Xcalibur 14 (set)

User Manual

Excalibur 14 Splitter (HX150-14-18G)
Excalibur 11 Receiver (HX150-11-18G-R)

1x4 HDMI 2.0 Extender
150m @1080p or 120m @4K

HDMI 2.0 (4K60 4:4:4), Down-Scaler, Test Pattern, VKA,
EDID & HDCP control, Audio de-embed, PoC

Thank you for purchasing the PRODUCT.

This PRODUCT is designed with the professional AV installers in mind. The many extensive features assist in system integration, validation, and maintenance.

Installation precautions

This product has special circuitry to protect it against moderate surges and static discharges. However, to ensure reliable operation and long service life, it is important to take the necessary precautions against any spikes, surges and static discharges.

Place the units away from heat sources and allow adequate ventilation.

Shielded cable and in particular cat6, cat6a or cat7 is highly recommended. As much as possible cables should be routed away from any noisy sources and avoiding long runs in close proximity to AC mains cables.

CONTENTS

This 18Gbps HDMI 1x4 Splitter/Extender can distribute one HDMI source to up to four displays using Xcalibur Receivers. The transmission distance can be up to 150m for 1080p or 120m for 4K2K.

The Xcalibur 14 also extend bi-directional IR & RS232 signals, together with many features such as 4K → 1080p down-scaler, Test Pattern generator, VKA (video Keep Alive), HDCP and EDID management, as well as audio outputs. The Xcalibur Receiver unit also provides a de-embedded stereo L/R audio output.

IMPORTANT: The Xcalibur 14 set works with all Xcalibur product range. They are not compatible with HDBaseT products.

Features

- HDMI 2.0 compatible – 18Gbps signal bandwidth
- Supports all PC and HDMI resolutions up to 4K60 4:4:4
- **150m** for 1080p or **120m** for 4K, using single Cat5e, 6, 6a, 7
- Built-in **Test Pattern** feature with several pattern types and resolutions
- Video Keep-Alive (**VKA**) option prevents displays entering standby mode
- 4K → 1080p **Down-Scaler** per output– Set or Auto option for any 4K to 1080p
- HDCP 1.4 and HDCP 2.2 compliant
- **HDCP** and **EDID** management
- Supports HDR, HDR10, HDR10+, HDR12, HLG and Dolby vision
- HDMI audio support up to 7.1 surround sound
- **De-embedded Audio** – Digital and balanced Analogue stereo (L/R) outputs
- Each Receiver unit provides stereo audio (L/R only)
- Selectable RS232 routing for 3rd party commands to each output or all outputs
- **RS232** pass-through for 3rd party control commands
- Bidirectional global **IR** pass-through to and from all receivers
- **PoC** - The Receivers are powered over the cat5e/6/6a/7 cable from the transmitter
- Only one 24V PSU required
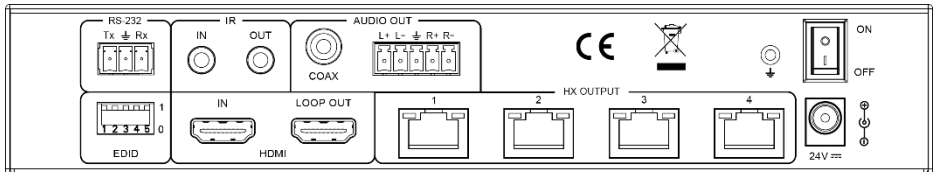
Connectors and Controls
Main Splitter Unit
Front

Xcalibur 14

OUTPUTS

⏻   IN   LOOP   1   2   3   4

18G HDMI 1x4 HX DA

sy
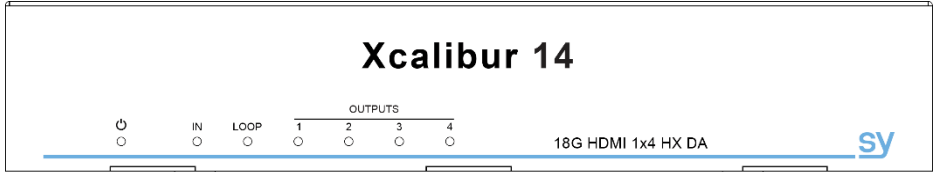
Name	Description
Power LED	Lit – Xcalibur-14 Splitter is powered
IN	Lit – Valid HDMI signal at the input
LOOP	Lit – Valid HDMI signal at the HDMI LOOP OUT connector
OUTPUT 1 ~ 4	Lit – Valid Link status at the HX outputs

Rear

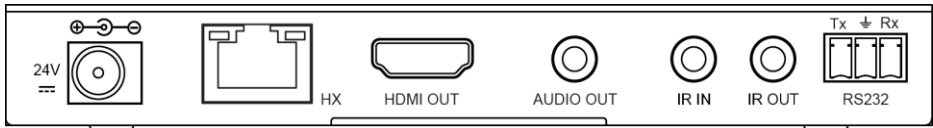| Name	Description
RS232	RS232 input for controlling the transmitter and sending commands to the remote Receiver RS232 ports
IR IN	Input for IR control to all the Receivers
IR OUT	IR signal output from the Receivers
COAX	S/PDIF digital audio output
5-WAY BLOCK	Balanced analogue stereo audio output
EARTH	Earth point for system ground
SWITCH	On/Off switch for 24V DC input
DIP Switches	Manual EDID setting options (Also Test Pattern selection)
HDMI IN	HDMI input from source device
HDMI LOOP OUT	HDMI output to local display device
HX OUTPUTS 1~4	HX RJ45 outputs - PoC and HX signal outputs for up to four Receivers
24V	24V DC PSU input (2.1mm barrel jack)

Receiver

Front

Name	Description
Power LED	Lit – Receiver is powered
SERVICE	Micro USB for configuration or update

Rear

Name	Description
24V	24V DC Power input – not required when used with Xcalibur-14
HX (Cat6 Input)	Cat6 cable input from the Xcalibur-14 splitter
HDMI OUT	HDMI output to the display device
AUDIO OUT	Stereo (L/R) analogue audio output
IR IN	Input for IR control to the Xcalibur-14
IR OUT	IR control signal output from the Xcalibur-14 unit
RS232	Bi-directional RS232 control supporting Tx and Rx signals only

RJ45 Status LEDs

The RJ45 connectors on both the Xcalibur-14 Splitter and Receiver units also provide LED indication of the cable link status and data signal status:

RJ45 LEDs	Meaning
GREEN LED	Lit when there is a valid link status between the Transmitter and the Receiver: **Solid:** Good Link status **Flashing:** Poor Link status **Off:** No link detected
YELLOW LED	Lit when there is a valid data signal between the Transmitter and the Receiver. This LED also indicates the HDCP status: **Solid:** HDCP Present **Flashing:** No HDCP **Off:** No data signal

Using this Product

This Xcalibur-14 Splitter Extender product is designed to function only with the Xcalibur Receivers (provided with the set). **Important:** The HX ports are not compatible with HDBaseT devices.

1. Connect the video source to the HDMI input.
2. Connect the HX outputs to the HX input of the Receivers using Cat6 cable.
3. If a local display is required, connect it to HDMI OUT.
4. Connect the 24V DC PSU to the Xcalibur-14 (This will power the 4x Receiver units too).
5. Connect any external controls that are required to their respective ports: i.e. RS232 or IR.
6. Connect any audio amplifiers to the audio connections, as required.
7. Power up the system.

De-embed Audio Outputs

Balanced Analogue Audio output

The differential (Balanced) analogue audio output only provides the Front Left and Front Right audio channels. When connecting to an unbalanced audio input, only connect to the L+, R+, and Ground signal pins on the five way connector as shown in the following diagrams:
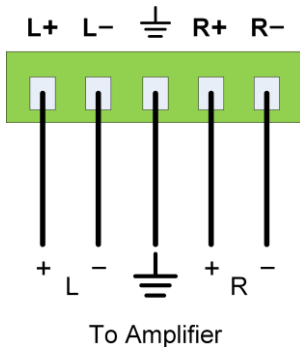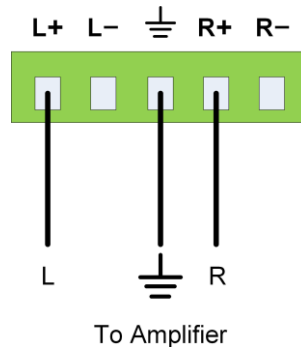

Figure 1 – Balanced Audio Out   *Figure 2 – Unbalanced Audio Out*

Coax (S/PDIF) Audio Output

The COAX audio output provides de-embedded digital S/PDIF audio data. It always outputs the same number of audio channels as is present in the input HDMI signal.

EDID Options

The SY-HX150-14-18G splitter has a 5 way DIP switch, providing the following 32 EDID options. In the following table **U** means switch set to Up position (indicated as 1 on the unit); and **D** means switch set to Down position (indicated as 0 on the unit).

EDID Mode	EDID Resolution	Audio Channels	Audio Format
UUUUU	1080p60	2.0	Stereo
UUUUD	1080p60	5.1	Dolby DTS
UUUDU	1080p60	7.1	HD Audio
UUUDD	1080i60	2.0	Stereo
UUDUU	1080i60	5.1	Dolby DTS
UUDUD	1080i60	7.1	HD Audio
UUDDU	1080p60 3D	2.0	Stereo
UUDDD	1080p60 3D	5.1	Dolby DTS
UDUUU	1080p60 3D	7.1	HD Audio
UDUUD	4K30 4:4:4	2.0	Stereo
UDUDU	4K30 4:4:4	5.1	Dolby DTS
UDUDD	4K30 4:4:4	7.1	HD Audio
UDDUU	4K30 4:2:0	2.0	Stereo
UDDUD	4K30 4:2:0	5.1	Dolby DTS
UDDDU	4K30 4:2:0	7.1	HD Audio
UDDDD	4K60 4:4:4	2.0	Stereo
DUUUU	4K60 4:4:4	5.1	Dolby DTS
DUUUD	4K60 4:4:4	7.1	HD Audio
DUUDU	4K60 4:4:4 HDR	2.0	Stereo
DUUDD	4K60 4:4:4 HDR	5.1	Dolby DTS
DUDUU	4K60 4:4:4 HDR	7.1	HD Audio
DUDUD	Copy EDID from HDMI LOOP OUT		
DUDDU	Copy EDID from PoC Output 1		
DUDDD	Copy EDID from PoC Output 2		
DDUUU	Copy EDID from PoC Output 3		
DDUUD	Copy EDID from PoC Output 4		
DDUDU	USER EDID		
DDUDD	USER EDID		
DDDUU	**Enable Test Pattern at 1080p 60Hz**		
DDDUD	**Enable Test Pattern at 4K 30Hz**		
DDDDU	**Enable Test Pattern at 4K 60Hz**		
DDDDD	PC Control Mode		

The five **Copy EDID** commands only perform a copy if a display is detected at the respective output. The EDID data is stored in the transmitter until it is overwritten by another EDID copy. The factory default setting for these locations is 1080p60 with 2.0CH Audio.

The **USER EDID** switch settings select the USER EDID memory location. The factory default for the USER EDID location is 1080p60 with 2.0ch stereo audio.

The **Enable Test Pattern** switch options allow manual selection of currently set Test Pattern, at 1080p 60Hz, 4K30 30Hz, or 4K60Hz resolution.

The **PC Control Mode** setting allows the use of RS232 commands to configure the EDID setting for the HDMI input connector. The other switch setting will always take priority over the RS232 setting when the EDID switch is not in the **PC Control Mode** position.

RS232 Control Commands

All the configuration commands in the following sections must be sent to the RS232 connector on rear of the SY-HX150-14-18G splitter.

Only the "**r fw version!**" command can be sent into the SERVICE USB on the front of the SY-HX150-R-18G receiver using the SERVICE USB. Connecting to the SERVICE USB on the receiver will appear as a serial port on the PC or laptop.

The serial port settings for all control commands are:

115200 baud, 8 data bits, no parity and one stop bit.

All commands are in lowercase and any spaces shown must always be included. Commands should be sent as a single burst as manual typing will often result in the response `unknown command!`

Every command must end with both the exclamation mark (!). A carriage-return (0x0d) and line-feed character (0x0a) can be transmitted, but it will be ignored by the SY-HX150-14-18G.

Every response message will terminate with a carriage-return and line-feed (0x0d 0x0a) character sequence.

In the following tables, **x**, **y** and **z** represent parameter values that are presented in the description of the respective command.

System Commands

RS232 Command	Description	Response Example
s power z!	Set the power state of the transmitter: **z** = 0 for off **z** = 1 for on	Power on
r power!	Get the current power on/off state	Power on[note 1]
s reboot!	Reboot the transmitter unit	Reboot...[note 1]
s reset!	Restore the splitter to factory defaults	Reset to factory defaults[note 1]
help!	List all available commands	(note 2)
r type!	Get device model type	
r status!	Get current device status	(note 3)
r fw version!	Get the installed firmware versions	MCU BOOT: Vx.xx.xx MCU APP: Vx.xx.xx
r link in!	Get signal status for the HDMI input	hdmi input: connect
r link out y!	Get the link status for the outputs: **y** = 0 for all outputs **y** = 1 ~ 4 for the HX outputs 1 to 4 **y** = 5 for the HDMI output	hdmi loop out: connect

Notes:

1. The "**r power!**", "**s reboot!**" and "**s reset!**" commands all respond with the **System initialising…** messages.
2. The "**help!**" command will list all available command for installed firmware version.
3. The "**r status!**" command responds with the power mode status, input/output connection status and current EDID setting.

4K Down-Scaling

The Xcalibur 14 can downscale 4K video to 1080p at the same refresh rate, by either directly downscaling 4K signals to 1080p or the 'Auto' mode (default) which depends on the connected Display capability.

The downscaling feature is independently controllable for the HDMI Loop-out and each of the HX outputs.

RS232 Command	Description	Response Example
s hdmi downscaler mode x!	Select down-scaler mode for the local HDMI Loop-out. **x** = 0 **Auto** down scaling mode (default) **x** = 1 **4K→1080p** down scaling mode **x** = 2 **Bypass** mode. No down-scaling	hdmi output Down-Scale: auto
r hdmi downscaler mode!	Get the current status of the output down-scaler mode for the local HDMI Loop-out.	hdmi output Down-Scale: 1080p
s hx y downscaler mode x!	Select down-scaler mode for HX outputs. **y** = 0 for all HX outputs **y** = 1 ~ 4 **y** = 1 ~ 4 for HX outputs 1 to 4 **x** = 0 **Auto** down scaling mode (default) **x** = 1 **4K→1080p** down scaling mode **x** = 2 **Bypass** mode. No down-scaling	hx output 1 Down-Scale: auto
r hx y downscaler mode!	Get the current status of the output down-scaler mode for the HX outputs. **y** = 0 for all outputs **y** = 1 ~ 4 for the HX outputs	hx output 3 Down-Scale: Bypass

HDCP Options

The following commands control the input and output HDCP options for Xcalibur 14 Splitter:

RS232 Command	Description	Response Example
s input hdcp x!	Enable / disable the HDCP for the HDMI input. **x** = on **x** = off	input hdcp on
r input hdcp!	Return the current status of the input HDCP.	input hdcp off
s hdmi hdcp z!	Select HDMI Loop-out HDCP mode. **z** = 0 HDCP off **z** = 1 HDCP 1.4 **z** = 2 HDCP 2.2 **z** = 3 HDCP bypass mode	hdmi output hdcp: HDCP 2.2
r hdmi hdcp!	Get the HDCP mode of the HDMI Loop out	hdmi output hdcp: BYPASS

RS232 Command	Description	Response Example
s hx y hdcp z!	Select HX output HDCP mode. **y** = 0 for all HX outputs **y** = 1 ~ 4 for HX outputs 1 to 4 respectively **z** = 0 HDCP off **z** = 1 HDCP 1.4 **z** = 2 HDCP 2.2 **z** = 3 HDCP bypass mode	hx output 4 hdcp: OFF
r hx y hdcp!	Get the HDCP mode for HX output **y.** **y** = 0 for all HX outputs **y** = 1 ~ 4 for HX output 1 ~ 4 respectively	hx output 2 hdcp: BYPASS

Output Stream Control

The following commands control the output data stream for each output, by enabling or disabling the HDMI or HX output data streams.

RS232 Command	Description	Response Example
s hdmi stream z!	Enable or disable the HDMI Loop-out data stream **z** = 0 to disable **z** = 1 to enable	Enable hdmi out stream Disable hdmi out stream
r hdmi stream!	Get the HDMI Loop-out data stream status	Enable hdmi out stream Disable hdmi out stream
s hx y stream z!	Enable or disable the HX output data stream. Where **y** is in the range 0 to 4 as follows: **y** = 0 for all HX outputs **y** = 1 ~ 4 for HX output 1 to 4 respectively **z** = 0 to disable **z** = 1 to enable	Enable hx out 1 stream Disable hx out 4 stream
r hx y stream!	Get the HX output data stream status. Where **y** is in the range 0 to 4 as follows: **y** = 0 for all Hx outputs **y** = 1 ~ 4 for Hx output 1 ~ 4 respectively	Enable hx out 2 stream Disable hx out 3 stream

EDID Settings

These commands can only be used when the 5-way DIP switch on the back of the Xcalibur 14 is set to the PC Control Mode position (All switches down, DDDDD).

RS232 Command	Description	Response Example
s edid in from z!	Set an EDID option for the HDMI input **z** = 1 ~ 27, for the EDID options given in the next following tables.	Input EDID: 1080p, Stereo
s edid user1 <EDID_DATA>!	Program the user1 EDID memory with the contents of <EDID_DATA>. The data must be a valid EDID file and must contain 256 bytes	User1 EDID data **<EDID data>**
r edid user1!	Read the EDID data stored in the user1 EDID memory	User1 EDID data **<EDID data>**
r edid in!	Read the EDID setting of the HDMI input	Input EDID: 4K2K60_444,Stereo Audio 2.0
r edid in data!	Read the EDID data present at the HDMI input	Input EDID: **<EDID data>**

The **z** parameter for the "**s edid in from z!**" command will set one of the following 27 EDID options for the HDMI input:

z Value	HDMI Resolution (max)	Audio Format	Audio Channels
1	1080p	Stereo Audio	2.0
2	1080p	Dolby/DTS	5.1
3	1080p	HD Audio	7.1
4	1080i	Stereo Audio	2.0
5	1080i	Dolby/DTS	5.1
6	1080i	HD Audio	7.1
7	1080p 3D	Stereo Audio	2.0
8	1080p 3D	Dolby/DTS	5.1
9	1080p 3D	HD Audio	7.1
10	4K2K30 4:4:4	Stereo Audio	2.0
11	4K2K30 4:4:4	Dolby/DTS	5.1
12	4K2K30 4:4:4	HD Audio	7.1
13	4K2K60 4:2:0	Stereo Audio	2.0
14	4K2K60 4:2:0	Dolby/DTS	5.1
15	4K2K60 4:2:0	HD Audio	7.1
16	4K2K60 4:4:4	Stereo Audio	2.0
17	4K2K60 4:4:4	Dolby/DTS	5.1
18	4K2K60 4:4:4	HD Audio	7.1
19	4K2K60 4:4:4 HDR	Stereo Audio	2.0
20	4K2K60 4:4:4 HDR	Dolby/DTS	5.1
21	4K2K60 4:4:4 HDR	HD Audio	7.1

The following table gives the **z** values used in "**s edid in from z!**" command when copying display EDID data connected to a port, or using stored User EDID.

z Value	Description
22	Copy EDID from HDMI LOOP output
23	Copy EDID from HX 1 output
24	Copy EDID from HX 2 output
25	Copy EDID from HX 3 output
26	Copy EDID from HX 4 output
27	User EDID data stored in User location

Test Pattern

The Xcalibur 14 splitter (SY-HX150-14-18G) can generate 6 different Test Patterns, with 3 possible resolution settings. The selected Test Pattern is activated by sending the "**s test pattern on!**" command and deactivated with the "**s test pattern off!**" command. The activated Test Pattern is displayed on the LOOP OUT and all HX outputs simultaneously.

Note: Test pattern can also be activated via the 5W DIP switch.

The default Test Pattern is set to 'Chequerboard at 1080p 60Hz', but disabled (Test Pattern off).

RS232 Command	Function	Response Example
s tp pattern x resolution y!	Set the desired Test Pattern and its resolution. **x** = 0 Chequerboard **x** = 1 Red **x** = 2 Green **x** = 3 Blue **x** = 4 Black **x** = 5 White **y** = 0 1080p60 **y** = 1 4K30 **y** = 2 4K60	Test pattern: Red Resolution: 4K60
r tp pattern!	Get the current settings for the Test Pattern	Test pattern: Green Resolution: 1080p60
s test pattern on!	Enable the Test Pattern for all outputs	Test pattern: on
s test pattern off!	Turn off the Test Pattern for all outputs	Test pattern: off

Video Keep-Alive (VKA)

When there is no signal present at the HDMI input, VKA can be activated. VKA is suspended should the HDMI input signal resume, or VKA time out. The following VKA options are available:
- Output current Test Pattern – Maintain output video stream (Video Keep-Alive).
- No timing output (default) – (VKA off) No output video; hence video drop-out.
- The Test Pattern can be displayed permanently or for a programmable time interval.

RS232 Command	Description	Response Example
s vka time x!	Set the time, in minutes, after which the VKA times out and Test Pattern will be suspended. **x** = 1 - 240 **x** = 0 or > 240 will set the VKA to never time out.	Video keep-alive timeout: 38 minutes
r vka time!	Get the current maximum timeout value.	Video keep-alive timeout: 38 minutes
s vka mode x!	Enable / Disable the VKA mode: **x** = 0 VKA mode off (default) **x** = 1 VKA mode on	Video keep-alive on
r vka mode!	Get the current state of the VKA mode.	Video keep-alive off

Sending RS232 Commands through the Receivers

The following commands are to control the routing of RS232 commands to the Receivers. Sending command to the Receiver requires the following steps:
1. Select the desired Receiver using the **s rs232 bypass hx y!** command.
   Note: When all ports are enabled (**y** = 0), no Receiver RS232replies are sent back.
2. Set third-party device baud rate using **s device baud w size x stop y parity z!** command.
3. Send RS232 pass-through commands to the Receiver.
   Note: To communicate with a different Receiver, repeat steps 1. & 2. with the new target Receiver details.

4. To stop any further commands being sent through the Receivers, use the **s rs232 bypass hx 5!** command to disable the RS232 output for all the HX output ports
5. The Xcalibur 14 splitter will only respond to its own commands at a baud rate of 115200.

RS232 Command	Description	Response Example
s rs232 bypass hx y!	Enable / disable the HX outputs for RS232 command operation. **y** = 0 Enables all outputs for RS232, **y** = 1 ~ 4 for HX outputs 1 to 4 respectively **y** = 5 Disable all outputs for RS232	Bypass Command Responses table
r rs232 bypass hx!	Get the current RS232 states for the PoC outputs	Bypass Command Responses table
s device baud w size x stop y parity z!	Set the receiver RS232 parameters. **w** = 2400, 4800, 9600, 19200, 38400, 57600, 115200 (baud rate) **x** = 7 or 8 (number of Data bits) **y** = 1 or 2 (number of Stop bits) **z** = none, even, odd (parity)	receiver device COM setting baud rate: 57600 data size: 8 stop: 1 parity: none
s RS232 time x!	Set the time (ms) to wait before sending the same command to the next HX output. **x** is in the range 200 ~ 5000 (default is 200)	send RS-232 command wait time 200ms

Bypass Command Responses

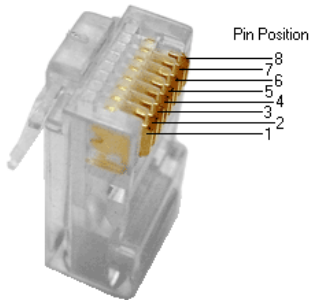The response messages to the above RS232 bypass commands are detailed as follows:

RS232 Command	Xcalibur 14 Response Example
s rs232 bypass hx 0!	RS-232 connect to all Hx outputs
s rs232 bypass hx 1!	RS-232 connect to Hx OUT1
s rs232 bypass hx 2!	RS-232 connect to Hx OUT2
s rs232 bypass hx 3!	RS-232 connect to Hx OUT3
s rs232 bypass hx 4!	RS-232 connect to Hx OUT4
s rs232 bypass hx 5!	RS-232 not connect to Hx OUT
r rs232 bypass hx!	Any one of the above responses

System Configuration
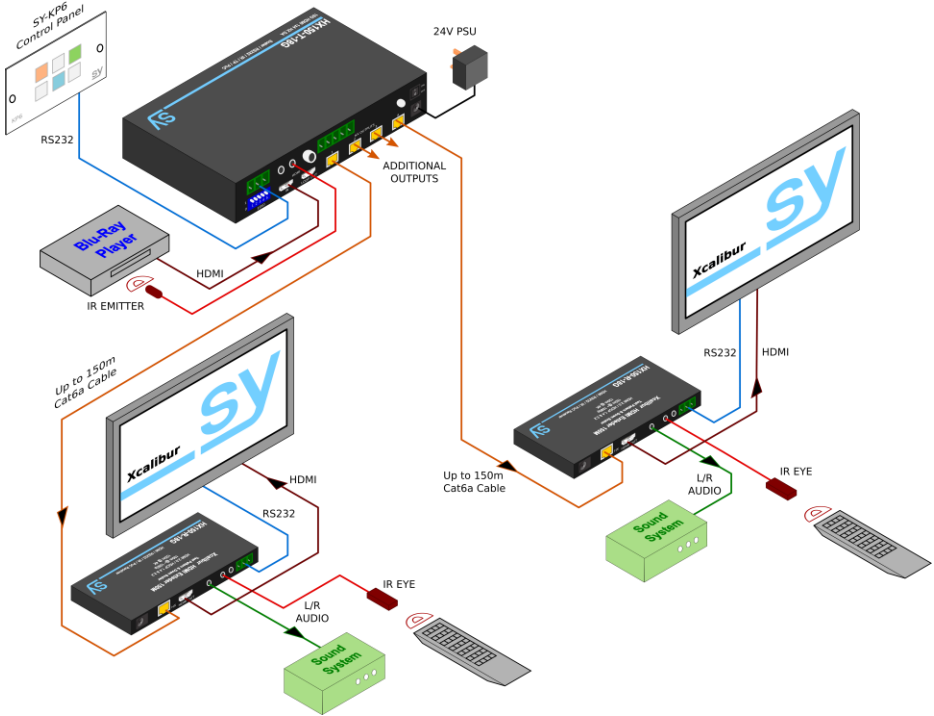
RJ45 Wiring

Both RJ45 connectors must be wired identically.

RJ45 Plug Colour Code (T568B)
Contact Side - Tab is on Back

Pin	Colour
8	BROWN
7	WHITE / BROWN
6	GREEN
5	WHITE / BLUE
4	BLUE
3	WHITE / GREEN
2	ORANGE
1	WHITE / ORANGE

IMPORTANT: The signals used by this extender set will not pass through any Ethernet device. The Splitter and Receivers provided in this set will only work with the Xcalibur product range.

Please make sure that the Cat6 cable uses 4 pairs of 23AWG solid copper wires. Do not use inferior cables such as CCA, as these exhibit high resistances.

It is best for the cable run between the HX (RJ45) connectors on this splitter and the connected receiver units must be a continuous cable run of either cat5e, cat6a or cat7.

It is recommended for the cable run between the Xcalibur 14 and the Receiver units to be a continuous run.   Cat6a cabling is preferred for best signal quality.

IR Pass Through

The IR IN on the rear of the Xcalibur-14 Splitter unit sends the IR signal to all the remote Receivers simultaneously. The IR OUT will mix the IR signals from all the receivers, so it is best to ensure that only one Xcalibur 11 Receiver is sending IR signal at a time. The emitter connector can be a 3.5mm mono style, in which case the entire sleeve is the +ve signal.
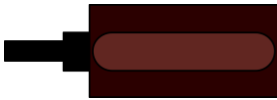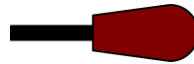

Figure 3 - Xcalibur IR Eye

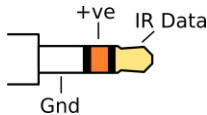*Figure 4 -Xcalibur IR Emitter*
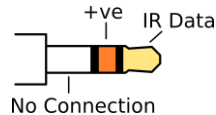

Figure 5 - IR Eye Connector Wiring

Figure 6 - IR Blaster Connector Wiring

Factory Defaults

The following table lists the factory default settings for each command type:

Command	Factory Default Setting
Input HDCP	On
HDMI Loop-out HDCP	Bypass
HX Output HDCP	Bypass
HDMI Loop-out Down-scaler Mode	Auto
HX Down-scaler Mode	Auto
VKA Mode (Video-Keep Alive)	Off
VKA Timeout Value	0
Test Pattern and Resolution	Chequerboard at 1080p 60Hz
Test Pattern State	Off
RS232 Send Wait Time	200ms

Specifications

General

	Xcalibur 14 Splitter	Xcalibur 11 Receiver
HDMI Resolutions	All HDMI and PC resolutions up to 4K2K 60 Hz 4:4:4	
HDMI Standard	Up to HDMI 2.0	
HDCP Compliance	HDCP 1.4 & HDCP 2.2	
HDMI Audio	L-PCM 2.0, 2.1, 5.1, 6.1, 7.1 Dolby Digital, Dolby TrueHD, Dolby Digital+ (DD+), DTS-ES, DTS HD Master, DTS-HRA, DTS-X	
Analogue Audio Out	Differential Stereo L+R (balanced)	Stereo L/R analogue output – 0.775 V rms
Coax Audio Out	All input HDMI audio modes are supported	
RS232 Port	RS232 (Tx, Rx) control and bypass to receivers	RS232 (Tx, Rx) bypass port
RS232 Settings	Control Mode: 115200,n,8,1 Bypass Mode: As required for 3rd party device	As required for device being controlled
IR IN, IR OUT	25-60 KHz carrier frequency	
Transmission Distance	**150m** @ 1080p, **120m** @ 4K2K	
Power Supply	24V 2.7A	
Power Consumption	19W Max	7.25W Max (per Receiver)

Environmental

Operating Temperature	0 ~ 40°C (32 ~ 104°F)
Operating Humidity	10 ~ 90% RH (non-condensing)

Physical

Dimensions (WxDxH)	220 x 130 x 40 mm	140 x 65 x 18 mm
Weight	855g	250g

Packing List

- 1x User Manual
- 1x Main unit
- 4x Receivers
- 1x 24V 2.7A Power Supply
- 1x UK 13A Mains Cable to IEC-60320 C13 Connector
- 4x Pairs of Receiver mounting Plates
- 1x Pair Main Unit Mounting Brackets
- 4x Screw-On Feet
- 5x 3-way Screw Terminal Connectors
- 1x 5-way Screw Terminal Connector
- 5x IR Detectors
- 5x IR Emitters

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. **ONLY USE** the power supply provided. If an alternate supply is required, check the voltage, polarity and that it has sufficient power to supply the device it is connected to.

2. **DO NOT** operate this product outside the specified temperature and humidity range given in the above specifications.

3. Ensure there is adequate ventilation as this product generates heat while operating.

4. Repair of this product 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 indoors and 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 and/or your local dealer before contacting SY Technical Support.

2. When calling SY Technical Support, please provide the following information:
   - Full 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. The 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.

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