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KVM Extension
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Introduction

WELCOME

Thank you for choosing the AdderLink Infiniti (aka ALIF) family of high capacity digital extenders/switches. By encoding high quality DVI video, digital audio and USB data into Internet Protocol (IP) messages, ALIF units offer flexible ways to link peripherals and systems via standard networks.

This guide covers the ALIF 1000 and ALIF dual (1000 series) models, both of which can transfer single link DVI video, digital audio and USB signals across your network. The ALIF dual models can additionally handle either a second single link DVI video stream or one very high resolution dual link DVI video connection.

ALIF 1000 and ALIF dual variants both provide a choice of link connections. Each supports both copper-based Gigabit Ethernet cabling as well as Fiber Channel over Ethernet (FCoE). These can be used in parallel to provide up to 2 Gigabit connection speeds with the added benefit of link redundancy that can maintain operation in the event of a failed connection. Additionally, the ALIF dual models also benefit from a Management port that makes configuration even more straightforward.

ALIF units promote sharing: you can arrange for a limitless number of screens and speakers, distributed anywhere across the network, to receive video and audio. You can also switch between any number of transmitter units using a single screen, keyboard and mouse in order to monitor a potentially vast collection of remote systems.

All units feature browser-based configuration utilities to allow quick and easy set up, from near or far.

Mixing ALIF dual units with the original ALIF 1000 series

ALIF dual (1000 series) are complementary to the original ALIF 1000 series models which do not support dual DVI channels or fiber optic linking. It is possible to mix ALIF and ALIF dual transmitters and receivers on a network. However, whenever the two types are cross connected, the extra abilities of the ALIF dual units will be temporarily disabled.

The newer ALIF 1000 models now include the ability for a second Gigabit Ethernet or Fiber Channel over Ethernet connection as per the ALIF dual models. ALIF 1000 units can be mixed with ALIF dual (1000 series) without any loss of functionality.

ALIF FEATURES

AFZ lossless codec

The AFZ compression scheme is primarily focused on improving the performance for "natural" images (i.e. photographs and movies) and is automatically selected whenever there is a benefit to do so. The AFZ codec is lossless and is very low latency (a small fraction of a frame delay). It generally achieves 50% improvement (in compression) over the H.264 scheme for any areas of the screen that consist of images, gradients, shadows etc., elements commonly found in modern desktop environments.

To maintain compatibility with non AFZ-enabled transmitters and receivers there is an automatic switching method which will revert back to H.264 compression when an ALIF (1000) receiver is connected to the newer ALIF 1000 series or ALIF dual (1000 series).

New feature: AFZ+ codec

AFZ+ complements the existing AFZ codec by providing greater compression for increased speed where visual perfect results are not the primary focus. The [transmitter video configuration page](#) allows you to choose the required compression mode. Choices are:

- 'Visual perfect' - only uses visual perfect AFZ.
- 'Adaptive' - guarantees frame rate, builds to visual perfect.
- 'Smoothest video' - forces the maximum compression, or
- 'Advanced' - allows you to choose the mode:

- WZ+ only (good perf.)
- WZ+ Maximum compression
- WZ+ Middle compression
- WZ+ Maximum compression

Magic Eye (anti-dither support added)

The Magic Eye feature increases performance and reduces network traffic when ALIF units are used with Apple Macs and other host computers that have dithered video output. It also improves performance if the video source is noisy (e.g. from a VGA-to-DVI converter).

Dithering is a technique used by some graphics cards to improve perceived image quality by continuously varying the color of each pixel slightly. This gives the illusion of more shades of color than the display can really reproduce, and smooths the appearance of gradually shaded areas in images. Unfortunately dithering is an issue for KVM extenders such as ALIF because it makes the image slower to be changing all the time even when it is static, thus creating much more network data than can be carried by a Gigabit Ethernet. The result is a reduction in video frame rate, which the user sees as slow mouse response.

Magic Eye works by ignoring small variations in the video from frame to frame. It is enabled by default as it is not obvious to the user that his poor mouse behaviour is caused by dithering. In most cases Magic Eye is invisible, but it can produce slight color inaccuracies on the monitor. For full color accuracy, Magic Eye can be disabled (within the [transmitter video configuration page](#)) for video sources which are not dithered or noisy.

One-to-one configuration

The simplest configuration links one RX unit to a single TX unit, either by a direct link or over much greater distances via a high speed network. In both cases, Gigabit cable linking and/or fiber can be used. When both are deployed, connection speeds of up to 2 Gigabits are possible.



One-to-many configuration

Using multicast techniques, an unlimited number of receiver* can receive video and audio data streams from a single TX unit.



*A maximum of thirteen concurrent USB inputs (via multiple RX units) are permitted to a single TX unit.

ALIF and A.I.M.

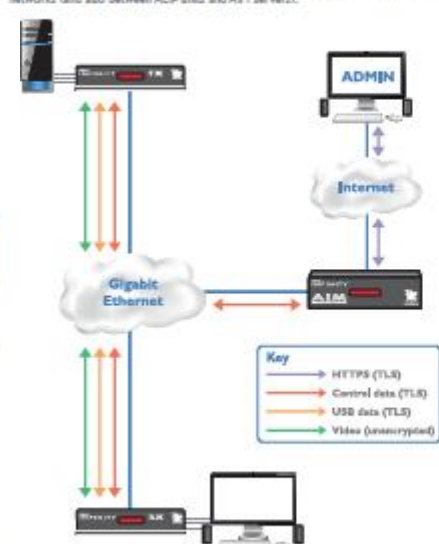
Where multiple ALIF units are used on a network, we have developed the AdderLink Infiniti Management (A.I.M.) server to allow comprehensive and secure central control of all transmitters, receivers and users.

When using an A.I.M. server to configure ALIF units, it is vital that all ALIF units that you wish to locate and control are set to their factory default settings. Otherwise they will not be located by the A.I.M. server. If necessary, perform a [factory reset](#) on each ALIF unit.

Please also see [Appendix C - Tips for success when networking ALIF units](#)

Transport Layer Security (TLS)

ALIF 1000 and ALIF dual units support the industry standard Transport Layer Security (TLS) protocol. This offers protection against eavesdropping and tampering by third parties when data are transferred between ALIF transmitters and receivers across networks (and also between ALIF units and A.I.M. servers).



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Teaming operation

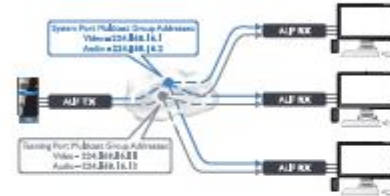
The System and Teaming ports of ALIF units can be used in parallel to produce two important benefits:

- Improved connection speeds up to 8 Gigabits per second, and
- Important link redundancy that can maintain operation in the event of a failed connection.

Teaming offers immediate speed improvements in a one-to-one arrangement.



...and also in multicast installations:



ADDERLINK INFINITY (1002) UNIT FEATURES

The ALIF 1002 units are housed within durable, metallic enclosures with most connectors situated at the rear panel - the Ethernet ports are situated on the front panel. The smart front faces also feature the operation indicators.

ALIF 1002 transmitter - front



Indicators

- NET On when valid network link is present.
- SER On when the ALUX (serial) port is enabled and active.
- AUD On when audio is enabled and active.
- USB On when the USB link with the connected PC is active.
- DVI On when a video input signal from the PC is detected.
- PWR Power indicator.

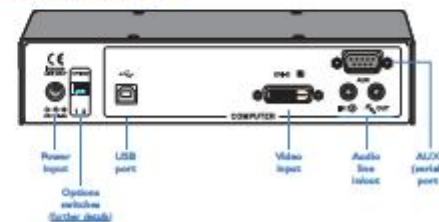
ALIF 1002 receiver - front



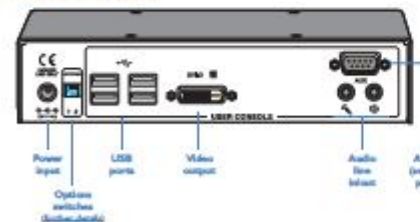
Indicators

- NET On when valid network link is present.
- SER On when the ALUX (serial) port is enabled and active.
- AUD On when audio is enabled and active.
- USB On when USB is enabled and active.
- DVI On when DVI video is enabled and active.
- PWR Power indicator.

ALIF 1002 transmitter - rear



ALIF 1002 receiver - rear



ADDERLINK INFINITY DUAL UNIT FEATURES

The ALIF dual units are housed within durable, metallic enclosures with most connectors situated at the rear panel - the Ethernet ports are situated on the front panels. The smart front faces also feature the operation indicators.

ALIF dual transmitter - front



These six indicators clearly show the key aspects of operation:

- NET On when valid network link is present.
- SER On when the AUX (serial) port is enabled and active.
- AUD On when audio is enabled and active.
- USB On when the USB link with the connected PC is active.
- DVI On when a video input signal from the PC is detected.
- PWR Power Indicator.

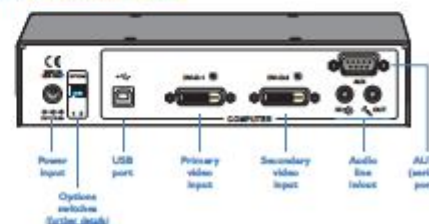
ALIF dual receiver - front



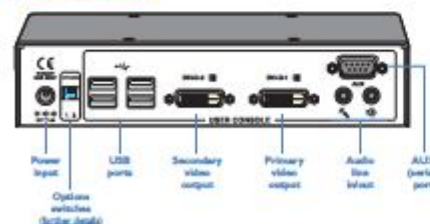
These six indicators clearly show the key aspects of operation:

- NET On when valid network link is present.
- SER On when the AUX (serial) port is enabled and active.
- AUD On when audio is enabled and active.
- USB On when the USB link with the connected PC is active.
- DVI On when a video input signal from the PC is detected.
- PWR Power Indicator.

ALIF dual transmitter - rear



ALIF dual receiver - rear



SUPPLIED ITEMS - ALIF 1002

ALIF transmitter (1002T) package



ALIF receiver (1002R) package



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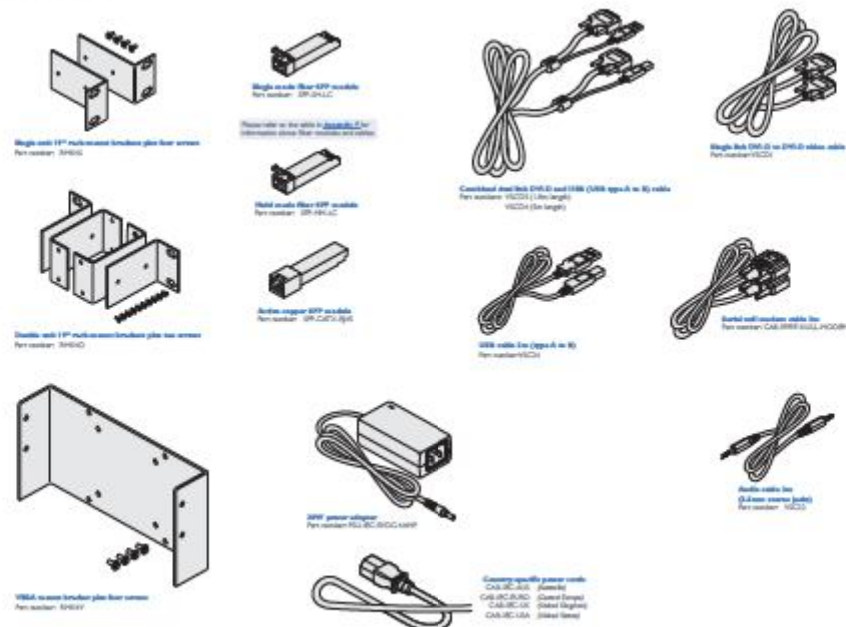
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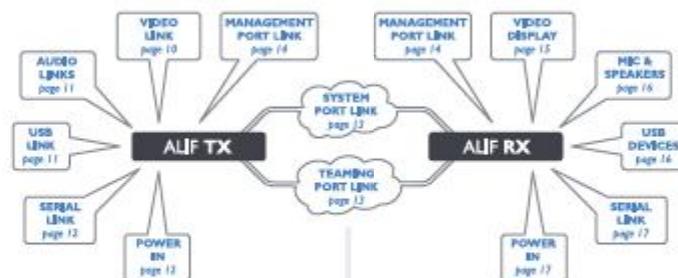


CONNECTIONS

Installation involves linking the ALIF TX unit to various ports on the host computer, while the ALIF RX unit is attached to your peripherals:

MOUNTING

Please see [Appendix H](#) for details about mounting options for the ALIF units.



Click a connection to see details

IMPORTANT: When using an Asterisk Infratech Management box to configure ALIF units, it is vital that all ALIF units that you wish to locate and control are set to their factory default settings. Otherwise they will not be located by the ALIP server. If necessary, perform a [factory reset](#) on each ALIF unit. Please also see [Appendix C - Tips for success when networking ALIF units](#).

TX video link

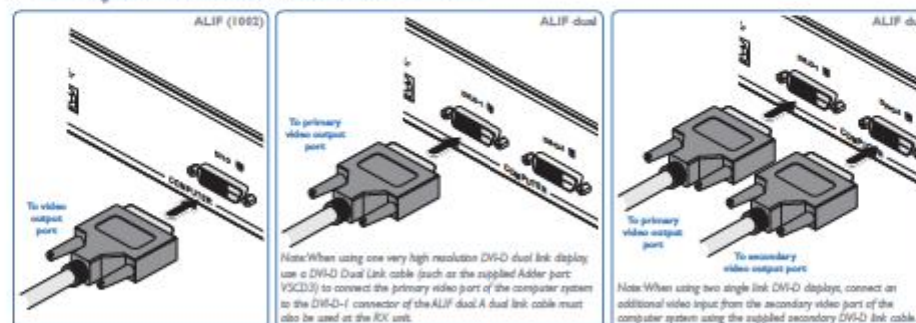
Standard ALIF (1000) units support one Single Link video display at clock speeds up to 165MHz (equivalent to a maximum resolution of 1920 x 1080 at 60Hz).

ALIF dual units can simultaneously support up to two Single Link high resolution video displays at clock speeds up to 165MHz (1920 x 1080 at 60Hz maximum); or can alternatively support a single Dual Link very high Resolution video display at clock speeds up to 220MHz (equating to an example display mode of 2560 x 1440 at 60Hz).



To make a video link:

1. Wherever possible, ensure that power is disconnected from the ALIF and the host computer.
2. Connect your digital video link cable(s) to the DVI-D socket(s) on the TX unit rear panel:



3. Connect the plug at the other end of the cable(s) to the corresponding DVI-D video output socket(s) of the host computer.

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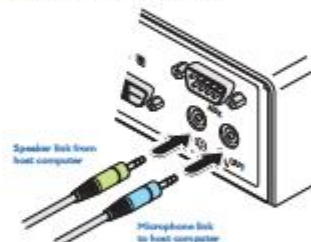
TX audio links

ALIF (1000) and ALIF dual units support two way stereo digital sound so that you can use a remote microphone as well as speakers.



To make audio links

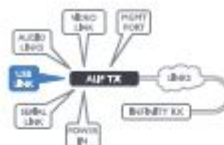
- 1 Connect an audio link cable between the **AUDIO LINK** socket on the TX unit rear panel and the speaker output socket of the host computer.



- 2 Where a microphone is to be used: Connect a second audio link cable between the **AUX** socket on the TX unit rear panel and the Line In socket of the host computer.

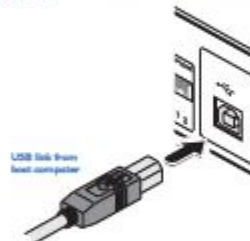
TX USB link

ALIF (1000) and ALIF dual units act as USB 2.0 hubs and so can provide four sockets at the RX unit with only a single connection at the TX unit.



To make a USB link

- 1 Connect the free A connector of the supplied USB cable to the USB port on the TX unit rear panel.



- 2 Connect the free A connector of the cable to a vacant USB socket on the host computer.



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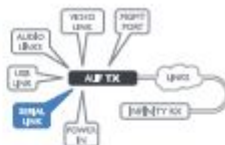
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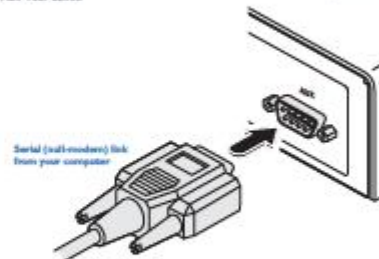
TX AUX (serial) port

The AUX port is an RS232 serial port that allows extension of RS232 signals up to a baud rate of 115200. The port has software flow control, but no hardware flow control.



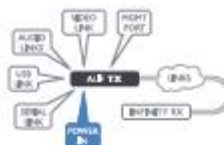
To connect the AUX port

- 1 Connect a suitable serial 'null-modem' cable (see [Appendix E](#) for pin-out) between a vacant serial port on your computer and the AUX port on the right hand side of the ALIF rear panel.



TX power in

Each ALIF unit is supplied with a power adaptor and country-specific power cord. When all other connections have been made, connect and switch on the power adaptor unit.



To apply power in

- 1 Attach the output lead from the power adaptor to the IEC socket on the rear panel of the unit.



Note: Ensure that Options switches 1 and 2 are both in the 'OFF' (up) position to enable normal operation of the unit. See [Options switches](#) for details.

- 2 Connect the IEC connector of the supplied country-specific power cord to the socket of the power adaptor.
- 3 Connect the power cord to a nearby main supply socket.

Note: Both the unit and its power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 40°C. Do not place the products in contact with equipment whose surface temperature exceeds 40°C.



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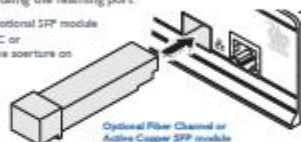
TX/RX high speed links

ALIF (100G) and ALIF dual units can be either connected directly to each other or via a high speed network. The connections can be copper-based Gigabit Ethernet as well as Fiber Channel over Ethernet (FCoE). These can be used in parallel to provide up to 2 Gigabit connections speeds.

A single System port (Gigabit Ethernet) is provided as standard on the right side of the front panel. Additionally, the Teaming port, located just to the left, allows you to insert either an optional Fiber Channel SFP module or Active Copper SFP module. The chosen module can then allow either a fiber optic or additional Gigabit Ethernet link to be used in parallel with the fixed System (Gigabit Ethernet) port.

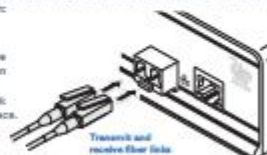
To link ALIF dual units using the Teaming port:

- 1 Insert the appropriate optional SFP module (SFP-MF-LC, SFP-S1-LC or SFP-CATX-S43) into the aperture on the ALIF front panel:



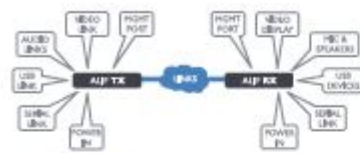
- 2 Make your connection(s) between the chosen SFP module and either the other ALIF unit or a suitable network switch:

Connect the transmit and receive fiber optic links to the sockets on the Fiber Channel SFP module. Then close the latch over the link connectors to lock them into place.



or

Connect a CAT 5, 5e, 6, or 7 cable to the socket on the Active Copper SFP module.



Please see [Appendix C](#) for important tips about networking ALIF units.

To link ALIF units using the System port:

- 1 Connect a CAT 5, 5e, 6, or 7 cable to the System port socket on the front panel of the ALIF unit.



- 2 Connect the other end of the cable either to the other ALIF unit or to a Gigabit Ethernet switch, as appropriate.

- 3 (For connections via a network) repeat steps 1 and 2 for the other ALIF unit.

Cable and fiber details

- For direct links over Ethernet cable, the length of cable should not exceed 100 metres (328 feet). Network cables used for connections may be category 5, 5e, 6 or 7 twisted-pair cable. ALIF TX units have an auto-sensing capability on their network interfaces, so for direct point-to-point connections, no "crossover" Ethernet cable is required.
- For direct links via fiber, varying distances can be achieved depending on the module and cable type used. Please refer to the table in [Appendix C](#) for detailed information. The fiber links must have crossovers.

TX/RX Management port (ALIF dual units only)

The Management port on each ALIF dual unit provides a consistent method to gain access to the Internal configuration utility of each ALIF dual. Although the configuration utility is accessible via the System (Gigabit Ethernet) port and also the Teaming port, if the ALIF dual units are being used in a point-to-point arrangement, then it would be necessary to temporarily reconnect each unit to a network in order to make configuration changes. The Management port allows the admin user to simply connect a computer directly to each ALIF dual unit and access the configuration utility using a consistent IP address - thus negating the need to know the main port addresses of each ALIF dual unit in advance.

To connect a computer to access the configuration utility:

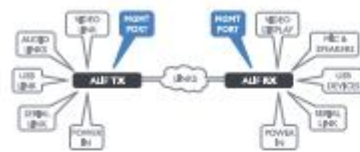
- 1 Connect a CAT 5, 5e, 6, or 7 link cable to the Management port socket located on the far left side of the ALIF dual front panel. The port automatically configures itself, so no cross-over cable is required (but is supported if you do use one).



- 2 Connect the other end of the link cable directly to the network port of your computer.
- 3 Use a web browser to gain access to the Internal configuration utility. The standard IP address of the Management port is 192.168.1.42.

Note: This standard IP address can be changed within the configuration utility.

Please see the section [Adding Link Infinity browser-based configuration utility](#) for further details.



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RX video display

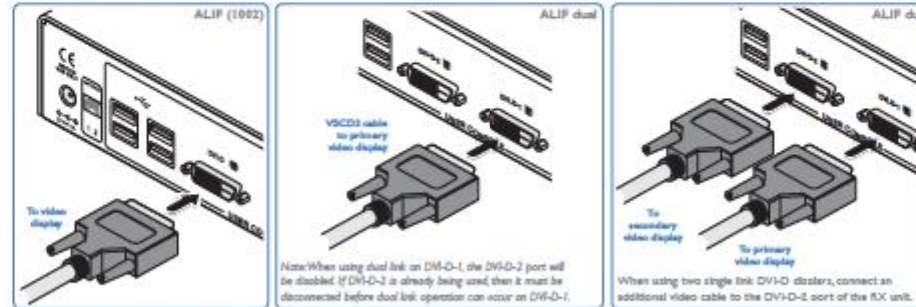
Standard ALIF (1000) units support one Single Link video display at pixel clocks up to 163MHz (equivalent to a maximum resolution of 1920 x 1080 at 60Hz).

ALIF dual units can simultaneously support up to two Single Link high resolution video displays at pixel clocks up to 163MHz (1920 x 1080 at 60Hz maximum); or can alternatively support a single Dual Link very high resolution video display at pixel clocks up to 320MHz (equating to an example display mode of 2560 x 1600 at 60Hz).



To connect video displays

1 Connect the lead from the primary video display to the DVI-D-1 (DVI-Q on ALIF 1000 models) socket on the RX unit rear panel.



2 (ALIF dual only) If required, connect the lead from the second video display to the DVI-D-2 socket on the RX unit rear panel.

RX microphone & speakers

ALIF units can support a microphone as well as speakers providing the necessary connections have been made between the ALIFTX unit and the host computer.



To connect a microphone (or line in) and/or speakers

1 Connect the lead from a mono microphone to the 2.5mm socket labeled on the rear panel.

2 Connect the lead from stereo speakers to the 2.5mm socket labeled on the rear panel.



3 Once the unit has been fully connected and powered on, access the RX System Configuration page to check that the Audio input type setting matches the connection that you have made to the port: line, mic or line (the latter provides +10dB gain).

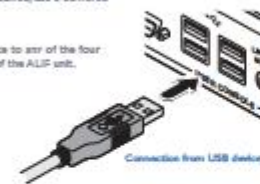
RX USB devices

The ALIF RX unit has four USB ports to which peripherals may be connected. The ports are interchangeable. To connect more than four peripherals, one or more USB hubs may be used. The total current that may be drawn from the USB ports is 1.2A, which should be sufficient for a keyboard, mouse (no more than 100mA each) and any two other devices (500mA maximum each). If more power for USB devices is required, use a powered USB hub.



To connect a USB device

1 Connect the lead from the device to any of the four USB sockets on the rear panel of the ALIF unit.



Supported USB Devices

The transmitter unit uses True Emulation technology to emulate the signals of certain USB peripherals to the computer. This means that those peripherals appear to the computer to be permanently connected, even when the receivers are switched elsewhere. This enables faster keyboard and mouse switching and allows for more than 11 identical USB devices. If the keyboards and mice are identical across the connected receivers, they are only enumerated once by the host. The following limitations apply:

- Keyboards, mice and other HID devices are supported.
- Storage devices (i.e. flash drives, USB hard disks, CD-ROM drives) are supported, but they may operate more slowly than with a direct connection.
- Isochronous devices (including microphones, speakers, webcams and TV receivers) are not currently supported.
- Many other devices (such as printers, scanners, serial adapters and specialist USB devices) will work, but due to the huge variety of devices available, successful operation cannot be guaranteed.
- If a device cannot be made to work, please contact Adler technical support as a special entry within the advanced configuration may solve it.

RX AUX (serial) port

The AUX port is an RS232C serial port that allows extension of RS232C signals to a baud rate of 115200. The port has software flow control, but no hardware flow control.



To connect the AUX port

- 1 Connect a suitable serial 'null-modem' cable (see [Appendix E](#) for pin-out) between the AUX port on the right hand side of the ALIF rear panel and your remote serial device.



RX power in

Each ALIF unit is supplied with an appropriate power adapter. When all other connections have been made, connect and switch on the power adapter unit.



To apply power in

- 1 Attach the output lead from the power adapter to the IEC socket on the rear panel of the unit.



- 2 Connect the IEC connector of the supplied country-specific power cord to the socket of the power adapter.
- 3 Connect the power cord to a nearby main supply socket.

Note: Both the unit and its power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 40°C. Do not place the products in contact with equipment whose surface temperature exceeds 40°C.

Configuration

INITIAL CONFIGURATION

ALIF units are designed to be as flexible as possible and this article extends also to their configuration.

Direct linking

Where ALIF transmitters and receivers are directly linked to each other, very little configuration action is required, provided that they have their factory default settings in place. If the standard settings have been changed in a previous installation, you may need to perform a factory reset on each unit.

Networked linking

Where ALIF units are connected via networked links, you can either configure them individually, or configure them collectively using an ALIF server.

- Configuring networked ALIF units individually - You need to specify the network addresses of the ALIF units so that they can locate each other. This is done by running the [AdderLink Infratec browser-based configuration utility](#) on a computer system linked to the same network as the ALIF units.
- Configuring ALIF units collectively - The AdderLink Infratec Management (ALIF) server allows you to configure, control and coordinate any number of ALIF transmitters and receivers from a single application.

IMPORTANT: When using ALIF to configure ALIF units, it is vital that all units that you wish to locate and control are set to their factory default settings. Otherwise they will not be located by the ALIF server. If necessary, perform a factory reset on each ALIF unit.

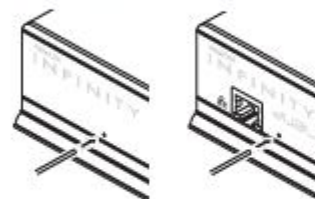
Please also see [Appendix C - Tips for success when networking ALIF units](#).

Manual factory reset

A factory reset returns an ALIF TX or RX unit to its default configuration. You can perform factory reset using the [AdderLink Infratec browser-based configuration utility](#) or by using this direct manual method.

To perform a manual factory reset

- 1 Remove power from the ALIF unit.
- 2 Use a narrow insulator (e.g. a straightened-out paper clip) to press-and-hold the recessed reset button on the front panel. With the reset button still pressed, re-apply power to the unit and then release the reset button.



Use a straightened-out paper clip to press the reset button while powering on the unit.

After roughly eight seconds, when the factory reset has completed, five of the front panel indicators will flash for a period of three seconds to indicate a successful reset operation.



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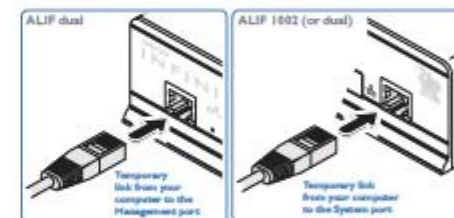
AdderLink Infinity browser-based configuration utility

The browser-based configuration utility within all TX and RX units requires a network connection between the ALUF unit and a computer on the same network. The configuration utility allows you to perform many important functions. Please see [Appendix A](#) for TX unit details and [Appendix B](#) for RX unit details.

It is possible to gain access to the internal configuration utility via any of the ports located on the front panel of each ALUF dual unit. For temporary connections on ALUF dual units, you are recommended to use the Management port. There is no Management port on ALUF 1002 models, so use the System port instead.

To connect a computer to access the configuration utility:

- 1 Connect a CAT 5, 5e, 4, or 7 link cable to either the Management (ALUF dual only) or System port socket on the front panel. The port automatically configures itself, so no cross-over cable is required (but is accepted if you do use one).



- 2 Connect the other end of the link cable directly to the network port of your computer.

To access the browser-based configuration utility:

- 1 Temporarily connect the ALUF unit and your computer, as discussed left.
- 2 Run a web browser on your computer and enter the IP address of the ALUF port that you are using.

The default settings are as follows:

	TX units	RX units	
Management port	192.168.1.42	192.168.1.42	ALUF dual only
System port	169.254.1.32	169.254.1.32	
Teaming port	169.254.1.42	169.254.1.42	

Note: Where the port addresses of a unit have been changed and are not known, providing it is appropriate to do so, perform a [manual factory reset](#) to restore the default addresses.

The opening page of the ALUF configuration utility should be displayed:



Use the menu options to choose the required configuration page.

You can find further information about the configuration pages for the TX and RX units within separate appendices later in this guide:

- [Appendix A - Transmitter \(TX\) unit configuration pages](#)
- [Appendix B - Receiver \(RX\) unit configuration pages](#)

PERFORMING AN UPGRADE

ALUF units are flash upgradable using the method outlined here. However, for larger installations we recommend that you use the AdderLink Infinity Manager (ALIM) to upgrade multiple ALUF units. When using the method below, the ALUF unit will be upgraded in sequence.

IMPORTANT: Upgrades must be performed on both the transmitters and the receivers at the same time. Mixed firmware operation is not supported.

WARNING: During the upgrade process, ensure that power is not interrupted as this may leave the unit in an inoperable state.

If the upgrade process is interrupted and fails, it may be necessary to switch to the backup firmware image in order to regain operation. See right for details.

To upgrade a single unit via network link:

- 1 Download the latest upgrade file from the Adder Technology website.
Note: There are separate upgrade files for TX and RX units.
- 2 Temporarily connect the ALUF unit and a computer via a network (see [AdderLink Infinity browser-based configuration utility](#) section for details).
- 3 Run a web browser on your computer and enter the IP address of the ALUF unit to be upgraded.
- 4 Click the Firmware Upgrade link. Within the Firmware Upgrade page, click the Choose File button. In the subsequent file dialog, locate the downloaded upgrade file - check that the file is correct for the unit being upgraded. The file contains main and backup images; you can choose to upgrade either the Main or the Backup.
- 5 Click the Upgrade Now button. A progress bar will be displayed (however, if your screen is connected to the unit being upgraded then video may be interrupted) and the indicators on the front panel will flash while the upgrade is in progress.
- 6 The indicators should stop flashing in less than one minute, after which the unit will automatically reboot itself. The upgrade process is complete.

Finding the latest upgrade files

Firmware files for the ALUF units are available from the Technical Support > Updates section of the Adder Technology website (www.adder.com).

Note: It is possible to downgrade the AdderLink Infinity firmware. After installing the older firmware, perform a factory reset on each AdderLink Infinity in order to clear the configuration file.

OPTIONS SWITCHES

A pair of Options switches are located on the rear panel of every ALUF unit.

Switch 1 - firmware image select

Each ALUF unit retains a backup firmware image which can be used in situations where the primary firmware becomes corrupted (most often through failed upgrade operations). Using the backup firmware will allow you to regain operation of the unit.

Option switch 1 OFF Normal operation using the main firmware
ON Operate using the backup firmware image

Option switch 2 is reserved and must remain in the OFF (left) position for normal operation.



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Operation

In operation, most ALP installations require no intervention once configured. The TX and RX units take care of all connection control behind the scenes so that you can continue to work unhindered.

FRONT PANEL INDICATORS

The six front panel indicators on each unit provide a useful guide to operation:



Indicators

These six indicators clearly show the key aspects of operation:

- NET On when valid network link is present.
- SER On when the AUX (serial) port is enabled and active.
- AUD On when audio is enabled and active.
- USB On when USB is enabled and active.
- DVI On when the DVI Video channel is enabled and active.
- PWR Power Indicator.

Further information

This chapter contains a variety of information, including the following:

- Getting assistance - see right
- [Appendix A](#) - Transmitter (TX) unit configuration pages
- [Appendix B](#) - Receiver (RX) unit configuration pages
- [Appendix C](#) - Tips for success when networking ALP units
- [Appendix D](#) - Troubleshooting
- [Appendix E](#) - Glossary
- [Appendix F](#) - RS232 'null-modem' cable, General specifications.
- [Appendix G](#) - Fiber modules and cables
- [Appendix H](#) - Mounting options
- [Safety Information](#)
- [Warranty](#)
- [Radio frequency energy statements](#)

GETTING ASSISTANCE

If you are still experiencing problems after checking the information contained within this guide, then we provide a number of other solutions:

- Online solutions and updates - www.adder.com/support
Check the Support section of the adder.com website for the latest solutions and firmware updates.
- Adder Forum - forum.adder.com
Use our forum to access FAQs and discussions.
- Technical support - www.adder.com/contact-support-form
For technical support, use the contact form in the Support section of the adder.com website - your regional office will then get in contact with you.



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APPENDIX A - Transmitter (TX) unit configuration pages

This section covers the browser-based configuration utility for the AdderLink Infinir TX (transmitter) unit. The TX utility has ten pages, titled as follows:

- System Configuration
- Video Configuration
- USB Settings
- Security
- APM Manager
- System Messages
- Statistics
- Firmware Upgrade
- Restore
- About



POSTAL ADDRESS

DOI: 10.1002/for

1000

WILLIAM

1000

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TX System Configuration

[illegible]

Please indicate that you can also be contacted at this unit from all others. The name entered here will be used by A.P.S. units (if used) for administrative purposes.

Unit Description

There was no controlled field observation of the nest such as to determine if birds were more likely to enter the hole when

System 2000

This section determines the IP address, netmask, and gateway details for the main Gigabit Ethernet port located on the right side of the front panel. The default IP address is 192.154.1.23 which is the main routing IP address that allows the unit to work immediately in point-to-point mode. You are recommended to change this to an appropriate address in the private IP range 192.168.0.0/24.

The default network is 192.168.0.0. If you change the IP address to the private range, you are recommended to change this to 192.168.168.0. The default gateway address is 169.254.1.1.

Management port (ALIF dual mode only - not shown in screenshot left)

The default IP address is 192.168.1.42. You are recommended to leave this address unchanged (or at least keep each address constant across all of your MFEs) so that all address components all know which address to use.

Keywords: *workplace spirituality, spirituality, spirituality in the workplace, spirituality in the workplace, spirituality in the workplace*

Determines whether the GPP socket on the right side of the front panel is enabled and which IP address details it should use. The default IP address is 169.254.1.43 which is the zero-conflict IP address that allows the unit to

It is recommended that you change the default IP address to 192.168.1.1, which is the only using IP address that allows the unit to work immediately in point-to-point mode. You are recommended to change this to an appropriate address in the private IP range (192.168.0.0/24). The default network is 192.168.0.0. If you change the IP address to the static mode, you are recommended to change this to 192.168.1.1.

The default gateway address is 169.254.1.1. From before the learning part can be used for connection via a network, you need to ensure that the system part has been configured away from its own specific IP address.

Enable options

Keywords: child sexual abuse; disclosure; social support

Serial port options

These allow you to:

Identify unit
When clicked, these buttons cause the front panel indicators to flash to assist with identifying the A/F unit within a rack.

- The Identify Unit (Ident) button flashes the indicators for five seconds.
- The Identify Unit (Ident) button flashes the indicators for one hour but can be overridden by clicking the Identify Unit (Ident) button.

Thank you

The Threatfeed shows snap shots of the video feeds that are connected and reports the video resolution/code details that have been detected. Click the Refresh Threatfeed button to update.

Server Multicast Configuration

The name within this section are required if a multicast group is being arranged (i.e. many members connected to the one transmitter). For the video port(s) and/or audio channel, you need to enter the multicast IP addresses. In each case, the first address relates to the System (Uplink Ethernet) port and the second address

In previous versions of firmware, the destination IP address for video was decided by the ROC. If multiple ROCs requested the same video source then all had to resolve the same multicaster destination IP address. In

vertices h, j and above, the TX now decides the destination IP address for video and automatically informs any interested RX units. In a system with a mix of new and old units, both RX and TX units must be configured

Also *NF* output addresses for each service output must be unique across the whole *NF* topology.



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CONTRIBUTOR STATEMENTS

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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TXVideo Configuration

ADDERLink INFINITY TRANSMIT (dual)
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Video Configuration
USB Settings
Security
Hot Plug
System Messages
Status
Firmware Upgrade
About

Video Configuration

Background Refresh Control for Video 1 and Video 2

Peak bandwidth limiter percentage: 95%

Web 1 Control

Background Refresh: every 32 frames
Motion Magic: on
Use Default DDC: on
Disable Hot Plug Detect on change of state: on
Period of Hot Plug Detect signal: Default - 100ms
Frame Dropping Percentage: 0
Compression: Best Perfect

Web 2 Control

Background Refresh: every 32 frames
Motion Magic: on
Use Default DDC: on
Disable Hot Plug Detect on change of state: on
Period of Hot Plug Detect signal: Default - 100ms
Frame Dropping Percentage: 0
Compression: Best Perfect

[About Us](#)

Now,ALIP dual screenshot shown above,ALIP 1002 module will provide options for a single video port.

Peak bandwidth limiter percentage

The TX unit will employ a 'best effort' strategy to sending video and other data over the IP network. This means it will use as much of the available network bandwidth as necessary to achieve optimal data quality, although typically the TX unit will use considerably less than the maximum available in order to prevent the TX unit from 'hogging' too much of the network's capacity; you can reduce this setting to place a tighter limit on the maximum bandwidth permissible to the TX unit, range 0 to 95%.

None of the following controls are available separately for each video port:

Background Refresh

The TX unit sends portions of the video image only when they change, in order to give the best user experience, the TX unit also sends the whole video image, at a lower frame rate, in the background. The Background Refresh parameter controls the rate at which this background image is sent. The default value is 'every 32 frames', meaning that a full frame is sent in the background every 32 frames. Reducing this to 'every 4 frames' or more will reduce the amount of bandwidth that the TX unit consumes. On a high-traffic network the parameter should be reduced in this way to improve overall system performance. Options: every 32 frames, every 64 frames, every 128 frames, every 256 frames or disabled.

Disable Magic Eye

The feature, enabled as standard, aims to reduce the effect of dithering - a technique used by some graphics cards to improve the perceived quality and color depth of images by dithering or altering the color of pixels between video frames. The Magic Eye feature increases the frame rate and eliminates unnecessary network traffic by ignoring the color dithering where it occurs. If the video source is not noisy or dithered then you can switch off Magic Eye to enable full color accuracy.

Use Default DDC and Choose Default DDC

When the Use Default DDC option is switched, ADDERLink Infinity will use the EDD that is reported by the monitor connected to the receiver unit. However, if you tick the Use Default DDC option, you can then select from a range of preset video resolutions from the Choose Default DDC drop down box. Once selected, the TX will report itself capable of only supporting this one video resolution. Please note that all of the listed video resolutions are single bit DVI with a maximum pixel clock of 165MHz and a 60Hz refresh rate.

Disable Hot Plug Detect...

When this option is ticked, every time the monitor is changed at the receiver unit, a hot plug detect message will be sent to the graphics card of the PC attached to the TX unit.

Period of Hot Plug Detect signal

This is the length of time that a hot-plug detect signal is applied. The default of 100ms is sufficient for the majority of graphics cards, however, a small minority may need to be given a longer a period.

Frame skipping percentage

Frame skipping involves 'letting out' video frames between those captured by the TX unit. For video sources that update only infrequently or for those that update very frequently but where high fidelity is not required, frame skipping is a good strategy for reducing the overall bandwidth consumed by the system. Range 0 to 100%.

Compression

Describes the (H.264 and H.265) compression method used for video transmission. Choices are:

- 'Best perfect' - only uses pixel perfect H.264
- 'Adaptive' - guarantees frame rate, holds to pixel perfect
- 'Smartest choice' - forces the maximum compression, or
- 'Advanced' - allows you to choose a fixed compression mode

To get here

1 Connect your computer to a port on the front panel.

2 Run a web browser and enter the IP address of the Management (ALIP dual only) or System port used: <http://192.168.1.42> (management port) or <http://192.168.1.33> (system port). If the address is unknown, perform a [network discovery](#).

3 If necessary click the Video Configuration tab.

TX USB Settings

ADDERLink INFINITY TRANSMIT
USB Settings

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Video Configuration
USB Settings
Security
Hot Plug
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USB Settings

Enable Dummy Boot Keyboard: on
Enable H.264: on
Reserved Port Range: 0
[Default Value](#)

Enable Dummy Boot Keyboard

When ticked, the TX unit reports a virtual dummy boot keyboard to the attached PC to ensure that a keyboard is always reported when the PC boots up. The dummy boot keyboard uses one of the 12 USB endpoints, therefore if all 12 endpoints are required elsewhere for USB devices (or a TVM switch only supports one H.264 device) then it can be disabled by deselecting this option. See also Reserved Port Range below.

Disable H.264

This option allows you to force the system to run at the lowest USB speed of 12Mbps, thus forcing USB 2.0 Hi-Speed devices to adapt to the lower rate.

Hub Size

Using this option you can select whether the transmitter should report itself as a 1.1 or a 2.0 port USB hub. Some USB hosts are only able to support 2.0 port USB hubs. If this option is set to 2, then only 2 USB devices are supported by the PC.

Reserved Port Range

For some devices, e.g. switch servers, you may wish to ensure that they are always reported to the same USB port number so that the USB driver will always find the device. This option allows you reserve up to 8 ports for certain devices. At the TX unit, the devices are assigned to the reserved ports. If a port reservation is to be applied, then the dummy boot keyboard should be disabled. The default value for this option is 0, i.e. disabled. See [Port Reservation](#) on RX unit for further details.

TX Security

ADDERLink INFINITY TRANSMIT
Security

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Security

Why, how and when: (system default password: password)

USB Encryption: on
Control Encryption: on
Secure Web page with password: on
Change password: on
New password:
Confirm password:
[Save](#)

USB Encryption

This setting determines whether encryption should be applied to the USB data passed across the link. Note that video data is never encrypted.

Control Encryption

This setting determines whether encryption should be applied to the control data passed across the link. Note that video data is never encrypted.

Secure Web page with password

When ticked, this option enables https security so that the configuration pages are only accessible to the admin user with a password.

Change/confirm password

These options allow you to change the admin password for the system.

To get here

1 Connect your computer to a port on the front panel.

2 Run a web browser and enter the IP address of the Management (ALIP dual only) or System port used: <http://192.168.1.42> (management port) or <http://192.168.1.33> (system port). If the address is unknown, perform a [network discovery](#).

3 Click either the USB Settings or Security tab, as appropriate.



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TX AIM Manager



Enable AIM Control

Click this button to allow an AIM (Adder Identity Manager) box to take control of this TX. When the button is clicked, the TX unit will be released to allow the AIM box to discover and control it.

TX System Messages



Enable system messages

Tick to allow the creation of status and error messages by the unit.

Send system messages to remote Log Server

Choose this option to send the system messages to a remote server via the network. Provide the IP address of a suitable server here also.

AdderLink Identity servers use the User Datagram Protocol (UDP) for all logging traffic.

Store system messages in unit

When ticked, this option will store system messages within the memory of the unit. Click the View messages button to view the list or the Clear messages button to delete the list.

Update Now

Click to save and implement any changes that you make.

To get here

- 1 Connect your computer to a port on the front panel.
- 2 Run a web browser and enter the IP address of the Management (AIM dual only) or System port (see <http://192.168.1.42> (management port) or <http://169.254.1.33> (system port)). If the address is unknown, perform a [power factory reset](#).
- 3 Click either the AIM Manager or System Messages link, as appropriate.

TX Statistics



Enable collection of bandwidth statistics

AIM units can record data transfer statistics from the System port and plot them on a graph for troubleshooting and optimisation purposes. When you enable this option, you will first be presented with a pop-up from which you can choose which aspects you would like to graph. Data throughput, various packet rates and/or frame rates.

Save/Plot

Click this button after ticking the above checkbox to plot the chosen statistics on a pop-up graph.

TX Firmware Upgrade



Upgrade

Use this page to upgrade the main or backup firmware image on the unit. Please see the section [Performing an upgrade](#) for details.

TX Reboot



Reboot

Use this page to perform a reboot or a factory reset. Please see the section [Power factory reset](#) for details.

To get here

- 1 Connect your computer to a port on the front panel.
- 2 Run a web browser and enter the IP address of the Management (AIM dual only) or System port (see <http://192.168.1.42> (management port) or <http://169.254.1.33> (system port)). If the address is unknown, perform a [power factory reset](#).
- 3 Click either the Statistics, Firmware Upgrade or Reboot link, as appropriate.



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About

This page displays key information about the TX unit that may be requested by Adder Technical Support.

To get here

- 1 Click on [CONNECTION](#) on the front panel.
- 2 Run a web browser and enter the IP address of the Management (ALP Unit only) or System port used (<http://192.168.1.43> (management port) or <http://192.168.1.33> (system port)). If the address is unknown, perform a [manual factory reset](#).
- 3 Click the About link.

APPENDIX B - Receiver (RX) unit configuration pages

This section covers the browser-based configuration utility for the AdderLink Infinity RX (receiver) unit. The RX utility has nine pages, titled as follows:

- [Screen Configuration](#)
- [USB Settings](#)
- [Security](#)
- [USB Manager](#)
- [System Message](#)
- [Statistics](#)
- [Firmware Upgrade](#)
- [Reboot](#)
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Unit Name

Here details that you can alter to distinguish this unit from all others.

Unit Description

Allows you to add a description of the unit, such as its location. Useful when many ALIF units are being used.

System port

This section determines the IP address, network and gateway details for the main Gigabit Ethernet port located on the right side of the front panel. The default IP address is 192.168.1.21 which is the same as the IP address that allows the unit to work immediately in point-to-point mode. You are recommended to change this to an appropriate address in the private IP range 192.168.0.0/24.

The default network is 192.168.0.0. If you change the IP address to the private range, you are recommended to change this to 192.168.0.0. The default gateway address is 192.168.1.1.

Management port (ALIF dual module only - not shown in screenshot left)

Determines whether the port on the left side of the front panel is enabled and which IP address details it should use. The default IP address is 192.168.1.42. You are recommended to have this address unchanged (or at least keep such address constant across all of your ALIF units) so that all visiting engineers will know which address to use.

Teaming port

Determines whether the IP address on the right side of the front panel is enabled and which IP address details it should use. The default IP address is 192.168.1.43 which is the same as the IP address that allows the unit to work immediately in point-to-point mode. You are recommended to change this to an appropriate address in the private IP range 192.168.0.0/24. The default network is 192.168.0.0. If you change the IP address to the private range, you are recommended to change this to 192.168.0.0. The default gateway address is 192.168.1.1.

Before the teaming port can be used for connection on a network, you need to ensure that the System port has been configured away from its own single IP address.

Enable options

These checkboxes allow you to determine which peripheral options will be used: Video, Audio, USB and serial.

Audio Input Type

Choose 'line' for stereo line input, 'mic' for mono microphones or 'line boost' for a mono microphone that requires extra gain (+20dB).

Enable Video Compatibility Check (for DVI-D 1 and 2 on ALIF dual module)

If enabled, this option compares the EDID reported by the PC graphics card and determines whether the display connected to the RX is capable of displaying the chosen video resolution. If not, an error message is generated and the connection is not made.

Force Video Refresh Rate to 60Hz

If enabled, the receiver frame rate is held at 60Hz regardless of the video input frame rate. The Video Switching options (below) cannot be altered when this option is enabled.

Video switching

Provides two options for video switching:

- Fast Switching (default state) - Facilitates the same frame rate (at either 30Hz or 60Hz) depending upon which video resolution was displayed first.

- Match Frame Rate - Follows the source frame rate and will change the frame rate every time the changes occur. If the video resolution doesn't change, if you have one receiver switching between 1920x1080@60Hz and 1920x1080@30Hz then this setting will change the frame rate from 60Hz to 30Hz every time that you switch.

Identify unit

These buttons cause the front panel indicators to flash. The (short) button flashes indicators for 3 seconds, the (long) button for one hour. Click the (short) button to override.

To get here

- 1 Connect your computer to a port on the front panel.
- 2 Run a web browser and enter the IP address of the Management (ALIF dual only) or System port used: <http://192.168.1.42> (management port) or <http://192.168.1.21> (system port). If the address is unknown, perform a [power factory reset](#).
- 3 If necessary click the System Configuration link.



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Note: ALIF dual screenshot shown above ALIF 1002 models will provide options for a single video port only.

Target Transmitter Unit Settings

This section is where you configure the IP address details of the ALIF transmitter(s) that this receiver will connect with. You can quickly set all peripheral feeds (video 1/2, audio, USB and serial) to use the same primary (and secondary) locations using the IP Address (System port) and IP Address 2 (Teaming port) entries.

For normal one-to-one connections enter the IP address(es) that match the System IP Address and Teaming Port IP Address settings of the target transmitter with in this section. However, if this receiver is to take part in a redundant connection then you need to enter the IP address(es) that are not within the transmitter's Target Multicast Configuration section.

Alternatively click the ▼ arrow to expand the section as shown below left.

In the expanded view, for each peripheral feed, the first IP address is that of the targeted TX unit's System port (to match the address(es) IP Address 2 corresponds to the optional Teaming port (when used).

The use of the Teaming port as a parallel secondary link offers a degree of redundancy for your ALIF installation. With the Teaming ports of the TX and RX units connected in addition to the System ports, if one of the links should fail for any reason, there will be a short delay for a few video frames (and possibly some on-screen corruption) as all the data packets are rearranged to be sent down the other link. Obviously the bandwidth will be halved and frame rate will automatically drop, but a fully usable system will remain.

[ALIF dual only] The Video Rx, for DVI-Dx option allows you to determine which video feed is sent to each output port. By default, the primary video feed is presented at port 1 while the secondary feed goes to port 2. These options allow you to 'steal' one of the video signals and deliver it to both ports - this, requiring only one receiver to drive two displays. This solution is commonly used where two signals displays are connected back-to-back and need to show the same video feed. With these options, you can also swap the two video feeds between the two ports.

To get here

- 1 Connect your computer to a port on the front panel.
- 2 Run a web browser and enter the IP address of the Management (ALIF dual only) or System port used: <http://192.168.1.42> (management port) or <http://192.168.1.21> (system port). If the address is unknown, perform a [power factory reset](#).
- 3 If necessary click the System Configuration link.
- 4 Click ▼ within the Target Transmitter Unit Settings section.



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Allow Human Interface Devices (HID) only

When enabled, this option restricts supported USB devices to keyboards and mice only. The use of memory sticks and other devices will be disabled.

Asynchronous Endpoint OSD Alerts

The ALP USB system does not support asynchronous USB. When enabled, this option will alert the user when an asynchronous USB device is connected.

Enable asynchronous Endpoint Alerts

When enabled, this option will allow for an exchange of control information with an asynchronous device. Some devices have multiple endpoints e.g. a keyboard with an audio controller. By enabling this option, the keyboard functionality will work even though the asynchronous audio functionality will not. Without this setting, the active keyboard would be rejected as it would be detected as being solely an asynchronous device.

Port Reservation

This section allows you map the four USB connectors on the receiver to a specific USB port that has been reserved on the transmitter. It is useful if you have a specific device e.g. a touch screen that must always be reported to a specific USB port on the USB host device. If you have two touch screens of the same type for each of the video displays, then using Port Reservation disables the USB merging mechanism and assigns individual USB ports for each display. This means that the driver can now separate the left hand screen from the right hand screen. See [Reserved Port Pages](#) on the TX unit for further details.

Advanced features

This section is used for special configuration and is disabled by default. If a USB device fails to operate as expected, this section allows special codes to be learned to attempt to solve the issue.

To get here

- 1 Connect your computer to a port on the front panel.
- 2 Run a web browser and enter the IP address of the Management (ALP dual only) or System port used: <http://192.168.1.42> (management port) or <http://192.168.1.32> (system port).
- 3 If the address is unknown, perform a [network factory reset](#).
- 4 Click the USB Settings link.


Encryption

This setting allows you to apply encryption to the USB and control data passed across the link. Note that video data is never encrypted.

SecureWeb pages with password

When ticked, this option enables https security so that the configuration pages are only accessible to the admin user with a password.

Change/confirm password

These options allow you to change the admin password for the system.

To get here

- 1 Connect your computer to a port on the front panel.
- 2 Run a web browser and enter the IP address of the Management (ALP dual only) or System port used: <http://192.168.1.42> (management port) or <http://192.168.1.32> (system port).
- 3 If the address is unknown, perform a [network factory reset](#).
- 4 Click the Security link.



RX AIM Manager



Enable AIM Control

Click the button to allow an AIM (Adder Infinity Manager) host to take control of this RX. When the button is clicked, the RX unit will be rebooted to allow the AIM host to discover and control it.

RX System Messages



Enable system messages

Tab to allow the creation of status and error messages by the unit.

Send system messages to remote Log Server

Choose this option to send the system messages to a remote server via the network. Provide the IP address of a reliable server here also.

AdderLink Infinity servers use the User Datagram Protocol (UDP) for all logging traffic.

Store system messages in unit

When checked, this option will store system messages within the memory of the unit. Click the View message button to view the list or the Clear messages button to delete the list.

Update Now

Click to save and implement any changes that you make.

To get here

1. Connect your computer to a port on the front panel.
2. Run a web browser and enter the IP address of the Management (ALP dual only) or System port (see <http://192.168.1.42> (management port) or <http://192.168.1.22> (system port)). If the address is unknown, perform a [power factory reset](#).
3. Click either the AIM Manager or System Messages links, as appropriate.

RX Statistics



Enable collection of bandwidth statistics

The ALP unit can record data transfer statistics from the System port and plot these on a graph for troubleshooting and optimization purposes. When you enable this option, you will first be presented with a pop-up from which you can choose which aspects you would like to graph: Data throughput, various packet rates and/or frame rates.

Save

Click the button after filling the above checkboxes to plot the chosen statistics on a pop-up graph.

RX Firmware Upgrade



Upgrade

Use this page to upgrade the main or backup firmware image on the unit. Please see the section [Performing an upgrade](#) for details.

RX Reboot



Reboot

Use this page to perform a reboot or a factory reset. Please see the section [Power Security reset](#) for details.

To get here

1. Connect your computer to a port on the front panel.
2. Run a web browser and enter the IP address of the Management (ALP dual only) or System port (see <http://192.168.1.42> (management port) or <http://192.168.1.22> (system port)). If the address is unknown, perform a [power factory reset](#).
3. Click either the Statistics, Firmware Upgrade or Reboot links, as appropriate.



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- Use no more than two cascade levels.
- Ensure high bandwidth between the two L2 switches and very high bandwidth between the top L2 and the L3. Typically 10Gb and 20Gb, respectively for 48 port L2 switches.

continued



Configuring the switches and devices

The lowest is vital but so too is the configuration:

- Enable [IGMP Snooping](#) on all L2 switches.
- Ensure that [IGMP Fast-Leave](#) is enabled on all switches with ALIF units connected directly to them.
- Enable the L3 switch as an [IGMP Querier](#).
- Enable [Spanning Tree Protocol \(STP\)](#) on all switches and immediately also enable portfast (on) on all switch ports that have ALIF units connected.
- If any hosts will use any video resolutions using 2048 horizontal pixels (e.g. 2048 x 1152), ensure that [Jumbo Frames](#) are enabled on all switches.
- Choose an appropriate forwarding mode on all switches. Use [Cut-through](#) if available, otherwise [Store and forward](#).
- Optimise the settings on the ALIF transmitters:
 - If moving video images are being shown frequently, then leave Frame Skidding at a low percentage and instead reduce the Peak bandwidth limiter.
 - Where screens are quite static, try increasing the Background Refresh Interval and/or increasing the Frame skidding percentage setting.

Make changes to the ALIF transmitters one at a time, in small steps, and view trial video images so that you can attribute positive or negative results to the appropriate control.

- Ensure that all ALIF units are fully updated to the latest firmware version (at least v1.1).

APPENDIX D - Troubleshooting

Problem: The video image of the ALIF receiver shows horizontal lines across the screen.

This issue is known as blinding because the resulting video image looks as though you're viewing it through a window blind.

When video is transmitted by ALIF units, the various lines of each screen are divided up and transmitted as separate data packets. If the reception of those packets is disturbed, then blinding is caused. The lines are distorted in place of the missing video data packets.

There are several possible causes for the loss of data packets:

- Incorrect switch configuration. The problem could be caused by multicast flooding, which causes unnecessary network traffic. This is what IGMP snooping is designed to combat, however, there can be numerous causes of the flooding.
- Speed/memory bandwidth issues within one or more switches. The speed and capabilities of different switch models varies greatly. If a switch cannot maintain pace with the quantity of data being sent through it, then it will inevitably start dropping packets.
- One or more ALIF units may be outputting jumbo frames due to the video resolution (2048 horizontal pixels) being used. If jumbo frames are output by an ALIF unit, but the network switches have not been configured to use jumbo frames, the switches will attempt to break the large packets down into standard packets. This process introduces a certain latency and could be a cause for dropped packets.
- One or more ALIF units may be using an old firmware version. Firmware versions prior to v1.1 exhibited an issue with the timing of IGMP join and leave commands that caused multicast flooding in certain configurations.

Remedies:

- Ensure that [IGMP snooping](#) is enabled on all switches within the subnet.
- Where each ALIF unit is connected as the sole device on a port connection to a switch, enable [IGMP Fast-Leave \(also Immediate Leave\)](#) to reduce unnecessary processing on each switch.
- Check the video resolution(s) being fed into the ALIF transmitters. If resolutions using 2048 horizontal pixels are unavoidable then ensure that [Jumbo frames](#) are enabled on all switches.
- Check the [forwarding mode](#) on the switches. If Store and forward is being used, try selecting Cut-through as this mode causes reduced latency on lesser switch designs.
- Ensure that one device within the subnet is correctly configured as an [IGMP Querier](#) using a layer 2 switch or multistage router.
- Ensure that the firmware in every ALIF unit is version 1.1 or greater.
- Try adjusting the transmitter settings on each ALIF to make the output data stream as efficient as possible. See [ALIF transmitter video settings](#) for details.

continued



Problem: The mouse pointer of the ALIF receiver is slow or sluggish when moved across the screen.

This issue is often related to either using dithering on the video output of one or more transmitting computers or using VGA-to-DVI video converters.

Dithering is used to improve the perceived quality and color depth of images by diffusing or altering the color of pixels between video frames. This practice is commonly used on Apple Mac computers using ATI or Nvidia graphics cards. VGA-to-DVI converters unwittingly produce a similar issue by creating high levels of pixel background noise.

ALIF units attempt to considerably reduce network traffic by transmitting only the pixels that change between successive video frames. When dithering is enabled and/or VGA-to-DVI converters are used, this can have the effect of changing almost every pixel between each frame, thus forcing the ALIF transmitter to send the whole of every frame, resulting in greatly increased network traffic and what's perceived as sluggish performance.

Remedies:

- Linux PCs
 - Check the video settings on the PC. If the Dither video box option is enabled, disable it.
- Apple Mac with Nvidia graphics
 - Use the Adder utility for Macs – Contact technical support.
- Apple Mac with ATI graphics
 - [Enable the Magic Sm. dither removal feature.](#)
- Windows PCs
 - If you suspect these issues with PCs, contact technical support for assistance.
- Replace old VGA adapters on host computers with DVI video cards.

Problem: The audio output of the ALIF receiver sounds like a scratched record.

This issue is called Audio crackle and is a symptom of the same problem that produces blinding (see previous page). The issue is related to missing data packets.

Remedies:

As per blinding discussed previously:

Problem: A.I.M. cannot locate working ALIF units.

There are a few possible causes:

- The ALIF units must be reset back to their zero config IP addresses for A.I.M. to discover. If you have a working network of ALIFs without A.I.M. and then add A.I.M. to the network, A.I.M. will not discover the ALIFs until they are reset to the zero config IP addresses.
- This could be caused by Layer 2 Cisco switches that have [Spanning Tree Protocol \(STP\)](#) enabled but do not also have portfast enabled on the ports to which ALIF units are connected. Without portfast enabled, ALIF units will all be assigned the same zero config IP address at reboot and A.I.M. will only acquire them one at a time on a random basis.
- You can easily tell whether portfast is enabled on a switch that is running STP. When you plug the link cable from a working ALIF unit into the switch port, check how long it takes for the port indicator to change from orange to green. If it takes roughly one second, portfast is on; if it takes roughly thirty seconds then portfast is disabled.

Remedies:

- Ensure that the ALIF units and the A.I.M. server are located within the same subnet because A.I.M. cannot cross subnet boundaries.
- [Manually reset](#) the ALIF units to their zero config IP addresses.
- Enable portfast on all switch ports that have ALIF units attached to them or try temporarily disabling STP on the switches while A.I.M. is attempting to locate ALIF units.



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APPENDIX E - Glossary

Internet Group Management Protocol

Where an ALIF transmitter is required to stream video to two or more receivers, multicasting is the method used.

Multicasting involves the delivery of identical data to multiple receivers simultaneously without the need to maintain individual links. When multicast data packets enter a subnet, the natural reaction of the switches that bind all the hosts together within the subnet is to forward the multicast data to all of their ports. This is referred to as Multicast flooding and means that the hosts (or at least their network interfaces) are required to process plenty of data that they didn't request. IGMP offers a partial solution.

The Internet Group Management Protocol (IGMP) is designed to prevent multicast flooding by allowing [Layer 2](#) switches to check whether host computers within their care are interested in receiving particular multicast transmissions. They can then direct multicast data only to those points that require it and can shut off a multicast stream if the subnet has no recipients.

There are currently three IGMP versions: 1, 2 and 3, with each version building upon the capabilities of the previous one:

- IGMPv1 allows host computers to opt into a multicast transmission using a Join Group message. It is then incumbent on the router to discover when they no longer wish to receive; this is achieved by polling them (see IGMPv2 below) until they no longer respond.
- IGMPv2 includes the means for hosts to opt out as well as in, using a Leave Group message.
- IGMPv3 encompasses the abilities of versions 1 and 2 but also adds the ability for hosts to specify particular sources of multicast data.

AdderLink Infinity units make use of IGMPv2 when performing multicasts to ensure that no unnecessary congestion is caused.

IGMP Snooping

The IGMP messages are effective but only coexist at [Layer 2](#) – intended for routers to determine whether multicast data should enter a subnet. A relatively recent development has taken place within the switches that glue together all of the hosts within each subnet: IGMP Snooping. IGMP snooping means these layer 2 devices now have the ability to take a peek at the IGMP messages. As a result, the switches can then determine exactly which of their own hosts have requested to receive a multicast – and only pass on multicast data to those hosts.

IGMP Querier

When IGMP is used, each subnet requires one [Layer 2](#) switch to act as a Querier. In this lead role, the switch periodically sends out IGMP Query messages and in response all hosts report which multicast streams they wish to receive. The Querier device and all snooping Layer 2 switches, then update their lists accordingly. The lists are also updated when Join Group and Leave Group (IGMPv2) messages are received.

IGMP Fast-Leave (also Immediate Leave)

When a device/host no longer wishes to receive a multicast transmission, it can leave an IGMP Leave Group message as mentioned above. This causes the switch to issue an IGMP Group-Specific Query message on the port that the Leave Group was received on to check no other receivers exist on that connection that wish to remain a part of the multicast. This process has a cost in terms of switch processor activity and time.

Where ALIF units are connected directly to the switch (with no other devices on the same port) then enabling IGMP Fast-Leave mode means that switches can immediately remove receivers without going through a full checking procedure. Where multiple units are regularly joining and leaving multicasts, this can result in performance degradation.

Jumbo frames (jumbo packets)

Since its commercial introduction in 1980, the Ethernet standard has been successfully extended and adapted to keep pace with the ever improving capabilities of computer systems. The achievable data rates, for instance, have risen in ten-fold leaps from the original 10Mbps to a current maximum of 100Gbps.

While data speeds have increased massively, the standard defining the number of bytes (known as the Payload) placed into each data packet has remained resolutely stuck at its original level of 1500 bytes. This standard was set during the original wired era (10Mbps) and offered the best compromise at that speed between the time taken to process each packet and the time required to resend faulty packets due to transmission errors.

But now networks are much faster and files/data streams are much larger; so time for a change? Unfortunately, a wholesale change to the packet size is not straightforward as it is a fundamental standard and changing it would mean a loss of backward compatibility with older systems.

Larger packet options have been around for a while, however, they have often been vendor specific and at present they remain outside the official standard. There is, however, increased consensus on an optional 'jumbo' packet size of 9000 bytes and this is fully supported by the AdderLink Infinity (ALIF) units.

Jumbo frames (or jumbo packets) offer advantages for ALIF units when transmitting certain high resolution video signals across a network. This is because the increased data in each packet reduces the number of packets that need to be transferred and dealt with – thus reducing latency times. The main problem is that for jumbo frames to be possible on a network, all of the devices on the network must support them.



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Spanning Tree Protocol (STP)

In order to build a robust network, it is necessary to include certain levels of redundancy within the interconnections between switches. This will help to ensure that a failure of one link does not lead to a complete failure of the whole network.

The danger of multiple links is that data packets, especially multicast packets, become involved in continual loops as neighbouring switches use the duplicated links to send and resend them to each other.

To prevent such bridging loops from occurring, the Spanning Tree Protocol (STP), operating at [layer 2](#), is used within each switch. STP encourages all switches to communicate and learn about each other. It prevents bridging loops by blocking newly discovered links until it can discover the nature of the link: is it a new host or a new switch?

The problem with this is that the discovery process can take up to 30 seconds before the block is lifted, causing problematic timeouts.

The answer to this issue is to enable the portfast variable for all host links on a switch. This will cause any new connection to go immediately into forwarding mode. However, take particular care not to enable portfast on any switch to switch connections as this will result in bridging loops.

Forwarding modes

In essence, the job of a layer 2 switch is to transfer as fast as possible, data packets arriving at one port out to another port as determined by the destination address. This is known as data forwarding and most switches offer a choice of methods to achieve this. Choosing the most appropriate forwarding method can often have a sizeable impact on the overall speed of switching:

- Store and forward is the original method and requires the switch to save each entire data packet to buffer memory, run an error check and then forward if no error is found (or otherwise discard it).
- Cut-through was developed to address the latency issues suffered by some store and forward switches. The switch begins interpreting each data packet as it arrives. Once the initial addressing information has been read, the switch immediately begins forwarding the data packet while the remainder is still arriving. Once all of the packet has been received, an error check is performed and, if necessary, the packet is tagged as being in error. This checking 'on-the-fly' means that cut-through switches cannot discard faulty packets themselves. However, on receipt of the marked packet, a host will carry out the discard process.
- Fragment-free is a hybrid of the above two methods. It waits until the first 64 bits have been received before beginning to forward each data packet. This way the switch is more likely to locate and discard faulty packets that are fragmented due to collisions with other data packets.
- Adaptive switches automatically choose between the above methods. Usually they start out as a cut-through switches and change to store and forward or fragment-free methods if large number of errors or collisions are detected.

So which one to choose? The Cut-through method has the least latency so is usually the best to use with AdderLink InfiniTr units. However, if the network components and/or cabling generate a lot of errors, the Store and forward method should probably be used. On higher end store and forward switches, latency is rarely an issue.

Layer 2 and Layer 3: The OSI model

When discussing network switches, the terms Layer 2 and Layer 3 are very often used. These refer to parts of the Open System Interconnection (OSI) model, a standardised way to categorise the necessary functions of any standard network.

There are seven layers in the OSI model and these define the steps needed to get the data created by you (imagine that you are Layer 0) reliably down onto the transmission medium (the cable, optical fiber, radio wave, etc.) that



carries the data to another user; to complete the picture, consider the transmission medium is Layer 0. In general, think of the functions carried out by the layers at the top as being complex, becoming less complex as you go lower down.

As your data travel down from you towards the transmission medium (the cable), they are successively encapsulated at each layer within a new wrapper (along with a few instructions), ready for transport. Once transmission has been made to the intended destination, the reverse occurs: Each wrapper is stripped away and the instructions examined until finally only the original data are left.

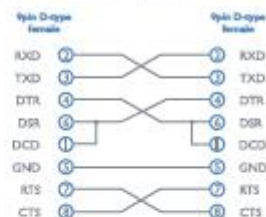
So why are Layer 2 and Layer 3 of particular importance when discussing AdderLink InfiniTr? Because the successful transmission of data relies upon fast and reliable passage through network switches – and most of these operate at either Layer 2 or Layer 3.

The job of any network switch is to receive each incoming network packet, strip away only the first few wrappers to discover the intended destination then rewrap the packet and send it in the correct direction.

In simplified terms, the wrapper that is added at Layer 2 (for the sending system) includes the physical address of the intended recipient system, i.e. the unique MAC address (for example, 08:00:22:07:64:1D) that is assigned to every networking device at manufacture. Deciphering recipients at this level is more straightforward than at Layer 3, where the address of the recipient is represented by a logical IP address (e.g. 192.168.0.10) and requires greater knowledge of the surrounding network structure. Due to their more complex circuitry, Layer 3 switches are more expensive than Layer 2 switches of a similar build quality and are used more sparingly within installations.

APPENDIX F - Cable pinouts, video modes and general specifications

RS232 'null-modem' cable pin-out



General specifications

Casing (w x h x d):	179mm (7.05") x 44mm (1.74") x 130mm (5.09")
Construction:	1U compact case, robust metal design
Weight:	1.1kg (2.42lb)
Mount kit:	Rack mount - single or dual units per 1U slot. VESA monitor / wall mount chassis.
Power to adapter:	100-240VAC 50/60Hz, 0.6A.
Power to unit:	5VDC 20W
Operating temp:	0°C to 40°C (32°F to 104°F)
Approvals:	CE, FCC

Supported video modes

ALUF units support all VESA and CEA video modes.



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APPENDIX G - Fiber modules and cables

To suit your installation layout, two fiber modules are available for the ALUF dual units to suit various fiber optic cables. The specifications for all are summarized in the table below:

Fiber Type	Fiber size	Fiber Type	Coding			Distance at 1 Gbps	Adapter part number for SFP module	Bar color	Conn. type
			Normal Applications	Military Applications	Suggested Print Name/Signature				
OPR1	(62.5/125)	Plastic mode (TIA-492AAAA)	Orange	State	62.5/125	300m	SP-PH-LC	Black	LC
OPR2	(30/125)	Plastic mode (TIA-492AAAB)	Orange	Orange	30/125	300m	"	"	"
OPD	(30/125)	Plastic mode (200 nm Laser-coated) (TIA-492AAAC)	Acas	Undefined	200 LC 30 / 125	300m	"	"	"
OPH	(30/125)	Plastic mode (200 nm Laser-coated) (TIA-492AAAC)	Acas	Undefined	200 LC 30 / 125	300m	"	"	"
OS1 and OS2	(10/125)	Single-mode (TIA-492C000 / TIA-492D000)	Yellow	Yellow	SPVH2/OS, SP1	1000m	SP-OS-LC	Blue	LC



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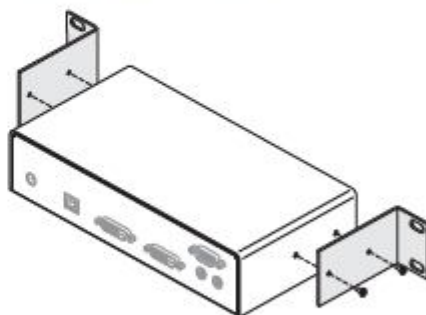
APPENDIX H - Mounting options

There are several mounting methods for transmitter and receiver units:

- The supplied four self-adhesive rubber feet
- Optional single unit rack brackets - this page
- [Optional dual unit rack brackets](#)
- [Optional VDA bracket mount](#)

Single unit rack brackets

The optional single unit brackets (also four screws), allow a unit to be secured within a standard rack half width slot.



IMPORTANT - allow space for airflow

The ALIF units and their power supplies generate heat when in operation and will become warm to the touch.

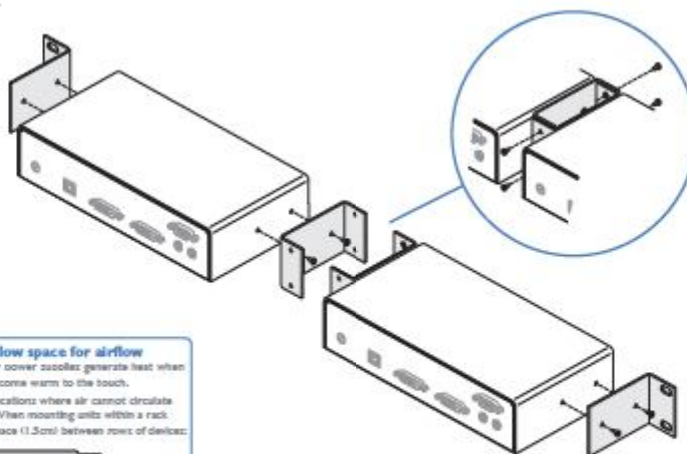
Do not place them in locations where air cannot circulate to cool the equipment. When mounting units within a rack chassis, allow a 1/2 U space (1.5cm) between rows of devices.



Do not operate the equipment in ambient temperatures exceeding 40°C. Do not place the products in contact with equipment whose surface temperature exceeds 40°C.

Double unit rack brackets

This optional kit comprises four brackets (also twelve screws) and allows two ALIF units to be connected side by side and fitted into a 1 U rack slot.



IMPORTANT - allow space for airflow

The ALIF units and their power supplies generate heat when in operation and will become warm to the touch.

Do not place them in locations where air cannot circulate to cool the equipment. When mounting units within a rack chassis, allow a 1/2 U space (1.5cm) between rows of devices.



Do not operate the equipment in ambient temperatures exceeding 40°C. Do not place the products in contact with equipment whose surface temperature exceeds 40°C.



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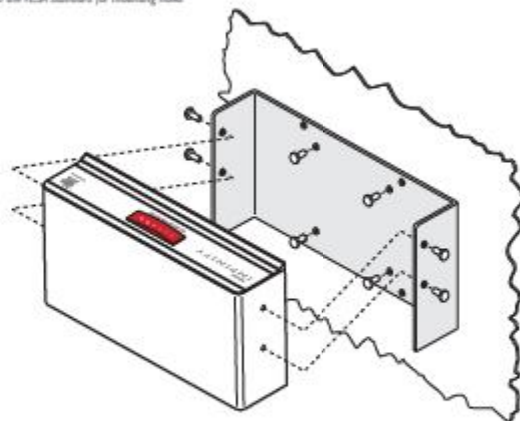
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VESA bracket mount

This optional kit comprises a bracket that allows a single AdderLink Infini module to be mounted onto the rear of a video display. The kit includes the bracket plus eight screws.

* The video display must adhere to the VESA standard for mounting holes on its rear panel.



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SAFETY INFORMATION

- For use in dry, oil free indoor environments only.
- Warning - live parts contained within power adapter.
- No user serviceable parts within power adapter - do not dismantle.
- Plug the power adapter into a socket outlet close to the module that it is powering.
- Replace the power adapter with a manufacturer approved one only.
- Do not use the power adapter if the power adapter case becomes damaged, cracked or broken or if you suspect that it is not operating properly.
- If you use a power extension cord with the units, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure that the total ampere rating of all the devices plugged into the wall outlet does not exceed the wall outlet's ampere rating.
- Do not attempt to service the units yourself.

WARRANTY

Adder Technology Ltd warrants that this product shall be free from defects in workmanship and materials for a period of two years from the date of original purchase. If the product should fail to operate correctly in normal use during the warranty period, Adder will replace or repair it free of charge. No liability can be accepted for damage due to misuse or circumstances outside Adder's control. Also Adder will not be responsible for any loss, damage or injury arising directly or indirectly from the use of this product. Adder's total liability under the terms of this warranty shall in all circumstances be limited to the replacement value of this product.

If any difficulty is experienced in the installation or use of this product that you are unable to resolve, please contact your supplier.



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RADIO FREQUENCY ENERGY

A Category 5 (or better) twisted pair cable must be used to connect the units in order to maintain compliance with radio frequency energy emission regulations and ensure a suitable high level of immunity to electromagnetic disturbances.

All other interface cables used with this equipment must be shielded in order to maintain compliance with radio frequency energy emission regulations and ensure a suitable high level of immunity to electromagnetic disturbances.

European EMC directive 2004/108/EC

This equipment has been tested and found to comply with the limits for a class A computing device in accordance with the specifications in the European standard EN55022. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions may cause harmful interference to radio or television reception. However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to correct the interference with one or more of the following measures: (a) Reorient or relocate the receiving antenna. (b) Increase the separation between the equipment and the receiver. (c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected. (d) Consult the supplier or an experienced radio/TV technician for help.

FCC Compliance Statement (United States)

This equipment generates, uses and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a class A computing device in accordance with the specifications in Subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Canadian Department of Communications RFI statement

This equipment does not exceed the class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.



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