datavideo

3-CHANNEL HDBASET

RECEIVER

HBT-30

Instruction Manual

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Disclaimer of Product & Services

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1)   This device may not cause harmful interference, and
(2)   This device must accept any interference received, including interference that may cause undesired operation.

Warnings and Precautions

1.   Read all of these warnings and save them for later reference.
2.   Follow all warnings and instructions marked on this unit.
3.   Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4.   Do not use this unit in or near water.
5.   Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6.   Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7.   This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8.   Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9.   If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord rating.

10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
    a. When the power cord is damaged or frayed;
    b. When liquid has spilled into the unit;
    c. When the product has been exposed to rain or water;
    d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
    e. When the product has been dropped or the cabinet has been damaged;
    f. When the product exhibits a distinct change in performance, indicating a need for service.

Warranty

Standard Warranty

- Datavideo equipment are guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- The product warranty period begins on the purchase date. If the purchase date is unknown, the product warranty period begins on the thirtieth day after shipment from a Datavideo office.
- All non-Datavideo manufactured products (product without Datavideo logo) have only one year warranty from the date of purchase.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered under warranty.
- Viruses and malware infections on the computer systems are not covered under warranty.
- Any errors that are caused by unauthorized third-party software installations, which are not required by our computer systems, are not covered under warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- All accessories including headphones, cables, and batteries are not covered under warranty.
- Warranty only valid in the country or region of purchase.
- Your statutory rights are not affected.

Three Year Warranty

- All Datavideo products purchased after July 1st, 2017 are qualified for a free two years extension to the standard warranty, providing the product is registered with

Datavideo within 30 days of purchase.

- Certain parts with limited lifetime expectancy such as LCD panels, DVD drives, Hard Drive, Solid State Drive, SD Card, USB Thumb Drive, Lighting, Camera module, PCIe Card are covered for 1 year.
- The three-year warranty must be registered on Datavideo's official website or with your local Datavideo office or one of its authorized distributors within 30 days of purchase.

Disposal

For EU Customers only - WEEE Marking

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

CE Marking is the symbol as shown on the left of this page. The letters "CE" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

1. Introduction

 The HBT-30 is an HDBaseT 3-channel receiver which is typically part of a live production "chain". It supports 4K50/60 Ultra HD video format up to 100m over a single CAT6A cable.

It is equipped with the PoE solution to provide power to these PTZ cameras, thereby solving the problem of lacking power supply in the field in the event of long-distance transmission.
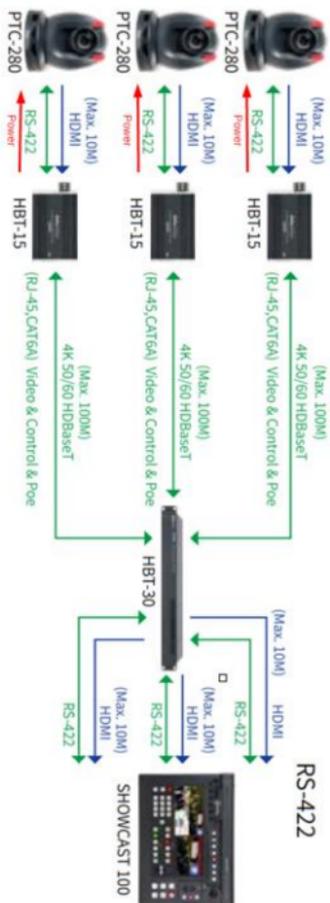
It is also responsible for handling signals sent over the Ethernet cable to the camera and to remotely control various camera parameters via DVIP, RS-422/RS-232.

Features

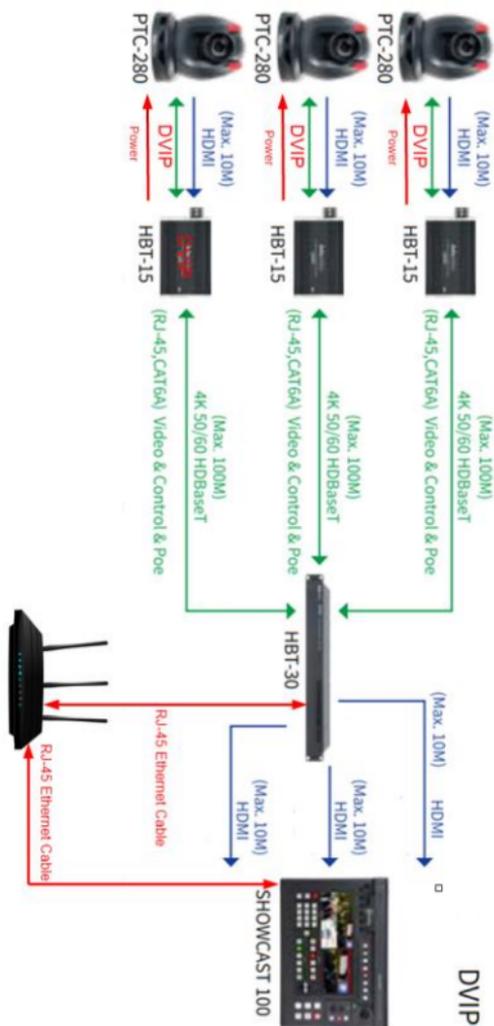- Supports up to HD 4K50/60 video formats.
- Supports single Ethernet cable video transmission by the HDBaseT technology.
- Supports long distance transmission up to 100m at 4K50/60 using a CAT 6A Ethernet cable.
- Supports PoE technology for powering up to three cameras.
- Supports DVIP, RS-422/RS-232 control protocols.
- Provides three HDMI 2.0 output interfaces.
- Supports HDMI DeepColor and 4K50/60.

2. System Diagram

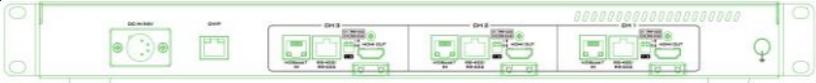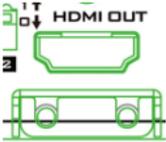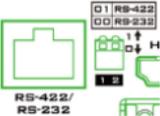- RS-422 Connection (Connecting to PTC-280 and ShowCast 100 as an example)

- DVIP Connection (Connecting to PTC-280 and ShowCast 100 as an example)

3. Connections
Rear Panel

HDBaseT IN	**HDBaseT IN Video and Audio Input (CH1/CH2/CH3)** This is the HDBaseT IN video/audio input interface. There are three HDBaseT IN video/audio input ports to allow you to input the video and audio signals by using RJ-45 Ethernet cables. Each channel allows you to power the connected camera for up to 65W per channel.
HDMI OUT	**HDMI OUT Video and Audio Output (CH1/CH2/CH3)** This is the HDMI OUT output interface to transfer up to 4K HDMI video/audio signal to its connected video switcher. There are three HDMI 2.0 Type A video/audio output interfaces.
RS-422/ RS-232	**RS-422/RS-232 Interface(CH1/CH2/CH3)** This is the RS-422/RS-232 interface to allow you to connect the HBT-30 to the RS-232/RS-422 REMOTE interface which is located on the rear panel of the Datavideo ShowCast 100 4K ShowCast Studio for controlling the cameras which are connected to the HBT-30 remotely.

	You can also connect other video switchers to the HBT-30. However, if the video switcher which is connected is not the ShowCast 100, you have to connect an RJ-45 Ethernet cable from this RS-422/RS-232 interface to another camera controller which the RS-422/RS-232 protocol is supported. There is a DIP Switch which is located next to the RS-232/RS-422 interface for you to determine whether you want to use RS-232 or RS-422 protocol for remote controlling. The settings of the DIP Switch are as follows. 01: RS-422 00: RS-232
DVIP	**DVIP Interface** This is the DVIP interface for you to connect the HBT-30 to your Wi-Fi router by using the RJ-45 Ethernet cable. After that, you can connect a switcher with the DVIP interface such as the ShowCast 100 4K ShowCast Studio to the same Wi-Fi router. After that, you can use the DVIP protocol to control the HDBaseT cameras which are connected to the HBT-30 remotely.
DC IN 56V	**56V DC IN interface** This is the 4 pin XLR 56V DC IN interface.

	Grounding Terminal When connecting this unit to any other component, make sure that it is properly grounded by connecting this terminal to an appropriate point. When connecting, use the socket and be sure to use wire with a cross-sectional area of at least 1.0 mm^2.

Front Panel
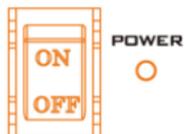
Power Switch and POWER LED Indicator

Power Switch
Please use this power switch to turn on or turn off the power.

POWER LED Indicator
When the Power Switch is turned on, this Power LED indicator will light up.

HDBaseT Link CH1/CH2/CH3 LED Indicator
When any of the HDBaseT interfaces for the CH1, CH2 or CH3 is connected to the HDBaseT interface of an HDBaseT camera, its corresponding LED indicator will light up.

4. Basic Setup

For the basic setup of the HBT-30, please refer to the steps in the following paragraphs.

4.1 If you use the RS-422 Protocols for Remote Controlling (Take system diagram as an example)

4.1.1 Required Equipment

- ➢ HBT-30 x 1

- ➢ DC IN 56V DC adapter included with HBT-30 x 1

- ➢ PTC-280 x 3

- ➢ HBT-15 x 3

- ➢ ShowCast 100 x 1

- ➢ HDMI Cable (Max.10M) x 6

- ➢ RJ-45 RS-422 cable x 6

- ➢ CAT 6A Ethernet cable (Max. 100M) x 3 (The upper limit for the power which is supplied by the HBT-30 for each channel is 65W)

- ➢ DC 12V male to male power cable x 3

4.1.2 Connection Steps

1. At first, please plug the bundled 56V DC IN adapter in the HBT-30 into the DC IN 56V interface which is located on the rear panel of the HBT-30.

2. Please make sure that power cables of the PTC-280 x 3 and ShowCast 100 x 1 are plugged.

3. Please use a DC 12V male to male power cable to connect from the DC OUT 12V30W interface which is located on the rear panel of the first HBT-15 to the DC 12V interface which is located on the rear panel of the first PTC-280.

4. Please use an HDMI cable (max. 10M) to connect from the 4K HDMI interface which is located on the rear panel of the first PTC-280 to the HDMI IN interface which is located on the rear panel of the first HBT-15.

5. Please use an RJ-45 RS-422 cable to connect from the RS-422 interface which is located on the rear panel of the first PTC-280 to the RS-232/RS-422 interface which is located on the front panel of the first HBT-15.

6. Please use a 100M CAT 6A Ethernet cable to connect from the HDBaseT interface which is located on the front panel of the first HBT-15 to the CH1 HDBaseT IN interface which is located on the rear panel of the HBT-30.

7. Please use an HDMI cable (max. 10M) to connect from the HDMI OUT interface which is located on the rear panel of the HBT-30 to

the VIDEO IN HDMI 1 interface which is located on the rear panel of the ShowCast 100.

8. Please use an RJ-45 RS-422 cable to connect from the RS-422/RS-232 interface which is located on the rear panel of the HBT-30 to the RS-232/RS-422 REMOTE 1 interface which is located on the rear panel of the ShowCast 100.

9. Please use a DC 12V male to male power cable to connect from the DC OUT 12V30W interface which is located on the rear panel of the second HBT-15 to the DC 12V interface which is located on the rear panel of the second PTC-280.

10. Please use an HDMI cable (max. 10M) to connect from the 4K HDMI interface which is located on the rear panel of the second PTC-280 to the HDMI IN interface which is located on the rear panel of the second HBT-15.

11. Please use an RJ-45 RS-422 cable to connect from the RS-422 interface which is located on the rear panel of the second PTC-280 to the RS-232/RS-422 interface which is located on the front panel of the second HBT-15.

12. Please use a 100M CAT 6A Ethernet cable to connect from the HDBaseT interface which is located on the front panel of the second HBT-15 to the CH2 HDBaseT IN interface which is located on the rear panel of the HBT-30.

13. Please use an HDMI cable (max. 10M) to connect from the HDMI OUT interface which is located on the rear panel of the HBT-30 to the VIDEO IN HDMI 2 interface which is located on the rear panel of the ShowCast 100.

14. Please use an RJ-45 RS-422 cable to connect from the RS-422/RS-232 interface which is located on the rear panel of the HBT-30 to the RS-232/RS-422 REMOTE 2 interface which is located on the rear panel of the ShowCast 100.

15. Please use a DC 12V male to male power cable to connect from the DC OUT 12V30W interface which is located on the rear panel of the third HBT-15 to the DC 12V interface which is located on the rear panel of the third PTC-280.

16. Please use an HDMI cable (max. 10M) to connect from the 4K HDMI interface which is located on the rear panel of the third PTC-280 to the HDMI IN interface which is located on the rear panel of the third HBT-15.

17. Please use an RJ-45 RS-422 cable to connect from the RS-422 interface which is located on the rear panel of the third PTC-280 to the RS-232/RS-422 interface which is located on the front panel of the third HBT-15.

18. Please use a 100M CAT 6A Ethernet cable to connect from the HDBaseT interface which is located on the front panel of the third HBT-15 to the CH3 HDBaseT IN interface which is located on the rear panel of the HBT-30.

19. Please use an HDMI cable (max. 10M) to connect from the HDMI OUT interface which is located on the rear panel of the HBT-30 to the VIDEO IN HDMI 3 interface which is located on the rear panel of the ShowCast 100.

20. Please use an RJ-45 RS-422 cable to connect from the RS-422/RS-232 interface which is located on the rear panel of the HBT-30 to the RS-232/RS-422 REMOTE 3 interface which is located on the rear panel of the ShowCast 100.

4.2 If you use the DVIP Protocol for Remote Controlling (Take system diagram as an example)

4.2.1 Required Equipment

- ➢ HBT-30 x 1

- ➢ DC IN 56V DC adapter included with HBT-30 x 1

- ➢ PTC-280 x 3

- ➢ HBT-15 x 3

- ➢ ShowCast 100 x 1

- ➢ HDMI cable (Max.10M) x 6

- ➢ RJ-45 DVIP Cable x 3

- ➢ CAT 6A Ethernet cable (Max. 100M) x 3 (The upper limit for the power which is supplied by the HBT-30 for each channel is 65W)

- ➢ DC 12V male to male power cable x 3

- ➢ Wi-Fi router x 1

- ➢ RJ-45 Ethernet cable x 2

4.2.2 Connection Steps

1. At first, please plug the bundled 56V DC IN adapter in the HBT-30 into the DC IN 56V interface which is located on the rear panel of the HBT-30.

2. Please make sure that power cables of the PTC-280 x 3 and ShowCast 100 x 1 are plugged.

3. Please use a DC 12V male to male power cable to connect from the DC OUT 12V30W interface which is located on the rear panel of the first HBT-15 to the DC 12V interface which is located on the rear panel of the first PTC-280.

4. Please use an HDMI cable (max. 10M) to connect from the 4K HDMI interface which is located on the rear panel of the first PTC-280 to the HDMI IN interface which is located on the rear panel of the first HBT-15.

5. Please use an RJ-45 DVIP cable to connect from the DVIP interface which is located on the rear panel of the first PTC-280 to the DVIP interface which is located on the rear panel of the first HBT-15.

6. Please use a 100M CAT 6A Ethernet cable to connect from the HDBaseT interface which is located on the first HBT-15 to the CH1 HDBaseT IN interface which is located on the rear panel of the HBT-30.

7. Please use an HDMI cable (max. 10M) to connect from the HDMI OUT interface which is located on the rear panel of the HBT-30 to the VIDEO IN HDMI 1 interface which is located on the rear panel of the ShowCast 100.

8. Please use a DC 12V male to male power cable to connect from the DC OUT 12V30W interface which is located on the rear panel of the second HBT-15 to the DC 12V interface which is located on the rear panel of the second PTC-280.

9. Please use an HDMI cable (max. 10M) to connect from the 4K HDMI interface which is located on the rear panel of the second PTC-280 to the HDMI IN interface which is located on the rear panel of the second HBT-15.

10. Please use an RJ-45 DVIP cable to connect from the DVIP interface which is located on the rear panel of the second PTC-280 to the DVIP interface which is located on the rear panel of the second HBT-15.

11. Please use a 100M CAT 6A Ethernet cable to connect from the HDBaseT interface which is located on the front panel of the second HBT-15 to the CH2 HDBaseT IN interface which is located on the rear panel of the HBT-30.

12. Please use an HDMI cable (max. 10M) to connect from the HDMI OUT interface which is located on the rear panel of the HBT-30 to the VIDEO IN HDMI 2 interface which is located on the rear panel of the ShowCast 100.

13. Please use a DC 12V male to male power cable to connect from the DC OUT 12V30W interface which is located on the rear panel of the third HBT-15 to the DC 12V interface which is located on the rear panel of the third PTC-280.
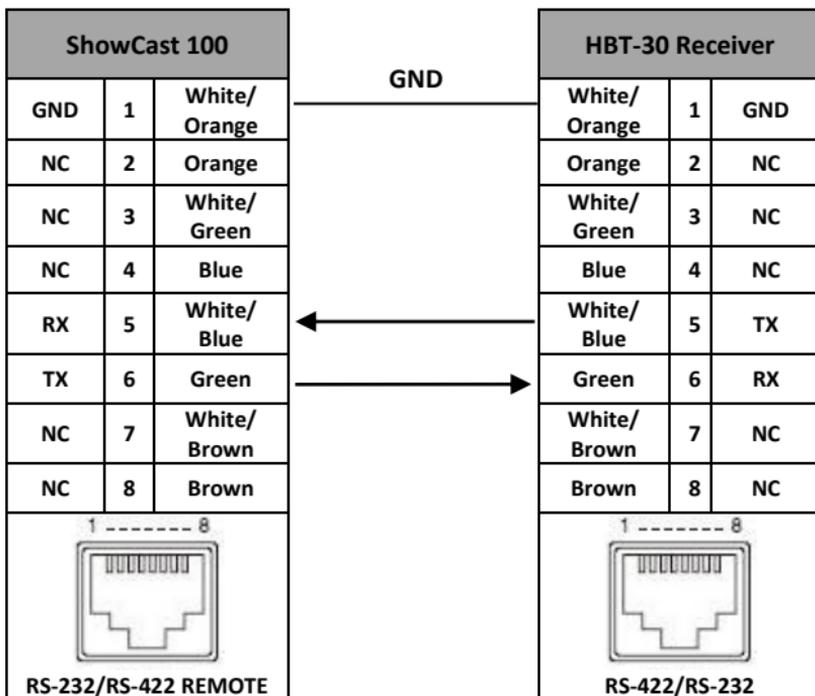
14. Please use an HDMI cable (max. 10M) to connect from the 4K HDMI interface which is located on the rear panel of the third PTC-280 to the HDMI IN interface which is located on the rear panel of the third HBT-15.

15. Please use an RJ-45 DVIP cable to connect from the DVIP interface which is located on the rear panel of the third PTC-280 to the DVIP interface which is located on the rear panel of the third HBT-15.

16. Please use a 100M CAT 6A Ethernet cable to connect from the HDBaseT interface which is located on the front panel of the third HBT-15 to the CH3 HDBaseT IN interface which is located on the rear panel of the HBT-30.

17. Please use an HDMI cable (max. 10M) to connect from the HDMI OUT interface which is located on the rear panel of the HBT-30 to the VIDEO IN HDMI 3 interface which is located on the rear panel of the ShowCast 100.

18. Please use an RJ-45 Ethernet cable to connect from the DVIP interface which is located on the rear panel of the HBT-30 to the RJ-45 LAN interface which is located on your Wi-Fi router.

19. Please use an RJ-45 Ethernet cable to connect from the DVIP interface which is located on the ShowCast 100 to the RJ-45 LAN interface which is located on your Wi-Fi router.

20. The whole connection is finished.

Note: For the above-mentioned procedures, the ShowCast 100 can be replaced by other Datavideo 4K-supported switchers no matter the RS-422 or DVIP protocol is used for the connection. What you need to know is that once the ShowCast 100 is replaced by any other switcher. Except for connecting the original HDMI cable from the HDMI OUT interface of the HBT-30 to the HDMI IN interface of your switcher, you also need to connect the RS-422 Ethernet cables from the CH1/CH2/CH3 RS-232/RS-422 interfaces on the rear panel of the HBT-30 to the control interfaces of another RS-422 supported controller such as Datavideo RMC-300A. When using the DVIP protocol for controlling, if the ShowCast 100 is not used, you need to connect an Ethernet cable from the DVIP interface of an external controller such as the Datavideo RMC-300A to the RJ-45 LAN interface of your Wi-Fi router.
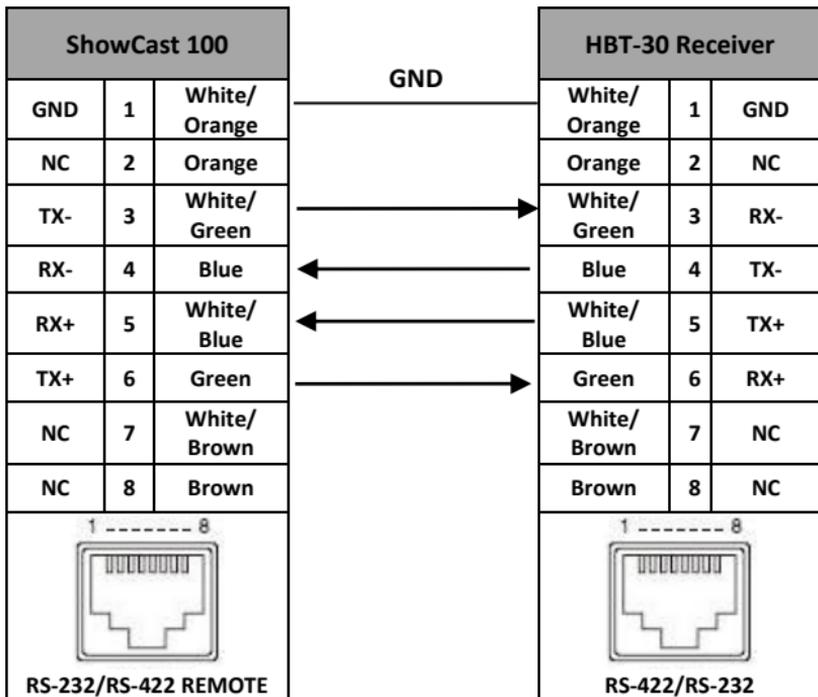
5. RS-232/RS-422 Pinout

You can use RS-232 or RS-422 control protocol to connect the Datavideo ShowCast 100 4K ShowCast Studio to the HBT-30 3-Channel HDBaseT Receiver to control the PTC-280T camera. You will need to use a custom Ethernet cable to connect between the ShowCast 100 4K ShowCast Studio and HBT-30. Wire the connection cable according to the respective RS-232 and RS-422 wiring diagrams shown below.

RS-232

ShowCast 100			GND	HBT-30 Receiver		
GND	1	White/Orange	───	White/Orange	1	GND
NC	2	Orange		Orange	2	NC
NC	3	White/Green		White/Green	3	NC
NC	4	Blue		Blue	4	NC
RX	5	White/Blue	◄───	White/Blue	5	TX
TX	6	Green	───►	Green	6	RX
NC	7	White/Brown		White/Brown	7	NC
NC	8	Brown		Brown	8	NC

RS-232/RS-422 REMOTE	RS-422/RS-232
1 ------- 8	1 ------- 8

RS-422

ShowCast 100				HBT-30 Receiver		
GND	1	White/Orange	GND	White/Orange	1	GND
NC	2	Orange		Orange	2	NC
TX-	3	White/Green	→	White/Green	3	RX-
RX-	4	Blue	←	Blue	4	TX-
RX+	5	White/Blue	←	White/Blue	5	TX+
TX+	6	Green	→	Green	6	RX+
NC	7	White/Brown		White/Brown	7	NC
NC	8	Brown		Brown	8	NC

RS-232/RS-422 REMOTE

RS-422/RS-232

6. Frequently-Asked Questions

This section describes problems that you may encounter while using this product. If you have any questions, please refer to related sections and follow all suggested solutions. If problem still exists, please contact your distributor or the service center.

No.	Problems	Solutions
1.	Is there any limitation for the HDMI cable which is used to connect from the HDMI OUT interface on the rear panel of the HBT-30 to the Video IN HDMI interface on the rear panel of the ShowCast 100?	• For 4K60 4:4:4 resolution, the HDMI cable can be up to 5M。 • For the 4K60 4:2:0 resolution, the HDMI cable can be up to 10M。
2.	How to know that whether the signal of the HBT-30 is transferred normally or not.	• Please check that whether the CH1/CH2/CH3 HDBaseT Link LED indicators on the front panel of the HBT-30 are lit or not, it those indicators are not lit, there may be an issue with the connection, please check that whether all of the cables are connected correctly or not.

7. Dimensions
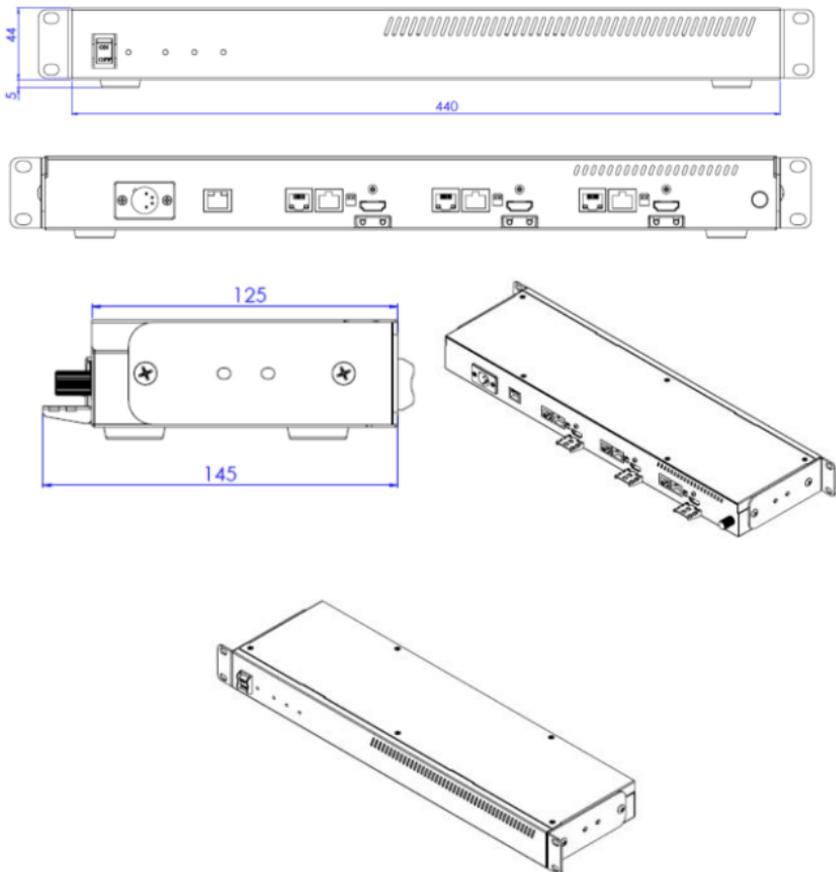
All measurements in millimeters (mm)

8. Specifications

HBT-30 3-Channel HDBaseT Receiver	
Model Name	HBT-30
Product Name	3-Channel HDBaseT Receiver
Video/Audio Input	HDBaseT (RJ-45) x 3 (with PoE function up to 65W per channel)
Video/Audio Output	HDMI Type-A x 3
Supported Control Protocol	RJ-45 x 3 (RS-232/RS-422) RJ-45 x1 (DVIP) How to set the control protocol: By DIP Switch x 3
LED Indicator	Power LED Indicator HDBaseT Link LED Indicator
Power	DC IN 56V
Supported Video Format	3840x2160p: 60/59.94/50/30/29.97/25/24/23.98 1080p: 60/59.94/50/30/29.97/25/24/23.98 1080i: 60/59.94/50 720p: 60/59.94/50 525i59.94 NTSC, 625i50 PAL
Video Processing	4K60 4:4:4, 8bit, 4K60 4:2:2 10bit, 4K60 4:2:0 10bit
Video Bandwidth	Single-link 594MHz [18Gbps]
HDBaseT Transmission Range	1080p@60 100M, by CAT. 6A Ethernet cable 4K@60 up to 100M, by CAT. 6A Ethernet cable
HDMI Compatibility	HDMI Deep Color & 4K@60
Audio Support	Surround Sound [up to 7.1 Channel] or Stereo Digital Audio
Operating Temp. Range	0°C to 40°C (32°F to 104°F)
Storage Temp. Range	-20°C to 60°C (-4°F to 140°F)

Humidity	10% to 80% (non-condensing)
Dimension (LxWxH)	440 x 125 x 44.5 (mm)
Weight	1.8Kg

Note

Service & Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff is available to assist you in setting up and operating your system. Please refer to our web site www.datavideo.com for answers to common questions, support requests or contact your local office below.

Please visit our website for latest manual update.
https://www.datavideo.com/product/HBT-30

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