LIGHTWARE USB20-1GBE-DS4 HDMI Distribution Amplifier User Guide

Contents

visual engineering LIGHTWARE

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Product Information

The USB20-1GBE-DS4 and USB20-1GBE-HS10 are USB 2.0 extenders that allow you to extend USB devices using CAT5e/6/7 cables up to 100 meters. They support LAN and direct cable connectivity and offer transparent USB extension with a throughput of up to 480 Mbps. The USB20-1GBE-DS4 features four USB A-Type connectors for connecting USB devices. Each USB-A port can supply up to 1A of power to connected devices, with a maximum total power output of 3A across all four ports. It also has a DC power connector for powering the device, a service port for service purposes, and an RJ45 connector for Ethernet connection. The USB20-1GBE-HS10 has a USB B-Type port for connection to the host device, a service port for service purposes, and an RJ45 connector for Ethernet connection. The devices have status LEDs that indicate power, link status, enumeration, and activity. The RJ45 connector also has LEDs that indicate the speed and activity of the Ethernet connection.

Product Usage Instructions

Powering Options

The USB20-1GBE-DS4 device is supplied with a 24V DC adaptor with interchangeable plugs. This adaptor is used to power the USB20-1GBE-DS4 device. On the other hand, the USB20-1GBE-HS10 device is powered over the USB connection to the host device.

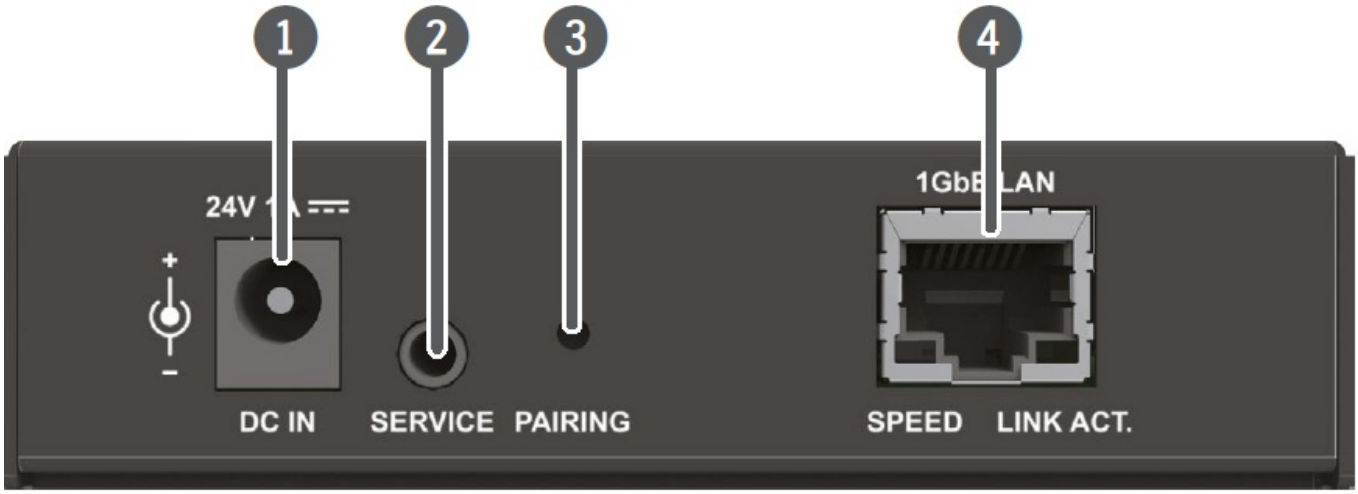
Pairing the Devices

Pairing between the USB20-1GBE-DS4 and USB20-1GBE-HS10 devices is done manually using the MAC address of the devices. Follow these steps to pair the devices:

1. Use a long, thin object (e.g., a paper clip) to press the Pairing button of one of the devices once shortly. This will cause the Link LED to flash quickly.
2. Press the Pairing button on the other device in the same way. The Link LED of both devices will light continuously, and the MAC address of the USB20-1GBE-DS4 device is added to the list of paired devices in the USB20-1GBE-HS10 device, and vice versa.
3. Repeat the procedure for each USB20-1GBE-DS4 device in the system. Up to seven USB20-1GBE-DS4 devices can be paired with a single USB20-1GBE-HS10 device at once.

Note: The pairing procedure has a time limit of 10 minutes. If the pairing does not occur within this timeframe, the procedure must be restarted.

Front view (USB20-1GBE-DS4)



1. USB A-Type connectors

   USB A-Type connectors for USB devices.
2. Status LEDs For the details, see the table on the right.

The USB-A ports are capable of supplying 1A to the connected USB devices, up to a maximum of 3A at the same time across all four ports.

Rear view (USB20-1GBE-DS4)

1. DC power connector

   24V DC connector for powering the device.
2. Service port Port for service purposes.
3. Pairing button For the details, see below.
4. RJ45 connector RJ45 connector for Ethernet connection.

Important Safety Instructions

Please read the supplied safety instruction document before using the product and keep it available for future reference.

Introduction
The USB20 Extender series can be used to build a system to transmit USB signals across greater distances than what is generally allowed by a USB cable, taking advantage of the data transmission capabilities of CATx cables and network switches. By using switches, transmission distances of up to 100 meters can be reached. This makes it possible to place USB devices (such as microphone, web camera, keyboard and mouse, mass storage etc.) far away from the Host device while still having full usage of them.

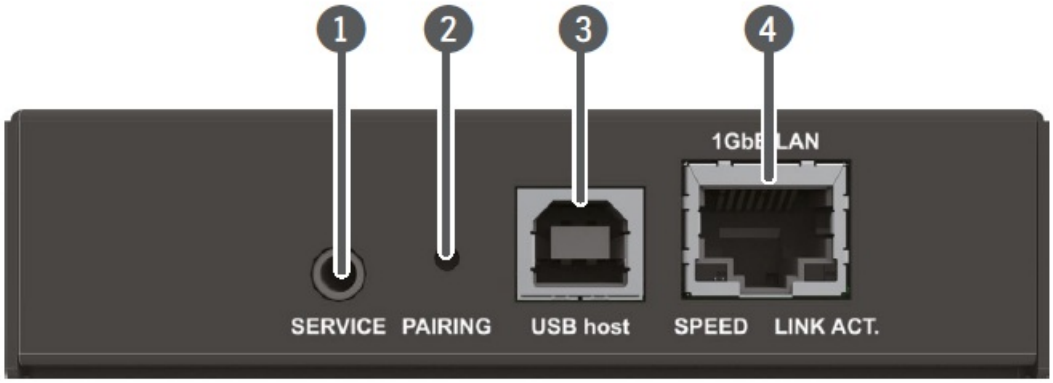
Highlighted features

- USB 2.0 extension using CAT5e/6/7 cables up to 100 meters
- LAN and direct cable connectivity supported
- Dynamic pairing to compatible host side extenders
- Transparent USB extension
- Throughput up to 480 Mbps

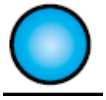
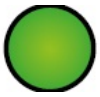
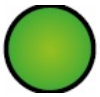
Front view (USB20-1GBE-HS10)

1. Status LEDs For the details, see the table on the right.

Rear view (USB20-1GBE-HS10)



1. Service port Port for service purposes.
2. Pairing button For the details, see below.
3. USB B-Type port USB B-Type port for connection to the host device.
4. RJ45 connector RJ45 connector for Ethernet connection.

Power LED		
	off	The device is not powered.
	on (blue)	The device is powered on.
Link LED		
	off	The device is not paired yet.
	blinking slow (green)	The linking process has started.
	blinking fast (green)	The pairing process has started.
	on (green)	The pairing process has finished, link is created.
Enumeration LED		
	off	Extender is not enumerated by the host.
	blinking (green)	Extender enumeration is suspended.
	on (green)	Extender enumeration is completed.
Activity LED		
	off	There is no transmission.
	blinking (yellow)	The extender is ready for transmission.

RJ45 LEDs

Speed LED		
	off	There is no Ethernet connection.
	on (green)	The connection bandwith is 1000 Mbps.
	on (orange)	The connection bandwith is 10/100 Mbps.
Link Activity LED		
	off	There is no Ethernet connection.
	blinking occasionally	Extender is not paired.
	blinking repeatedly	Host side extender is attempting to pair.
	blinking quickly	Extender is paired.

Box Contents

The adaptor is only supplied with the USB20-1GBE-DS4 device.

Cable Extension Information

The maximum cable length between the extenders or a switch and an extender is 100m. This means that by equipping a switch between the extenders, a maximum of 200m destance can be reached. If more switches are added between the extenders, each can lengthen the distance by 100m.
Either CAT5, CAT6 or CAT7 cables can be used.
If the extenders are placed in an environment where the ESD level can be higher than average, it is recommended using shielded CAT cables for undisturbed signal transmission.

Powering Options

Only the USB20-1GBE-DS4 device is supplied with a power adaptor. USB-1GBE-HS10 is powered over the USB connection to the Host device.

Pairing the Devices

Pairing happens using the MAC address of the devices. It does not happen automatically, it must be done manually. The process is the following:

1. Use a long, thin object (e.g. a paper clip) to press the Pairing button of one of the devices once shortly. This will cause the Link LED to flash quickly.
2. Press the Pairing button on the other device in the same way. The Link LED of both devices will light continuously, and the MAC address of the DS4 device is added to the list of paired devices in the HS10 device and vice versa.
3. Repeat the procedure for each DS4 device in the system. Up to seven DS4 devices can be paired with a single HS10 device at once.

The pairing procedure has a time limit of 10 minutes. If the pairing does not occur in this timeframe, the procedure must be restarted.

If the devices are paired, but there is no network connection, the Link LED will blink slowly.

Deleting a paired device
You can delete paired devices from the memory by pressing the Pairing button for more than 10 seconds. Please keep in mind that this will only delete the pairing list in the current device. To completely remove the pairing on both devices, this procedure must be done on both of them.

Setting a Dynamic IP address (DHCP)
You can set DHCP by pressing the Pairing button for the first 5 seconds of the device turning on. DHCP gets enabled and the device restarts.

The User's Manual is also available via the QR code below:
TAKE CARE OF ME
I AM THE ONE AND ONLY USER DOCUMENT FOR THIS PRODUCT
Lightware Visual Engineering PLC.
Budapest, Hungary
sales@lightware.com
+36 1 255 3800
support@lightware.com
+36 1 255 3810

Further information on the device is available at **www.lightware.com**.
Doc. ver.: 1.0

Mounting options

The device can be mounted to a rack shelf, UD kits and UD mounting plates.

Rack Shelf
The 1U high rack shelf provides mounting holes for fastening up to four extenders.

Mounting Steps:
Always use the fixing screws that are supplied with the mounting accessory. Longer screws may damage the device.

1. Unplug all the cables connected to the device(s).
2. Turn the device(s) upside down.
3. Put the shelf upside down on the device(s). Position it to get the mounting holes aligned.
4. Fasten the device to the shelf with the provided screws.
5. Fix the shelf to the desired place (screws are not supplied).

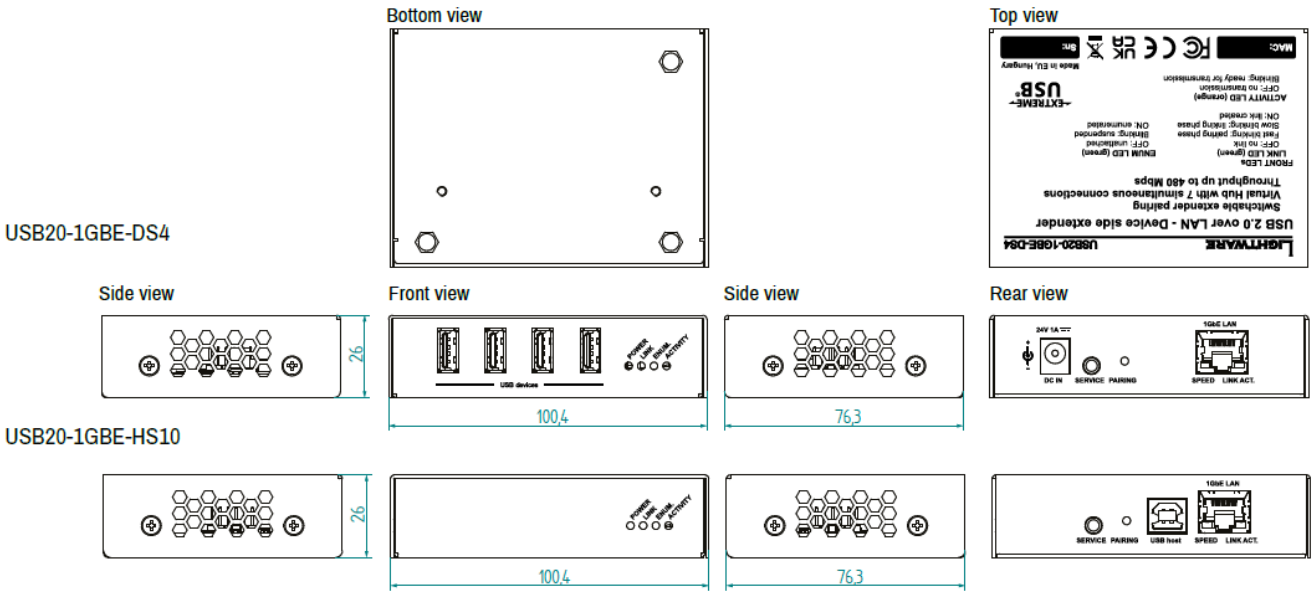
   Under Desk Mounting Kit (UD-kit)

   The UD-kit makes it easy to mount one extender under any flat surface (e.g. furniture).

UD Mounting Kit Double (UD-kit double)
The UD-kit double makes it easy to mount two extenders under any flat surface (e.g. furniture).

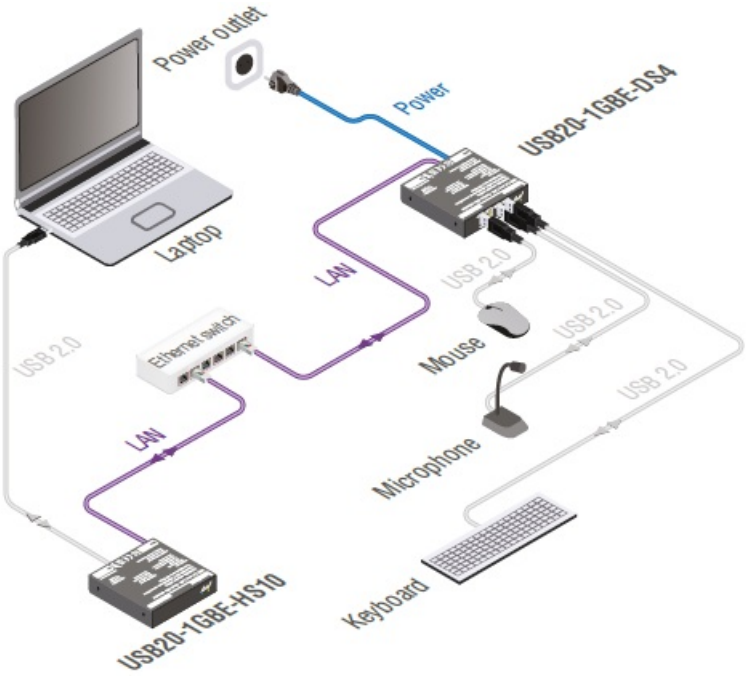
UD Mounting Kit Double (UD-kit double)
The UD-kit double makes it easy to mount two extenders under any flat surface (e.g. furniture).

Mechanical drawings

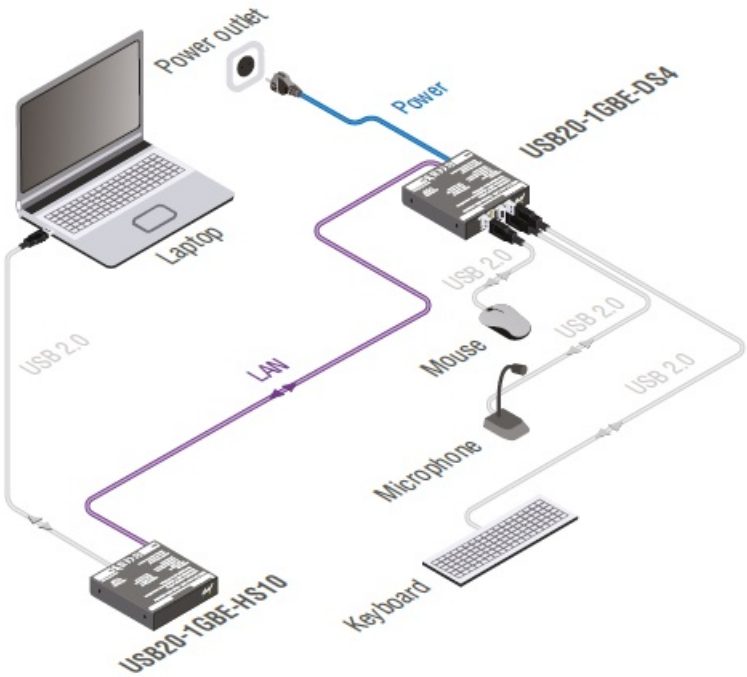


Application diagram

Creating a system using an Ethernet switch



Creating a system by connecting the extenders directly



Specifications

General

- Compliance……..CE, UKCA
- Electrical safety…….. EN 62368-1:2020
- EMC compliance (emission)……..EN 55032:2015+A1:2020
- EMC comliance (immunity)……..EN 55035:2017+A11:2020
- RoHS compliance……..EN 63000:2018
- Warranty……..3 years
- Operating temperature……..0 to 55°C (32 to 122°F)

- Operating humidity……. 20 to 80%, non-condensing

Power

- Power supply option…….. Power adapter
- Supported power source……..100-240V AC; 50/60 Hz
- Power consumption (USB20-1GBE-HS10)……1W
- Heat dissipation (USB20-1GBE-HS10)……..4 BTU/h
- Power consumption (USB20-1GBE-DS4)……..9W
- Heat dissipation (USB20-1GBE-DS4)……..31 BTU/h

Power adaptor

- Supplied power……24V DC, 1A
- DC power connector……. Locking DC connector (2.1/5.5 mm pin)

Enclosure

- Rack mountable…….. yes, with mounting accesories
- Enclosure material…….. 1 mm steel
- Dimensions (mm)……..100.4(W), 26(H), 76.3(D)
- Dimensions (inch)……3.95(W), 1.02(H), 3(D)

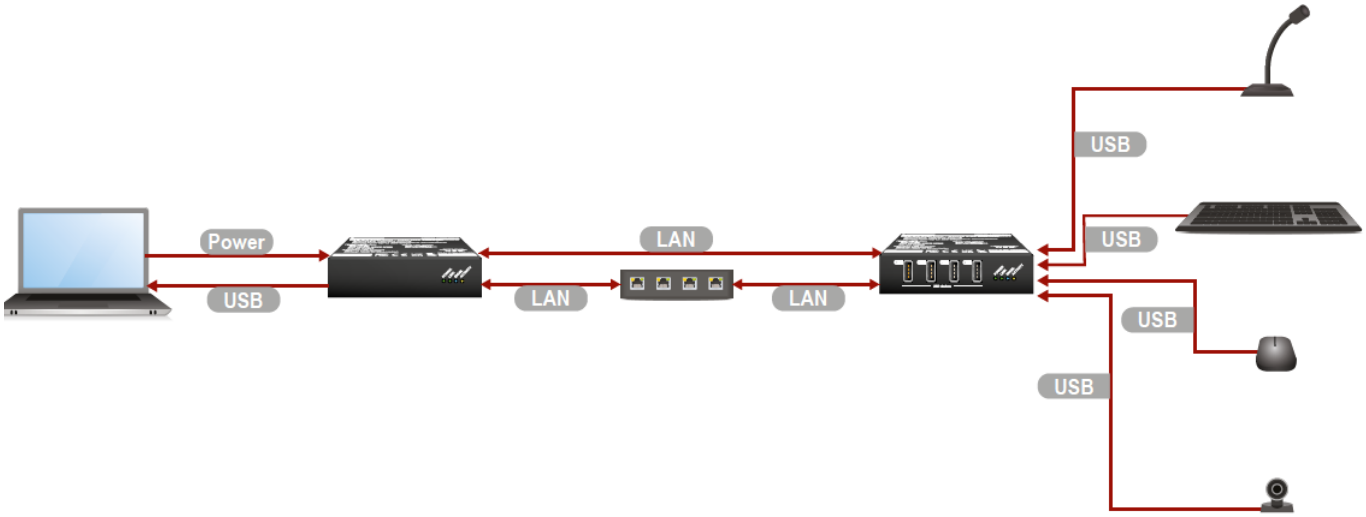
Control ports

- Ethernet port
- Connector type…….. RJ45 female connector
- Ethernet data rate……..1 GbE
- Power over Ethernet…….not supported
- USB port (Host side)
- Connector type……USB B-type receptacle
- USB compliance…… USB 2.0

USB port (Device side)

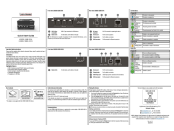
- Connector type…… USB A-type receptacle
- USB compliance…… USB 2.0

Connecting steps



- **USB**
  Connect the host device to the USB20-1GBE-HS10 device with a USB cable through the USB B-type connector.
- **Power**
  The host provides power to the USB20-1GBE-HS10 device via the USB cable.
- **LAN**
  Connect the USB20-1GBE-HS10 and USB20-1GBE-DS4 devices with CATx cables. Optionally you can insert an Ethernet switch between the extenders for additional extension distances.
- **USB**
  Connect the USB devices to the USB20-1GBE-DS4 device with USB cables through the USB A-type connectors

Documents / Resources

	LIGHTWARE USB20-1GBE-DS4 HDMI Distribution Amplifier [pdf] User Guide USB20-1GBE-DS4, USB20-1GBE-HS10, USB20-1GBE-DS4 HDMI Distribution Amplifier, HDMI Distribution Amplifier, Distribution Amplifier, Amplifier

References

- Lightware Visual Engineering