HGXT²

4K HDMI & GIGABIT FIBEROPTIC EXTENDER

User Manual

Visit us on www.xt2-extenders.com

BELRAM

Thank you

Thank you for purchasing the HGXT² 4K HDMI & Gigabit FiberOptic Extender.

This user guide provides technical specifications, instructions for installation as well as operation (by qualified and professional technicians)

Table of Contents

Safety and Notice

- Do not bend the power cord by force, or do not put heavy objects on the power cord to prevent breakdown. It can cause a fire.
- Do not touch the power plug with wet hands. You may be struck by electricity. Insert the power plug firmly to avoid shaking. If not inserted firmly, fire hazard may occur.
- Use mains power with correct voltage. Not doing so may result in unit damage.
- Do not insert metallic objects (hair pin or ironware) or combustible foreign objects (match, paper and so on) into the terminal hole, or drop the terminal. It may cause a fire and an injury by electrical shock.
- Don't put heavy objects on top of the product. It may cause malfunction.
- Do not disassemble, repair or modify. It can cause a fire and an injury by electrical shock due to abnormal operation.
- Place the product in an even and stable location. If the product falls down or is dropped, injury and/or malfunction may occur.
- Do not spray water on the product. It may cause a fire and an injury by electrical shock. Scrub the product surface softly with a dry towel.
- Do not twist or pull the optical cable by force. It can cause malfunction.
- Do not look directly at the light coming from the fiber optic connectors and cable as it is harmful to the eyes.
- Use the unit in environmental temperatures between 0°C and +50. Not doing so may result in unit malfunction.

Belram shall have no further obligation under the limited warranty (1 year) if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Belram or its authorized agents, and causes other than from ordinary use or failure to properly use the product in the application for which the product is intended.

Belram underlines that the warranty only covers manufacturing defects.

Overview

The HGXT² HDMI extender is a rugged, tour grade fiber optic extender for transmitting HDMI signals up to 4K @ 60Hz and Gigabit Ethernet (1000BaseT).

The bandwidth of 18Gbps allows for 4:4:4 color subsampling (uncompressed video) and HDR capability as well as automatic EDID management.
It supports HDCP 1.4 and 2.2 content protection. The multi-color LED informs the user of transmission status at all time.

Power is provided through Neutrik powerCON TRUE1 connectors (mains power cables included with Belgian Schuko plug).

The Neutrik HDMI connector is compatible with all current HDMI cables (we recommend using 18Gbps certified HDMI 2.0 cables not exceeding 1m on transmitter's and receiver's side to guarantee maximum resolution timing and color space).

The Neutrik etherCON CAT5E connector is compatible with standard RJ45 (we recommend using network cables fitted with etherCON cable carriers to ensure the strongest connection)

The HGXT² is fitted with Neutrik opticalCON DUO chassis for the optical link allowing for a robust connection between sender TX and receiver RX. Common LC duplex OM3/OM4 fiber may be used. However, we strongly recommend to use Neutrik opticalCON DUO for the fiber link.

Contents

- 1 HGXT² Transmitter (TX)
- 1 HGXT² Receiver (RX)
- 2 Power cables with Neutrik powerCON TRUE1 Female <-> Belgian Plug (2m)
- 1 USB A Male to USB B Male cable for Firmware update (only for HDMI) (1m)

Available accessories:

- Purelink ProSpeed PS3000 HDMI 18Gbps cables (1m/1,5m)
- Neutrik Locking HDMI cables (0,6m/1m)
- Belden 1305A CAT5E etherCON Link Cable (different lengths available)

Features

- Ruggedized touring quality HDMI 2.0 extender over optical fiber
- UHD 4K60 4:4:4 color sub sampling with HDR support
- 18Gbps bandwidth
- HDCP 2.2 compliant
- Bi-directional Gigabit Ethernet
- Suited for Neutrik opticalCON DUO or standard LC duplex OM3 multimode fiber
- Transmission length up to 500m for HDMI
- Multi colored signal status LED
- Thread hole for stand or truss mounting
- CE Certified

Technical Specifications

Video Signal	HDMI 2.x ; HDMI 1.x
Optical Connection	Neutrik opticalCON DUO Multimode
Max. Resolution	4K UHD (4096x2160@60Hz; 3840x2160@60Hz)
Color subsampling	4:4:4 (RGB and YUV)
Supported bitrates	8bit, 10bit, 12bit, 16bit
Video Bandwidth	18 Gbps
Ethernet Bandwidth	1 Gbps
HDR	HDR10, HDR12, HLG, PQ, Dolby Vision
EDID	Fully automatic
HDCP Content Protection	Off/1.4/2.2
Max. Transmission Distance	500m (OM3 multimode fiber)
Enclosure	Lightweight aluminum housing
Dimension	TX and RX unit (L x H x W): 200mm x 61mm x 151mm
Weight	1100g per unit (2,2kg total)
Device I/O	Video: Neutrik HDMI A female Network: Neutrik etherCON CAT5E female Optical: Neutrik opticalCON DUO (Multimode) Power: Neutrik powerCON TRUE1 TOP Firmware Update: Neutrik USB B female (for HDMI only)
Operating temperature	0°C to 50°C
Storing temperature	-20°C to 70°C
Power Consumption	2,1W (TX) / 1,3W (RX)
Power Rating	100-240V AC
Suited for outdoor	Yes, if not exposed to water (unit must be covered)
Miscellaneous	Thread hole for truss or stand mounting 5-color status LED (for HDMI) Anti-slip corners

Setup

1. Connect the HDMI source to the HGXT² Transmitter unit ("HDMI IN").

   Note:
   For highest resolution, timing, bitrate and color space (2160p60, 8bit, 4:4:4) use 18Gbps certified HDMI cables not exceeding 1,5m in length.

2. Connect the CAT5E cable to the HGXT² Transmitter's unit ("DATA IN").

3. Plug the power cable in the HGXT² Transmitter's powerCON TRUE1 TOP chassis ("POWER").

4. Connect the fiber cable to the HGXT² Transmitter's Neutrik opticalCON DUO chassis ("FIBER OUT").

   Note:
   Multimode OM3 or OM4 is required.

   You can also use opticalCON LITE DUO or standard Duplex LC Multimode OM3/OM4 optical fiber.

Setup (continued)

4. Connect your HDMI display to the HXT² Receiver unit ("HDMI OUT").

   Note:
   For highest resolution, timing, bitrate and color space (2160p60, 8bit, 4:4:4) use 18Gbps certified HDMI cables not exceeding 1,5m in length.

5. Connect the CAT5E cable to the HGXT² Receiver unit ("DATA OUT").

6. Plug the power cable in the HXT²
   Receiver's powerCON TRUE1 TOP chassis ("POWER").

7. Connect the fiber cable to the HXT² Receiver's Neutrik opticalCON DUO chassis ("FIBER IN").

   Note:
   Multimode OM3 or OM4 is required.

8. Check the status LED:
   If everything is connected correct ly, the LED will show the HDMI signal status:

   - Green (steady) -> No HDCP
   - Green (flashing) -> HDCP 1.4
   - Blue (flashing) -> HDCP 2.2

Maintenance

Optical fiber connections are capable of transmitting very high bandwidths but are prone to dust and dirt. Therefore we strongly recommend a good maintenance after every use. There are a couple of simple and cost effective ways to easily clean both the cables and connectors on the XT² extenders. These cleaning tools are available through Belram.

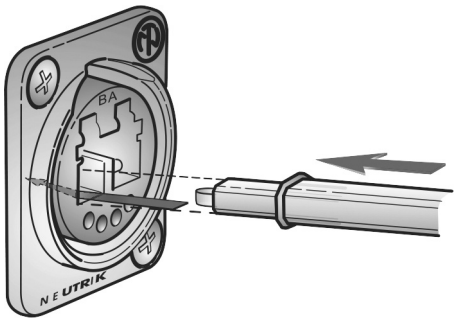
Cleaning the HGXT² optical connector(s)

Required tooling:

- Dry Cleaner 1,25mm

Instructions:

1. Remove protective cap from Dry Cleaner.
2. Insert the tip of the Dry Cleaner in LC slot “a”.
3. Push down on the Dry Cleaner 4 - 5 times.
4. Remove Dry Cleaner and repeat for LC slot “b”.
5. The optical connector has been cleaned.
6. Repeat above steps if necessary.



Cleaning the optical fiber cables (opticalCON DUO, standard LC)

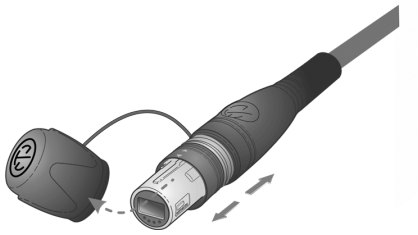
Required tooling:

Neutrik FOCD-STD
(for Neutrik opticalCON DUO)

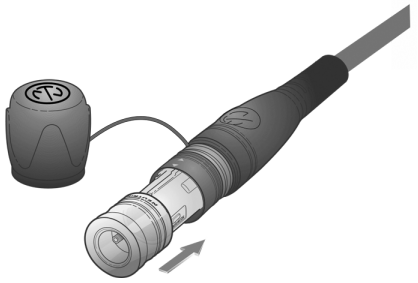
Dry Cleaner 1,25mm

Instructions:

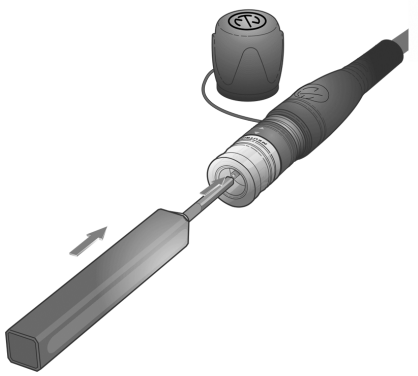
1. Remove protective cap from the opticalCON DUO connector.



2. Click the FOCD-STD onto the connector.



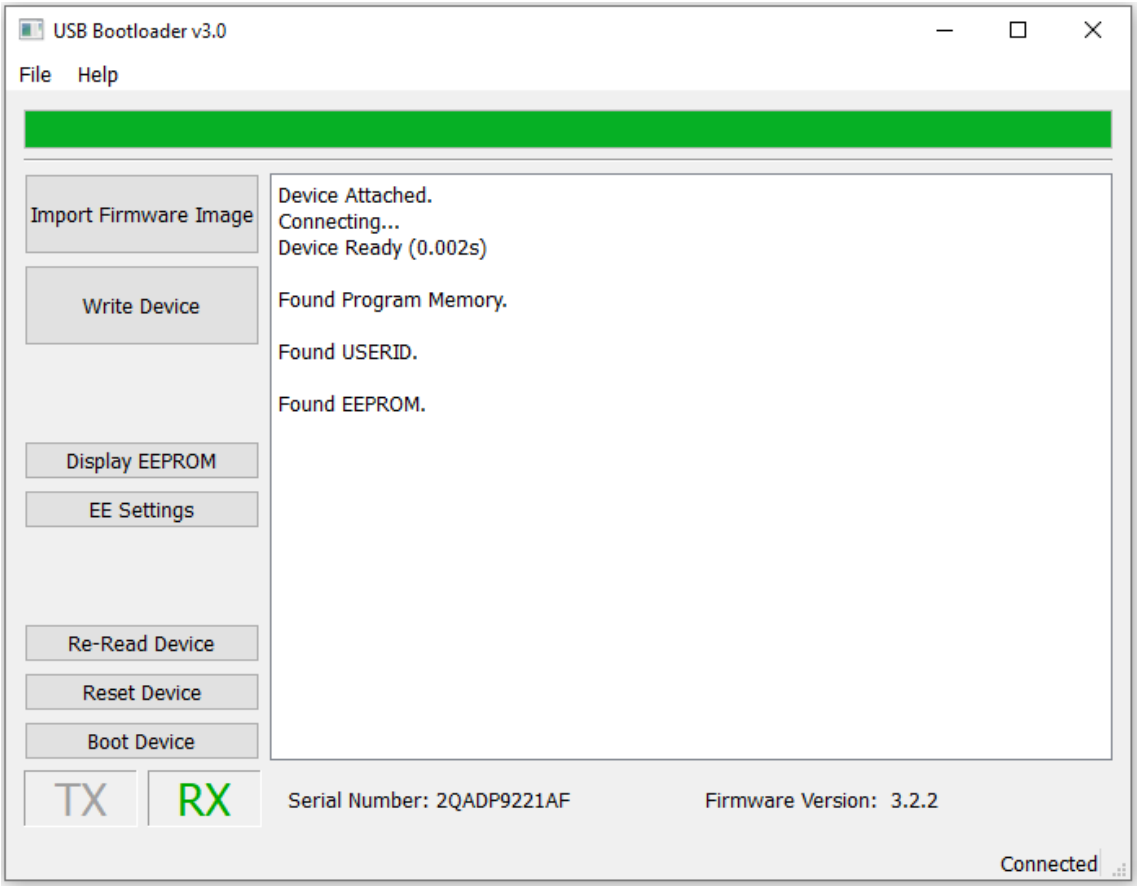
3. Insert the Dry Cleaner's tip into the ferrule hole of the FOCD-STD.
4. Push down on the Dry Cleaner 4 - 5 times.
5. Repeat for the remaining ferrule hole of the FOCD-STD.
6. Repeat above steps if necessary.



Firmware Update (only for HDMI)

The HGXT² Extender features an USB B female connector located left of the HDMI ports. You can use the supplied USB cable or any other USB A Male to USB B Male cable.

1. Connect the USB B male to the USB port "FW UPGRADE".
2. Plug the USB A Male in a PC or laptop.
3. The status LED on the HGXT² turns purple (Bootloader mode active)
4. Go to www.xt2-extenders.com and download the "HID Bootloader" tool under Support section.
5. Start "*HIDBootloader.exe*"
6. The Bootloader software will automatically detect the HGXT² TX or RX and show the serial number and firmware version of the connected unit.

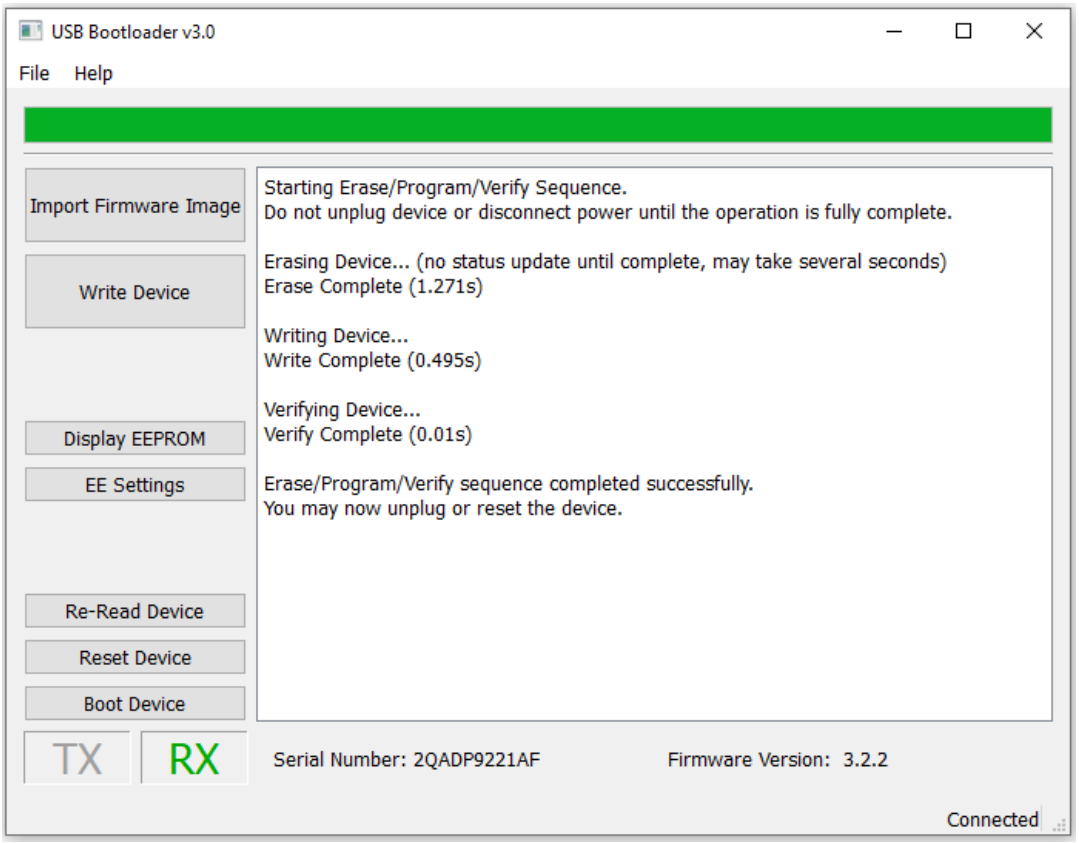


Firmware Update (continued)

7. Click on "*Import Firmware Image*" and locate the following firmware files:

   - for TX: "**TxJaguarApplication_vx.x.x.hex**"
   - for RX: "**RxJaguarApplication_vx.x.x.hex**"

8. Click on "*Write Device*".
   The HIDBootloader will now rewrite the firmware version on the HGXT² and perform a validation check.



9. When done, click on "*Boot Device*" to safely disconnect the HGXT² from your PC.

Troubleshooting

No HDMI signal detected (HDMI LED flashing “Yellow”)	▪ Make sure the input HDMI cable is connected correctly to the HDMI source and the output HDMI cable is connected correctly to the display. ▪ When using high resolutions and timings, verify the HDMI cable’s length, shorten down if possible {typical max. length for 2160p 4:4:4 8bit is± 1,5m with a copper HDMI 2.0 cable). ▪ When transmitting 4K60, be sure to use an HDMI 2.0 cable {Premium HDMI - 18Gbps).
No optical connection detected (HDMI LED flashing “Red”)	▪ Verify the correct connection of the optical cable on both Transmitter and Receiver side. ▪ Verify if the Receiver unit is connected to a working power source. ▪ Clean the fiber optic cables. ▪ Clean the optical chassis connectors of the HGXT².

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