User Guide

MS-3R

HDBaseT™ Extender Set - 4K to 100m 18G,
Uncompressed 4K 4:4:4 60, PoC, RS-232 pass through

Revision: 1.0 March 2023

Contents

Introduction 03
Key Features 03
Connectivity Overview (TX and RX) 04
Understanding the LED's 05
Cabling for HDBaseT 05
Power 06
IR Control & RS-232 Control 06
Specifications 06
Package Contents & Schematic 07

Notices

- This MSolutions product contains electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection is highly recommended in order to protect and extend the life of your equipment.
- The transmission distances of HDMI over Cat cables are measured using TE CONNECTIVITY 1427071-6 EIA/ TIA-568-B termination (T568B) of cables is recommended for optimal performance. To minimise interference of unshielded twisted pairs in the Cat5e/6 cable, do not run the HDBaseT / Cat5e/6/6a cabling with or in close parallel proximity to mains power cables.
- Do not substitute or use any other power supply other than the enclosed unit, or an MSolutions approved replacement. Do not disassemble either the Transmitter or Receiver units for any reason. Doing so will void the manufacturer's warranty.
- The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.
- Dolby is a trademark of Dolby Laboratories.
- MSolutions reserves the right to change the specifications of this unit without prior notice. As a result of this, physical representations or graphical elements contained within this user guide may not be accurate.

Introduction

The MSolutions MS-3R is a 4K 4:4:4 60 HDMI extender using uncompressed HDBaseT technology to extend 4K HDR video (18Gbps) to a distance of up to 100m over single CAT cable.

The extender provides bi-directional RS-232 between TX to RX, or RX to TX. Bi-directional PoC (Power over Cable) allows for either the TX or RX to be powered.

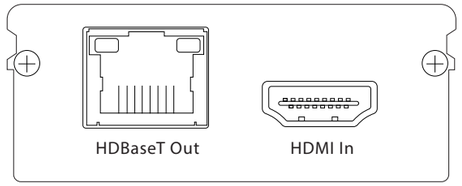
Key Features

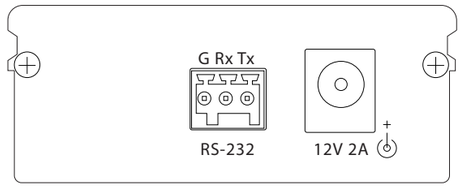
- Uncompressed extension of HDMI at resolutions up to 4K 60Hz 4:4:4 using HDBaseT technology
- 4K signal extension to 100m over single CAT including HDR formats suppported under 18Gbps
- 1080p or lower video resolutions up to 100m over single CAT
- Supports HDMI pass-through all known HDMI audio formats including Dolby Atmos / DTS:X
- Bi-directional 12V PoC (Power over Cable)
- Bi-directional RS-232 serial pass through
- CEC (Consumer Electronics Control) pass through
- HDCP2.2 compliant

Video resolution capabilities - 18Gbps HDMI 2.1 specification max:

Resolution	Refresh	Chroma	Depth
4096x2160 (DCI) 3840x2160	50Hz / 60Hz 60Hz 24Hz	4:4:4 4:2:0 / 4:2:2 / 4:4:4 4:2:0 / 4:2:2 / 4:4:4	8-bit 8 / 10 / 12-bit 8 / 10 / 12-bit
1920x1080	up to 60Hz	4:4:4 / RGB	up to 16-bit
1280x720 1024x768	up to 60Hz	4:4:4 / RGB	up to 16-bit
VGA to WUXGA	up to 60Hz		

Connectivity Overview - TX





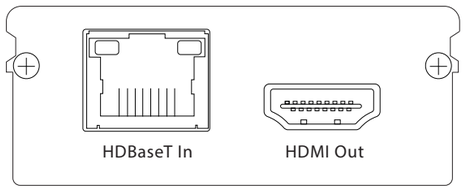
Front panel:

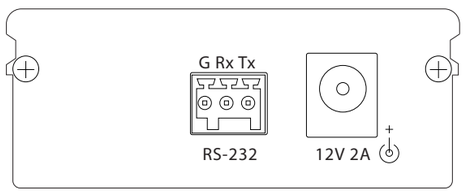
- HDBaseT Out - connect to Cat cable to receiver
- HDMI In - connect to HDMI source

Rear panel:

- RS-232 - use supplied 3-pin phoenix connector to connect to serial device
- Power - connect to supplied 12V 2A power supply (or connect to RX)

Connectivity Overview - RX





Front panel:

- HDBaseT In - connect to Cat cable from transmitter
- HDMI Out - connect to HDMI sink device

Rear panel:

- RS-232 - use supplied 3-pin phoenix connector to connect to serial device
- Power - connect to supplied 12V 2A power supply (or connect to TX)

Understanding the LED's

This MSolutions extender set includes status LED indicators on both the Transmitter and Receiver products to show active connections and to further help integrators diagnose potential problems with the associated cabling.

The RJ45 HDBaseT connections on both the transmitter and receiver units have orange and green LED's.

- The orange LED indicates that the unit is receiving power. The LED will blink continuously.
- The green LED indicates that the unit is communicating with the unit attached to the far side of the link over the Cat cable. The LED will be solid whilst the units are able to host a HDBaseT link across the infrastructure.
- Internal LED's that may be seen through venting of the product are not indicative of a working / non-working unit.

Cabling for HDBaseT

It is important that the interconnecting Cat cable between the MSolutions HDBaseT products is terminated using the correct RJ45 pin configuration. The link Cat cable must be a 'straight' (pin-to-pin) Cat cable and it is advised that this is wired to the T568B wiring standard as this format is less prone to EMI (Electro-Magnetic Interference).

When installing Cat cables it is advised that the best possible Cat cable quality possible is used. HDMI distribution products will only work if used with Cat5e standard cable or above. MSolutions recommends using a CAT6A (or higher) cable for installations, especially when running over longer distances, in areas of high EMI, or with 4K signal distribution.

The HDMI cable infrastructure should be compliant to High-Speed standards, especially where 4K is being distributed. It is important to understand that where excessive HDMI cable lengths are used, this brings increased reduction in signal integrity over distance compared to HDBaseT. It is therefore recommended to use short HDMI cables to ensure the integrity of the signal over the link.

For HDBaseT and HDMI testing capabilities, please refer to the MSolutions MS-TestPro to prove both Cat and HDMI cables can be used for video signal distribution.

Power

The MS-3R uses Power over Cable (PoC) to provide bi-directional power from either the Transmitter to the Receiver, or Receiver to the Transmitter over the CAT cable link. Please only use the supplied 12V/2A DC PSU supplied with the MSolutions MS-100PRI to power the unit.

RS-232 Control

The MS-3R can distribute bi-directional serial commands between the transmitter and receiver to allow for control commands to be sent alongside the video and audio distribution.

Each HDBaseT unit is fitted with a 3-pin Phoenix connector block that will need the serial TX, RX and Ground pins terminating into. HDBaseT has the ability to transparently send any type of serial data as both pieces of equipment are able to communicate using the same baud rate, stop-gap, and parity.

Specifications

Transmitter

- Video connectivity: 1 x HDMI input (female), 1 x HDBaseT output (RJ45 keystone)
- RS-232 connectivity: 1 x 3-pin Phoenix connector, block included
- Power supply: 1 x 12V/2A DC
- Individual unit dimensions (W x D x H): 60 x 84 x 25mm
- Individual unit weight: 0.1kg
- Operating temperature: 32°F to 104°F (0°C to 40°C)
- Storage temperature: -4°F to 140°F (-20°C to 60°C)
- Operating humidity: 0-80% non condensing

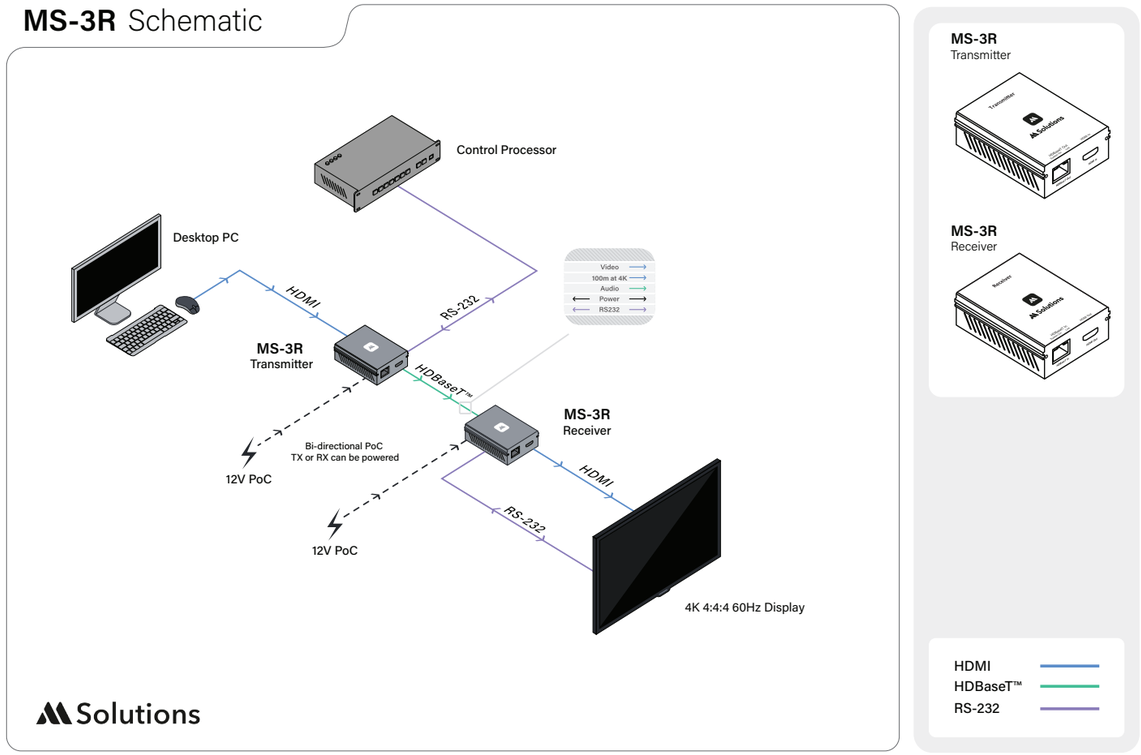
Receiver

- Video connectivity: 1 x HDBaseT input (RJ45 keystone), 1 x HDMI output (female)
- RS-232 connectivity: 1 x 3-pin Phoenix connector, block included
- Power supply: 1 x 12V/2A DC
- Individual unit dimensions (W x D x H): 60 x 84 x 25mm
- Individual unit weight: 0.1kg
- Operating temperature: 32°F to 104°F (0°C to 40°C)
- Storage temperature: -4°F to 140°F (-20°C to 60°C)
- Operating humidity: 0-80% non condensing

Package Contents

- 1 x MS-3R (transmitter)
- 1 x MS-3R (receiver)
- 1 x 12V/2A DC power supply with US, UK, and EU clips
- 2 x 3-pin Phoenix connector blocks
- 2 x Surface mounting brackets

Schematic



Solutions

www.m4sol.com