fiber extension
- Long distance data and video transmission immune to RF interference
- Point-to-point secure video conferencing
- Hotel or convention center display
- Multi-monitor broadcast
- Distributed video matrix system
- Distributed video wall system
- Remote KVM system control

#### **1.3 PACKAGE CONTENTS**

- (1) UHD+ copper or fiber transmitter
- (1) 12V/3A DC power adapter
- (1) Power cord
- (1) IR emitter
- (1) 3-pin terminal block



#### **1.4 SYSTEM REQUIREMENTS**

- HDMI or Type-C video source equipment, such as a media player, video game console, PC, or set-top box
- · HDMI receiving equipment, such as an HDTV, monitor, or audio amplifier
- · Analog audio receiving equipment, such as headphones, an audio amplifier, or powered speakers
- A 10-Gbps Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-encoder/decoder copper systems)
- A 10-Gbps fiber Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-encoder/decoder fiber systems)
- IEEE 802.3ae compatible SFP+ fiber module supporting a dual-optical fiber connection style, such as LC, or a pre-terminated crossover dual-optical fiber cable (required for fiber encoder)
- Note: Single-mode and multi-mode support is dependent on the SFP+ modules used
- MCX Gen2 Controller or control software to configure distributed matrix, video wall or multi-view systems (Optional)







#### **1.5 FEATURES**

- Provides AV, IR, RS-232, USB 2.0, and ethernet extension
- HDMI 2.0 and DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.4 compliant
- (1) HDMI, (1) HDMI Loop-Through, (1) USB Type C; and (1) 3.5mm phone jack input
- IP switchable with virtually zero latency (requires optional MCX Gen2 controller or control software)
- Optional lossless compression to allow video transfer within limited bandwidth
- Extends up to 100m in point-to-point mode (with CAT.6A cable for copper encoder)
- Extends up to 30km over fiber (maximum distance depends on the SFP+ module and type of fiber used for fiber encoder)
- Supports independent breakaway A/V matrix switching with minimum latency, video wall generation, and multi-view compositing (requires optional MCX Gen2 controller/control software)
- Facilitates pass-through of 10/12-bit HDR sources (point-to-point and Genlock modes only)
- Enables pass-through of audio formats including LPCM (up to eight channels), Bitstream and HD Bitstream from HDMI or DP sources
- Unit can be powered directly by PoE when connected to a 10 Gigabit Ethernet (10GbE) switch that provides PoE (802.3at) (for copper encoder)
- Signal transmission interfaces with 10-Gigabit Ethernet switches via XFI (IEEE 802.3ae) compatible SFP+ fiber modules (for fiber encoder)
- Basic configuration via front panel buttons with an OSD
- Supports the use of an external control center (MCX Gen2 Controller) or control software to provide expanded functionality (Contact Black Box for more information.)





### **1.6 OPERATION CONTROLS AND FUNCTIONS**

### 1.6.1FRONT PANEL



FIGURE 1-1: FRONT PANEL

## TABLE 1-1. FRONT-PANEL COMPONENTS

NUMBER IN FIGURE 1-1	COMPONENT	DESCRIPTION
1	(1) Power LED indicator	Lights ON or OFF for Power
		<b>GbE LED:</b> This LED will illuminate and blink to indicate a live and active connection on the local gigabit Ethernet port.
2	(1) Status LED block	<b>VIDEO LED:</b> This LED will illuminate Green when a video signal is live on the optical fiber streaming port or illuminate Amber when streaming a detected input stream. When no video is active, the LED will remain off, even if the streaming connection is valid.
		<b>LINK LED:</b> These LEDs will illuminate and blink to indicate data transmission and reception activity across the optical fiber streaming connection.
		<b>USB LED:</b> This LED will illuminate when the unit's USB ports have successfully paired with the USB ports on another unit. This LED will blink if the unit's USB ports are not currently paired and are in stand-by mode.
3	(1) Menu button	Press to enter the OSD menu or to back out from menu items.
4	(1) Menu button: - Minus button	Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between encoder source inputs.
5	(1) Menu button: + button	Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between decoder source inputs.
6	(1) Enter/Info button	When inside an OSD menu, press to confirm a selection or to go deeper into a menu item. When not in a menu, press to activate the Information OSD.



LIVE 24/7 TECHNICAL SUPPORT 1.877.877.2269

1.6.2 REAR PANEL



FIGURE 1-2: REAR PANEL (COPPER)



FIGURE 1-3: REAR PANEL (FIBER)



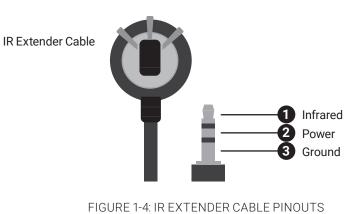
### **TABLE 1-2. REAR-PANEL COMPONENTS**

NUMBER IN FIGURE	COMPONENT	DESCRIPTION
1	(1) HDMI Out Port	Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
2	(1) HDMI In Port	Connect to HDMI source equipment, such as a media player, game console, or set-top box.
3	(1) Type C In Port	Connect to Type C or USB Type A to Type C source equipment, such as a PC or laptop
	(1) Cat5E/6/7 port	Connect directly to a compatible encoder/decoder for point-to-point extension, or to a 10 Gigabit Ethernet switch for distributed matrixing (requires MCX Gen2 Controller or control software) with a single Cat.5e/6/7 cable for extension of all data signals (for copper encoder).
4	OR	NOTE: If the connected network switch supports the IEEE 802.3at-2009 PoE (Power over Ethernet) standard, this unit can optionally be powered directly via this Ethernet port.
		Insert a standard SFP+ module and connect the appropriate optical cable to allow data transmission to a compatible decoder or to a 10-gigabit optical fiber network switch (for fiber encoder).
	(1) SFP+ port	NOTE: The SFP+ module must support a dual-optical fiber connection style, such as LC, or be pre-terminated dual-optical fiber cables. Single-mode and multi-mode support is dependent on the SFP+ modules used.
		As OUT: Connect to powered speakers or an amplifier for stereo analog audio output.
		As IN: Connect to the stereo analog output of a device, such as a CD player or PC.
5	(1) Audio port	NOTE: When the encoder and decoder are connected directly in a point-to-point configuration, audio is routed directly to the opposite end's Ports. Free routing can only be configured by use of the optional MCX Gen2 Master Controller or control software.
		<b>OUT Port:</b> Connect to an IR Blaster to broadcast IR signals from a connected encoder to devices within direct line-of sight of the IR Blaster.
6	(2) IR ports	<b>IN Port:</b> Connect to an IR Extender to receive IR control signals and extend them to devices connected to a connected encoder. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
		NOTE: Currently, only 38KHz IR signal extension is supported.
7	(1) RS-232 Terminal Block	Connect directly to a PC, laptop or serial controllable device with a 3-pin adapter cable to extend the RS-232 signal between encoder and decoder.
8	LAN Port	Connection for device configuration only
9	DC 12V Port	Plug the 12V DC power adapter into this port and connect it to an AC wall outlet for power.





#### 1.6.3 IR CABLE PINOUTS



#### 1.6.4 RS-232 PINOUT AND DEFAULTS

SERIAL PORT DEFAULT SETTIN	IGS
BAUD RATE	57600
DATA BITS	8
PARITY BITS	NONE
STOP BITS	1
FLOW CONTROL	NONE

FIGURE 1-5: SERIAL PORT DEFAULT SETTINGS

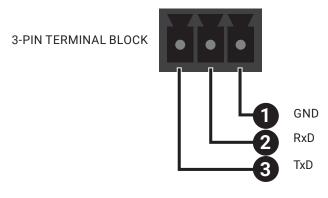
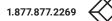


FIGURE 1-6: 3-PIN TERMINAL BLOCK

NOTE: The default Serial Port baud rate can only be changed by use of the optional MCX Gen2 Controller or control software.





#### 1.6.5 OSD MENU

All functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the **[MENU]** button on the front of the unit. Use the **[+]** (PLUS), **[-]** (MINUS), and **[ENTER]** buttons to navigate the OSD menu. Press the **[MENU]** button to back out from any menu item and then press it again to close the menu.

MAIN MENU
OSD
EDID
HDCP
DEVICE SETTING
INFORMATION
USB INFORMATION
FACTORY SETTING

FIGURE 1-7: MAIN MENU

The individual functions of the OSD will be introduced in the following section. Items marked in BOLD are the factory default settings.





OSD	
2ND LEVEL	3RD LEVEL
DISPLAY INFORMA-	ON
TION	OFF
INFORMATION TIM-	OFF
EOUT	10~40 SEC [10 SEC]
MENU TIMEOUT	OFF
	10~40 SEC [10 SEC]
MENU H POSITION	0~100 <b>[10]</b>
MENU V POSITION	0~100 <b>[90]</b>

FIGURE 1-8: OSD MENU

### TABLE 1-3. OSD

SECOND LEVEL IN FIGURE 1-8	SELECTION	DESCRIPTION
Display Information	On/Off	Enable or disable the Information OSD.
Information Timeout	Multiple	Set the display timeout for the Information OSD.
Menu Timeout	Multiple	Set the display timeout for the OSD Menu.
Menu H position	Multiple	Set the horizontal position of the OSD Menu.
Menu V Position	Multiple	Set the horizontal position of the OSD Menu.





EDID	
2ND LEVEL	3RD LEVEL
HDMI EDID	INTERNAL 1 (FHD 2CH)
	INTERNAL 2 (FHD MCH)
	INTERNAL 3 (UHD 2CH)
	INTERNAL 4 (UHD MCH)
	INTERNAL 5 (UHD+2CH)
	INTERNAL 6 (UHD+ MCH)
	EXTERNAL A [HDMI OUTPUT]
	EXTERNAL B [VOIP OUTPUT]
	USER 1
	USER 2
TYPE-C EDID	INTERNAL 1 (FHD 2CH)
	INTERNAL 2 (FHD MCH)
	INTERNAL 3 (UHD 2CH)
	INTERNAL 4 (UHD MCH)
	INTERNAL 5 (UHD+2CH)
	INTERNAL 6 (UHD+ MCH)
	EXTERNAL A [HDMI OUT]
	EXTERNAL B [VOIP OUT]
	USER 1
	USER 2

FIGURE 1-9: EDID MENU

### TABLE 1-4. EDID

SECOND LEVEL IN FIGURE 1-9	SELECTION	DESCRIPTION
HDMI EDID	Multiple	Select the EDID to send to the unit's HDMI input.
Type-C EDID	Multiple	Select the EDID to send to the unit's DisplayPort $^{\scriptscriptstyle \mathrm{M}}$ input.







This unit provides the following six default EDIDs:

UNIT'S DEFAU	LT EDIDS
FHD 2CH	1920×1080P@60HZ (4.95GBPS), 8-BIT COLOR, LPCM 2.0
FHD MCH	1920×1080P@60HZ (4.95GBPS), 8-BIT COLOR, LPCM 7.1 & BITSTREAM
UHD 2CH	3840×2160P@30HZ (10.2GBPS), 12-BIT DEEP COLOR, LPCM 2.0
UHD MCH	3840×2160P@30HZ (10.2GBPS), 12-BIT DEEP COLOR, LPCM 7.1 & BITSTREAM
UHD+2CH	3840×2160P@60HZ (18GBPS), 12-BIT DEEP COLOR, LPCM 2.0
UHD+ MCH	3840×2160P@60HZ (18GBPS), 12-BIT DEEP COLOR, LPCM 7.1 & BITSTREAM

FIGURE 1-10: DEFAULT EDIDS

NOTE: In some rare cases it is possible for custom or external EDIDs to cause compatibility issues with certain sources. If this happens, it is recommended to switch to one of the six default EDIDs for maximum compatibility.





HDCP	
2ND LEVEL	3RD LEVEL
HDMI HDCP	DISABLE
	FOLLOW OUT
	FOLLOW IN
	FOLLOW API
TYPE-C HDCP	DISABLE
	FOLLOW OUT
	FOLLOW IN
	FOLLOW API

FIGURE 1-11: HDCP MENU

### TABLE 1-5. HDCP

SECOND LEVEL IN FIGURE 1-11	SELECTION	DESCRIPTION		
		Selects the HDCP logic to use with the HDMI input.		
		<b>Follow In:</b> The input supports up to the HDCP version required by the connected source.		
		<b>Follow Out:</b> The input supports up to the HDCP version supported by the connected display.		
HDMI HDCP	Multiple	<b>Disable:</b> HDCP support is completely disabled.		
		<b>Follow API:</b> Uses the HDCP setting defined by the MCX Gen2 Controller or control software.		
		NOTE: In a point-to-point configuration, "Follow API" will behave the same as "Follow Out", if the API hasn't been manually redefined.		
	Multiple	Selects the HDCP logic to use with the DisplayPort input.		
		<b>Follow In:</b> The input supports up to the HDCP version required by the connected source.		
		<b>Follow Out:</b> The input supports up to the HDCP version supported by the connected display.		
Type-C HDCP		Disable: HDCP support is completely disabled.		
		<b>Follow API:</b> Uses the HDCP setting defined by the MCX Gen2 Controller or control software.		
		NOTE: In a point-to-point configuration, "Follow API" will behave the same as "Follow Out", if the API hasn't been manually redefined.		



DEVICE SETTING			
2ND LEVEL	3RD LEVEL		
USB VIRTUAL HUB	OFF		
	ON		
HDMI OUT SOURCE	INPUT 1 (HDMI)		
	INPUT 2 (YPE-C)		
VOIP OUT SOURCE	INPUT 1 (HDMI)		
	INPUT 2 (YPE-C)		
HDMI OUT AUTO	OFF		
MODE	AUTO SWITCH		
VOIP OUT AUTO	OFF		
MODE	AUTO SWITCH		

FIGURE 1-12: DEVICE SETTING MENU

### **TABLE 1-6. DEVICE SETTINGS**

SECOND LEVEL IN FIGURE 1-12	SELECTION	DESCRIPTION           Enables or disables the "simultaneous connection" USB mode which allows the PC/Laptop connected to this unit to be paired with the USB devices on up to seven decoders.				
USB Virtual hub	Off/On					
HDMI Out Source	HDMI/TYPE-C	Select the input source to display on the HDMI output.				
VOIP Out Source	HDMI/TYPE-C	Select the input source to transmit as an AV over IP stream.				
HDMI Out Auto Mode	Off/Auto Switch	Enable or disable the HDMI output's automatic source selection mode. When enabled, the unit will automatically switch the input routed to the local HDMI output whenever a new source is detected or if the current source is lost.				
VOIP Out Auto Mode	Off/Auto Switch	Enable or disable the AVoIP streaming output's automatic source selection mode. When enabled, the unit will switch the input routed to the AVoIP out whenever a new source is detected or if the current source is lost.				





INFORMATION	
2ND LEVEL	3RD LEVEL
RESOLUTION	[CURRENT SOURCE RESOLUTION]
STATUS	ENCODER
FW VERSION	[CURRENT FIRMWARE VERSION]
IP	[CURRENT IP ADDRESS]
MAC	[UNIT'S MAC ADDRESS]
SN	[UNIT'S SERIAL NUMBER]

FIGURE 1-13: INFORMATION MENU

### **TABLE 1-7. INFORMATION**

SECOND LEVEL IN FIGURE 1-13	SELECTION	DESCRIPTION	
Resolution	Default	Displays the unit's detected source resolution	
Status	Default	Always show ENCODER	
FW Version	Default	Displays the unit's firmware version	
IP	Default	Displays the unit's IP address	
MAC	Default	Displays the unit's MAC address	
SN	Default	Displays the unit's serial number	





USB INFORMATION				
2ND LEVEL	3RD LEVEL			
IP MODE	[UNIT'S USB IP MODE]			
IP	[UNIT'S USB IP ADDRESS]			
MAC	[UNIT'S USB MAC ADDRESS]			
PAIRED MAC 1				
PAIRED MAC 2				
PAIRED MAC 3				
PAIRED MAC 4	[USB MAC ADDRESSES OF CONNECTED USB SOURCES]			
PAIRED MAC 5				
PAIRED MAC 6				
PAIRED MAC 7				

FIGURE 1-14: USB INFORMATION MENU

### **TABLE 1-8. USB INFORMATION**

SECOND LEVEL IN FIGURE 1-14	SELECTION	DESCRIPTION		
IP Mode	Default	Displays the unit's USB IP mode		
IP	Default	Displays the unit's USB IP address		
MAC	Default	Displays the unit's USB MAC address		
PAIRED MAC 1-7	Default	Displays the unit's USB addresses of connected USB sources		



FACTORY SETTING	
2ND LEVEL	3RD LEVEL
ARE YOU SURE?	NO
	YES

FIGURE 1-15: FACTORY SETTING MENU

### **TABLE 1-9. FACTORY INFORMATION**

SECOND LEVEL IN FIGURE 1-15	SELECTION	DESCRIPTION		
		Selecting [Yes] will reset the unit's settings back to their factory defaults.		
Are you sure?	No/Yes			
		Selecting [No] will keep the current settings.		

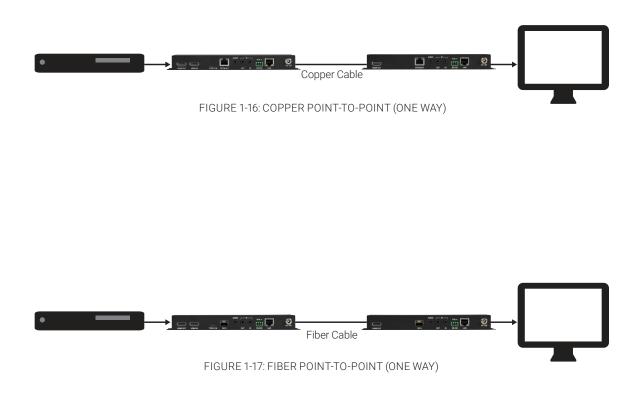




### 1.6.6 BASIC AV EXTENSION

### 1.6.6.1 POINT-TO-POINT (ONE WAY)

The most basic extension configuration available is a point-to-point system with a single transmitter unit acting as an encoder connected directly to a single receiver unit acting as a decoder. In this configuration the HDMI/DP input on the encoder side is transmitted to the connected decoder side without modification to the audio or video format. The analog stereo audio input on the encoder transfers audio directly to the analog stereo audio output on the decoder. The LAN, RS-232 and IR ports form direct connections between the encoder and decoder as well. This configuration is ideal for basic video extension as well as remote KVM applications.



NOTE: These configurations do not use or require an external control center, such as the MCX Gen2 Controller, to function. No audio insertion/extraction is performed in these configurations.





### **1.6.7 ADVANCED AV EXTENSION**

### 1.6.7.1 MCX GEN2 CONTROLLER

The MCX Gen2 Controller is a hardware solution designed to provide a unified and easy method to access and control all of the encoders and decoders in a system. It provides a user-friendly, and operating system agnostic, web-based interface allowing easy control over all of the most critical functions within a distribution system.

The MCX Gen2 hardware is an optional component and is not included with individual encoder, decoder, or transcoder units. Please contact your authorized dealer for more information.

	- 0 X
	♦ + 0 0 (a) (a bit strengt) (0.2011/0.000)
Calence Mox Calence Ca	🖉 MARKAN MOREE 🔯 tapa- 🛊 Senge 🔿 tapa-
Global Serrings Device Serrings Shanes Taulo Matrix Veter Wall Multiview	Global Sentrago Eleviera Sentrago Daviso Taulos Matrixe Video Hall Matrixes
bint ALCONS v StortSub-Trans. Active	telet All DEVOID
	C bywardogiał kuści kuści C Bibliotowie Witer / Opisk kuści kuści Bonia bibliotowie 108
EXCOURS CONSCIENTS	
→ MML (header.) (00.0)	s (D))/ (D))/ + Clock score to highlight jame
Ald5_tende2_ #Ald5_tende2_ #Ald5_tende2_	E No deter No deter
Marcine (1982) (1982)	CROSSPONTS - Johnan
Equal*	2 2 eteroing
	NOVOS J J source
	y)))( "
	()))) Eventer, I
d Capyoga 2020 Black Black Dankamer	6 Capyora 2020 Black Black Caudianaer
m KOCombanyMapr X +	with the test of test
6	
C MAXXEE BD C A C A C A C A C A C A C A C A C A C	C RADOR MCX CEED (D RADOR CONTRACTOR CONTRAC
Out-bring Destributing Data Tata Mate Workful Million	Gotal Serings Device Serings Device Tools Matrix Voles Nat Matrice
Select ALLOYCES * BOOMER	Sent AL 1970
Welline Baster -	ALL DEPOID
body v v v v v v v v v v v v v v v v v v v	
DisplayTexiLifus 100040 ·	See Second Auto
Apet Maio	
Aged Moo full count w	
Appen Table Contact of	See 22 Mar
Approximation of the second se	Image         Image <th< td=""></th<>
Apple And Apple Ap	100         100
Approximation of the second se	Image         Image <th< td=""></th<>
Average and a second and a seco	Image: Control (International Control (Internatio)))
Appendie Construction of the second s	Image         Image <th< td=""></th<>
Average and a second and a seco	Image         Image <th< td=""></th<>
Average and a second and a seco	Image         Image <th< td=""></th<>
Average and a second and a seco	Sime         Sime <td< td=""></td<>
Average and a second and a seco	Sime         Sime <td< td=""></td<>
Average and a second and a seco	Sime         Sime <td< td=""></td<>

FIGURE 1-18: SAMPLE MCX GEN2 CONTROLLER SCREENSHOTS

NOTE: Interface images are for example only and may differ from the delivered product.

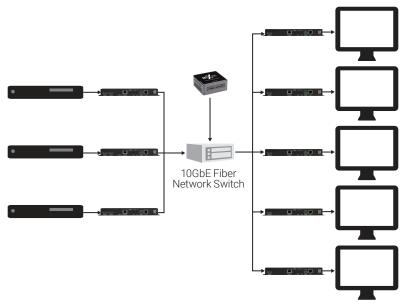




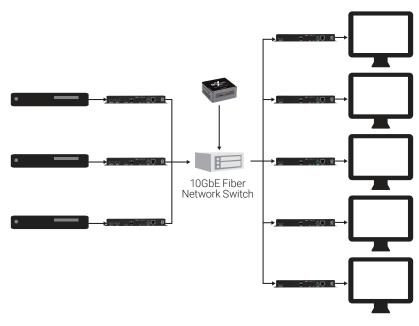
### **1.6.7.2 CONFIGURATION EXAMPLES**

When combined with the MCX Gen2 Controller, and a 10 Gigabit fiber Ethernet switch, this extension system gains a large number of additional configuration options including: multi-in/multi-out matrix switching with breakaway audio, video wall creation, and a multiview output mode. Audio extraction and embedding is fully controllable. Additionally, audio, USB, IR, and RS-232 routing can be fully controlled.

(1) Matrix Configuration











23

(2) Video Wall Configuration

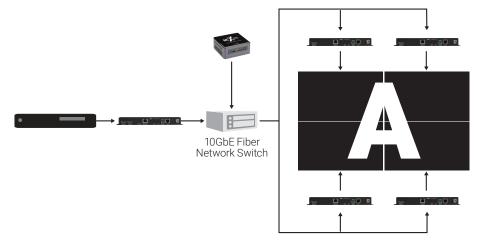


FIGURE 1-21: COPPER VIDEO WALL CONFIGURATION

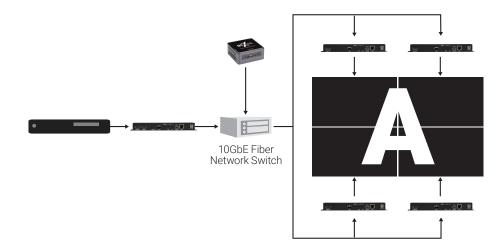


FIGURE 1-22: FIBER VIDEO WALL CONFIGURATION

(3) Multiview (PiP/PoP/Quad/Etc.) Configuration

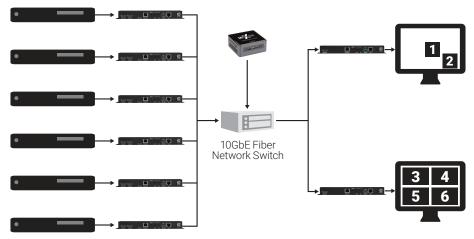


FIGURE 1-23: COPPER MULTIVIEW (PIP/POP/QUAD/ETC.) CONFIGURATION

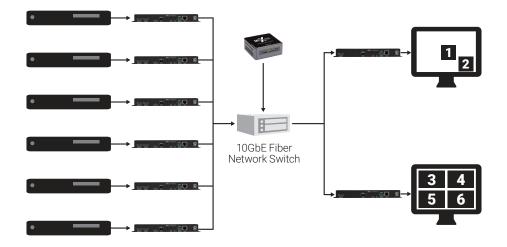


FIGURE 1-24: FIBER MULTIVIEW (PIP/POP/QUAD/ETC.) CONFIGURATION

(4) KVM Switch Configuration

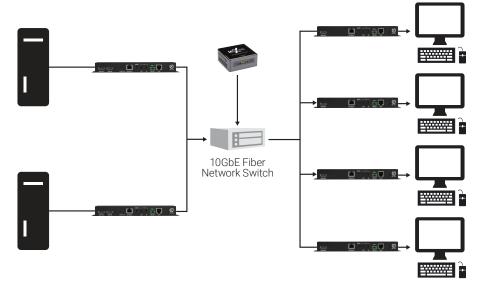
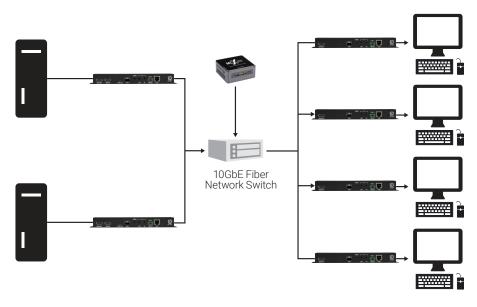
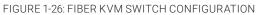


FIGURE 1-25: COPPER KVM SWITCH CONFIGURATION









LIVE 24/7 TECHNICAL SUPPORT 1.877.877.2269

### **1.7 CONNECTION DIAGRAMS**

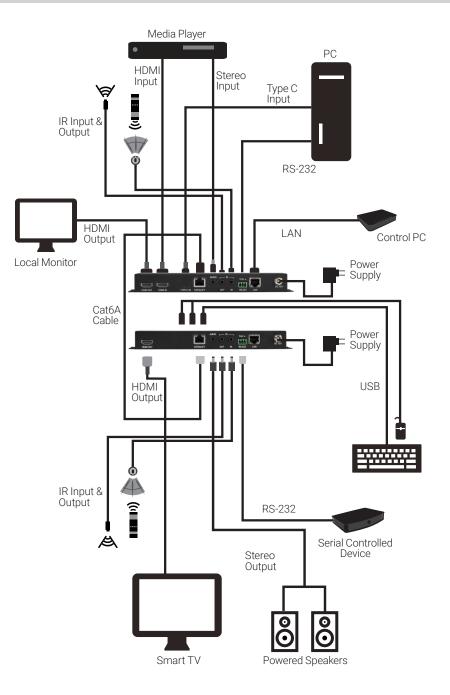


FIGURE 1-27: COPPER CONNECTION DIAGRAM



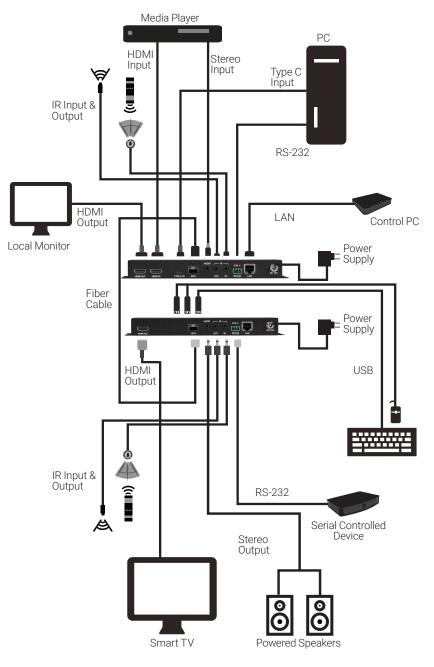


FIGURE 1-28: FIBER CONNECTION DIAGRAM





### **1.8 SPECIFICATIONS**

### **TABLE 1-10. GENERAL SPECIFICATIONS**

SPECIFICATION	DESCRIPTION
HDMI Version	HDMI 2.0b
10GbE Bandwidth	10 Gbps
	(1) HDMI (Type A) female;
Input Ports	(1) Type C female;
	(1) Stereo Audio (3.5mm) female
Output Ports	(1) HDMI (Type A) female
	(1) 10GbE LAN (RJ-45 for copper; SFP+ for fiber) female;
Pass-Through Ports	(2) IR (3.5mm) female;
Pass-Iniougii Polits	(1) RS-232 (3-pin terminal block) female;
	(1) LAN (RJ-45) female
IR Frequency	38kHz
Baud Rate	57600 (default), up to 115200 bps
Power Supply	12V/3A DC (US/EU standards, CE/FCC/UL certified)
	±8kV (air discharge);
ESD Protection (HBM)	±4kV (contact discharge);
	215mm x 25mm x 108mm (case only);
Dimensions	215mm x 25mm x 116.7 mm (all inclusive)
Weight	916g
Chassis Metal	Metal (steel)
Chassis Color	Black
Operating Temperature	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 60°C (-4 to to 140°F)
Relative Humidity	20 to 90% RH (Non-condensing)
Power Consumption	14.3w (for copper); 18.51w (for fiber)

 $\mathbf{S}$ 

	INPUT OUTPUT			
SUPPORTED RESOLUTIONS ( <b>HZ</b> )	HDMI	TYPE-C	10GBE	HDMI
720×400p@70/85	√ TIPINI	√	TUGBE ✓	√ TIDINI
640×480p@60/72/75/85	· ·	· · · · · · · · · · · · · · · · · · ·	· · ·	 √
720×480i@60	· ·	 ✓	 ✓	 ✓
720×480p@60	· ·	√	 ✓	 ✓
720×576i@50	· ·	· · · · · · · · · · · · · · · · · · ·	· ·	 
720×576p@50		· · · · · · · · · · · · · · · · · · ·	· ·	· · · · · · · · · · · · · · · · · · ·
800×600p@56/60/72/75/85	· · ·	√	 ✓	 ✓
848×480p@60	$\checkmark$	√	✓	
1024×768p@60/70/75/85		$\checkmark$	✓	
1152×864p@75	✓	$\checkmark$	✓	√
1280×720p@50/60	$\checkmark$	$\checkmark$	✓	
1280×768p@60/75/85	✓	√	✓	
1280×800p@60/75/85		√	✓	√
1280×960p@60/85	✓	$\checkmark$	✓	
1280×1024p@60/75/85	✓	$\checkmark$	✓	$\checkmark$
1360×768p@60	✓	$\checkmark$	✓	√
1366×768p@60	✓	$\checkmark$	✓	
1400×1050p@60		$\checkmark$	✓	
1440×900p@60/75	✓	$\checkmark$		√
1600×900p@60RB	✓	$\checkmark$		√
1600×1200p@60	✓	$\checkmark$	~	
1680×1050p@60	✓	$\checkmark$	~	
1920×1080i@50/60	✓	$\checkmark$	~	√
1920×1080p@24/25/30	✓	$\checkmark$	~	√
1920×1080p@50/60	~	√	~	√
1920×1200p@60RB	√	√	~	√
2560×1440p@60RB	~	√	~	√
2560×1600p@60RB	$\checkmark$	√	~	√
2048×1080p@24/25/30	√	$\checkmark$	~	~
2048×1080p@50/60	~	$\checkmark$	$\checkmark$	√
3840×2160p@24/25/30	~	$\checkmark$	~	√
3840×2160p@50/60 (4:2:0)	~	$\checkmark$	$\checkmark$	√
3840×2160p@24, HDR10	~	$\checkmark$	~	~
3840×2160p@50/60 (4:2:0), HDR10	✓	$\checkmark$	~	√
3840×2160p@50/60	✓	$\checkmark$	~	√
4096×2160p@24/25/30	✓	$\checkmark$	~	√
4096×2160p@50/60 (4:2:0)	✓	$\checkmark$	~	√
4096×2160p@24, HDR10	~	$\checkmark$	~	~

### **TABLE 1-11. VIDEO SPECIFICATIONS**



### TABLE 1-11. VIDEO SPECIFICATIONS CONTINUED

	INPUT		OUTPUT	
SUPPORTED RESOLUTIONS (HZ)	HDMI	TYPE-C	10GBE	HDMI
4096×2160p@50/60 (4:2:0), HDR10	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
4096×2160p@50/60	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$



### TABLE 1-12. DIGITAL AUDIO HDMI INPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
LPCM	
Max Channels	8 channels
Sampling Rate (kHz)	32, 44.1, 48
Bitstream	
Supported Formats	Standard and High Definition

### TABLE 1-13. CAT5E/6/7 OUTPUT (COPPER)/FIBER OUTPUT (FIBER)

DESCRIPTION
8 channels
32, 44.1, 48
Standard and High Definition





### TABLE 1-14. ANALOG AUDIO INPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Max Audio Level	1Vrms
Impedance	10kΩ
Туре	Unbalanced

### TABLE 1-15. ANALOG AUDIO OUTPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Max Audio Level	1Vrms
THD+N	< -80dB@0dBFS 1kHz (A-wt)
SNR	> 80dB@0dBFS
Frequency Response	< ±1dB@20Hz~20kHz
Crosstalk	< -80dB@10kHz
Impedance	470Ω
Туре	Unbalanced



### **TABLE 1-16. CABLE SPECIFICATIONS**

	1080P		4K30	4K60	
			(4:4:4)	(4:4:4)	
<b>C</b> ABLE LENGTH	8-BIT	12-BIT	8-BIT	8-BIT	
HIGH SPEED HDMI CABLE					
HDMI INPUT	15m	10m	5m	3m	
HDMI OUTPUT	15m	10m	5m	3m	
CATEGORY CABLE (COPPER)					
CAT. 5E/6	100m		70m		
CAT. 6A/7	100m				
FIBER CABLE					
MULTI-MODE FIBER (OM3)	300m				
MULTI-MODE FIBER (OM4)	550m				
SINGLE-MODE FIBER	30km				

### Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit color
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

4K30 (4K UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit color
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (4K UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps





### 2.1 INTRODUCTION

This Decoder is designed for high-quality, IP routable, AV extension with virtually zero latency. The unit is capable of receiving AV and other data for long extension, enhancing the flexibility of any installation. By using a sophisticated ultra-light compression scheme (lossless for most content) it is a great solution for extending 4K audio/video streams (HDMI or DisplayPort<sup>™</sup>) and data. Advanced HDMI content, such as HDR (High Dynamic Range), 10-bit color and multi-channel HD Bitstream audio, can be transmitted in pass-through mode.

For the copper decoder, the use of high-quality 10-Gbps Ethernet ports and Cat.6A or better cable allows for point-to-point transmission of the video signal up to 100m.

For the fiber decoder, the use of interchangeable, field replaceable, SFP+ modules allows for transmission distances of up to 30km. (Maximum transmission distance depends on the SFP+ modules used.)

Multiple control and data signals may also be transmitted along with the audio and video, including IR, RS-232, and Ethernet.

When combined with the optional MCX Gen2 Controller, or control software, the functionality of the decoders expands exponentially. Multiple encoders/decoders may be combined with one or more 10-Gigabit fiber Ethernet switches. The units can be used together to form a distributed video matrix, a multi-viewer system, or a video wall system. This AV network capability provides flexibility in large event installations.

The integrated USB hub of each decoder can be configured to be in USB Host or Device Mode. It can function as a simple point-topoint KVM extension, freely routed between any two endpoints, or it can be configured into a special "Simultaneous" mode, allowing up to 7 Host Mode units to extend their USB ports to a single Device Mode unit. This type of USB KVM routing flexibility enables a wide range of multi-user, control room, or on-demand installation scenarios.

The built-in EDID and HDCP management functionality enables the unit to fit into every video distribution situation. Basic configuration of the unit can be achieved via front panel buttons with an OSD (On-Screen Display). Advanced control requires the optional MCX Gen2 controller, or control software, and a LAN connection.

### 2.2 APPLICATIONS

- Video, Audio, LAN, IR, and USB over Copper Cable or Fiber extension
- Long distance data and video transmission immune to RF interference
- Point-to-Point Secure Video Conferencing
- Hotel or convention center display
- Multi-monitor broadcast
- Distributed video matrix system
- Distributed video wall system
- Remote KVM system control

### 2.3 PACKAGE CONTENTS

- (1) UHD+ Copper or Fiber Receiver
- (1) 12V/3A DC Power Adapter
- (1) Power Cord
- (1) 3-pin terminal block



### **2.4 SYSTEM REQUIREMENTS**

- Compatible encoders
- · HDMI receiving equipment, such as an HDTV, monitor, or audio amplifier
- Analog audio receiving equipment, such as headphones, an audio amplifier, or powered speakers
- A 10-Gbps Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-encoder/decoder copper systems)
- A 10-Gbps fiber Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-encoder/decoder fiber systems)
- IEEE 802.3ae compatible SFP+ fiber module supporting a dual-optical fiber connection style, such as LC, or a pre-terminated crossover dual-optical fiber cable (required for fiber decoder)

NOTE: Single-mode and multi-mode support is dependent on the SFP+ modules used.

• MCX Gen2 Controller or control software to configure distributed matrix, video wall, or multi-view systems (Optional)



## **CHAPTER 2: DECODERS**



### 2.5 FEATURES

- Provides AV, IR, RS-232, USB 2.0, and Ethernet extension
- HDMI 2.0 and DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.4 compliant
- (1) HDMI -output, (3) USB TYPE A, (1) Cat5e/6/7 input, (1) 3.5 mm phone jack output; also copper model: (1) 10G RJ-45 input or output, fiber mode: (1) SFP+ input or output
- IP switchable with minimum latency (requires optional MCX Gen2 Controller or control software)
- · Optional lossless compression to allow video transfer within limited bandwidth
- Extends up to 100m in point-to-point mode (with Cat.6A cable for copper decoder)
- Extends up to 30km (Maximum distance depends on the SFP+ module and type of fiber used for fiber decoder.)
- Supports independent breakaway A/V matrix switching with minimum latency, video wall generation, and multi-view compositing (requires optional MCX Gen2 Controller/control software)
- Facilitiates pass-through of 10/12-bit HDR sources (Point-to-Point and Genlock modes only)
- Enables pass-through of audio formats including LPCM (up to eight channels), Bitstream and HD Bitstream from HDMI or DP sources
- Unit can be powered directly by PoE when connected to a 10 Gigabit Ethernet (10GbE) switch that provides PoE (802.3at) (for copper decoder)
- Signal transmission interfaces with 10-Gigabit Ethernet switches via XFI (IEEE 802.3ae) compatible SFP+ fiber modules (for fiber decoder)
- Basic configuration via front panel buttons with an OSD
- Supports the use of an external control center (MCX Gen2 Controller) or control software to provide expanded functionality (Contact Black Box for more information.)







## **2.6 OPERATION CONTROLS AND FUNCTIONS**

## 2.6.1FRONT PANEL

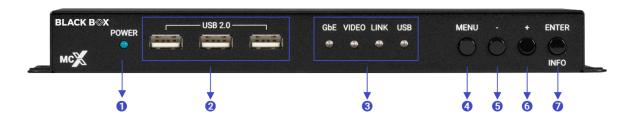


FIGURE 2-1: FRONT PANEL

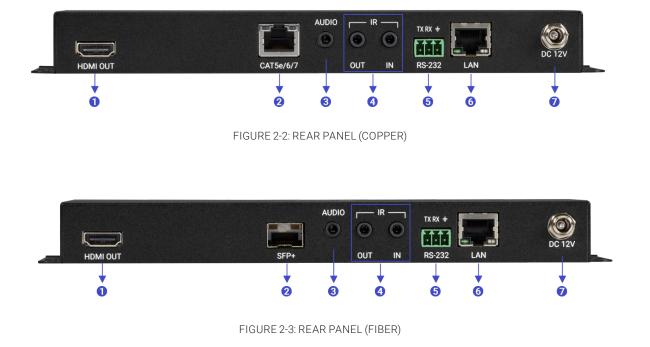
TABLE 2-1. FRONT-PANE	L COMPONENTS
-----------------------	--------------

NUMBER IN FIGURE 2-1	COMPONENT	DESCRIPTION
1	(1) Power LED indicator	Lights ON or OFF for Power
2	(3) USB 2.0 (Type A) ports	Connect directly to standard USB devices, such as a mouse, keyboard or flash drive to extend their USB functionality to the currently active/routed encoder.
3 (1) Status LED Block		<b>GbE LED:</b> This LED will illuminate and blink to indicate a live and active connection on the local gigabit Ethernet port.
	<b>VIDEO LED:</b> This LED will illuminate Green when a video signal is live on the optical fiber streaming port or illuminate Amber when streaming a detected input stream. When no video is active, the LED will remain off, even if the streaming connection is valid.	
	<b>LINK LED:</b> These LEDs will illuminate and blink to indicate data transmission and reception activity across the optical fiber streaming connection.	
		<b>USB LED:</b> This LED will illuminate when the unit's USB ports have successfully paired with the USB ports on another unit. This LED will blink if the unit's USB ports are not currently paired and are in stand-by mode.
4	(1) Menu button	Press to enter the OSD menu, or to back out from menu items.
5	(1) Menu button: - Minus button	Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between encoder source inputs.
6	(1) Menu button: + button	Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between decoder source inputs.
7	(1) Enter/Info button	When inside an OSD menu, press to confirm a selection or to go deeper into a menu item. When not in a menu, press to activate the Information OSD.





## 2.6.2 REAR PANEL



#### **TABLE 2-2. REAR-PANEL COMPONENTS**

NUMBER IN FIGURE	COMPONENT	DESCRIPTION
1	(1) HDMI Out Port	Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
	(1) Cat5E/6/7 port	Connect directly to a compatible encoder/decoder for point-to-point extension, or to a 10 Gigabit Ethernet switch for distributed matrixing (requires MCX Gen2 Controller or control software) with a single Cat.5e/6/7 cable for extension of all data signals (for copper decoder).
2	OR	NOTE: If the connected network switch supports the IEEE 802.3at-2009 PoE (Power over Ethernet) standard, this unit can optionally be powered directly via this Ethernet port.
		Insert a standard SFP+ module and connect the appropriate optical cable to allow data transmission to a compatible encoder or to a 10-gigabit optical fiber network switch (for fiber decoder).
	(1) SFP+ port	NOTE: The SFP+ module must support a dual-optical fiber connection style, such as LC, or be pre-terminated dual-optical fiber cables. Single-mode and multi-mode support is dependent on the SFP+ modules used.
		As OUT: Connect to powered speakers or an amplifier for stereo analog audio output.
		As IN: Connect to the stereo analog output of a device, such as a CD player or PC.
3 (1) Audio port	NOTE: When the encoder and decoder are connected directly in a point-to-point configuration, audio is routed directly to the opposite end's Ports. Free routing can only be configured by use of the optional MCX Gen2 Master Controller or control software.	
		<b>OUT Port:</b> Connect to an IR Blaster to broadcast IR signals from a connected decoder to devices within direct line-of sight of the IR Blaster.
4 (2) IR por	(2) IR ports	<b>IN Port:</b> Connect to an IR Extender to receive IR control signals and extend them to devices connected to a connected decoder. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
		NOTE: Currently, only 38KHz IR signal extension is supported.
5	(1) RS-232 Terminal Block	Connect directly to a PC, laptop or serial controllable device with a 3-pin adapter cable to extend the RS-232 signal between encoder and decoder.
6	LAN Port	Connection for device configuration only
7	DC 12V Port	Plug the 12V DC power adapter into this port and connect it to an AC wall outlet for power.





## 2.6.3 IR CABLE PINOUTS

IR Blaster Cable

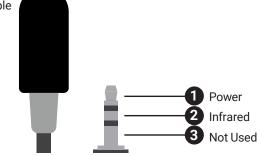


FIGURE 2-4: IR BLASTER CABLE PINOUTS



### 2.6.4 RS-232 PINOUT AND DEFAULTS

SERIAL PORT DEFAULT SETTINGS		
BAUD RATE	57600	
DATA BITS	8	
PARITY BITS	NONE	
STOP BITS	1	
FLOW CONTROL	NONE	

FIGURE 2-5: SERIAL PORT DEFAULT SETTINGS

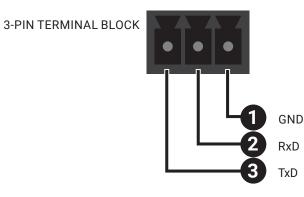


FIGURE 2-6: 3-PIN TERMINAL BLOCK

NOTE: The default Serial Port baud rate can only be changed by use of the optional MCX Gen2 Controller or control software.







#### 2.6.5 OSD MENU

All functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the **[MENU]** button on the front of the unit. Use the **[+]** (PLUS), **[-]** (MINUS), and **[ENTER]** buttons to navigate the OSD menu. Press the **[MENU]** button to back out from any menu item and then press it again to close the menu.

MAIN MENU
OSD
INFORMATION
USB INFORMATION
FACTORY SETTING
FIGURE 2-7: MAIN MENU

FIGURE 2-7: MAIN MENU

The individual functions of the OSD will be introduced in the following section. Items marked in BOLD are the factory default settings.

OSD	
2ND LEVEL	3RD LEVEL
DISPLAY INFORMATION	ON
	OFF
INFORMATION TIMEOUT	OFF
	10~40 SEC [10 SEC]
MENU TIMEOUT	OFF
	10~40 SEC [10 SEC]
MENU H POSITION	0~100 <b>[90]</b>
MENU V POSITION	0~100 <b>[90]</b>

FIGURE 2-8: OSD MENU



#### TABLE 2-3. OSD

SECOND LEVEL IN FIGURE 2-8	SELECTION	DESCRIPTION
Display Information	On/Off	Enable or disable the Information OSD.
Information Timeout	Multiple	Set the display timeout for the Information OSD.
Menu Timeout	Multiple	Set the display timeout for the OSD Menu.
Menu H position	Multiple	Set the horizontal position of the OSD Menu.
Menu V Position	Multiple	Set the horizontal position of the OSD Menu.





INFORMATION	
2ND LEVEL	3RD LEVEL
RESOLUTION	[CURRENT SOURCE RESOLUTION]
STATUS	DECODER
FW VERSION	[CURRENT FIRMWARE VERSION]
IP	[CURRENT IP ADDRESS]
MAC	[UNIT'S MAC ADDRESS]
SN	[UNIT'S SERIAL NUMBER]

FIGURE 2-9: INFORMATION MENU

#### **TABLE 2-4. INFORMATION**

SECOND LEVEL IN FIGURE 2-9	SELECTION	DESCRIPTION
Resolution	Default	Displays the unit's detected source resolution
Status	Default	Always shows DECODER
FW Version	Default	Displays the unit's firmware version
IP	Default	Displays the unit's IP address
MAC	Default	Displays the unit's MAC address
SN	Default	Displays the unit's serial number



USB INFORMATION		
2ND LEVEL	3RD LEVEL	
IP MODE	[UNIT'S USB IP MODE]	
IP	[UNIT'S USB IP ADDRESS]	
MAC	[UNIT'S USB MAC ADDRESS]	
PAIRED MAC	[USB MAC ADDRESSES OF CONNECTED USB SOURCES]	

FIGURE 2-10: USB INFORMATION MENU

#### **TABLE 2-5. USB INFORMATION**

SECOND LEVEL IN FIGURE 2-10	SELECTION	DESCRIPTION
IP Mode	Default	Displays the unit's USB IP mode
IP	Default	Displays the unit's USB IP address
MAC	Default	Displays the unit's USB MAC address
PAIRED MAC	Default	Displays the unit's USB addresses of connected USB sources





FACTORY SETTING	
2ND LEVEL	3RD LEVEL
ARE YOU SURE?	NO
	YES

FIGURE 2-11: FACTORY SETTING MENU

#### **TABLE 2-6. FACTORY INFORMATION**

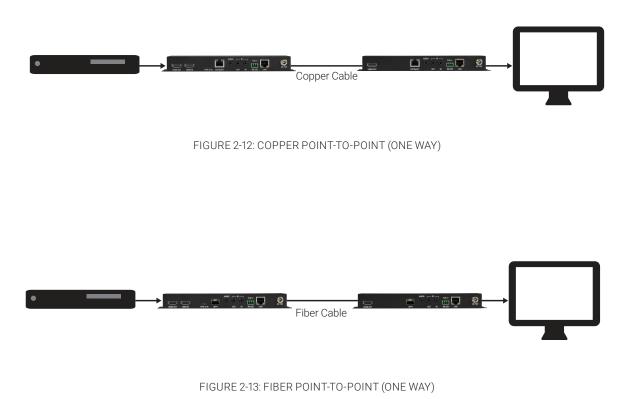
SECOND LEVEL IN FIGURE 2-11	SELECTION	DESCRIPTION
		Selecting [Yes] will reset the unit's settings back to their factory defaults.
Are you sure?	No/Yes	
		Selecting [No] will keep the current settings.



## 2.6.6 BASIC AV EXTENSION

## 2.6.6.1 POINT-TO-POINT (ONE WAY)

The most basic extension configuration available is a point-to-point system with a single transmitter unit acting as an encoder connected directly to a single receiver unit acting as a decoder. In this configuration the HDMI/DP input on the encoder side is transmitted to the connected decoder side without modification to the audio or video format. The analog stereo audio input on the encoder transfers audio directly to the analog stereo audio output on the decoder. The LAN, RS-232 and IR ports form direct connections between the encoder and decoder as well. This configuration is ideal for basic video extension as well as remote KVM applications.



NOTE: These configurations do not use or require an external control center, such as the MCX Gen2 Controller, to function. No audio insertion/extraction is performed in these configurations.





## 2.6.7 ADVANCED AV EXTENSION

## 2.6.7.1 MCX GEN2 CONTROLLER

The MCX Gen2 Controller is a hardware solution designed to provide a unified and easy method to access and control all of the encoders and decoders in a system. It provides a user-friendly, and operating system agnostic, web-based interface allowing easy control over all of the most critical functions within a distribution system.

The MCX Gen2 Controller hardware is an optional component and is not included with individual encoder, decoder, or transcoder units. Please contact your authorized dealer for more information.

+ MOIOHNEDHISHINGH X +						- 0 ×	+ ACConstitution Meager X +							- 0 ×
€ → C ☆ A Notamire   1092543	LLL/M/Marca					* * • * O # O :	← → Ø Ø (▲ Network   18525433/H)natic							* * * * <b>*</b> • :
C RACERS MC	1				ED the Meso	at Bagan a Sempt O Light	C-RACERS MC						E terminal @ try	puh - 🧿 Settingsi 🕐 Logaut
04	shal Sersings Device Sersings	Status	Texts	Matrix	Video Not Multi	New	Global Settings	Device Settings	Status	Tools	Matrix	Video Wall	Multiview	
								brind in	au 000000					
		ALCONCES			Stoperstatus Report A Deup Realty	•	C Separate Digital Audio Routing C Birdinational							
	Exceeds		~		DECODERS	×	Vites / Digital Audio Analog Audio Berial Indo	ured USB						
	04.0005		×		1000005	Ť	Mr. d.Mr. d	DEVICE ICONS						
ANNE Encoder_1			Ø	NAME ( Decoder, 2			. (0)))(0)))	<ul> <li>Click icone to highlight joins</li> </ul>						
			1.54	GAOUP - AUAS : Bernder, 2			1	No Joins						
IP-Address : 109-254.12.19 MAR - Description	95			IP Address : 165 254 164 34 MAT - NINE 10000043			: :	a Joined						
MAE: 0000005000 554925: 5740/00/00				MAD : 000(100000A3 \$74705 : Exceder_1				CROSS POINTS Join Statua						
Expand •				Expand •			2 2 2	Cworing						
							ncessens J J	a Joined						
-							- M (							
							»)))( ···							
							3)))) ( terreter, 2							
							- M C							
							3))) [ 0.000.1							
						C								- anu ni
© Copyright 2020 Black Box Discharrer						SDV:E	O Dopyright 2022 Black Box Disclariner							SDV:E
- ACConstitution and Access						- 0 X	+ Millord Inite Tenge X +							- 0 ×
+ Millond beingtleage × +     +     +     + → C O ▲ Notices 1002547	13.5.W/video-mail					- 0 X * 0 0 <b>* 0</b> 1								- a ×
4 0 C Q A NEW 19254					(D) particular	~ ÷ 0 * O i	E + C O A Service 19826118/million						Description of the second	* • • <b>* 0</b> :
					👔 ter time	- 0 X N 0 0 5 0 1 d @ tapat 0 temps 0 temps							💷 mer Mercel - 📵 scyle	
		2064	Turks	Mark	El Cortónia Vilio Nal Male	n () () () () () () al () () () () () () () () () () () () ()	E + C O A Service 19826118/million	Device Services	(anus	Trada	Mes		E the Marcel 🕘 Engle	* • • <b>* 0</b> :
	) skal betings — Device Betings	2014	Tuels	Max		n () () () () () al () () () () () () () () () al () () () () () () () () () () () () ()	Contractions	Device Serings	(anus	Tank	Mark	Velo Val	Multirew	* • • <b>* 0</b> :
	1	254	Tools	Matix				Bankar Santings	(neus	Teels	Nex	Voio Ral	Multiree	+ • • • • • • • • • • • • • • • • • • •
	) skal betings — Device Betings	24	Tashs	Mark		n () () () () () al () () () () () () () () () al () () () () () () () () () () () () ()	Contractions	Device Settings	9au	Tash	Nes	Vdes Kall	Mutsriew	* • • <b>* 0</b> :
€     →     C     ▲     Antonion     NB2241       ♦     B ACCENCE     MO     ECEN     ECEN       Select     NB Configuration     ECEN     ECEN	atud Denings Device Detings		Turk	Mark			Contractions	Bovies Settings	5ana	Teels	Nex	Vdes Kall	Multiree	+ + + + + + + + + + + + + + + + + + +
€     →     C     ▲     Antonion     NB2241       ♦     B ACCENCE     MO     ECEN     ECEN       Select     NB Configuration     ECEN     ECEN	and brings being brings ALL BRADES • Branded •	554	Taala	Main			Contractions	denne Settinge	Sec	ter.	Nes	Vdes Kall	Mutsriew	+ • • • • • • • • • • • • • • • • • • •
	ALL DEVICES T ALL DEVICES T Standard T 2 T T T T T T T T T T T T T T		Task	Matrix			Contractions	Beau Setings	Sec	••	kes	Velo Val	Multiriew DCr005 Secoler Devoter Auto	
Conference	Image: state in the s	Dia	Task	Maix			Contractions	(inite Setions	Deta	Tata	Maris	Voire Hall	Multiriew DCr005 Secoler Devoter Auto	+ + + + + + + + + + + + + + + + + + +
€         >         C	Interference         Description           Ass. SPACES         *           Banded         *           2         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *		Tash	Marx			Contractions	denne Sattrage	Sona	Tech	Net	Veles Hall	Multiriew DCr005 Secoler Devoter Auto	• • • • • • • • • • • • • • • • • • •
	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v		Taula	Max			Contractions	Cecity Settings	Set.	Tata Tata	¥.	Veles Hall	Multirev Broots Secolar Auto ME	
€ → C C C A Antonio (1935/CEC)	Interference         Description           Ass. SPACES         *           Banded         *           2         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *           1         *		Fash	Many			Contractions	Beiter Settings	(ona	Tak	Manu	Velex Wall	Multirier BENDES Geoder Geoder Auto Mil Digitig Resolution	• • • • • • • • • • • • • • • • • • •
€ → € ↑ ↑ ↑ American National	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v		Taula	Mes			Contractions	Jona Serva	Data	Task	Jan State	Velex Wall	Multiview benotis Besoder Desoder Auto Mi Daplig Resolution Lapont Son	• • • • • • • • • • • • • • • • • • •
C - C C C C C C C C C C C C C C C C C C	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v		Data	Mark			Contractions	Bear Serve	Des	-	Net	Velor Holl	Multiree BCNDSS Beroder Auto SE Dapity Resolution Legant Sox 10	· · · · · · · · · · · · · · · · · · ·
€ → € ↑ ↑ ↑ American National	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v		Tunis	Wes			Contractions	leas trings	Det	Int	ыn	Vein Kull	Multime ECCCES Second Adde MC Dataly Resultion Logant Size 10 Second Adde MC Dataly Resultion	· · · · · · · · · · · · · · · · · · ·
C - C C C C C C C C C C C C C C C C C C	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v		Fals	Mark			Contractions	Seise Serrys	(one	hain	Men	Veter Hell Keter K	Moltone 1 1000053 6ecolor 2000de Auto 50 2004gef Secolor 30 2004gef Secolor 30 2004gef Secolor 30 2004gef Secolor 30 2004gef Secolor 30 30 30 30 30 30 30 30 30 30 30 30 30	• • • • • • • • • • • • • • • • • • •
€ -> € ) ▲ Amazen Marcon La Amazen A	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v		Taula	Varia			Contractions	less tring	Det	Tank	-	Velas Kall	Mutterer Stretch Geoder M Dazig tesstation Dazig tesstation Stand Ster Stold Mark	• • • • • • • • • • • • • • • • • • •
€ -> € ) ▲ Amazen Marcon La Amazen A	Al Decos Unique Al Decos Unique 2 v 2 v 1980al v Default v Default v				Volue met		Contractions	Analan	(one	101	Jan Series	Veter Hull Utter Hull Utter Hull Utter Utt	Multime tendos decidar Seundo Audio Sel Dapla tesunition Ligant files 19 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	
€ -> € ) ▲ Amazen Marcon La Amazen A	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met		Contractions	Bene Serega	DAS	Init		Veloc Holl	Multiver SCHOOL SCHO	
€ -> € ) Access Maximum Maximum Access Acce	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met		Contractions	Sens Surge			w	Veloc Holl	Multime tendos decidar Seundo Audio Sel Dapla tesunition Ligant files 19 19 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	
€ -> € ) Access Maximum Maximum Access Acce	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met				Des		Er.	Veloc Holl	Multiver SCHOOL SCHO	
€ -> € ) Access Maximum Maximum Access Acce	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met			Anna Saraya			For	Veloc Holl	Multiver SCHOOL SCHO	
€ -> € ) Access Maximum Maximum Access Acce	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met						In the second seco	Veloc Holl	Multiver SCHOOL SCHO	
€ -> € ) ▲ Amazen Marcon La Amazen A	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met						Fra	Veloc Holl	Multiver SCHOOL SCHO	
€ -> € ) ▲ Amazen Marcon La Amazen A	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met	A set of the set						Veloc Holl	Multiver SCHOOL SCHO	
€ -> € ) ▲ Amazen Marcon La Amazen A	Al Decos Units Al Decos Units Bandal - 2 - V 2 - 1980al - Colum - Decos V				Volue met							Veloc Holl	Multiver SCHOOL SCHO	

FIGURE 2-14: SAMPLE MCX GEN2 CONTROLLER SCREENSHOTS.

NOTE: Interface images are for example only and may differ from the delivered product.

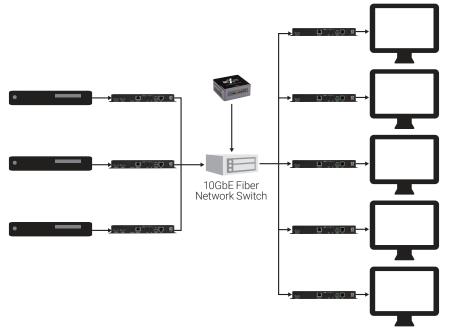




## 2.6.7.2 CONFIGURATION EXAMPLES

When combined with the MCX Gen2 Controller, and a 10 Gigabit fiber Ethernet switch, this extension system gains a large number of additional configuration options including: multi-in/multi-out matrix switching with breakaway audio, video wall creation, and a multiview output mode. Audio extraction and embedding is fully controllable. Additionally, audio, USB, IR, and RS-232 routing can be fully controlled.

(1) Matrix Configuration





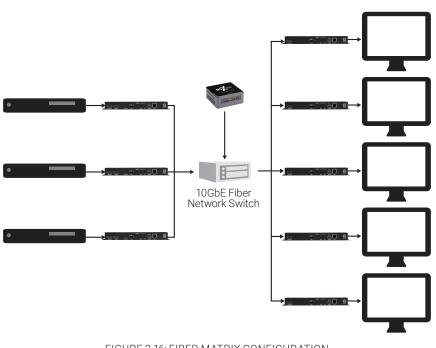
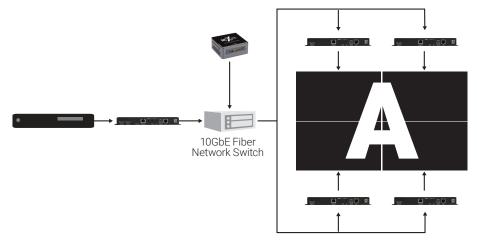


FIGURE 2-16: FIBER MATRIX CONFIGURATION





(2) Video Wall Configuration





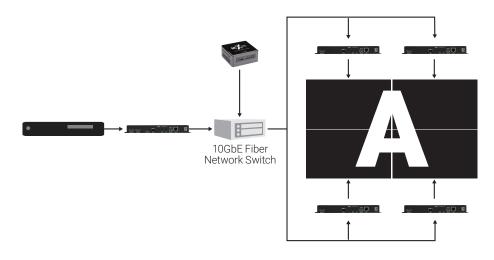


FIGURE 2-18: FIBER VIDEO WALL CONFIGURATION

**CHAPTER 2: DECODERS** 

(3) Multiview (PiP/PoP/Quad/Etc.) Configuration

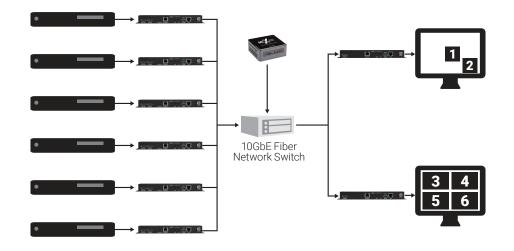


FIGURE 2-19: COPPER MULTIVIEW (PIP/POP/QUAD/ETC.) CONFIGURATION

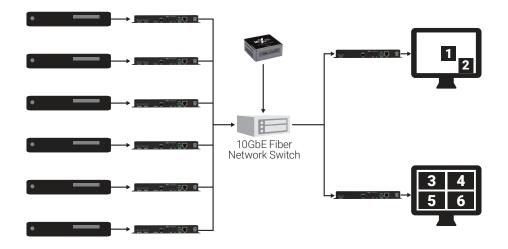


FIGURE 2-20: FIBER MULTIVIEW (PIP/POP/QUAD/ETC.) CONFIGURATION



(4) KVM Switch Configuration

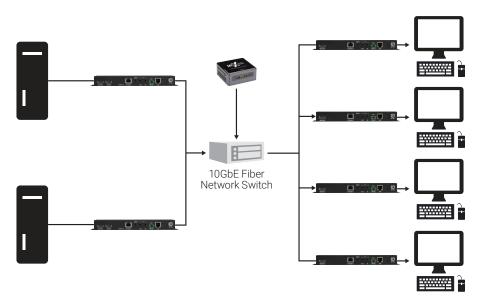


FIGURE 2-21: COPPER KVM SWITCH CONFIGURATION

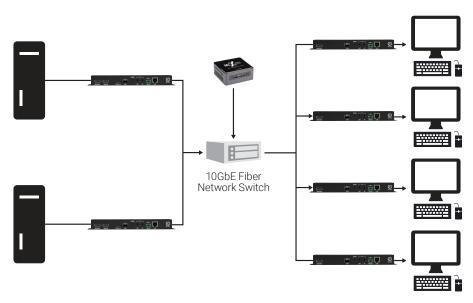


FIGURE 2-22: FIBER KVM SWITCH CONFIGURATION

LIVE 24/7 TECHNICAL SUPPORT 1.877.877.2269

## **2.7 CONNECTION DIAGRAMS**

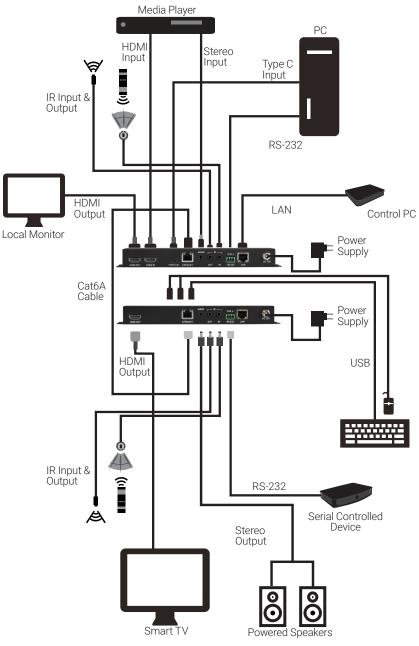
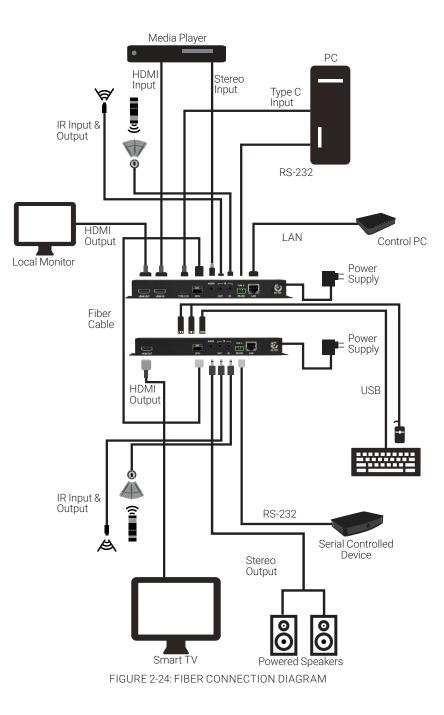


FIGURE 2-23: COPPER CONNECTION DIAGRAM



**CHAPTER 2: DECODERS** 





## 2.8. SPECIFICATIONS

SPECIFICATION	DESCRIPTION
HDMI Version	HDMI 2.0b
10GbE Bandwidth	10 Gbps
Input Ports	N/A
Output Dorto	(1) HDMI (Type A) female;
Output Ports	(1) Stereo Audio (3.5mm) female
	(1) 10GbE LAN (RJ-45 for copper; SFP+ for fiber) female;
	(2) IR (3.5mm) female;
Pass-Through Ports	(1) RS-232 (3-pin terminal block) female;
	(1) LAN (RJ-45) female;
	(3) USB 2.0 (Type A) female
IR Frequency	38kHz
Baud Rate	57600 (default), up to 115200 bps
Power Supply	12V/3A DC (US/EU standards, CE/FCC/UL certified)
	±8kV (air discharge);
ESD Protection (HBM)	±4kV (contact discharge);
Dimensione	215mm x 25mm x 108mm (case only);
Dimensions	215mm x 25mm x 116.7 mm (all inclusive)
Weight	916g
Chassis Metal	Metal (steel)
Chassis Color	Black
Operating Temperature	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 60°C (-4 to to 140°F)
Relative Humidity	20 to 90% RH (Non-condensing)
Power Consumption	14.3w (for copper); 18.51w (for fiber)



#### **TABLE 2-8. VIDEO SPECIFICATIONS**

	INPUT	OUTPUT
SUPPORTED RESOLUTIONS (HZ)	10GBE	HDMI
720×400p@70/85	√	✓
640×480p@60/72/75/85	~	~
720×480i@60	~	~
720×480p@60	~	~
720×576i@50	~	~
720×576p@50	~	~
800×600p@56/60/72/75/85	~	~
848×480p@60	~	~
1024×768p@60/70/75/85	~	~
1152×864p@75	~	~
1280×720p@50/60	~	~
1280×768p@60/75/85	~	~
1280×800p@60/75/85	~	~
1280×960p@60/85	~	~
1280×1024p@60/75/85	~	~
1360×768p@60	~	~
1366×768p@60	~	~
1400×1050p@60	~	$\checkmark$
1440×900p@60/75	~	~
1600×900p@60RB	~	$\checkmark$
1600×1200p@60	~	~
1680×1050p@60	~	~
1920×1080i@50/60	~	~
1920×1080p@24/25/30	~	~
1920×1080p@50/60	~	~
1920×1200p@60RB	~	$\checkmark$
2560×1440p@60RB	~	$\checkmark$
2560×1600p@60RB	$\checkmark$	$\checkmark$
2048×1080p@24/25/30	$\checkmark$	~
2048×1080p@50/60	~	$\checkmark$
3840×2160p@24/25/30	✓	~
3840×2160p@50/60 (4:2:0)	✓	$\checkmark$
3840×2160p@24, HDR10	✓	~
3840×2160p@50/60 (4:2:0), HDR10	$\checkmark$	✓

	INPUT	OUTPUT
SUPPORTED RESOLUTIONS (HZ)	10GBE	HDMI
3840×2160p@50/60	$\checkmark$	$\checkmark$
4096×2160p@24/25/30	$\checkmark$	$\checkmark$
4096×2160p@50/60 (4:2:0)	$\checkmark$	$\checkmark$
4096×2160p@24, HDR10	$\checkmark$	$\checkmark$
4096×2160p@50/60 (4:2:0), HDR10	$\checkmark$	$\checkmark$
4096×2160p@50/60	~	✓

#### TABLE 2-8. VIDEO SPECIFICATIONS CONTINUED





#### TABLE 2-9. DIGITAL AUDIO HDMI OUTPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
LPCM	
Max Channels	8 channels
Sampling Rate (kHz)	32, 44.1, 48
Bitstream	
Supported Formats	Standard and High Definition

#### TABLE 2-10. CAT5E/6/7 INPUT (COPPER)/FIBER INPUT (FIBER)

SPECIFICATION	DESCRIPTION
LPCM	
Max Channels	8 channels
Sampling Rate (kHz)	32, 44.1, 48
Bitstream	
Supported Formats	Standard and High Definition

#### TABLE 2-11. ANALOG AUDIO INPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Max Audio Level	1Vrms
Impedance	10kΩ
Туре	Unbalanced

#### TABLE 2-12. ANALOG AUDIO OUPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Max Audio Level	1Vrms
THD+N	< -80dB@0dBFS 1kHz (A-wt)
SNR	> 80dB@0dBFS
Frequency Response	< ±1dB@20Hz~20kHz
Crosstalk	< -80dB@10kHz
Impedance	470Ω
Туре	Unbalanced



#### **TABLE 2-13. CABLE SPECIFICATIONS**

	1080P		4K30	4K60	
<b>C</b> ABLE LENGTH	8-BIT	12-BIT	( <b>4:4:4</b> ) 8-BIT	( <b>4:4:4</b> ) 8-BIT	
HIGH SPEED HDMI CABLE					
HDMI OUTPUT	15m	10m	5m	3m	
CATEGORY CABLE (COPPER)					
CAT. 5E/6	100m 70r		)m		
CAT. 6A/7	100m				
FIBER CABLE					
MULTI-MODE FIBER (OM3)	300m				
MULTI-MODE FIBER (OM4) 550m					
SINGLE-MODE FIBER 30km					

#### Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit color
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

4K30 (4K UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit color
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (4K UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps



#### **3.1 INTRODUCTION**

This Transcoder is designed for high-quality, IP routable, AV extension with virtually zero latency. The transcoder is able to be configured as an encoder or a decoder, and it is capable of receiving AV and other data for long extension, enhancing the flexibility of any installation. By using a sophisticated ultra-light compression scheme (lossless for most content) it is a great solution for extending 4K audio/video streams (HDMI or DisplayPort<sup>™</sup>) and data.

For the copper connection, the use of high-quality 10-Gbps Ethernet ports and Cat.6A or better cable allows for point-to-point transmission of the video signal up to 100m.

For the fiber connection, the use of interchangeable, field replaceable, SFP+ modules allows for transmission distances of up to 30km. (Maximum transmission distance depends on the SFP+ modules used.)

Multiple control and data signals may also be transmitted along with the audio and video, including IR, RS-232, and Ethernet.

When combined with the optional MCX Gen2 Controller, or control software, the functionality of the Transcoder expands exponentially. Multiple transcoders may be combined with one or more 10-Gigabit fiber Ethernet switches. The units can be used together to form a distributed video matrix, a multi-viewer system, or a video wall system. This AV network capability provides flexibility in large event installations.

The integrated USB hub of each transcoder can be configured to be in USB Host or Device Mode. It can function as a simple point-topoint KVM extension, freely routed between any two endpoints, or it can be configured into a special "Simultaneous" mode, allowing up to 7 Host Mode units to extend their USB ports to a single Device Mode unit. This type of USB KVM routing flexibility enables a wide range of multi-user, control room, or on-demand installation scenarios.

The built-in EDID and HDCP management functionality enables the unit to fit into every video distribution situation. Basic configuration of the unit can be achieved via front panel buttons with an OSD (On-Screen Display). Advanced control requires the optional MCX Gen2 controller, or control software, and a LAN connection.

#### **3.2 APPLICATIONS**

- Video, Audio, LAN, IR, and USB over Copper Cable or Fiber extension
- Long distance data and video transmission immune to RF interference
- Point-to-Point Secure Video Conferencing
- Hotel or convention center display
- Multi-monitor broadcast
- Distributed video matrix system
- Distributed video wall system
- Remote KVM system control

### **3.3 PACKAGE CONTENTS**

- (1) UHD+ Copper/Fiber Transcoder
- (1) 12V/3A DC Power Adapter
- (1) Power Cord
- (1) 3-pin terminal block







### **3.4 SYSTEM REQUIREMENTS**

- HDMI or DisplayPort<sup>™</sup> source equipment, such as a media player, video game console, PC, or set-top box
- DisplayPort receiving equipment, such as an HDTV, monitor, or audio amplifier
- Analog audio receiving equipment, such as headphones, an audio amplifier, or powered speakers
- A 10-Gbps Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-encoder/decoder copper systems)
- A 10-Gbps fiber Ethernet network switch with jumbo frame and IGMP snooping support is required for distributed video systems. (Optional, required for multi-encoder/decoder fiber systems)
- IEEE 802.3ae compatible SFP+ fiber module supporting a dual-optical fiber connection style, such as LC, or a pre-terminated crossover dual-optical fiber cable (required for fiber decoder)

NOTE: Single-mode and multi-mode support is dependent on the SFP+ modules used.

• MCX Gen2 Controller or control software to configure distributed matrix, video wall or multi-view systems (Optional)

## **CHAPTER 3: TRANSCODERS**



### **3.5 FEATURES**

- Provides AV, IR, RS-232, USB 2.0, and Ethernet extension
- HDMI 2.0, DisplayPort<sup>™</sup> 1.2, and DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.4 compliant
- Multiple input/output options:

Encoder mode: (1) DisplayPort input; (1) HDMI input, and (1) DisplayPort Loop-through; Decoder mode: (1) DisplayPort output;

USB connections:

Encoder mode: (1) USB Type B; Decoder mode: (3) USB Type A

Other connections: Encoder mode: (1) 3.5mm phone jack input; Decoder mode: (1) 3.5mm phone jack output, (1) 10G RJ-45 input/output, or (1) SFP+ input/output

- IP switchable with minimum latency (requires optional MCX Gen2 Controller or control software)
- Optional lossless compression to allow video transfer within limited bandwidth
- Extends up to 100m in point-to-point mode (with Cat.6A cable for copper decoder)
- Extends up to 30km (Maximum distance depends on the SFP+ module and type of fiber used for fiber decoder.)
- Supports independent breakaway A/V matrix switching with minimum latency, video wall generation, and multi-view compositing (requires optional MCX Gen2 Controller/control software)
- Enables pass-through of audio formats including LPCM (up to eight channels), Bitstream and HD Bitstream from HDMI or DP sources
- Unit can be powered directly by PoE when connected to a 10 Gigabit Ethernet (10GbE) switch that provides PoE (802.3at) (for copper decoder)
- Signal transmission interfaces with 10-Gigabit Ethernet switches via XFI (IEEE 802.3ae) compatible SFP+ fiber modules (for fiber decoder)
- Basic configuration via front panel buttons with an OSD
- Supports the use of an external control center (MCX Gen2 Controller) or control software to provide expanded functionality (Contact Black Box for more information.)

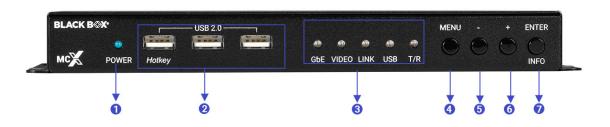






## **3.6 OPERATION CONTROLS AND FUNCTIONS**

## 3.6.1FRONT PANEL



#### FIGURE 3-1: FRONT PANEL

NUMBER IN FIGURE 3-1	COMPONENT	DESCRIPTION
1	(1) Power LED indicator	Lights ON or OFF for Power
2	(3) USB 2.0 (Type A) ports	Connect directly to standard USB devices, such as a mouse, keyboard or flash drive to extend their USB functionality to the currently active/routed USB Device Mode decoder.
		<b>GbE LED:</b> This LED will illuminate and blink to indicate a live and active connection on the local gigabit Ethernet port.
		<b>VIDEO LED:</b> This LED will illuminate Green when a video signal is live on the optical fiber streaming port or illuminate Amber when streaming a detected input stream. When no video is active, the LED will remain off, even if the streaming connection is valid.
3	(1) Status LED Block	<b>LINK LED:</b> These LEDs will illuminate and blink to indicate data transmission and reception activity across the optical fiber streaming connection.
		<b>USB LED:</b> This LED will illuminate when the unit's USB ports have successfully paired with the USB ports on another unit. This LED will blink if the unit's USB ports are not currently paired and are in stand-by mode.
		<b>T/R LED:</b> This LED will illuminate Green when device is set as an Encoder. This LED will illuminate Amber when device is set for Decoder.
4	(1) Menu button	Press to enter the OSD menu, or to back out from menu items.
5	(1) Menu button: - Minus button	Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between encoder source inputs.
6	(1) Menu button: + button	Press to move up or adjust selections within OSD menus. When not in a menu, press to manually switch between decoder source inputs.
7	(1) Enter/Info button	When inside an OSD menu, press to confirm a selection or to go deeper into a menu item. When not in a menu, press to activate the Information OSD.

#### **TABLE 3-1. FRONT-PANEL COMPONENTS**



## 3.6.2 REAR PANEL





#### **TABLE 3-2. REAR-PANEL COMPONENTS**

NUMBER IN FIGURE 3-2	COMPONENT	DESCRIPTION
1	(1) DP OUT Port	Connect to a DisplayPort™ TV, monitor, or amplifier for digital video and audio output.
2	(1) HDMI IN port	Connect to HDMI source equipment, such as a media player, game console, or set-top box
3	(1) DP IN port	Connect to DisplayPort source equipment, such as a media player, game console, or set-top box
4	(1) SFP+ port	For fiber decoder, insert a standard SFP+ module and connect the appropriate optical cable to allow data transmission to a compatible device or to a 10-gigabit optical fiber network switch.
		NOTE: The SFP+ module must support a dual-optical fiber connection style, such as LC, or be pre-terminated dual-optical fiber cables. Single-mode and multi-mode support is dependent on the SFP+ modules used.
5	(1) Cat5E/6/7 port	Connect directly to a compatible encoder/decoder for point-to-point extension, or to a 10 Gigabit Ethernet switch for distributed matrixing (requires MCX Gen2 Controller or control software) with a single Cat.5e/6/7 cable for extension of all data signals (for copper decoder).
		NOTE: If the connected network switch supports the IEEE 802.3at-2009 PoE (Power over Ethernet) standard, this unit can optionally be powered directly via this Ethernet port.
	(1) Audio port	As OUT: Connect to powered speakers or an amplifier for stereo analog audio output.
		As IN: Connect to the stereo analog output of a device, such as a CD player or PC.
б		NOTE: When the encoder and decoder are connected directly in a point-to-point configuration, audio is routed directly to the opposite end's Ports. Free routing can only be configured by use of the optional MCX Gen2 Master Controller or control software.
7	(2) IR ports	<b>OUT Port:</b> Connect to an IR Blaster to broadcast IR signals from a connected transcoder to devices within direct line-of sight of the IR Blaster.
		<b>IN Port:</b> Connect to an IR Extender to receive IR control signals and extend them to devices connected to a connected transcoder. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
		NOTE: Currently, only 38KHz IR signal extension is supported.
8	(1) RS-232 Terminal Block	Connect directly to a PC, laptop or serial controllable device with a 3-pin adapter cable to extend the RS-232 signal between units.
9	LAN Port	Connection for device configuration only
10	USB-B Port	When configuring the transcoder as an encoder, use a USB Type A to USB Type B cable to connect to a PC.
11	DC 12V Port	Plug the 12V DC power adapter into this port and connect it to an AC wall outlet for power.





## 3.6.3 IR CABLE PINOUTS

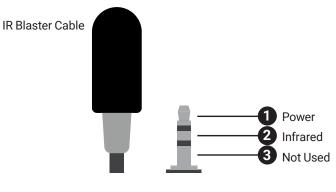


FIGURE 3-3: IR BLASTER CABLE PINOUTS

## 3.6.4 RS-232 PINOUT AND DEFAULTS

SERIAL PORT DEFAULT SETTINGS		
BAUD RATE	57600	
DATA BITS	8	
PARITY BITS	NONE	
STOP BITS	1	
FLOW CONTROL	NONE	

FIGURE 3-4: SERIAL PORT DEFAULT SETTINGS

**3-PIN TERMINAL BLOCK** 

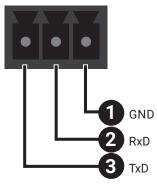


FIGURE 3-5: 3-PIN TERMINAL BLOCK

NOTE: The default Serial Port baud rate can only be changed by use of the optional MCX Gen2 Controller or control software.





#### 3.6.5 OSD MENU

All functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the **[MENU]** button on the front of the unit. Use the **[+]** (PLUS), **[-]** (MINUS), and **[ENTER]** buttons to navigate the OSD menu. Press the **[MENU]** button to back out from any menu item and then press it again to close the menu.

MAIN MENU	
OSD	
EDID	
HDCP	
DEVICE SETTING	
INFORMATION	
USB INFORMATION	
FACTORY SETTING	

FIGURE 3-6: MAIN MENU

The individual functions of the OSD will be introduced in the following section. Items marked in BOLD are the factory default settings.



# **CHAPTER 3: TRANSCODERS**



OSD	
2ND LEVEL	3RD LEVEL
DISPLAY INFORMATION	ON
	OFF
INFORMATION TIMEOUT	OFF
	10~40 SEC [10 SEC]
MENU TIMEOUT	OFF
	10~40 SEC [10 SEC]
MENU H POSITION	0~100 <b>[10]</b>
MENU V POSITION	0~100 <b>[90]</b>

FIGURE 3-7: OSD MENU

#### TABLE 3-3. OSD

· · · · · · · · · · · · · · · · · · ·		
SECOND LEVEL IN FIGURE 3-7	SELECTION	DESCRIPTION
Display Information	On/Off	Enable or disable the Information OSD.
Information Timeout	Multiple	Set the display timeout for the Information OSD.
Menu Timeout	Multiple	Set the display timeout for the OSD Menu.
Menu H position	Multiple	Set the horizontal position of the OSD Menu.
Menu V Position	Multiple	Set the horizontal position of the OSD Menu.





NOTE: This function is only available when the transcoder is configured as an encoder.

EDID	
2ND LEVEL	3RD LEVEL
HDMI EDID	INTERNAL 1 (FHD 2CH)
	INTERNAL 2 (FHD MCH)
	INTERNAL 3 (UHD 2CH)
	INTERNAL 4 (UHD MCH)
	INTERNAL 5 (UHD+2CH)
	INTERNAL 6 (UHD+ MCH)
	EXTERNAL A [HDMI OUTPUT]
	EXTERNAL B [VOIP OUTPUT]
	USER 1
	USER 2
DP EDID	INTERNAL 1 (FHD 2CH)
	INTERNAL 2 (FHD MCH)
	INTERNAL 3 (UHD 2CH)
	INTERNAL 4 (UHD MCH)
	INTERNAL 5 (UHD+2CH)
	INTERNAL 6 (UHD+ MCH)
	EXTERNAL A [HDMI OUT]
	EXTERNAL B [VOIP OUT]
	USER 1
	USER 2

Figure 3-8: EDID Menu

#### TABLE 3-4. EDID

SECOND LEVEL IN FIGURE 3-8	SELECTION	DESCRIPTION
HDMI EDID	Multiple	Select the EDID to send to the unit's HDMI input.
DP EDID	Multiple	Select the EDID to send to the unit's DisplayPort™ input.

This unit provides the following six default EDIDs:

UNIT'S DEFAULT EDIDS	
FHD 2CH	1920×1080P@60HZ (4.95GBPS), 8-BIT COLOR, LPCM 2.0
FHD MCH	1920×1080P@60HZ (4.95GBPS), 8-BIT COLOR, LPCM 7.1 & BITSTREAM
UHD 2CH	3840×2160P@30HZ (10.2GBPS), 12-BIT DEEP COLOR, LPCM 2.0
UHD MCH	3840×2160P@30HZ (10.2GBPS), 12-BIT DEEP COLOR, LPCM 7.1 & BITSTREAM
UHD+2CH	3840×2160P@60HZ (18GBPS), 12-BIT DEEP COLOR, LPCM 2.0
UHD+ MCH	3840×2160P@60HZ (18GBPS), 12-BIT DEEP COLOR, LPCM 7.1 & BITSTREAM

FIGURE 3-9 DEFAULT EDIDS

NOTE: In some rare cases it is possible for custom or external EDIDs to cause compatibility issues with certain sources. If this happens, it is recommended to switch to one of the six default EDIDs for maximum compatibility.



NOTE: This function is only available when the transcoder is configured as an encoder.

HDCP	
2ND LEVEL	3RD LEVEL
HDMI HDCP	DISABLE
	FOLLOW OUT
	FOLLOW IN
	FOLLOW API
DP HDCP	DISABLE
	FOLLOW OUT
	FOLLOW IN
	FOLLOW API

FIGURE 3-10 HDCP MENU

#### TABLE 3-5. HDCP

SECOND LEVEL IN FIGURE 3-10	SELECTION	DESCRIPTION
		Selects the HDCP logic to use with the HDMI input.
		<b>Follow In:</b> The input supports up to the HDCP version required by the connected source.
HDMI HDCP	Multiple	<b>Follow Out:</b> The input supports up to the HDCP version supported by the connected display.
	Multiple	Disable: HDCP support is completely disabled.
		Follow API: Uses the HDCP setting defined by the MCX Gen2 Controller or control software.
		NOTE: In a point-to-point configuration, "Follow API" will behave the same as "Follow Out", if the API hasn't been manually redefined.
DP HDCP		Selects the HDCP logic to use with the DisplayPort $^{\scriptscriptstyle \mathrm{M}}$ input.
		Follow In: The input supports up to the HDCP version required by the connected source.
		Follow Out: The input supports up to the HDCP version supported by the connected display.
	Multiple	Disable: HDCP support is completely disabled.
		Follow API: Uses the HDCP setting defined by the MCX Gen2 Controller or control software.
		NOTE: In a point-to-point configuration, "Follow API" will behave the same as "Follow Out", if the API hasn't been manually redefined.

NOTE: The available options depend on the transcoder configuration as either encoder or decoder; some options may not be available.

DEVICE SETTING		
2ND LEVEL	3RD LEVEL	
STATUS	ENCODER	
	DECODER	
TYPE	COPPER	
	FIBER	
USB CONTROL	HOST	
MODE	DEVICE	
USB VIRTUAL HUB	OFF	
	ON	
DP OUT SOURCE	INPUT 1 (DP)	
	INPUT 2 (HDMI)	
VOIP OUT SOURCE	INPUT 1 (DP)	
	INPUT 2 (HDMI)	
HDMI OUT AUTO	OFF	
MODE	AUTO SWITCH	
VOIP OUT AUTO	OFF	
MODE	AUTO SWITCH	

FIGURE 3-11: DEVICE SETTING MENU

# **TABLE 3-6. DEVICE SETTINGS**

SECOND LEVEL IN FIGURE 3-11	SELECTION	DESCRIPTION
STATUS	ENCODER/DECODER	Select transcoder as encoder or decoder.
ТҮРЕ	COPPER/FIBER	(Selection depends on available 10G copper or fiber connection) Device automatically switches between copper and fiber network. If both copper and fiber networks are connected, device will select the copper network. If selection is changed to fiber, the device will only use 10g fiber for connection.
USB Control Mode	DEVICE/HOST	Select DEVICE to enable USB Type-B connector, allowing a connection to a USB host, such as a PC or laptop. Select HOST to enable USB Type-A connectors in front, allowing a connection to USB devices, such as a keyboard, mouse, or USB storage.
		NOTE: In a point-to-point extension configuration, only one of the two transcoders should be set as a USB Device to avoid conflicts.
		Enables or disables the "simultaneous connection" USB mode which allows the PC/Laptop connected to this unit to be paired with the USB devices on up to seven "Host" mode units.
USB Virtual hub	Off/On	NOTE: Only available when USB Control Mode is set to "Device." USB routing can only be configured by use of the optional MCX Gen2 Controller or control software and is not valid in point-to-point configurations.
HDMI Out Source	DP/HDMI	Select the input source to display on the HDMI output.
VOIP Out Source	DP/HDMI	Select the input source to transmit as an AV over IP stream.



TABLE 3-6.	<b>DEVICE SET</b>	TTINGS CONTINUED	
IT DEL 0 0.	DEVICEOEI		

SECOND LEVEL IN FIGURE 3-11	SELECTION	DESCRIPTION
HDMI Out Auto Mode	Off/Auto Switch	Enable or disable the HDMI output's automatic source selection mode. When enabled, the unit will automatically switch the input routed to the local HDMI output whenever a new source is detected or if the current source is lost.
VOIP Out Auto Mode	Off/Auto Switch	Enable or disable the AVoIP streaming output's automatic source selection mode. When enabled, the unit will switch the input routed to the AVoIP output whenever a new source is detected or if the current source is lost.

INFORMATION	
2ND LEVEL	3RD LEVEL
RESOLUTION	[CURRENT SOURCE RESOLUTION]
STATUS	[CURRENT TRANSCODER MODE]
FW VERSION	[CURRENT FIRMWARE VERSION]
IP	[CURRENT IP ADDRESS]
MAC	[UNIT'S MAC ADDRESS]
SN	[UNIT'S SERIAL NUMBER]

FIGURE 3-12: INFORMATION MENU

#### **TABLE 3-7. INFORMATION**

SECOND LEVEL IN FIGURE 3-12	SELECTION	DESCRIPTION
Resolution	Default	Displays the unit's detected source resolution
Status	Default	Displays the unit's transcoder mode
FW Version	Default	Displays the unit's firmware version
IP	Default	Displays the unit's IP address
MAC	Default	Displays the unit's MAC address
SN	Default	Displays the unit's serial number

# **CHAPTER 3: TRANSCODERS**

USB INFORMATION		
2ND LEVEL	3RD LEVEL	
IP MODE	[UNIT'S USB IP MODE]	
IP	[UNIT'S USB IP ADDRESS]	
MAC	[UNIT'S USB MAC ADDRESS]	
PAIRED MAC 1		
PAIRED MAC 2		
PAIRED MAC 3		
PAIRED MAC 4	[USB MAC ADDRESSES OF CONNECTED USB SOURCES]	
PAIRED MAC 5		
PAIRED MAC 6		
PAIRED MAC 7		

FIGURE 3-13: USB INFORMATION MENU

#### **TABLE 3-8. USB INFORMATION**

SECOND LEVEL IN FIGURE 3-13	SELECTION	DESCRIPTION
IP Mode	Default	Displays the unit's USB IP mode
IP	Default	Displays the unit's USB IP address
MAC	Default	Displays the unit's USB MAC address
PAIRED MAC 1-7	Default	Displays the unit's USB addresses of connected USB sources





FACTORY SETTING	
2ND LEVEL	3RD LEVEL
ARE YOU SURE?	NO
	YES

FIGURE 3-14: FACTORY SETTING MENU

#### **TABLE 3-9. FACTORY INFORMATION**

SECOND LEVEL IN FIGURE 3-14	SELECTION	DESCRIPTION
		Selecting [Yes] will reset the unit's settings back to their factory defaults.
Are you sure?	No/Yes	
		Selecting [No] will keep the current settings.



# 3.6.6 BASIC AV EXTENSION

# 3.6.6.1 POINT-TO-POINT (ONE WAY)

The most basic extension configuration available is a point-to-point system with a single transcoder unit acting as an encoder connected directly to a single transcoder unit acting as a decoder. In this configuration the HDMI/DP input on the encoder side is transmitted to the connected decoder side without modification to the audio or video format. The analog stereo audio input on the encoder transfers audio directly to the analog stereo audio output on the decoder. The LAN, RS-232 and IR ports form direct connections between the encoder and decoder as well. This configuration is ideal for basic video extension as well as remote KVM applications.

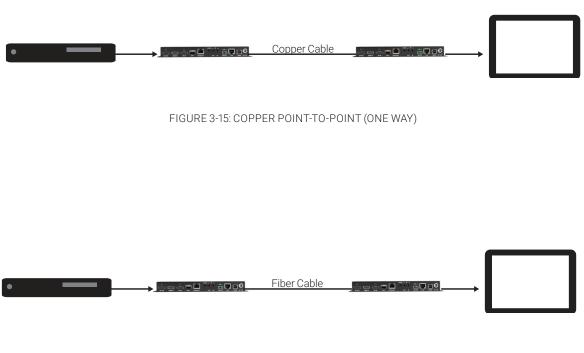


FIGURE 3-16: FIBER POINT-TO-POINT (ONE WAY)

NOTE: These configurations do not use or require an external control center, such as the MCX Gen2 Controller, to function. No audio insertion/extraction is performed in these configurations.





# 3.6.7 ADVANCED AV EXTENSION

#### 3.6.7.1 MCX GEN2 CONTROLLER

The MCX Gen2 Controller is a hardware solution designed to provide a unified and easy method to access and control all of the encoders and decoders in a system. It provides a user-friendly, and operating system agnostic, web-based interface allowing easy control over all of the most critical functions within a distribution system.

The MCX Gen2 Controller hardware is an optional component and is not included with individual encoder, decoder, or transcoder units. Please contact your authorized dealer for more information.

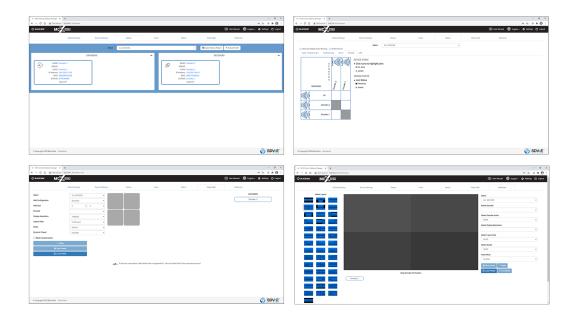


FIGURE 3-17: SAMPLE MCX GEN2 CONTROLLER SCREENSHOTS.

NOTE: Interface images are for example only and may differ from the delivered product.

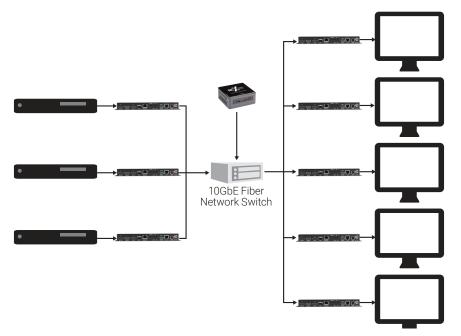




# 3.6.7.2 CONFIGURATION EXAMPLES

When combined with the MCX Gen2 Controller, and a 10 Gigabit fiber Ethernet switch, this extension system gains a large number of additional configuration options including: multi-in/multi-out matrix switching with breakaway audio, video wall creation, and a multiview output mode. Audio extraction and embedding is fully controllable. Additionally, audio, USB, IR, and RS-232 routing can be fully controlled.

(1) Matrix Configuration





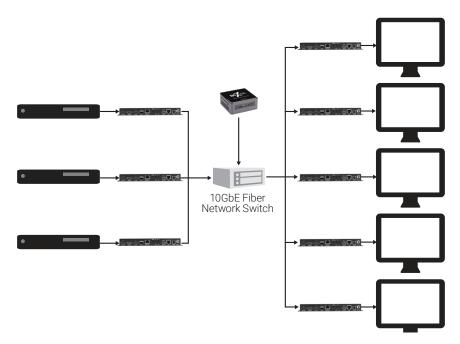
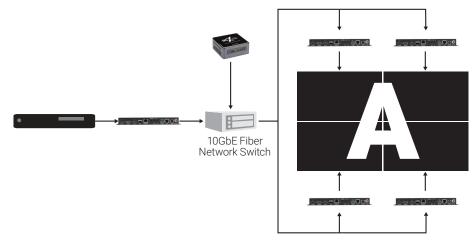


FIGURE 3-19: FIBER MATRIX CONFIGURATION





(2) Video Wall Configuration





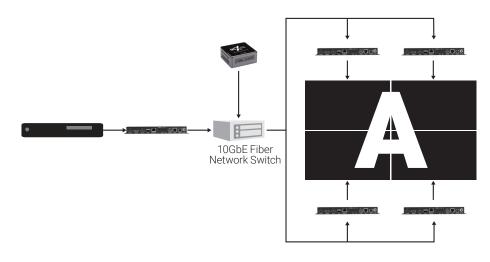


FIGURE 3-21: FIBER VIDEO WALL CONFIGURATION

(3) Multiview (PiP/PoP/Quad/Etc.) Configuration

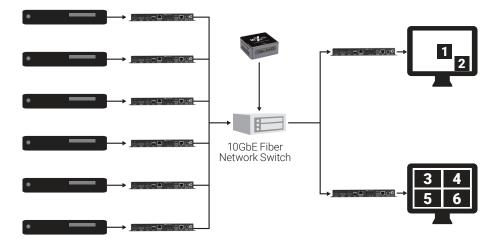


FIGURE 3-22: COPPER MULTIVIEW (PIP/POP/QUAD/ETC.) CONFIGURATION

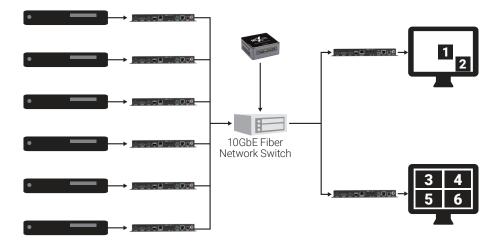


FIGURE 3-23: FIBER MULTIVIEW (PIP/POP/QUAD/ETC.) CONFIGURATION





(4) KVM Switch Configuration

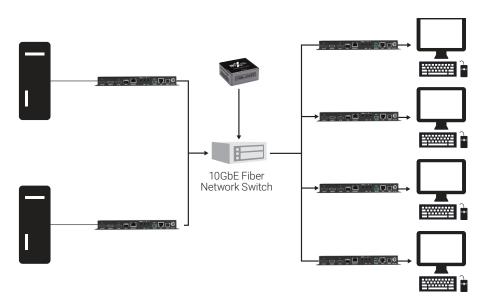


FIGURE 3-24: COPPER KVM SWITCH CONFIGURATION

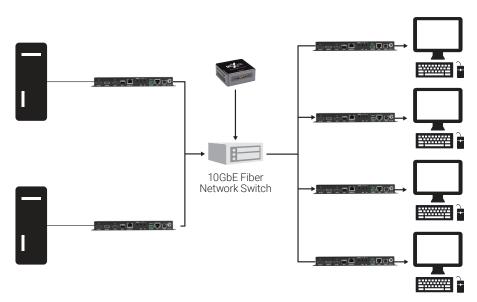


FIGURE 3-25: FIBER KVM SWITCH CONFIGURATION



# **3.7 CONNECTION DIAGRAM**

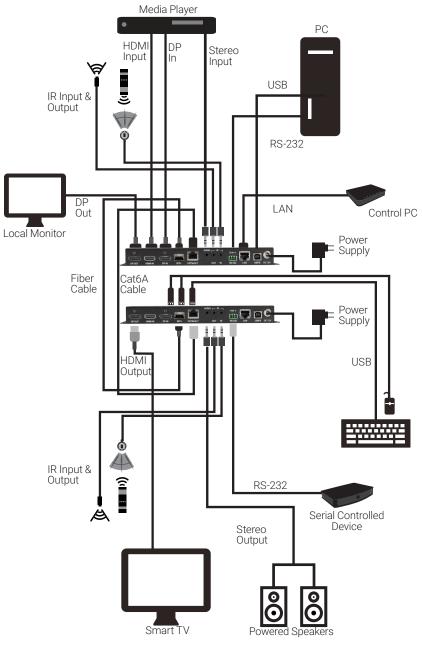


FIGURE 3-26: COPPER/FIBER CONNECTION DIAGRAM







# **3.8. SPECIFICATIONS**

SPECIFICATION	DESCRIPTION
DisplayPort Version	DisplayPort™ 1.2
HDMI Version	HDMI 2.0b
10GbE Bandwidth	10 Gbps
Input Porto	(1) DisplayPort;
Input Ports	(1) HDMI Type A
Output Ports	(1) DisplayPort (Loop -through in encoder mode)
Input or Output Port	(1) Stereo Audio (3.5mm) female
	(1) 10GbE LAN (RJ-45 or SFP+);
	(2) IR (3.5mm);
Pass-Through Ports	(1) RS-232 (3-pin terminal block);
Fass-Iniough Folits	(1) LAN (RJ-45);
	(3) USB 2.0 (Type A) (under decoder mode);
	(1) USB 2.0 (Type B) (under encoder mode)
IR Frequency	38kHz
Baud Rate	57600 (default), up to 115200 bps
Power Supply	12V/3A DC (US/EU standards, CE/FCC/UL certified)
ECD Directostics (LIDM)	±8kV (air discharge);
ESD Protection (HBM)	±4kV (contact discharge);
Dimensions	9.1" x 1" x 4.6" (231.5 x 25 x 116.7 mm)
Weight	2 lb. (916g)
Chassis Metal	Metal (steel)
Chassis Color	Black
Operating Temperature	32 to 104°F (0 to 40°C)
Storage Temperature	-4 to to +140°F (-20 to +60°C)
Relative Humidity	20 to 90% RH (Non-condensing)
Power Consumption	14.3w (for copper); 18.51w (for fiber)

#### **TABLE 3-10. GENERAL SPECIFICATIONS**



INPUT           SUPPORTED RESOLUTIONS (HZ)         10GBE           720×400p@70/85         ✓           640×480p@60/72/75/85         ✓	OUTPUT HDMI ✓
720×400p@70/85	$\checkmark$
640×480p@60//2//5/85 ✓	$\checkmark$
720×480i@60 ✓	$\checkmark$
720×480p@60 ✓	$\checkmark$
720x576i@50 ✓	$\checkmark$
720×576p@50 ✓	$\checkmark$
800×600p@56/60/72/75/85 ✓	$\checkmark$
848×480p@60 ✓	$\checkmark$
1024×768p@60/70/75/85 ✓	$\checkmark$
1152×864p@75 ✓	$\checkmark$
1280×720p@50/60 ✓	$\checkmark$
1280×768p@60/75/85 ✓	$\checkmark$
1280×800p@60/75/85 ✓	$\checkmark$
1280×960p@60/85 ✓	$\checkmark$
1280×1024p@60/75/85	$\checkmark$
1360×768p@60 ✓	$\checkmark$
1366×768p@60 ✓	$\checkmark$
1400×1050p@60 ✓	$\checkmark$
1440×900p@60/75 ✓	$\checkmark$
1600×900p@60RB ✓	$\checkmark$
1600×1200p@60 ✓	$\checkmark$
1680×1050p@60 ✓	$\checkmark$
1920×1080i@50/60 ✓	$\checkmark$
1920×1080p@24/25/30 ✓	$\checkmark$
1920×1080p@50/60 ✓	$\checkmark$
1920×1200p@60RB ✓	$\checkmark$
2560×1440p@60RB ✓	$\checkmark$
2560×1600p@60RB ✓	$\checkmark$
2048×1080p@24/25/30 ✓	$\checkmark$
2048×1080p@50/60 ✓	$\checkmark$
3840×2160p@24/25/30 ✓	$\checkmark$
3840×2160p@50/60 ✓	$\checkmark$
3840×2160p@24 ✓	$\checkmark$
3840×2160p@50/60 ✓	$\checkmark$
	$\checkmark$
4096×2160p@24/25/30 ✓	$\checkmark$
4096×2160p@50/60 ✓	$\checkmark$
4096×2160p@24 ✓	$\checkmark$
4096×2160p@50/60 ✓	$\checkmark$
4096×2160p@50/60 ✓	$\checkmark$

#### **TABLE 3-11. VIDEO SPECIFICATIONS**



#### TABLE 3-12. DIGITAL AUDIO HDMI OUTPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
LPCM	
Max Channels	8 channels
Sampling Rate (kHz)	32, 44.1, 48
Bitstream	
Supported Formats	Standard and High Definition

#### TABLE 3-13. CAT5E/6/7 INPUT (COPPER)/FIBER INPUT (FIBER)

SPECIFICATION	DESCRIPTION
LPCM	
Max Channels	8 channels
Sampling Rate (kHz)	32, 44.1, 48
Bitstream	
Supported Formats	Standard and High Definition

#### TABLE 3-14. ANALOG AUDIO INPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Max Audio Level	1Vrms
Impedance	10kΩ
Туре	Unbalanced

#### TABLE 3-15. ANALOG AUDIO OUPUT SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Max Audio Level	1Vrms
THD+N	< -80dB@0dBFS 1kHz (A-wt)
SNR	> 80dB@0dBFS
Frequency Response	<±1dB@20Hz~20kHz
Crosstalk	< -80dB@10kHz
Impedance	470Ω
Туре	Unbalanced

# **TABLE 3-16. CABLE SPECIFICATIONS**

	1080P		4K30	4K60
			( <b>4:4:4</b> )	(4:4:4)
<b>C</b> ABLE LENGTH	8-BIT	12-BIT	8-BIT	8-BIT
HIGH SPEED HDMI CABLE				
HDMI OUTPUT	15m	10m	5m	3m
CATEGORY CABLE (COPPER)				
CAT. 5E/6	100m 70m		)m	
CAT. 6A/7	100m			
FIBER CABLE				
MULTI-MODE FIBER (OM3) 300m				
MULTI-MODE FIBER (OM4) 550m				
SINGLE-MODE FIBER 30km				

#### Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit color
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

#### 4K30 (4K UHD Video)

- 4K@24/25/30Hz, 8-bit color
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (4K UHD<sup>+</sup> Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- Data rates higher than 10.2Gbps



BLACKBOX.COM

# A.1 ACRONYMS

#### **TABLE A-1 ACRONYMS**

ACRONYM	COMPLETE TERM	
10GBE	10 GIGABIT ETHERNET	
ADC	ANALOG-TO-DIGITAL CONVERTER	
AVOIP	AUDIO/VIDEO OVER IP	
CAT.5E	ENHANCED CATEGORY 5 CABLE	
CAT.6	CATEGORY 6 CABLE	
CAT.6A	AUGMENTED CATEGORY 6 CABLE	
CAT.7	CATEGORY 7 CABLE	
DAC	DIGITAL-TO-ANALOG CONVERTER	
DB	DECIBEL	
DHCP	DYNAMIC HOST CONFIGURATION PROTOCOL	
DP	DISPLAYPORT	
DVI	DIGITAL VISUAL INTERFACE	
EDID	EXTENDED DISPLAY IDENTIFICATION DATA	
GBE	GIGABIT ETHERNET	
GBPS	GIGABITS PER SECOND	
GUI	GRAPHICAL USER INTERFACE	
HDCP	HIGH-BANDWIDTH DIGITAL CONTENT PROTECTION	
HDMI	HIGH-DEFINITION MULTIMEDIA INTERFACE	
HDR	HIGH DYNAMIC RANGE	
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGI- NEERS	
IGMP	INTERNET GROUP MANAGEMENT PROTOCOL	
IP	INTERNET PROTOCOL	
IR	INFRARED	
KHZ	KILOHERTZ	
KVM	KEYBOARD/VIDEO/MOUSE	
LAN	LOCAL AREA NETWORK	
LED	LIGHT-EMITTING DIODE	
LPCM	LINEAR PULSE-CODE MODULATION	
MAC	MEDIA ACCESS CONTROL	
MHZ	MEGAHERTZ	
OSD	ON-SCREEN DISPLAY	
PIP	PICTURE IN PICTURE	
POP	PICTURE OUTSIDE OF PICTURE	
SDVOE	SOFTWARE DEFINED VIDEO OVER ETHERNET	
SNR	SIGNAL-TO-NOISE RATIO	
ТСР	TRANSMISSION CONTROL PROTOCOL	
THD+N	TOTAL HARMONIC DISTORTION PLUS NOISE	
TMDS	TRANSITION-MINIMIZED DIFFERENTIAL SIGNALING	
4K UHD	4K ULTRA-HIGH-DEFINITION (10.2GBPS MAX)	
	4K ULTRA-HIGH-DEFINITION (18GBPS MAX)	



#### **TABLE A-1 ACRONYMS CONTINUED**

COMPLETE TERM
UNIVERSAL SERIAL BUS
VIDEO GRAPHICS ARRAY
VIDEO OVER IP
WIDESCREEN ULTRA EXTENDED GRAPHICS ARRAY (RE- DUCED BLANKING)
EXTENDED GRAPHICS ARRAY
ОНМ







# **B.1 FCC STATEMENT**

This equipment has been tested and found to comply with the regulations for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this Quick Installation Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his/her own expense.

## **B.2 CE STATEMENT**

This is a Class B product in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

#### **B.3 ROHS**

This product is RoHS compliant.A.4 NOM Statement



## **B.4 NOM STATEMENT**

- 1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
- 2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
- 3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
- 4. Todas las instrucciones de operación y uso deben ser seguidas.
- 5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
- 6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
- 7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
- 8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
- 9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
- 10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
- 11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
- 12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
- 13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
- 14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
- 15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
- 16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
- 17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
- 18. Servicio por personal calificado deberá ser provisto cuando:
  - A: El cable de poder o el contacto ha sido dañado; u
  - B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
  - C: El aparato ha sido expuesto a la lluvia; o
  - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E: El aparato ha sido tirado o su cubierta ha sido dañada.





#### **C.1 DISCLAIMER**

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

# C.2 TRADEMARKS USED IN THIS MANUAL

Black Box and the Black Box logo type and mark are registered trademarks of Black Box Corporation.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.



NEED HELP? LEAVE THE TECH TO US



1.877.877.2269



© COPYRIGHT 2021, 2022. BLACK BOX CORPORATION. ALL RIGHTS RESERVED MCX\_G2-USER\_REV2.PD