Extensiv Optical Cables

VIDEO AND USB FIBER EXTENDER CABLES

Demo of DisplayPort 8K30 and USB 3.1 extension

- Wide range of high-performance active optical cables transporting uncompressed video or USB
- Video can be HDMI, DisplayPort, DVI, or USB-C
- Video cables have fixed or detachable connectors for pulling through conduit
- USB cables are either pure optical or can supply power to remote device
- USB cables transport USB 3.1 at 5GBps rate with optional embedded conversion to USB 2.0
- Distances of up to 328 feet (100m)
- Low bending radius and high pull strength
- Available in plenum, low smoke zero halogen (LSZH), or armored jackets
- Uses interface's power, no external power needed

Features and Benefits

► High resolution uncompressed video

HDMI 2.0: 18 Gbps (4K60)

HDMI 2.1: 48 GBps (8K60)

DisplayPort 1.4 : 32.4 Gbps (8K30)

DVI: 4.95 Gbps (2560x1600 @30Hz)

► USB cables support all USB 3.1 transfer types: control, interrupt, bulk and isochronous, at unrestricted bandwidth of 5 Gbps

► Available lengths (not all products in these lengths, please see distance specifications) :

32.8' (10m)	65.6' (20m)	98.4' (30m)
164.0' (50m)	229.6' (70m)	328.0' (100m)

► HDMI cables also support audio, HDR, HDCP, CEC, DDC, ARC, and Ethernet

► Full HDR support including 10-bit and 12-bit

► All audio formats are supported including Dolby TrueHD and DTS-HD Master audio

► Supports all HDCP types 1.4, 2.2, and 2.3

► Display port 1.4 and HDMI 2.1 support DSC compression

► Detachable cables have removable heads to allow pulling cable through a smaller conduit and are supplied with a pulling cover

► Converting cables support DP to HDMI translation and USB-C alt-mode to HDMI 2.0

Product Overview

To extend your high-resolution video or USB 3.1 up to 300 feet away it does not get any easier than this. All of the optics and electronics are embedded into the zinc alloy cable heads to provide a sleek and streamlined installation. No external power supply is needed because all of the power is supplied by the interface. Unlike the traditional concept of using a transmitter and receiver unit at each end, you just plug the cable in like a standard copper cable.

Extensiv Active Optical Cables are lightweight, slim, and flexible with a low bending radius. The video cables are available with detachable connectors for pulling through conduit and are supplied with a pulling sleeve. Plenum rated jacket is standard, but you can get video cables with a low smoke (LSZH) jacket or the HDMI cables can be armored with a thermoplastic polyurethane jacket for those demanding environments.

Areas that can benefit from the use of Rose Extensiv Optical Cables include digital signage, presentation venues, hotels and restaurants, medical facilities, retail locations, conference rooms, industrial settings, military sites, and many other environments.

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Typical Application

DisplayPort up to 50m
Laptop Computer — 4K/60 or 8K/30 Display

HDMI 2.0/2.1 up to 100m
Blu-ray Disc Player — Projector

USB 3.1 up to 100m
USB3 Vision Camera — Image Capturing Computer

Mix of USB 3.1 and 2.0 devices
USB 3.1 up to 100m
Computer — Rose USB Converting Hub
Converts USB 3.1 to 2.0

USB 3.1 + 2.0 up to 100m
Computer — Printer/Scanner

HDMI Cables   Extensiv HDMI cables support up to 4K60 for HDMI 2.0 and up to 8K60 for HDMI 2.1. All audio formats, per the HDMI specs, are sent along with the video. Maximum distance is 328 feet (100m). The CEC, DDC, hot-plug detect, ARC, and Ethernet signals are passed without any protocol changes and therefore the cable is plug-and-play. The cables are HDCP compliant to all versions.

The detachable style uses a cable terminated with a HDMI type D connector and a type D to type A adapter. You can also use a HDMI type D to DVI adapter on these cables.

Also available are two converting cables, DisplayPort to HDMI and USB type-C alt-mode to HDMI. These are limited in length to 30m.

DVI Cables   Extensiv DVI cables support all single-link DVI resolutions up to 328 feet (100m). The DVI specification does not support audio. Compared to copper cables, the diameter is much less and the cable is more flexible. The detachable style uses the HDMI cable with a HDMI type D to DVI adapter.

DisplayPort Cables   Extensiv DisplayPort cables support up to 8K30 with one cable and 8K60 when using two cables. All audio formats per the DisplayPort spec are sent along with the video. The maximum distance is 100m.

The detachable style uses a cable terminated with a mini-DP connector and a mini-DP to standard DP adapter. The mini-DP cable can also connect directly to a device with that connector.

USB Cables   Extensiv USB cables support USB3.1 transparently with an unrestricted bandwidth of 5 Gbps up to a distance of 328ft (100m). They support all USB 3.1 transfer types: control, interrupt, bulk, and isochronous. The number of devices can be increased by using hubs.

To support USB2.0 extension, a novel approach to reduce size and cost is used. Only USB 3.1 is transported, but it is converted to USB3.1+USB 2.0 at the remote end by an external converting hub or with conversion embedded in the cable.

Extensiv USB cables are available as pure optical with no power to the remote end or with hybrid copper construction to power the remote device. Pure optical is great for intrinsically safe or medical applications where no electrical connection between host and device is desired. Connectors available include USB 3.1 A male to USB 3.1 A male, USB3.1 A female, or USB 3.1 B male.

Jacket style   Extensiv optical cables come standard as a plenum rated (CMP) jacket, but are available in a low smoke zero halogen (LSZH) jacket. Typically, US requirements are for CMP style and European and Asian countries use LSZH, but it varies. HDMI 2.0 cables can be ordered with an armored interior with a thermoplastic polyurethane jacket. Contact Rose for agency test reports if needed.

Cable construction   All but the USB pure optical cable are hybrid construction with both glass fiber and copper. The high-speed video or data signals are sent over fiber and the remaining low speed signals or power are sent over copper.

The video or USB high-speed signals at the source end are converted from electrical to optical using VCSEL laser diodes. At the other end, photodiodes convert the optical signals back to electrical. Except for the USB male A-A cables, all cables must be installed in the correct direction. The cable ends are clearly marked source/host and display/device.

Specifications

Resolution/Bandwidth	**Color space 4:4:4**
HDMI 2.0	4K60 / 18 GBps
HDMI 2.1	8K60 / 48 GBps
DVI	2560x1600 @30Hz / 4.95 Gbps
Display Port 1.4	8K30 / 32.4 Gbps
DP1.2 to HDMI2.0	4K60 / 21.6 Gbps
USB C to HDMI	4K30 / 10.2 GBps
USBC-USB-C	4K60 / 21.6 Gbps
USB3.1-USB3.1	5 GBps
Distance	
HDMI 2.0 /2.1	328ft (100m)
DVI	328ft (100m)
Display Port 1.4	164ft (100m)
DP1.2 to HDMI2.0	98ft (30m)
USB C to HDMI	98ft (30m)
USB3.1 to USB3.1	328ft (100m)
Cable Diameter:	
HDMI 2.0 /2.1	4.5mm
HDMI (armored)	5.8 mm
DVI (fixed)	4.0mm
DVI (detachable)	4.5mm
DisplayPort 1.4	4.8mm
USB3.1	4.0mm
Min Bend Radius:	**Dynamic / Static**
HDMI 2.0 /2.1	45 mm / 90mm
HDMI (armored)	58 mm / 116mm
DVI (fixed)	40 mm / 80mm
DVI (detachable)	45 mm / 90mm
DisplayPort 1.4	48 mm / 96mm
USB 3.1	40 mm / 80mm
Connector Type:	
HDMI (fixed)	HDMI type A male-male
HDMI (detachable)	Cable: HDMI type D male- male
	Adapter: HDMI D female-A male
DVI (fixed)	DVI-D Single Link male-male
DVI (detachable)	Cable: HDMI type D male- male
	Adapter: HDMI D female-DVI male
DP (fixed)	DisplayPort male-male
DP (detachable)	Cable: mini-DP male- male
	Adapter: mini-DP female-DP male
USB 3.1 M-M	USB 3.1 A male-male
USB 3.1 M-F	USB 3.1 A male-female
DP1.2 – HDMI2.0	DP male – HDMI A male
USB C – HDMI 1.4b	USB C male – HDMI A male
USB C-C DP alt mode	USB C male-male
Operating Temp: **(all Cables)**	32°F to 122°F (0°C to 50°C)
Storage Temp: **(all cables)**	-4°F to 158°F (-20°C to 70°C)
Rel. Humidity: **(all cables)**	5% to 90%

Installation of Detachable Cables

Before pulling the cable, test proper operation with the cable connected directly between your equipment.

1. Remove the detachable adapter from the end of the cable and put aside.
2. Place the pulling cover over the cable end and close its cover.
3. Attach the pulling cable to the pulling cover.
4. Carefully pull the cable (for example, in the wall or conduit or under the floor).
   Note: The cable can be pulled from either side. Ensure that the cable polarity is correct. For example, pull connector marked Display if pulling from the display side.
5. Re-connect the detachable adapter to the cable end.
6. Plug the SOURCE connector head of the cable into the source devices. Plug the DISPLAY connector head of the cable into the display device.
7. Switch on the power of the source and display devices or connect them with the power already on.

I.Place the Micro HDMI connector inside the Pulling Tool.

II.Close the Pulling Tool cover.

III.Insert the pulling cable through the Pulling Tool ring.

Extensiv HDMI detachable head

Cable head is HDMI type D male

Adapter is HDMI type D female to HDMI type A

Extensiv DisplayPort detachable head

Cable head is mini DisplayPort male

Adapter is mini-DisplayPort female to standard DisplayPort

Cable Part Numbers

HDMI, DVI, and DisplayPort cables

Detachable cables come with pulling cover and adapters
nnn = 005, 010, 020, 030, 050, 070, 100 length in meters

	HDMI fixed connectors AVP-H2AMAM*nnn*M HDMI2.0 AVP-H3AMAM*nnn*M HDMI2.1 AVP = plenum, use AVL for LSZH jacket
	HDMI detachable connectors AVP-H2DMDM*nnn*M HDMI 2.0 AVP-H3DMDM*nnn*M HDMI 2.1 AVP = plenum, use AVL for LSZH jacket
	HDMI armored AVA-H2AMAM*nnn*M HDMI 2.0 fixed AVA-H2DMDM*nnn*M HDMI 2.0 detachable TPU jacket (Thermoplastic polyurethane)
	DVI single-link AVP-DVAMAM*nnn*M fixed AVP-H2DMDM*nnn*M/DH2 detachable AVP = plenum, use AVL for LSZH jacket
	DisplayPort 1.4 AVP-D4AMAM*nnn*M fixed AVP-D4DMAD*nnn*M detachable AVP = plenum, use AVL for LSZH jacket Maximum length 50m
	DisplayPort 1.2 to HDMI 2.0 AVP-DHAMAM*nnn*M fixed connectors
	USB C to HDMI 1.4b AVP-UHAMAM*nnn*M fixed connectors

Detachable adapters

HDMI D female to HDMI A male	ACC-HAHD
DP mini-DP female to DP male	ACC-DPDM
HDMI D female to DVI male	ACC-HDDV

When ordering detachable cable, cable is supplied
with adapters and pulling cover

USB Cables

nnn = 005, 010, 020, 030, 050, 070, 100 length in meters
**All cables except last one (pure optical) provide power to
remote side**

	USB 3.1 Gen 1 **USB3.1 A male-male connectors** AVP-U1AMAM*nnn*M (A male-A male) AEL-U1AMBM*nnn*M (A male-B male) Does not extend USB2.0 AVP = plenum, use AVL for LSZH jacket
	USB 3.1 Gen 1 **USB3.1 A male-female connectors** AVP-U1AMAF*nnn*M Does not extend USB2.0 AVP = plenum, use AVL for LSZH jacket
	USB 3.1 Gen1/USB 2.0 **USB 3.1 male-female connectors** AVP-UTAMAF*nnn*M Extends USB3.1 and provides USB3.1 and USB2.0 at device side AVP = plenum, use AVL for LSZH jacket
	USB 3.1 type C DP 1.2 alternate mode **USB type C male-male connectors** AVP-UDCMCM*nnn*M Extends DP1.2 video over USB type C alternate mode AVP = plenum, use AVL for LSZH jacket
	USB 3.1 Gen 1 Pure optical **USB3.1 A male-male connectors** AEP-U1AMAM*nnn*M Pure optical does not power device side AVP = plenum, use AVL for LSZH jacket

Hubs

	CLK-UTHUB4 USB3.1 4-port converting hub USB 3.1 host to 4-port USB3.1/2.0 devices