User Guide

MS-DPA-HCP

The Ultimate Plug-and-Play USB-C, DP Alternate Mode Extender for 4K Video, Data, and Charging with a switchable HDMI video input



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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 data over Cat cables are measured using TE CONNECTIVITY 1427071-6 EIA/ TIA-568B termination (T568B) of cables is recommended for optimal performance. To minimise interference of unshielded twisted pairs in the Cat6A (or above) cable, do not run the Cat6A (or above) 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.
- 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 MS-DPA-HCP USB-C and HDMI Extender offers a new level of seamless connectivity. This product is capable of extending USB-C DP Alternate Mode over a single Cat6A cable. Supporting video up to 4K 60Hz 4:4:4 18G and USB 2.0 data. This solution delivers flawless performance with no Driver Installation, no applications required, and no hassle. In addition, the host unit includes an HDMI input as a secondary video source, allowing users to switch freely between HDMI and USB-C DP alt mode as the video source. The primary source of video is the USB-C port (this will auto switch upon connection). The user can switch the video source to the HDMI port when needed*. The MS-DPA-HCP extender ensures versatile connectivity for video and data, including a 60W charge of the laptop from the Host unit. The MS-DPA-HCP is the ultimate plug-and-play HDMI/USB-C DP alternate mode extender.

IMPORTANT INSTALLATION NOTICE: USB-C Charging Compatibility

This system supports bidirectional power, allowing either the Host or Device to power the link. However, due to differences between laptop manufacturers, some host computers may not accept a charge when the power supply is connected to the Device unit.

For Guaranteed Performance: Always connect the power supply to the Host side when host laptop charging is required.

Device-Side Powering: Charging functionality when powered from the Device side is host-dependent, cannot be guaranteed for all PC models, and may affect link stability.

Key Features

- Support for 4/2 lanes in DisplayPort Alt Mode via USB Type-C
- Robust video performance, supporting 4K60 4:4:4 18G
- Extension of USB DP Alternate mode signals up to 100m over a single CAT6A cable
- USB-C on the device side supports full DP Alt Mode including USB 2.0 data and just data when working with HDMI
- Supports 60W of charge to the Host laptop
- Bi-directional RS-232 serial pass through
- Bi-directional 24V PoC (Power over Cable)
- HDCP2.2 compliant
- *Priority video source is the USB-C with the ability to switch between sources with API or disconnecting one of the inputs
- Compatible with Mac and Windows devices

Connectivity Overview - Device



Front panel:

- RJ45 Link-in - connect to a Cat6A or higher towards the Host unit.
- USB-C - connect to a USB-C device
- HDMI out to a display
- Micro USB - For control, monitoring and FW updates
- Power - connect to 24V/4A power supply



Back panel:

- RS-232 - use supplied 3-pin phoenix connector to connect to serial device

Connectivity Overview - Host



Front panel:

- RJ45 Link-out - connect to a Cat6A or higher toward the Device unit
- USB-C DP alt mode connect to a host PC
- HDMI input for HDMI content sharing for HDMI PCs
- Micro USB - For control, monitoring and FW updates
- Power - connect to 24V/4A power supply



Back panel:

- RS-232 - use supplied 3-pin phoenix connector to connect to serial device

Understanding the LED's

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

The RJ45 Link connections on both the host and device units have orange and green LED's.

- The orange LED indicates that the unit is receiving power. The LED will blink continuously when there is a link to the unit on the opposing side of the cable.
- The green LED indicates that the unit is communicating with the unit attached to the far side of the link over the Cat cable.

Category Cabling for Extenders

It is important that the interconnecting category cable between the MSolutions products is terminated using the correct RJ45 pin configuration. The link category cable must be a 'straight' (pin-to-pin) category 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 category cables it is advised that the best possible category cable quality possible is used. MSolutions recommends using a Cat6A (or above) cable for installations, especially when running over longer distances, in areas of high EMI, or with high data rate signal distribution.

USB

This USB-C DP Alternate mode extender allows for USB-C DP alt mode video to be extended over a distance of up to 100m. The extender also supports USB 2.0 data extension on the same USB-C connection. The MS-DPA-HCP is transparent true plug and play USB-C to USB-C DP alt mode extender without the requirement of software or drivers. In addition, the MS-DPA-HCP has a secondary HDMI video input , allowing the user to switch between USB-C and HDMI content sharing at the host side.

On the device side the video output is simultaneously through the USB-C and HDMI outputs.

Make sure to use the supplied USB-C cables, they are certified full feature USB-C cables.

The Micro-USB connections on both Host and Device units are utilized for firmware updating, monitoring, and control. In order to control the switching between video inputs, connect to the host Micro USB and establish an RS232 serial connection with the host unit. baud rate is 115200 and the commands are C1 and C2 for switching between USB-C and HDMI as the video source.

RS-232 Control

The MS-DPA-HCP can distribute bi-directional serial commands between the host and device units to allow for control commands to be sent alongside USB.

Each unit is fitted with a 3-pin phoenix connector block that will need the serial TX, RX and Ground pins terminating into for serial pass-through.

Power

The MS-DPA-HCP uses bi-directional PoC (Power over Cable) to provide power from either the Host or Device unit to the far side of the link over the Cat6A (or above) cable. Please only use the supplied 24V/4A DC PSU supplied with the MSolutions MS-DPA-HCP to power the unit.

Specifications

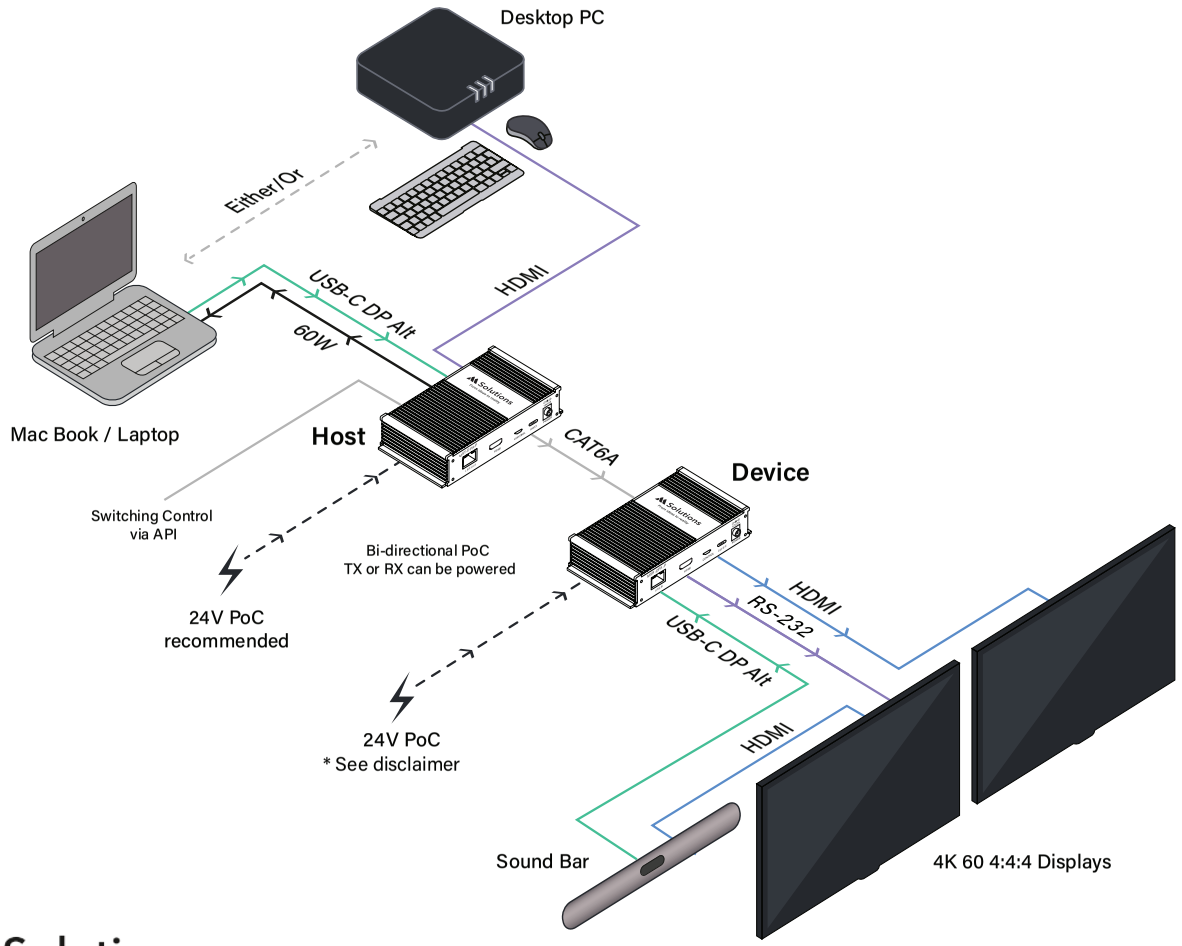
- Host (TX): 1x link output (RJ45 port), 1x USB-C (Female) - data and video
- HDMI input for video sharing
- Micro-USB connectivity for product update, Cloud control and monitoring
- Device (RX): 1x link input (RJ45 port), 1x USB-C (Female) - data and video
- HDMI output for an HDMI display
- Micro-USB connectivity for product update, Cloud control and monitoring
- RS-232 connectivity (Host & Device): 1x 3-pin phoenix connector, block included
- Power supply: 1x 24V 4A DC
- Power consumption: 10W
- Charging Power: 60W
- Individual unit dimensions (W x D x H): 135 x 70 x 31mm
- Individual unit weight: 0.24kg (0.53 lb)
- Package dimensions (W x D x H): 163 x 147 x 85mm
- Package weight: 1kg (2.2 lb)
- 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
- Installation requires CAT6A cable or above

Package Contents

- 1x MS-DPA-HCP Host
- 1x MS-DPA-HCP Device
- 1 x 24V/4A DC power supply with US, UK, and EU clips
- 2x Full feature 1 meter USB-C cables
- 2 x 3-pin phoenix connector blocks

Schematic

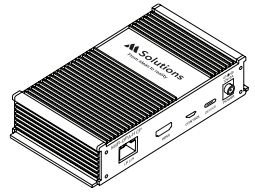
MS-DPA-HCP Schematic



Host



Device



* **For Guaranteed Performance:** Always connect the power supply to the Host side when host laptop charging is required.

Device-Side Powering: Charging functionality when powered from the Device side is host-dependent, cannot be guaranteed for all PC models, and may affect link stability.

USB-C DP Alt
RS-232
HDMI



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