



## User Manual

# **SY-HDBT-231-70** **SY-HDBT-231-100**

## **Dual HDMI Input to 3 x HDBaseT and 1 x HDMI Outputs**

HDBaseT Transmitted up to 70 or 100 metres

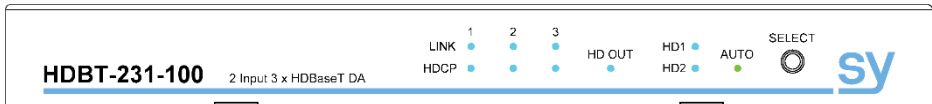
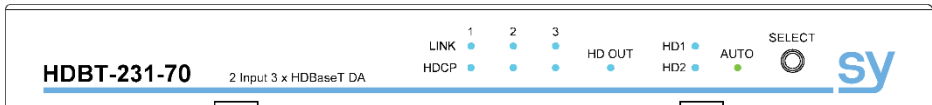
The SY-HDBT-231-70 and SY-HDBT-231-100 provide a selection from one of two HDMI input sources and distributes that selection to three HDBaseT outputs and a local HDMI output. The HDBaseT outputs can respectively broadcast up to 70m / 100m @ 1080p or 40m / 70m @ 4K 30Hz using cat6a cable (using SY-HDBT-70-SLIM-R or SY-HDBT-100-SLIM-R receivers).

## Features

- 2x selectable HDMI inputs
- 3x HDBaseT outputs
- 1x HDMI output
- All outputs show the same HDMI input selection
- De-Embedded audio output
- RS232 and IR control through the HDBaseT outputs
- Controllable from front panel or via RS232 commands
- EDID Management
- PoC on HDBT outputs. Each port can power a receiver unit

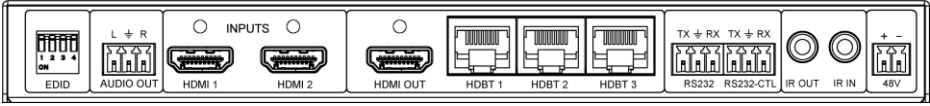
## Connectors and Controls

### Front Panel



Name	Description
<b>LINK 1, 2, 3</b>	Solid – HDBT Transmitter Receiver pair are linked
<b>HDCP 1, 2, 3</b>	Solid – HDCP ON    Flashing – HDCP OFF
<b>HD Out</b>	Lit when the Local HDMI output is operating
<b>HD1 , HD2</b>	Solid – Currently selected input is active Flashing – No video on currently selected input
<b>AUTO</b>	Signifies auto detection mode is active
<b>SELECT button</b>	Input selection for HD1 & HD2. > 3s for Auto mode

## Rear Panel



Name	Description
<b>EDID Switches</b>	Selects the desired EDID mode – (applied to both inputs)
<b>Audio Out</b>	De-embedded stereo analogue audio out from the selected input
<b>HDMI 1 &amp; HDMI 2</b>	HDMI signal input connectors
<b>HDMI OUT</b>	Local HDMI output connector
<b>HDBT1, 2 &amp; 3</b>	HDBaseT outputs to remote receivers – Provides PoC
<b>RS232</b>	Pass-through RS232 to all 3 HDBT ports – Receive from HDBT 1 only
<b>RS232-CTL</b>	RS232 control for the SY-HDBT-231
<b>IR Out</b>	IR output from HDBT ports – Summed output
<b>IR In</b>	IR input to HDBT ports – Broadcast to all
<b>48V</b>	48V DC power supply input

## Using the SY-HDBT-231-70 / 100

1. Connect the two HDMI inputs to any HDMI sources. Connect to the HDBaseT and Local HDMI outputs as needed. The HDBaseT outputs should be connected to the receivers using Cat6 cabling to ensure the best signal quality over the maximum cable length.
2. Connect the 48V power supply.
3. Use the SELECT button to switch between the two HDMI inputs.

## Using the Auto-Detect Mode

Hold down the SELECT button until the AUTO LED lights up (~3S) – Auto-detection enabled.

Hold down the SELECT button until the AUTO LED goes out (~3S) – Auto-detection disabled.

When in Auto mode, the unit will automatically switch to a newly active HDMI input and will fall back to the other active input if no signal on current selection detected.

When in Manual mode (Auto off), either input can be selected regardless of being active or not.

## EDID Switch Settings

The four-way switch on the rear of the SY-HDBT-231 provides twelve fixed EDID settings, one programmable setting and three EDID copying modes. The switch settings are given in the following table. (Switch position: U = Up, D= Down)

EDID Index	Switch 1 2 3 4	EDID Mode	EDID Index	Switch 1 2 3 4	EDID Mode
0	U U U U	1080p 2CH	8	D U U U	4K@30Hz 3D 8CH
1	U U U D	1080p 6CH	9	D U U D	4K@60Hz YUV420 3D 2CH
2	U U D U	1080p 8CH	10	D U D U	4K@60Hz YUV420 3D 6CH
3	U U D D	1080p 3D 2CH	11	D U D D	4K@60Hz YUV420 3D 8CH
4	U D U U	1080p 3D 6CH	12	D D U U	User 1 EDID Memory <sup>2</sup>
5	U D U D	1080p 3D 8CH	–	D D U D <sup>1</sup>	Copy from Output 1 (HDMI) <sup>3</sup>
6	U D D U	4K@30Hz 3D 2CH	–	D D D U <sup>1</sup>	Copy from 1 <sup>st</sup> Connected Output <sup>4</sup>
7	U D D D	4K@30Hz 3D 6CH	–	D D D D <sup>1</sup>	Set Cascade Mode

### Notes:

1. These three settings are commands and should not be used as EDID settings. When the switch is set to these commands, the EDID remains as the last valid EDID setting until another EDID setting is chosen.
2. The **USER 1 EDID Memory** can also be programmed using the appropriate RS232 command, see the *RS232-CTL Commands* section for details of this command.
3. The **Copy from Output 1** switch setting reads the EDID data from the display device connected to the HDMI output to the User 1 EDID memory of both inputs.
4. The **Copy from 1<sup>st</sup> Connected Output** switch setting will copy the EDID data from the first display device that is connected to the SY-HDBT-231 to the User 1 EDID of both inputs. This can be from either the HDMI output or any of the HDBT outputs.

## Cascade Mode

Cascade mode can be enabled/disabled via RS232 commands (SET CAS EN, SET CAS DIS), using RS232-CTL port. This may speed up the overall system switching speed when several devices are cascaded together (such as HDBT-231 to MSUHD88 to Apollo 4K to...).

Be sure to wire the RS232 connections correctly when using D-type connectors, as given in the following table:

SY-HDBT-231	DE-9 Pin
TX	2
Gnd	5
RX	3

## RS232-CTL Commands

All commands are sent at 57600 baud, 8 data bits, no parity and one stop bit.

Commands are not case sensitive, but must always be followed by a carriage-return (0x0d).

All responses are in uppercase and provide an acknowledgement of the command or reply with the requested data, and are terminated with a carriage-return & line-feed (0x0d 0x0a).

### System Control Set-Up Commands

RS232 Command	Command Details
H	Display the command help. This command lists all the available commands with a short description for each one.
STA	Display the system status.
SET RST	Reset to factory defaults.
SET ADDR xx	Set the Device Address, where xx is a decimal value in the range 00 to 99. Default value is 00.
SET CAS EN	Enable the cascade mode.
SET CAS DIS	Disable the cascade mode.
GET ADDR	Return the current Device Address.
GET STA	Returns a shorter version of the STA command.
GET CAS	Return the Cascade mode status

### Output Set-Up Commands

SET OUT0 VS IN <sub>y</sub>	Set the outputs to show input y. Input y = 1 or 2.
SET OUT EXA EN	Enable the external (de-embedded) audio output.
SET OUT EXA DIS	Disable the external (de-embedded) audio output.
GET OUT0 VS	Return the current video input being routed to the outputs.
GET OUT EXA	Get Ex-Audio (de-embedded) Output Enable/Disable Status

### Auto Mode Commands

SET HD AUTO EN	Enable Auto Mode.
SET HD AUTO DIS	Disable Auto Mode.
GET HD AUTO	Get output Auto mode status.

### RS232-CTL to Remote HDBT Commands

SET BPSEL HDBT <sub>x</sub>	Select HDBT port for data communication Port x is: 1 = HDBT1, 2 = HDBT2, 3 = HDBT3
SET SEPM x EN/DIS	Set data (8bit, no parity, 1 stop) Baud rate, and Enable or Disable x is: 0 = 57600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 14400 6 = 19200 7 = 38400 8 = 56000 9 = 115200
GET BPSEL HDBT	Get selected HDBT port number state
GET SEPM	Get RS232 Enable/Disable state

## Input EDID Setup Commands

RS232 Command	Command Details
SET IN <sub>x</sub> EDID y	<p>To use these memory settings, the EDID switch must be set to <b>User 1 EDID Memory (DDUU)</b>. The 24 available options are given below.</p> <p>Set Input x EDID to the built-in EDID y            Input x is: 1-2 = HDMI inputs 1 or 2</p> <p>EDID y is one of the following (0-23):</p> <ul style="list-style-type: none"> <li>0: 1080P_2CH(PCM)</li> <li>1: 1080P_6CH</li> <li>2: 1080P_8CH</li> <li>3: 1080P_3D_2CH(PCM)</li> <li>4: 1080P_3D_6CH</li> <li>5: 1080P_3D_8CH</li> <li>6: 4K30Hz_3D_2CH(PCM)</li> <li>7: 4K30Hz_3D_6CH</li> <li>8: 4K30Hz_3D_8CH</li> <li>9: 4K60Hz(Y420)_3D_2CH(PCM)</li> <li>10: 4K60Hz(Y420)_3D_6CH</li> <li>11: 4K60Hz(Y420)_3D_8CH</li> <li>12: 1080P_2CH(PCM)_HDR</li> <li>13: 1080P_6CH_HDR</li> <li>14: 1080P_8CH_HDR</li> <li>15: 1080P_3D_2CH(PCM)_HDR</li> <li>16: 1080P_3D_6CH_HDR</li> <li>17: 1080P_3D_8CH_HDR</li> <li>18: 4K30Hz_3D_2CH(PCM)_HDR</li> <li>19: 4K30Hz_3D_6CH_HDR</li> <li>20: 4K30Hz_3D_8CH_HDR</li> <li>21: 4K60Hz(Y420)_3D_2CH(PCM)_HDR</li> <li>22: 4K60Hz(Y420)_3D_6CH_HDR</li> <li>23: 4K60Hz(Y420)_3D_8CH_HDR</li> </ul>
SET IN <sub>x</sub> EDID CY OUT <sub>y</sub>	<p>Copy Output y EDID To Input x(USER1 BUF) {x[1~2], y[1~4]}</p> <p>Input x is: 1-2 = HDMI inputs 1 or 2            Output y is: 1 = Local HDMI output            2, 3, 4 = Remote HDBaseT outputs</p>
SET IN <sub>x</sub> EDID U1 DATA <sub>z</sub>	<p>Write EDID data To USER1 EDID of Input x {x[1~6], z[EDID Data]}</p> <p>Input x = 1 or 2, z must be a valid EDID data block of 256 bytes.</p>
GET IN <sub>x</sub> EDID	<p>Get Input x EDID Index {x[0~2](0 All)}</p> <p>Input x is: 1-2 = HDMI inputs 1 or 2 0 = Both input EDID index</p>
GET IN <sub>x</sub> EDID y DATA	<p>This command returns the EDID data from input x at EDID index y.            This command will return all 256 bytes of EDID data.            The value x is either 1 or 2, and y is the EDID Index in the range 0 to 12 as given in <b>EDID Switch Settings</b>.</p>
GET OUT <sub>x</sub> EDID DATA	<p>Get Output x EDID Data</p> <p>x is: 1 = Local HDMI output 2, 3, 4 = Remote HDBaseT outputs</p>

## RS232

The RS232 port is a direct data pass-through to the HDBT outputs.

The Tx data are broadcasted to all the remote receivers (via HDBT 1, 2, 3); whilst the Rx receives data only from the HDBT 1 port.

## IR IN / OUT

By attaching an IR eye (receiver) to the IR IN connector, IR signals from a remote controller can be broadcasted to all the HDBT outputs.

All the IR signals from the remote HDBT receivers are summed together and brought to the IR OUT connector. Connect an IR emitter (blaster) to this port for controlling a local device.

## Specification

Items	Description
<b>Video Input/output</b>	VESA and SMPTE 480p to 2160p (4K UHD) with 3D. (All resolutions to: 4096x2160p @60Hz 4:2:0 8bit, 3840x2160p @30Hz 4:4:4 8bit) All PC resolutions to 1920x1200
<b>HDMI Audio Input/output</b>	Pass through: All HDMI audio formats including Dolby D (TrueHD) / DTS (HD-Master Audio) / PCM. Channel count: from 2-8 (2.0 to 7.1) Sample rates: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz and 192 kHz
<b>De-embedded Audio out</b>	PCM 2.0 channel from selected input, onto 3 pin Phoenix connector. Stereo L/R, 0.7V Rms – 20Hz-20KHz
<b>HDBT (@1080p)</b>	70m (230feet) with HDMI video for SY-HDBT-231-70 to SY-HDBT-70SR 100m (328feet) with HDMI video for SY-HDBT-231-100 to SY-HDBT-100SR RS232 & IR control, and PoC.
<b>Control</b>	RS232 & IR Full function bi-directional pass-through RS232-CTL port – 57,600 Baud, no Parity, 1 Stop bit
<b>Power Supply</b>	48V DC @ 1.0A max.
<b>Power Consumption</b>	14.4W with one receiver, add 8W for each additional receiver.
<b>Dimensions</b>	220 x 134 x 24mm
<b>Case Materials</b>	Aluminium chassis
<b>Installation</b>	Supplied with removable ears mounting brackets
<b>Weight</b>	780g

**Note:** You may use cat5e, cat6 UTP in conjunction with the HDBaseT outputs; however for best performance use cat6a or cat7 (particularly in electrically noisy environments). The maximum distances & transmission performance for HDMI and HDBT may be compromised by cable quality, patch panels, poor termination, wall plates, cable kinks and electrical interferences. Generally ensure the cat cable is solid copper core (avoid CCA type), in one straight run (avoid/minimise patches) and avoid close proximity to any noisy electrical sources.

## Safety Instructions

To ensure reliable operation of this product as well as protecting the safety of any person using or handling these devices while powered, please observe the following instructions.

1. Use the power supplies provided. If an alternate supply is required, check Voltage, polarity and that it has sufficient power to supply the device it is connected to.
2. Do not operate either of these products outside the specified temperature and humidity range given in the above specifications.
3. Ensure there is adequate ventilation to allow this product to operate efficiently.
4. Repair of this equipment should only be carried out by qualified professionals as this product contains sensitive devices that may be damaged by any mistreatment.
5. Only use this product in a dry environment. Do not allow any liquids or harmful chemicals to come into contact with this product.

## After Sales Service

1. Should you experience any problems while using this product, firstly refer to the Troubleshooting section in this manual before contacting SY Technical Support.
2. When calling SY Technical Support, the following information should be provided:
  - Product name and model number
  - Product serial number
  - Details of the fault and any conditions under which the fault occurs.
3. This product has a two year standard warranty, beginning from the date of purchase as stated on the sales invoice. For full details please refer to our Terms and Conditions.
4. SY Product warranty is automatically void under any of the following conditions:
  - The product is already outside of its warranty period
  - Damage to the product due to incorrect usage or storage
  - Damage caused by unauthorised repairs
  - Damage caused by mistreatment of the product
5. Please direct any questions or problems you may have to your local dealer before contacting SY Electronics