MSolutions

User Guide

MS-210U6S

HDBaseT™ Extender Set - 4K to 40m (10G), 70m @ 1080p. USB 2.0 (x6), 2-way S/PDIF, one-way analogue audio pass-through, RS-232 pass through, with single channel bi-directional IR. HDCP2.2 compliant

Contents

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-210U6S is a 4K HDMI / KVM HDBaseT extender set allowing for uncompressed video and audio to be extended up to 40m at 4K UHD (10.2Gbps), and 70m at 1080p or lower resolutions. 6 x independent USB2.0 channels allow for bi-directional USB client to host connectivity for connectivity of various peripherals in a variety of commercial and residential applications. 2-way Optical S/PDIF audio return enables the sink to return audio to an audio amplification or distribution device located remotely to the display, and distribution from TX to RX. An additional one way analogue audio pass-through allows for a separate audio signal to be returned from the receiver to the transmitter. The unit also features RS-232 serial pass-through and single channel IR pass-through from TX to RX, or RX to TX. HDBaseT compliant PoE allows for the RX unit to be powered remotely from the TX.

Key Features

- Uncompressed extension of HDMI at resolutions up to 4K 60Hz 4:2:0 / 4K 30Hz 4:4:4 using HDBaseT technology
- 4K signal extension to 40m over single CAT including HDR formats suppported under 10.2Gbps
- 1080p or lower video resolutions up to 70m over single CAT
- Supports HDMI pass-through all known HDMI audio formats including Dolby Atmos / DTS:X
- HDBaseT 48V standard PoE support to power RX from the TX
- 6 x USB2.0 channels for KVM connectivity of multiple USB devices across the link - max 200Mbps data rate pass-through (combined)
- Flexible USB extension for: USB2.0 cameras, touch screens, smart boards, hard drives, games controllers, USB audio devices, printers, scanners, and HID's (mouse or keyboard)
- Bi-directional S/PDIF (Digital Optical Toslink) connectivity (TX to RX, RX to TX)
- Independent 1-way analogue audio pass-through (RX to TX)
- Bi-directional RS-232 serial pass through
- Single channel 5V IR pass-through (TX to RX, or, RX to TX)
- CEC (Consumer Electronics Control) pass through
- HDCP2.2 compliant

Video resolution capabilities - 10.2Gbps HDMI 1.4 specification max:

Resolution	Refresh	Chroma	Depth
4096x2160 (DCI) 3840x2160	50Hz / 60Hz 30Hz 24Hz	4:2:0 4:2:0 / 4:2:2 / 4:4:4 / RGB 4:2:0 / 4:2:2 / 4:4:4 / RGB	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		

M Solutions

# Connectivity Overview - TX
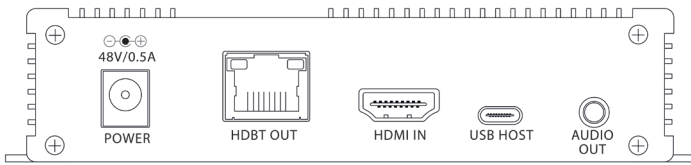
Front panel:

- Power - connect to supplied 48V/0.5A power supply

- HDBaseT Out - connect to Cat cable to receiver

- HDMI In - connect to HDMI source

- USB Host - connect to USB host device

- Audio Out - connect to analogue audio amplification / distribution device
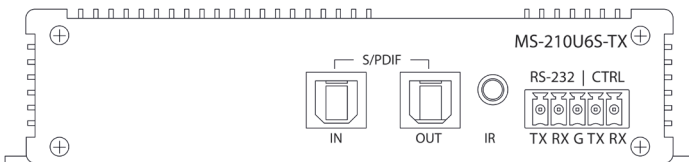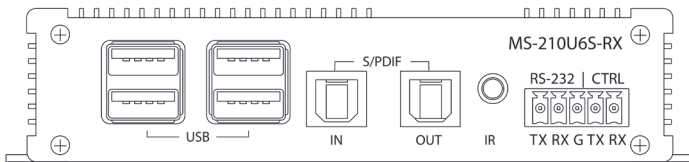
Rear panel:

- S/PDIF In - connect to optical audio device

- S/PDIF Out - connect to optical audio device

- IR - connect to either IR transmitter or IR receiver cables

- RS-232 - use supplied 5-pin phoenix connector to connect to serial device

Connectivity Overview - RX
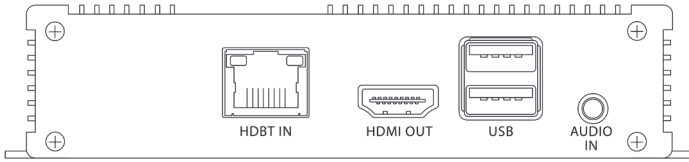
Front panel:

- HDBaseT In - connect to Cat cable from transmitter
- HDMI Out - connect to HDMI sink device
- USB - connect USB peripheral devices (x2 Type A connections)
- Audio In - connect to audio device

Rear panel:

- USB - connect USB peripheral devices (x4 Type A connections)
- S/PDIF In - connect to optical audio device or display
- S/PDIF Out - connect to optical audio device
- IR - connect to either IR transmitter or IR receiver cables
- RS-232 - use supplied 5-pin phoenix connector to connect to serial device

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 linked to the unit on the far side. The LED will be solid whilst the units are connected and communicating.

- The green LED indicates that the unit is receiving power, from either the local power connection, or via the CAT cable link from the unit that has the local power supply connected. This LED will flash continuously under normal operation.

- 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 Cat6 (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.

Audio

The MS-210U6S allows for bi-directional Optical audio signals to be transferred between TX and RX and vice-versa. This enables digital audio signals to be sent in either direction based on requirement of the install.

A single analogue audio channel (independent to the S/PDIF), can also be simultaneously run from RX to TX using the 3.5mm jack connections. These connections do not embed or de-embed audio from the HDMI video link.

USB

This KVM extender combines USB2.0 connectivity with video and audio to be passed between host on the transmitter side (via micro-USB to Type A USB cable - not supplied), to peripheral devices on the receiver side of the link.

The 6x USB type A connections on the Receiver can be used to connect USB2.0 cameras, touch screens, smart boards, hard drives, games controllers, USB audio devices, printers, scanners, and HID's (mouse or keyboard) to a host device on the far side of the HDBaseT link.

A maximum combined data transfer of 200Mbps can be achoeved over the link - please note that this may not be enough for some USB2.0 cameras to pass higher video resolutions.

IR Control

The MS-210U6S can distribute infrared comands from either the receiver to the transmitter, to provide source control from the display; or, from transmitter to receiver to provide display control from a centrally located control processor.

The MS-210U6S is supplied with a single 5V IR transmitter that can be connected to either of the 3.5mm jack sockets on the transmitter or receiver to the labelled 'IR' port. The 5V IR Receiver is then connected to the 3.5mm jack socket labelled 'IR' on the opposite end of the link.

Please use the supplied MSolutions IR equipment within this kit - alternative manufacturers IR cabling may not have the same pin configuration which, if used, could damage the componentry inside the MSolutions extender, or the IR cabling.

Note: the 3.5mm jack sockets are bi-directional - it is only possible to send IR control in one direction depending on which end of the link has the IR transmitter or receiver. It is not possible to send IR controls in two directions simultaneously.

RS-232 Control

The MS-210U6S 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. This uses the left side of the phoenix conector.

Each HDBaseT unit is fitted with a 5-pin phoenix connector block that will need the serial TX, RX and Ground pins terminating into for serial pass-through. 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.

The opposing connections on the right of the phoenix connector are used for firmware upgrading.

Please note: the ground connector is shared.

Specifications

Transmitter

- Video connectivity: 1 x HDMI input (female), 1 x HDBaseT output (RJ45 keystone)

- Digital audio connectivity: 2 x S/PDIF Toslink Optical (in and out)

- Analogue audio connectivity: 1 x analogue audio output - 3.5mm jack (female)

- USB connectivity: 1 x Micro USB (female)

- IR connectivity: 1 x 3.5mm stereo jack (female) - IR TX or IR RX

- RS-232 connectivity: 1 x 5-pin phoenix connector, block included

- Power supply: 1x 48V/0.5A DC

- Individual unit dimensions (W x D x H): 135 x 70 x 31mm

- Individual unit weight: 0.2kg

- 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)

- Digital audio connectivity: 2 x S/PDIF Toslink Optical (in and out)

- Analogue audio connectivity: 1 x analogue audio input - 3.5mm jack (female)

- USB connectivity: 6 x USB type A (female)

- IR connectivity: 1 x 3.5mm stereo jack (female) - IR TX or IR RX

- RS-232 connectivity: 1 x 5-pin phoenix connector, block included

- Individual unit dimensions (W x D x H): 135 x 70 x 31mm

- Individual unit weight: 0.2kg

- 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
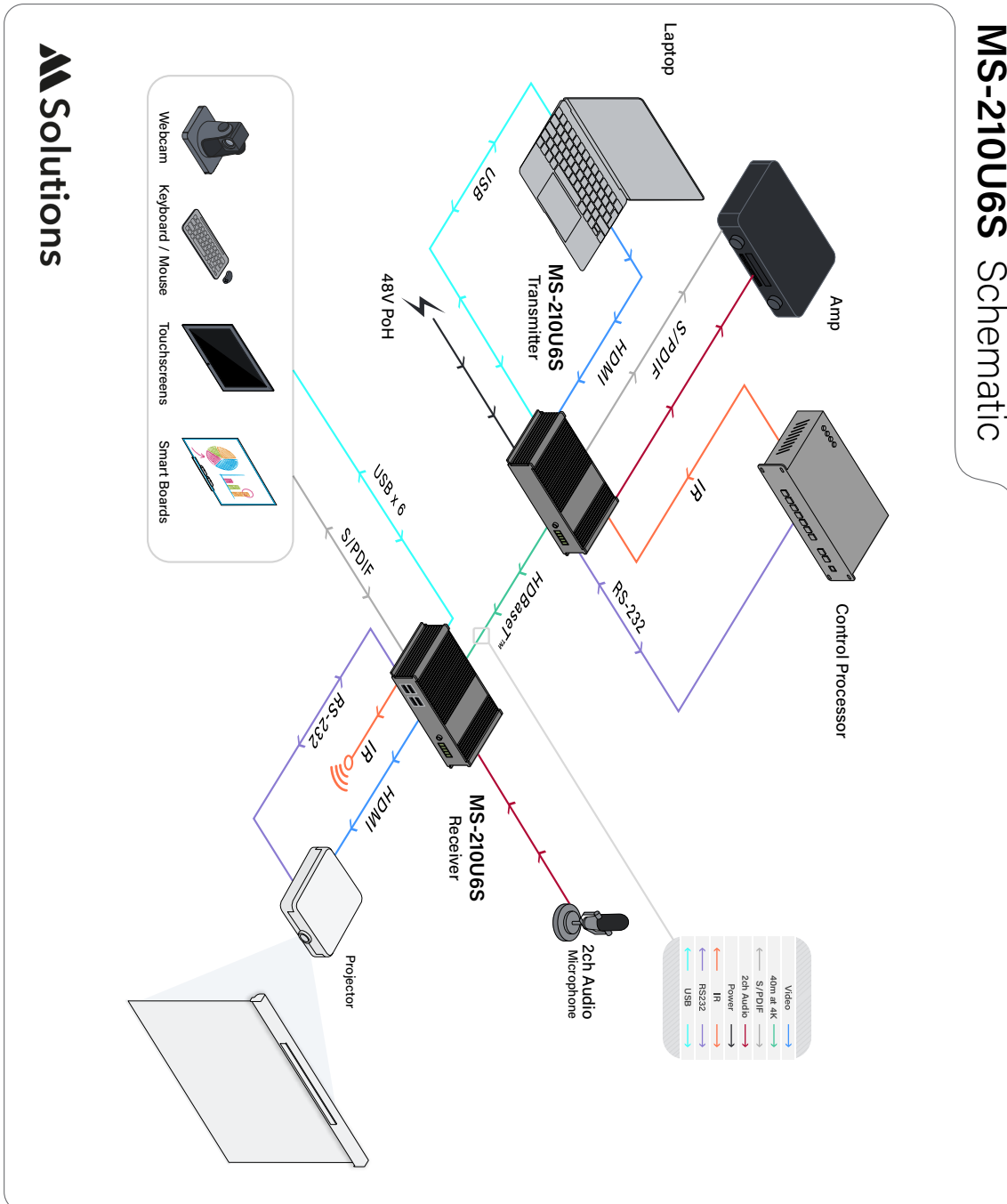
Package Contents

- 1 x MST-210U6S (transmitter)
- 1 x MSR-210U6S (receiver)
- 1 x 48V/0.5A DC power supply with US, UK, and EU clips
- 1 x 5V IR transmitter
- 1 x 5V IR receiver
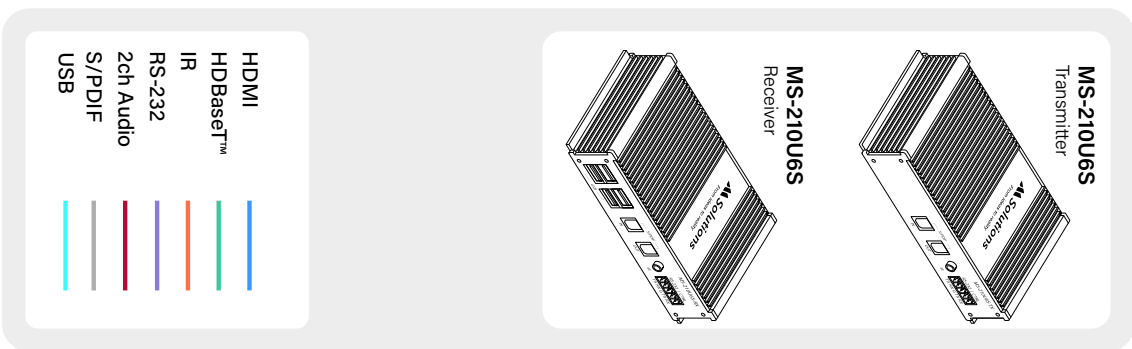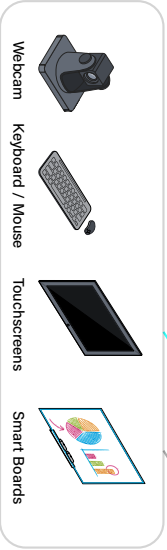- 2 x 5-pin phoenix connector blocks

Schematic

MS-210U6S Schematic

Laptop

MS-210U6S
Transmitter

48V PoH

USB

HDMI

S/PDIF

Amp

IR

RS-232

Control Processor

HDBaseT™

USB x 6

S/PDIF

Webcam

Keyboard / Mouse

Touchscreens

Smart Boards

Solutions

RS-232

IR

HDMI

MS-210U6S
Receiver

Projector

2ch Audio
Microphone

		Video
		40m at 4K
		S/PDIF
2ch Audio		
Power		
IR		
RS232		
USB		

HDMI
HDBaseT™
IR
RS-232
2ch Audio
S/PDIF
USB

MS-210U6S
Receiver

MS-210U6S
Transmitter