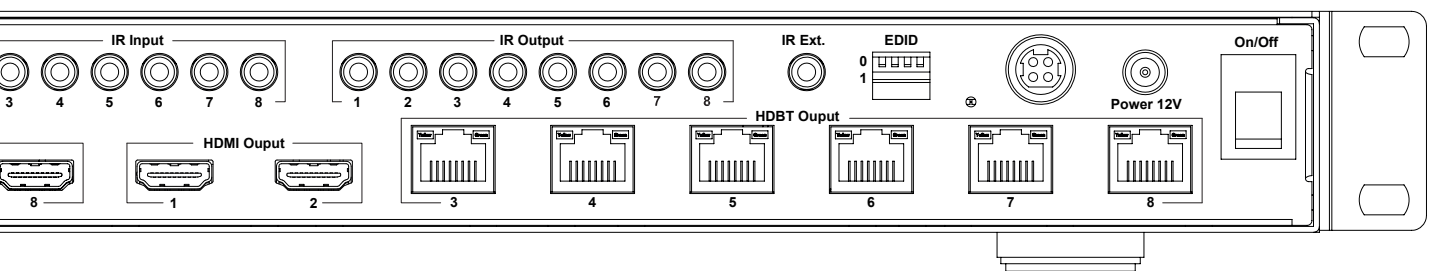
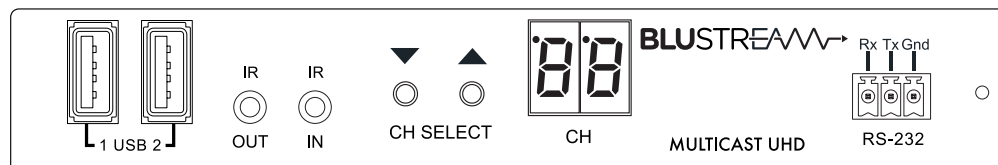
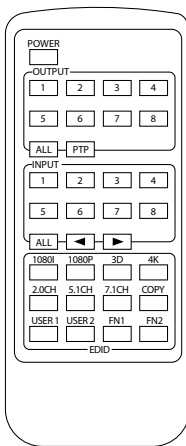
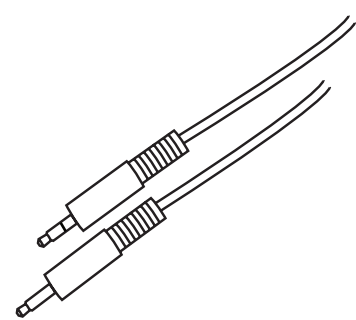
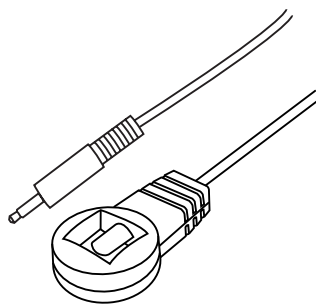
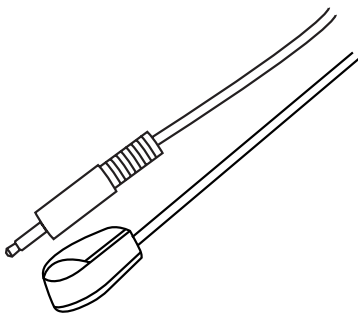


# User Integration Guide

for IR control & IR pass-through of Blustream equipment



## Contents

Introduction	02
IR Control Definitions	03
IR Components - IR Emitter, Receiver & Link Cables	04
IR Connections on Blustream Equipment	04
Source & Matrix IR Control	05
Display IR Control	06
IR Connectivity via Phoenix	06
Routed IR Control	07
IR Matricing	08
Use of 12V IR Emitters & Receivers	08
Troubleshooting IR	09 & 10

## Introduction

Whilst becoming less utilised in the professional AV installation industry as more equipment becomes controllable over IP or serial, IR is still widely used for basic line-of-sight control. Blustream has a range of HDMI and HDBaseT™ products that include multiple options for both control of the Blustream product, and for pass-through of IR commands where line-of-sight is not an option.

Many Blustream products can be controlled using the supplied IR remote control, the same as with a satellite receiver or Blu-Ray player. Users can point the remote directly at the Blustream equipment to control the function of the unit, or use its IR Extension port if the unit is local, but not in direct line-of-sight (i.e. in a cupboard under the TV).

IR pass-through is required where the HDMI source is located in a remote location from the zone where the media is being viewed. This could be a satellite receiver installed into a rack located in a different part of the property to the screen it is being watched on. IR pass-through allows for the user to send IR signals from the satellite receivers IR remote control through the Blustream distribution equipment to where the satellite receiver is located.

Blustream equipment is supplied with the necessary IR hardware required. This guide has been written to give users a more in-depth understand of how IR works, how it is routed or distributed through a system, and an overview of the Blustream components used.

**Please note:** most Blustream IR products and equipment work on a 5V line, and may not be compatible with alternative manufacturers IR solutions / equipment. When using third party 12V IR control solutions please use the supplied Blustream IRCAB cable for IR line conversion (12V to 5V). Damage caused to Blustream equipment as a consequence of using other manufacturers IR equipment is not covered under warranty. There are some Blustream products that allow for both 5V and 12V IR equipment to be connected, please see relevant section on page 8 for more information.

## IR Control Definitions

IR controls can be distributed through Blustream equipment in many differing ways. Some of which are detailed below:

### Local IR Control

Local or direct IR control would be standing directly in front of a unit and pressing the desired button to carry out the function required. This is line-of-sight control with no distribution required. Most Blustream matrix and switcher products have an IR extension port that allows for the Blustream unit to be located out of sight in a cupboard. An IR receiver can be connected to the unit which will be located in line-of-sight view.

When controlling the I/O (input / output) structure of a Blustream matrix product using local IR control, it is necessary to tell the matrix what output (zone) is being controlled first, followed by the input (source) the matrix needs to switch to.

**For example:** pressing the button marked 'Output 4', followed by the button marked 'Input 1' will switch zone 4 to watch the source connected to input 1 of the matrix.

### IR Pass-Back

HDBaseT™ and Multicast (Video over IP) technology allows for IR controls to be sent alongside AV signals through the CAT cable infrastructure. Control of the "matrix" can be achieved by pointing the Blustream IR remote at an IR receiver connected within the remote zone to switch to a new input. The IR signal terminates inside the matrix or Multicast receiver, so there is no requirement for an IR emitter to sit in front of the IR window of the HDBaseT™ matrix or Multicast control module.

When wanting to switch to a new input where the IR command is being sent from the zone, it is only necessary to press the required input number on the matrix remote control. The matrix knows the location that the IR command has been received from so will only switch this zone.

**Please note:** it is only possible to amend the I/O structure of the matrix for the zone where the IR command is being sent from. This stops the user in one zone from affecting a different zone to which they are located.

### Discrete IR Control

HDBaseT™ and Multicast technology allow for discrete IR control to source devices located and directly connected to the matrix, or Multicast Transmitters. The matrix has numbered IR outputs. These numbers correspond to the relevant inputs of the matrix where each IR emitter is placed directly over the IR window of the source device.

The IR control commands received at each of the outputs / zones of the matrix can be routed back to only the source being watched.

In practise, this means that a matrix can have 2x satellite receivers of the same brand, that would utilise the same IR remote controls and IR commands. Discrete IR allows for two separate outputs / zones to watch a receiver each, independantly controlling the satellite receiver they are watching, without affecting the other.

**For example:** if output 1 is watching HDMI input 1, IR emitter 1 will send IR codes received in zone 1 to that particular source device, not the other sources.

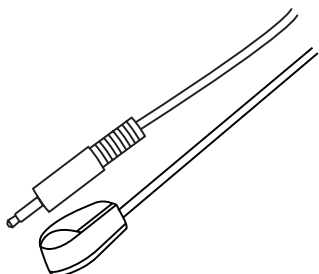
### IR Pass-Through

IR pass-through is used to send non-discrete IR signals in both directions across a point-to-point link between a source device and a display, where discreet IR control is not required. Generally utilised on a HDBaseT™ extender kit, or a Blustream Multicast Transmitter / Receiver pair being used as an extender, where there is no need for discrete IR control, but there is a requirement for IR comands to be passed in either direction (from screen to source, or, source to screen).

## Infrared (IR) Components

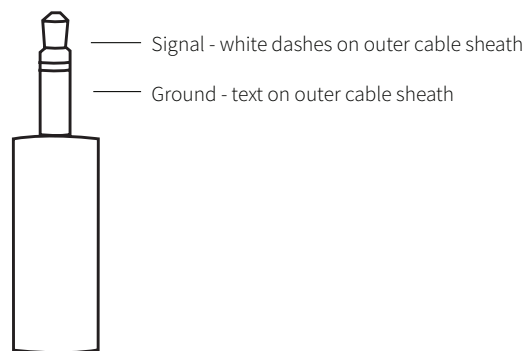
### IR Emitter - IRE1 (1.45m cable length - not including connector or emitter bud)

The Blustream 5V IR emitter is designed for IR control of AV hardware. The emitters have a short-range output and have been specifically designed for discreet IR control. Use the supplied double-sided sticky pad\* to attach the bottom / flat surface of the tear-drop shaped emitter bud directly over the IR window of the device needing control.



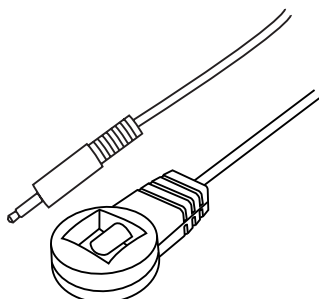
\* ensure both surfaces are clean before applying the sticky pad - failure to clean the surface may lead to the emitter not sticking in the desired location

### Pin out - IR Emitter - 3.5mm mono jack



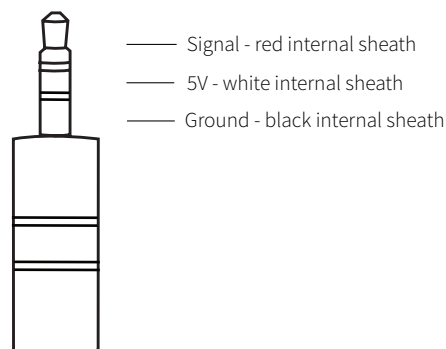
### IR Receiver - IRR (1.45m cable length - not including connector or receiver bud)

The Blustream 5V IR receiver is designed to receive an IR signal and distribute to, and through Blustream products. Use the supplied round double-sided sticky pad\* to attach the back of the round casing to stick onto a surface in a suitable place to receive an IR signal.



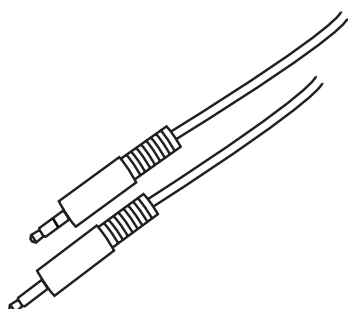
\* ensure both surfaces are clean before applying the sticky pad - failure to clean the surface may lead to the receiver not sticking in the desired location

### Pin out - IR Receiver - 3.5mm stereo jack



### IR Link Cable - IR-CAB (1.95m cable - not including connectors)

The Blustream 12V to 5V IR converter cable is designed to convert a 12V IR signal from a third party IR control product to a 5V IR signal compatible with Blustream IR inputs.

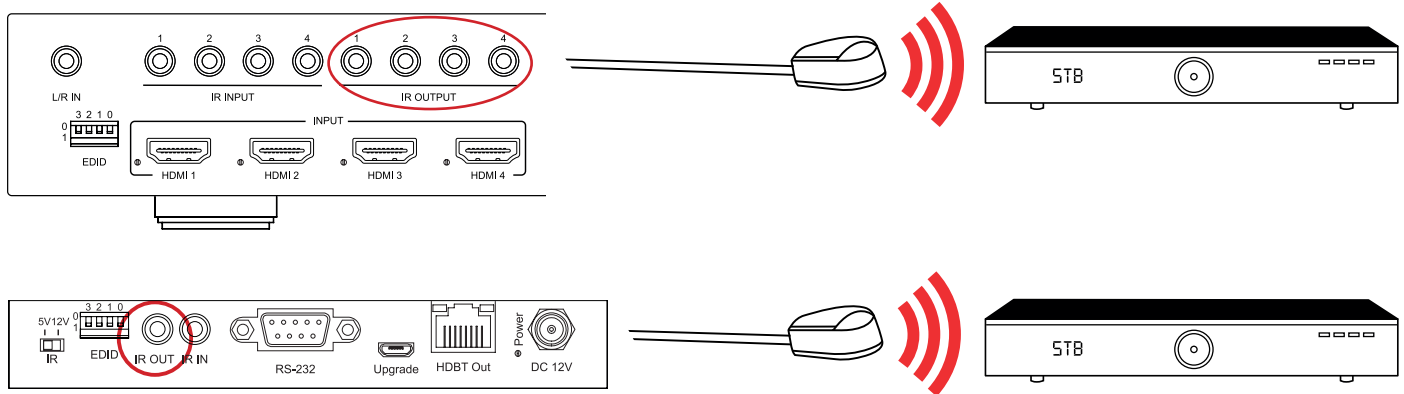


**Please note:** The Blustream IR-CAB cable is directional and will only convert a 12V IR signal to a 5V IR signal. The cable direction (direction the IR signal travels through the cable) is clearly marked on the module closest to the stereo connector.

Pin out connectivity mirrors the IRE1 and IRR cables as noted above.

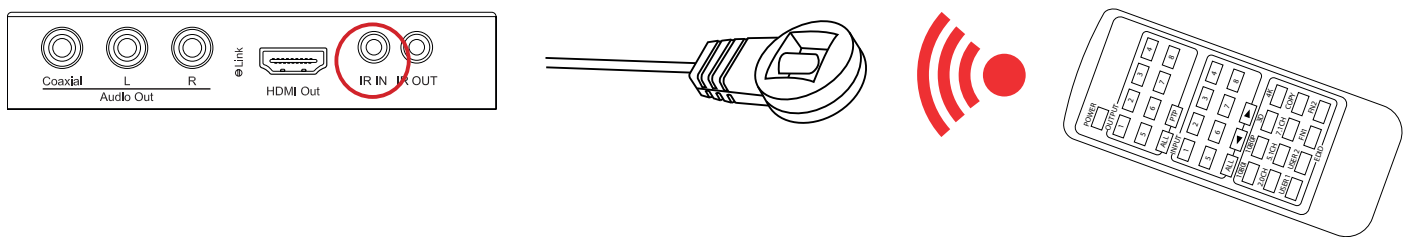
## Source Control via IR (Matrix / TX end)

Connecting a 5V IR emitter (IRE1) to a Blustream HDBaseT™ Matrix / Transmitter, or Multicast Transmitter to obtain source control. Connect the IRE1 to the relevant 3.5mm 'IR OUTPUT', 'IR OUT', or 'IR TX' port of the Blustream equipment:



## Source / Matrix Control via IR (RX end)

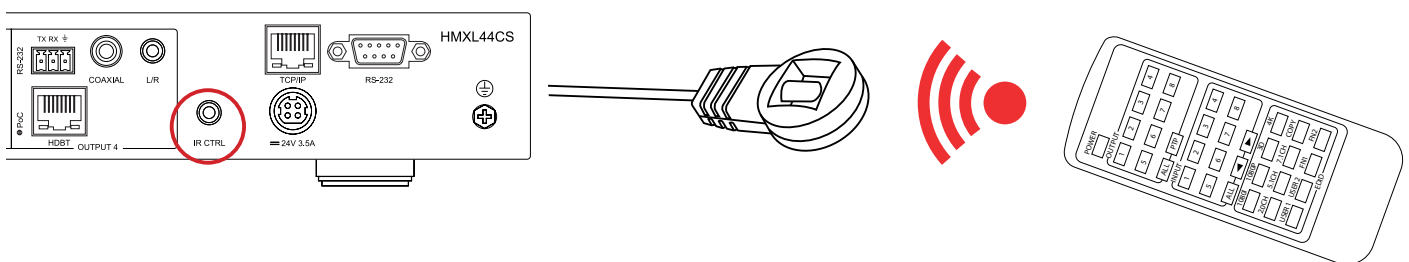
Connecting a 5V IR receiver (IRR) to a Blustream HDBaseT™ or Multicast Receiver to obtain source / matrix control. Connect the IRE1 to the relevant 3.5mm 'IR OUTPUT', 'IR OUT', or 'IR TX' port of the Blustream equipment:



**Please note:** when controlling the matrix using this method, the matrix knows which zone the IR command is being received from, so only requires a one-button press to select the input number required for the zone.

## Extended Matrix Control via IR (Matrix end)

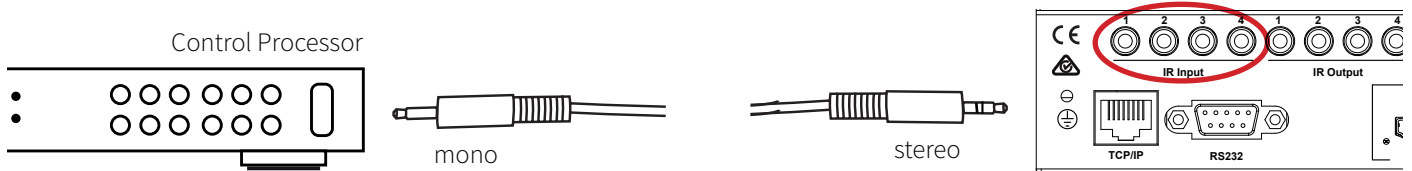
Connecting a 5V IR receiver (IRR) to the 'IR Ext' or 'IR CTRL' port to obtain matrix, or ACM200 control where the IR window of the matrix is hidden away in a cupboard, or out of line-of-sight view from the remote:



**Please note:** when controlling the matrix using this method, a two-button press is required. First select the output, then the input required.

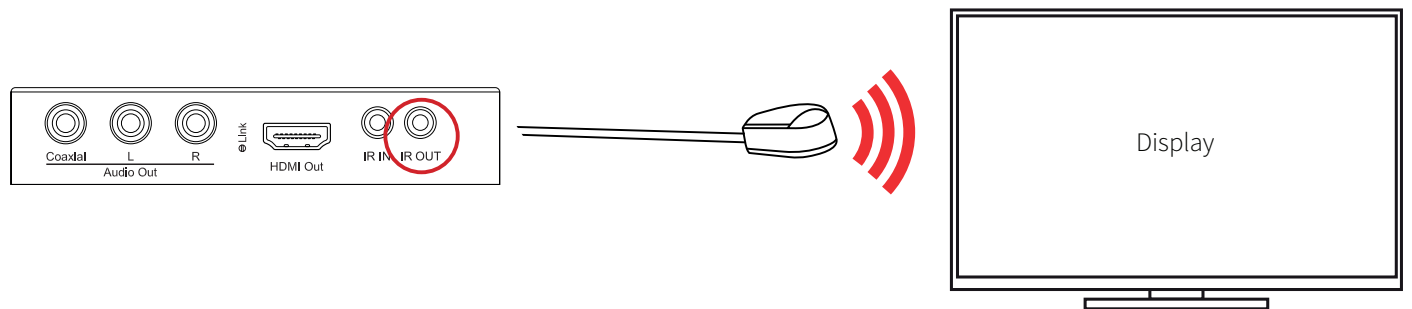
## Display Control via IR (Matrix / TX end)

Connecting to a Blustream HDBaseT™ Matrix or Transmitter to obtain display / zone IR control. Connect the stereo jack of the IR-CAB (3.5mm to 3.5mm link cable) to the 'IR INPUT', 'IR IN', or 'IR RX' port of the Blustream equipment. The mono jack is connected to the relevant 3rd party control processors IR output. For display control when using Blustream Multicast, see the IR Routing / Matricing section on the next page.



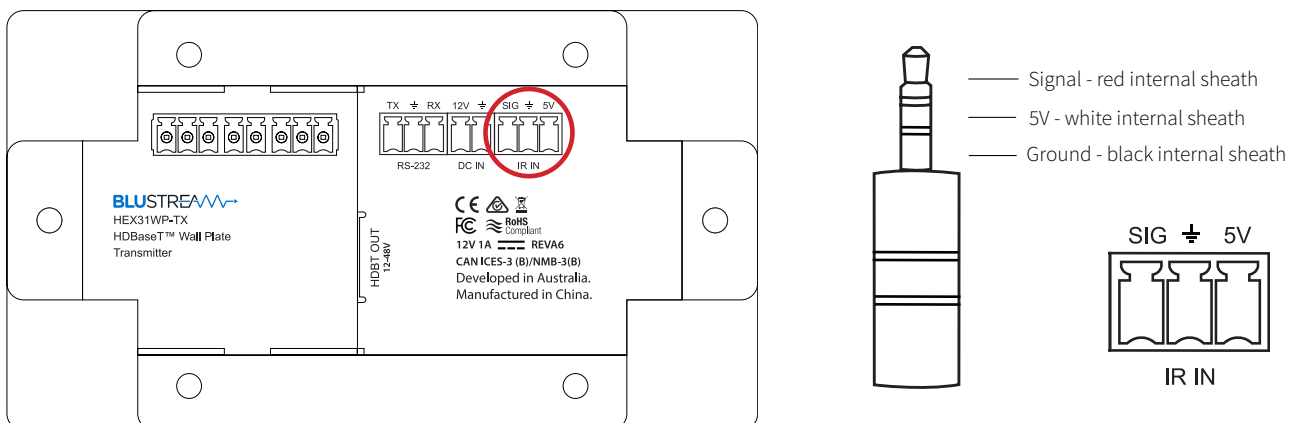
## Display Control via IR (RX end)

Connecting a 5V IR Emitter (IRE1) to a Blustream HDBaseT™ or Multicast Receiver to obtain display control from a control processor. Connect the IRE1 to the relevant 3.5mm 'IR OUTPUT', 'IR OUT', or 'IR TX' port of the Blustream HDBaseT™ / Multicast Receiver:



## IR Connectivity - via Phoenix

Some Blustream products feature IR connectivity via a 3-pin Phoenix connector. When wiring these products, it is essential to ensure that the cabling is terminated correctly to the phoenix block. Please use the pin-out descriptions below to ensure that the Signal, Ground, and 5V pins are wired correctly (phoenix block supplied with product as required).

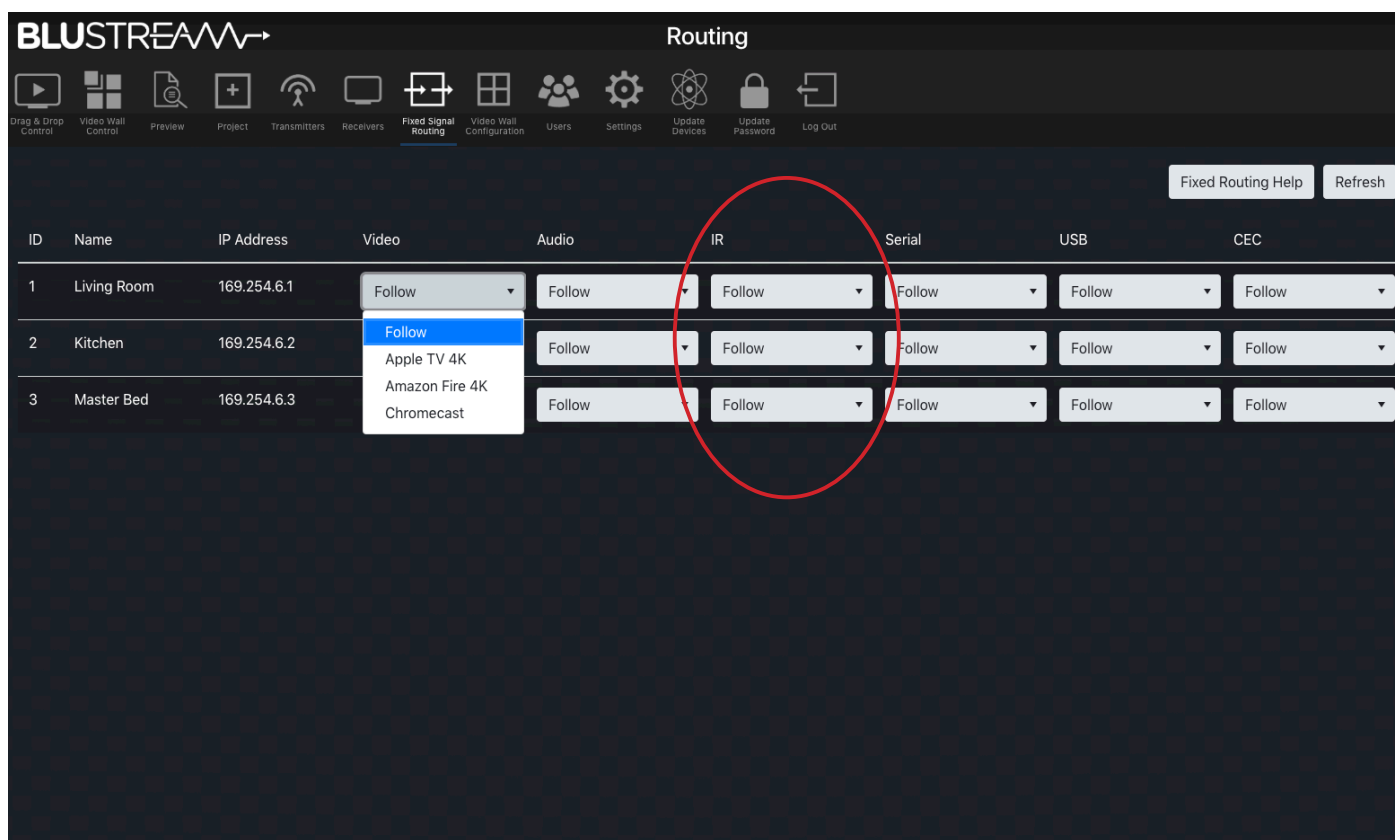


## Fixed Routing (Multicast - Video over IP)

Where IR pass-through on a Blustream HDBaseT™ matrix is required (for display control - head end to zone), there will always be the relevant number of IR inputs for the HDBaseT™ outputs for individual connectivity to each zone.

The Blustream Multicast solution is a fully modular build with infinite possibilities to build systems of different I/O structures. Each Multicast transmitter features a single IR Input which allows for a single connection to a Multicast receiver. Therefore there will always be systems that have more receivers than transmitters meaning that there would not be enough physical IR inputs on the transmitters to allow for IR control to every zone. Especially for systems with (eg) 2x inputs to 11x outputs.

The Blustream Multicast solution features the ability to route IR commands from an IR input on a transmitter to any receiver in the system, regardless of the HDMI signal transfer at that time. This is known as Fixed Routing. A fixed IR route can be configured in the web-GUI of the ACM200 for each IR input, and also the route amended through the API to gain control of multiple displays from a single input.



By default, each IR route is set to “Follow” the HDMI video data from TX to RX. Using the drop down selection in the IR column of the example above, a fixed route can be made from the transmitters IR Input to the IR output of a receiver by selecting the relevant transmitter for each zone.

This fixed routing can also be changed to accommodate more IR inputs than are physically available by issuing commands from a 3rd party controller to change the route the IR will take through the system. This can be activated using the API of the ACM200.

## IR Matricing

Much like 'Fixed Routing' in the Blustream Multicast product, certain Blustream HDBaseT™ matrix products allow for Infrared matricing where an IR signal can be routed through the system independently to the video and audio route.

There are a few ways in which this function can be utilised:

- Installs where an AVR is located at the head end of the system (rack mounted), remote from the zone in which it feeds audio to. In cases like this, discrete IR control is still required for source devices, but a separate "fixed" IR route to the AVR is required for permanent IR control for functions such as volume, or mute.
- Installs where a single IR command can be sent to the matrix to power on / off multiple displays of the same type (or that share the same 'power' command/s)
- Installs where a remote AVR and screen require IR control allowing for 2x separate IR input connections from a processor to travel to a zone over HDBaseT™.

IR matricing is not considered to be an everyday function, and as such: is not available on all Blustream matrix products; and, would need to be configured by serial / IP.

To check for IR matricing capabilities on a Blustream matrix, please either refer to the product API (which is available to download from the back of the User Guide - download from the Blustream website), or call a member of the Technical Support department for advice.

Example API commands:

Command	Function
MXIR xx FR yy	Remote RX:xx IR output from local IR in:yy xx=[00]: All remote IR output, [01..16]: Remote RX IR output yy=[01..16] Local IR in
MXIR GI (+-)xx	Global all IR In signal goes to which IR output:xx xx=[17..32]: Local IR output xx=[33..48]: Remote HDBT receiver IR output +: Add xx to current setting -: Remove xx from current setting
MXIR GO (+-)xx	Global all IR Out signal goes to which IR input:xx xx=[17..32]: Local IR input xx=[33..48]: Remote HDBT receiver IR input xx=[49]: Global all IR in +: Add xx to current setting -: Remove xx from current setting

## Use of 12V IR Emitters & Receivers

Some more recent Blustream products feature the ability to pass-through or accept a 12V IR signal. Products such as the HEX70CS-KIT, HEX100CS-KIT, HEX150CS-KIT, ACM200, or CustomPro PRO-8IR-V2 all contain a switch to set the product to accept and distribute a 12V IR signal when using 3rd party IR equipment.

Please check the specifications of the product in question before specifying, or contact a member of the Blustream Technical Support team to discuss system requirements.

**Please note:** using Blustream 5V IRE, IRE2 or IRR cabling with products when set to accept and distribute 12V IR signals may result in the IR cabling being damaged. All Blustream product that has the option to accept or distribute a 12V IR signal will be set by default to 5V.



## Troubleshooting IR Issues

Because IR is a line-of-sight technology, this can in itself present issues when trying to distribute an IR control command across a system. See below some simple troubleshooting tips to start fault finding before swapping out equipment:

### Check the remote control:

- Ensure you are using the correct remote control to issue the commands through the system. Check sending the IR command directly to the device to its IR window (local to the unit).
- It is always worth having fresh batteries or fully charged remotes when using an IR distribution system. Repeating the IR signal over longer distances sometimes needs a more powerful emission of IR than would be received from a set of flat batteries.
- Some source remote controls are not IR based. Some remotes can emit either an IR or an RF control command. Be sure that the remote is toggled to IR, or does emit IR commands as standard.
- Some mobile phone cameras can pick up an IR command by putting the remotes IR emitter directly in front of the camera lens. The IR emission shows up as a very feint purple/red burst of light.

### Check the position of the IR window on the equipment you are controlling:

- It is easy with some AV equipment to identify the IR window on the unit, but some equipment is harder to identify. Every device will have its IR receiver in a different position. Sometimes they are identified in the device manual, or is marked on the front of the device. Sometimes they can be hidden, or can be identified by a thinning of plastic (like a window for the IR to get in) on the front of the device. Shining a torch along the front of a device can assist to locate the optimal position for an emitter to be placed. Most IR emitters (like the Blustream IRE1) need to be placed directly over the top of the window / sensor.
- Check the Blustream IR receiver is located in a position where the user will point their IR remote. Usually this would be located somewhere local to the display itself. Users will generally point their remote directly at a display when they want to control their equipment, so there is no point locating an IR receiver to the side of where the user will be sat.
- Do not locate IR receiving equipment directly under bright lighting. IR is a form of light. Locating equipment directly underneath bright sources of light can 'wash-out' the IR control signal before it is received by the equipment. This can lead to signals not being received at all, or only some signals being received (meaning multiple button presses by the user until it works).

### IR Bleed:

- When locating "same brand" equipment close to one another within a rack, i.e satellite receivers, it is possible that the discrete IR signal meant for one receiver "bleeds" across and controls the other receiver at the same time. This can be combatted by moving the locations of the receivers to a different position within the rack (essentially increasing the distance between the IR windows), or by using a hood to cover the top of the IR emitter to stop the IR command from 'bleeding' to other devices.
- The same can be attributed to different equipment that uses the same IR string. For instance, some AV equipment can use standardised IR commands - so a 'Play' command from a Blu-Ray player may match the command for 'mute' on an amplifier. Luckily this does not happen often as most major AV equipment manufacturers use specific IR commands for their equipment which will not interfere with other equipment. A hood over the IR emitter will stop any 'bleed' from controlling equipment located nearby.

### Distance of IR signals being sent:

- As noted above, IR signals can be 'washed-out' by other sources of light being picked up en-route to the IR window or IR receiver, or they will lose strength over extended distance. Try to keep IR 'over air' distances to no more than 5 metres to ensure consistent control.

## Troubleshooting IR (continued)...

### Can control the HDBaseT™ matrix (input select), but not the source device:

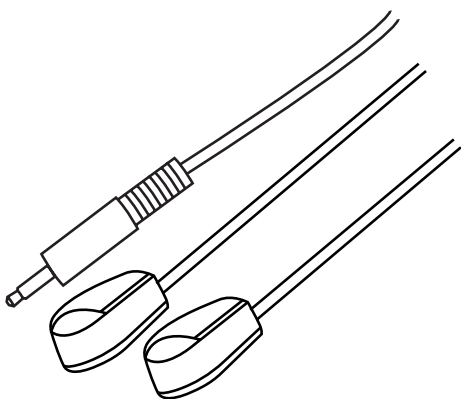
- This means that the IR receiver connected to the HDBaseT™ receiver is correct and working. But the IR connection to the source is not working.
- Ensure the jack plug/s are inserted all the way into the sockets. Not fully inserting the plug will not connect the pins of the jack to the required terminal inside the socket.
- Ensure the remote being used is an IR remote control, and not RF / Bluetooth / WiFi. This can be tested by placing the IR Emitter onto another source device and testing the relevant remote across the same link.
- Ensure you are using a Blustream IR Emitter (IRE1) and not a 3rd party IR emitter product.
- Check the IR Emitter is connected to the correct 'IR Output' of the matrix for the source you want to control (the source connected to HDMI input 2 should receive a discrete command from IR Output 2).
- Ensure the IR Emitter is located directly over the top of the IR window of the product you are wanting to control. If it is unclear the position of the IR window, it may be useful to enlist the help of a second person to hold the IR emitter in different positions across front of the unit until a solid IR connection can be made.
- Swap the IR Emitter with another of the same cable - Blustream provide multiple IR cables inside matrix products.

### Cannot get control to a display from a control processor:

- The IR-CAB cable is directional. Ensure that the stereo jack is plugged into the matrix, and the mono jack is plugged into the control processor output.
- Ensure that the stereo jack is plugged into the corresponding IR Input port (the display connected to HDBaseT output 2 should receive the command from IR Input 2).
- Ensure the jack plug/s are inserted all the way into the sockets. Not fully inserting the plug will not connect the pins of the jack to the required terminal inside the socket.
- Ensure you are using a Blustream IR-CAB link cable, and not a 3rd party IR link product. A standard stereo (headphone style) extension will not work for this type of connection.
- Ensure the control processor is sending an IR command from the correct output.
- Swap the IR-CAB with another of the same cable - Blustream provide multiple IR cables inside matrix products.

### Extending IR over longer distances, or to multiple outputs:

- Sometimes it is necessary to control multiple pieces of AV equipment with a single IR link. Blustream have a dual eye emitter (IRE2) which provides a dual IR emitter bud on the end of a single 3.5mm mono jack. The IRE2 cable is sold separately to all products but can be purchased through your authorised Blustream Distribution Partner or Reseller.



If having to splice together multiple IR cables to provide extra emitter diodes, or extending/shortening cables, this is done so at the users own risk. The 5V IR line provided by Blustream equipment will only have a set amount of current to drive the IR emission to the diodes. "Splitting" this signal multiple times, or extending over a longer cable will decrease the strength of the signal.

The use of 3rd party stereo or mono 3.5mm splitters can be used as a clean way of doing this without cutting into IR cables. For extension over longer distances, it is recommend to use an IR over Cat extension product which are available from other manufacturers.



[www.blustream.co.uk](http://www.blustream.co.uk)

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