



## Introduction

Welcome .....	2
Local feed through .....	3
Support for Standard and High Dynamic Ranges .....	4
Technical Specifications .....	5
ALIF4000 unit features .....	6
Supplied items .....	7
Optional extras .....	8

## Installation

Connections .....	9
Mounting .....	9
TX video links .....	10
TX analog audio links .....	10
TX USB links .....	11
TX AUX (serial) port .....	11
TX power in .....	12
TX/RX high speed links .....	13
RX video display .....	15
RX microphone & speakers .....	15
RX USB devices .....	16
RX power in .....	17

## Configuration

ALIF4000 configuration via web pages .....	18
Performing a manual factory reset .....	19
Placing the device into recovery mode .....	20
Configuring dual touchscreens .....	21
Creating an unmanaged matrix .....	22
Creating and editing presets .....	23

## Operation

Front panel indications .....	24
Using the On Screen Display .....	25
Port status popups .....	26

## Further information

Getting assistance .....	27
Appendix A - Configuration pages .....	28
Appendix B - Support for analog and digital audio .....	48
Appendix C - Tips for success when networking ALIF units .....	49
Appendix D - Troubleshooting .....	51
Appendix E - Glossary .....	53
Appendix F - Null modem cable pinout .....	56
Appendix G - Fiber/copper modules and cables .....	57
Appendix H - Using the optional ALIF4000 rack shelf .....	58
Appendix I - Open source licenses .....	59

## Index

# Introduction



## WELCOME

Thank you for choosing the ADDERLink™ INFINITY 4000 (aka ALIF4000) high performance extenders. The ALIF4000 range offers dual-head 4K, audio and USB delivered over a single fiber connection. Pixel-perfect color, accurate picture quality and USB2.0 with fast switching.

## Product in brief

- Support for dual link speeds up to 10GbE using either CATx and/or fiber. Two model variants available:
  - **ALIF4001** models\* have two SFP sockets for CATx or fiber modules (up to 10GbE).
  - **ALIF4021** models have two fixed 1GbE CATx ports as well as two SFP sockets for additional CATx or fiber modules (up to 10GbE).
- Dual-head 5K, video, audio and USB over a single fiber connection,
- Pixel-perfect, color accuracy at 4K60,
- Support for 5K resolution: 5120 pixels by 2880\*, 2160 or 1440 (\* at 30Hz refresh)
- Support for 240Hz frame rate at HD resolutions,
- Support for three dynamic color ranges: SDR8, SDR10 and HDR10 (see page 4),
- Bi-directional analog audio,
- DisplayPort™ audio with 2, 4, 6 or 8 channels on both video heads (supports 5.1 and 7.1),
- Adder's USB True Emulation for fast switching,
- Support for local feed through, using an additional ALIF transmitter to allow a local host PC to be connected directly to an ALIF4000 RX in addition to its network links (see page 3),
- Support for advanced diagnostic and troubleshooting tools,
- Backwards compatibility with existing ALIF range,
- Plug and play.

\*ALIF4001 models are only supported by software version v5.05 or later.

## Safety

Please refer to the safety booklet provided in the box before use of this product.

## Linking

ALIF4000 units can be linked in two main ways: Direct or Networked.

### Direct linking

Where ALIF4000 transmitters and receivers are directly linked to each other, very little configuration action is required, provided that they both have their factory default settings in place - just link them together. If the standard settings have been changed in a previous installation, you merely need to perform a [manual factory reset](#) on each unit.

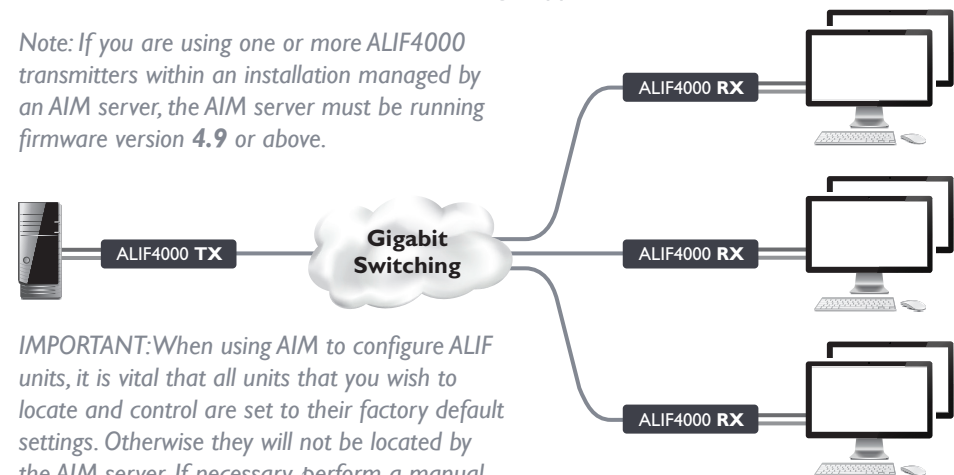


### Networked linking

Where ALIF4000 units are connected via networked links, you can either configure them individually, or configure them collectively using an AIM server:

- **Configuring networked ALIF units individually** - In the absence of an AIM server, unallocated ALIF4000 units have the ability to locate each other. You can alter settings via the OSD on the console connected to the RX unit by pressing **CTRL + ALT + C**.
- **Configuring networked ALIF units collectively** - The ADDERLink™ INFINITY Management (AIM) server allows you to configure, control and coordinate any number of ALIF transmitters and receivers from a single application.

*Note: If you are using one or more ALIF4000 transmitters within an installation managed by an AIM server, the AIM server must be running firmware version 4.9 or above.*



**IMPORTANT:** When using AIM 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 AIM server. If necessary, perform a manual factory reset on each ALIF unit.

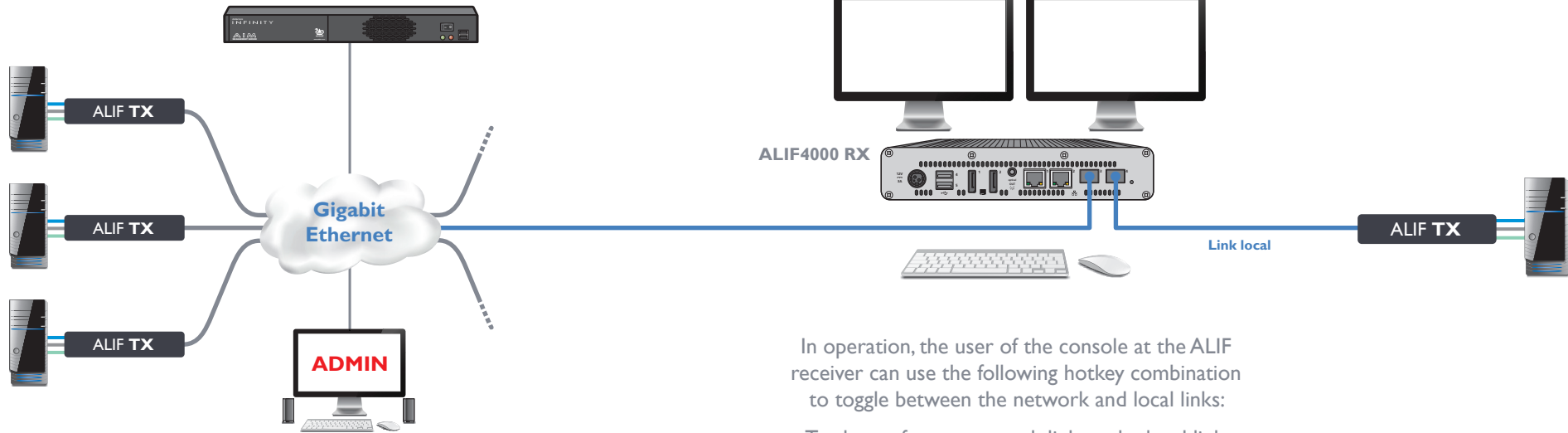
See [Start of Life: AIM or Point to Point configuration](#)

## LOCAL FEED THROUGH

ALIF receiver units can be configured to support a local link to a separate host PC, via a dedicated ALIF transmitter, in addition to the main link to the network. The locally linked PC remains completely isolated from the main network.

To configure this arrangement, ensure that the receiver is using its default IP address and is directly connected to the transmitter. The transmitter must use its primary network port, which is the interface using 169.254.1.33 as its default address, and be configured to either “Auto” or “Allow” for insecure connections (see “Insecure connections” on page 40). The easiest way to do this is to use a factory new or factory reset transmitter; you can then change any additional settings after connecting it to the receiver.

*Notes: For the local feed through feature to operate, the AIM server must be at version 4.8 or greater while the endpoints must be at version 4.0 or greater. The TX must use its primary network port and be in its default configuration, which can be achieved via a new unit or a factory refresh, when connected to the RX.*



In operation, the user of the console at the ALIF receiver can use the following hotkey combination to toggle between the network and local links:

To change from a network link to the local link:  
enter CTRL+ALT+L

To change from the local link to a network link:  
enter CTRL+ALT +C  
to display the OSD and choose  
the required connection.

*Note: The L and C default hotkeys can be changed within the AIM control panel.*

## SUPPORT FOR STANDARD AND HIGH DYNAMIC RANGES (SDR8/SDR10/HDR10)

With the introduction of firmware versions 4.00 (and above), ALIF4000 models now support video signals with color formats that use 30-bpp (bits per pixel) as well as the standard 24-bpp. The supported dynamic ranges are:

- **SDR8** - Uses 24-bpp (ie. 8-bits per color), as supported across the ALIF range.
- **SDR10** - Uses 30-bpp (10-bits per color) in order to define a wider color gamut.
- **HDR10** - Uses 30-bpp to define a wider color gamut and also benefits from support for ST2084 dynamic range mastering and BT.2020 colorimetry.

All ALIF devices use the AFZ24 codec to support SDR8 signals; ALIF4000 devices (with firmware v4.xx) also use the newer AFZ30 to support SDR10 and HDR10 modes.

The ability to successfully deliver full SDR10 or HDR10 video signals from a host PC to any particular remote video display relies upon a series of factors:

- The host PC must produce video signals with SDR10 or HDR10 content.
- The ALIF4000 TX must have firmware v4.00 or greater.
- The receiving ALIF4000 RX units must have firmware v4.00 or greater.
- The video display(s) connected to a receiver must support SDR10 or HDR10.

Where possible, you are recommended to upgrade all ALIF4000 devices to 4.xx firmware. Where a mix of ALIF4000 and non-ALIF4000 receivers exist, an ALIF4000 TX will respond in manner discussed on the right to negotiate access.

### To lock an ALIF4000 TX into SDR8 mode

If a mixture of new and legacy devices is unavoidable **and** it is vital that no legacy receiver is ever locked out from a particular ALIF4000 TX, then set the ALIF4000 TX to use a maximum of 24-bpp (regardless of the input signal):

#### If the unit IS under AIM control

- 1 Login to the AIM suite.
- 2 Click the Transmitters tab and locate the ALIF4000 TX within the list of devices.
- 3 Click the icon for the ALIF4000 TX.
- 4 For video port 1, set the Maximum Bits Per option to '24bpp'.
- 5 Repeat step 4 for video port 2, if necessary.
- 6 Click the Save button.

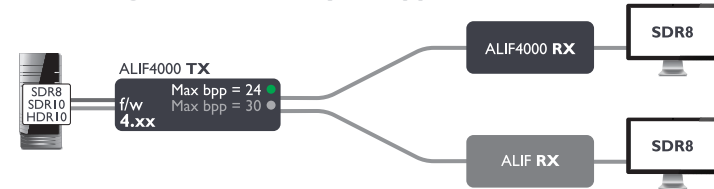
#### If the unit is NOT under AIM control

- 1 On the console keyboard attached to an RX unit, access the OSD by pressing: **CTRL + ALT + C**.
- 2 Click on the **Transmitters** option and click the icon for the required TX.
- 3 Click the **Ports** link and ensure that the page is selected.
- 4 For video port 1, set the Max Bits per Pixel option to '24'.
- 5 Repeat step 4 for video port 2, if necessary.
- 6 Click the Apply button.

## Mixing devices

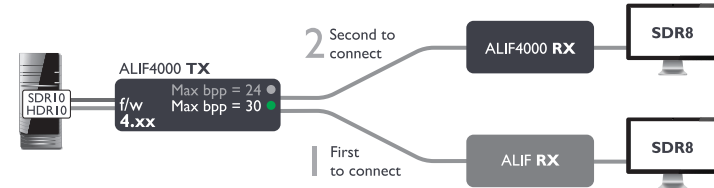
Care should be taken when using a mixture of ALIF4000 (v4.00 and greater) and non-ALIF4000 devices. It is not possible for an ALIF 4000 TX to deliver SDR10/HDR10 to multiple RX units if one or more of them are only able to process SDR8. When a mixture of RX devices make connection, the TX will employ the following methods to negotiate access - on a first-come, first-served basis:

### TX configured to use only 24-bpp



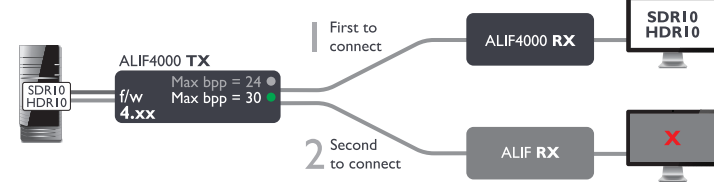
Max Bits per Pixel is set to '24' on the ALIF4000 TX. This means that regardless of the signal type received from the host (SDR8, SDR10 or HDR10), the TX will only send out SDR8. Consequently, all types of ALIF RX units are fully supported, albeit at the lower dynamic range and color depth (see lower left).

### Non-ALIF4000 RX connects first



Max Bits per Pixel is set to '30' on the ALIF4000 TX. However, the first RX to connect with the TX is a non-ALIF4000 type, which means that the TX scales back the video output to SDR8 for this and all subsequent RX units.

### ALIF4000 RX connects first



The ALIF4000 TX has been set to either SDR10 or HDR10. The first to connect with the TX is an ALIF4000 RX and subsequently receives SDR10/HDR10 output. The next to join is a non-ALIF4000 RX and is rejected from connecting. It will continue to attempt a connection.

After either of the last two scenarios have occurred; once all RX units have disconnected, the ALIF4000 TX will revert to SDR8, SDR10 or HDR10 (as determined by the host signal and the ALIF4000 TX settings) and be ready to respond accordingly to connecting RX units.

## TECHNICAL SPECIFICATIONS

### Operating/storage conditions

Operating temperature:	0 to 50°C / 32 to 122°F
Storage temperature:	0 to 50°C / 32 to 122°F
Storage and operating relative humidity:	10 to 90% non-condensing
Altitude:	< 2000m

### Power

External power:	12VDC, 5A
Typical power consumption:	20W

### Physical

Dimensions	(L)210mm /8.3" x (W)215mm/8.5" x (D)40mm/1.6"
Weight:	1.8kg / 4 lbs

### Materials

Aluminium and steel construction

### Connectors

#### Local Unit - Transmitter (TX)

Computer:	2x DisplayPort™, 2x USB type B, 2x 3.5mm audio jack sockets, 1x DB9 socket. 3-pin Kycon power socket.
	<b>ALIF4001</b> model: 2x SFP sockets for up to 10GbE fiber/CATx network connections.
	<b>ALIF4021</b> model: 2x 8p8c RJ45 CATx ports for 1GbE (no 10/100 support) plus 2x SFP sockets for up to 10GbE fiber or CATx network connections.

#### Remote Unit - Receiver (RX)

Desk:	2x DisplayPort, 5x USB type A, 2x 3.5mm audio jack sockets, 1x 3.5mm SPDIF socket. 3-pin Kycon power socket.
	<b>ALIF4001</b> model: 2x SFP sockets for up to 10GbE fiber/CATx network connections.
	<b>ALIF4021</b> model: 2x 8p8c RJ45 CATx ports for 1GbE (no 10/100 support) plus 2x SFP sockets for up to 10GbE fiber or CATx network connections.

### USB

4 ports of USB2.0 with USB True Emulation to support keyboard, mouse and touch. 1 additional port provides transparent high speed USB2.0, best suited to mass storage, web cams, headsets and microphones.  
USB device seen as: 7 or 13 port hub

### Max video resolution

Supports 4K UHD or DCI and refresh rates to 60Hz  
Supports 5K at 60, 50 or 30Hz refresh rates (dependent on vertical resolution)  
Supports 8- and 10-bit color depth

### Audio

Analog Line in/out 2 channel 16bit 48KHz 1V RMS in / 1V RMS out  
DisplayPort digital audio (LPCM), up to 8 channels, 16, 20 or 24bit, 32, 44.1, 48, 88.2, 96, 176.4 or 192KHz

### Ethernet

**ALIF4001** model\* features 2x SFP ports: CATx support for 10,5,2.5 and 1GbE. Fiber support for 10GbE (no 10/100/1000 support).

**ALIF4021** model\* features 2x SFP ports: CATx support for 10,5,2.5 and 1GbE. Fiber support for 10GbE (no 10/100/1000 support).  
Plus 2x 8p8c RJ45 CATx ports: Support for 1GbE (no 10/100 support).

### Packing Box

Dimensions:	(L) 285mm /11.2" x (W) 245mm/9.6" x (D)145mm/5.7"
Weight:	2.5kg / 5.5lb

### Approvals / Compliance

CE and FCC: See the compliance web page for the full list

### Product information labels

The product information labels are located on the base of each unit.

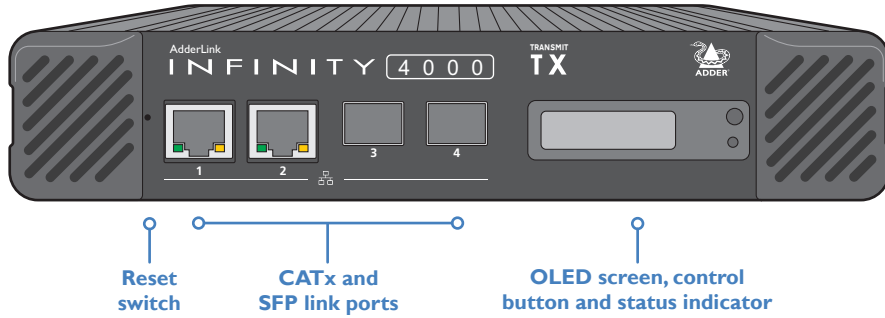
\* Software version v5.05 or later required.



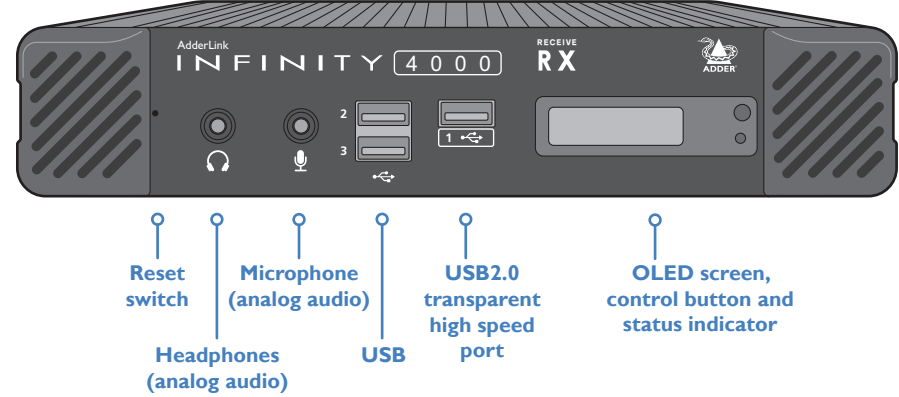
## ALIF4000 UNIT FEATURES

The transmitter and receiver modules are housed within durable, vented enclosures with connectors situated on the front and rear panels. The ALIF4001 model variants have two SFP sockets rather than SFP sockets plus CATx, but are otherwise identical.

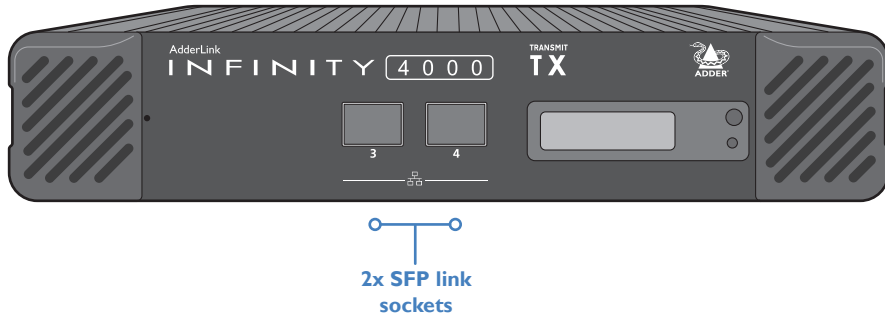
### Transmitter - front (ALIF4021 model)



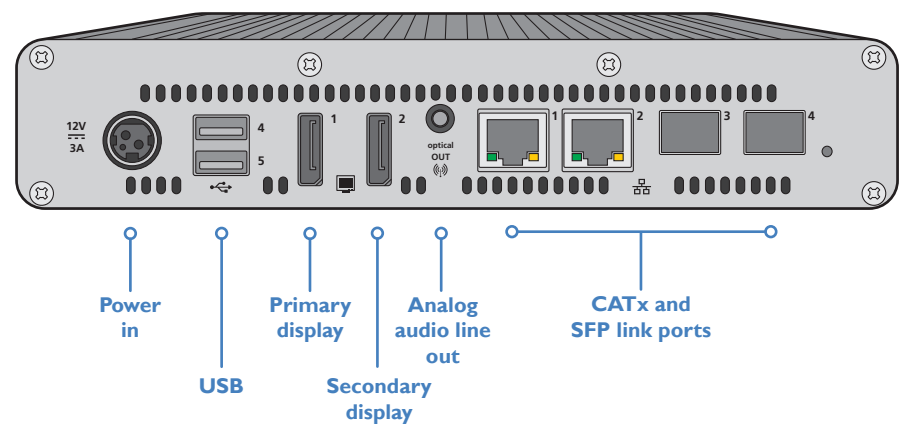
### Receiver - front



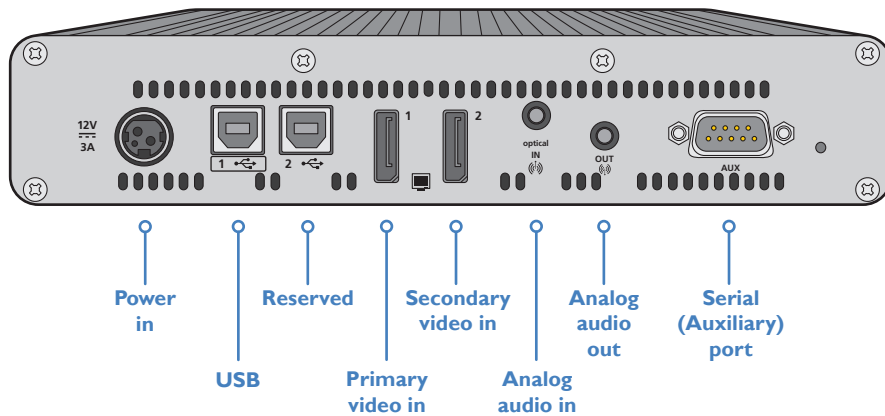
### Transmitter - front (ALIF4001 model)



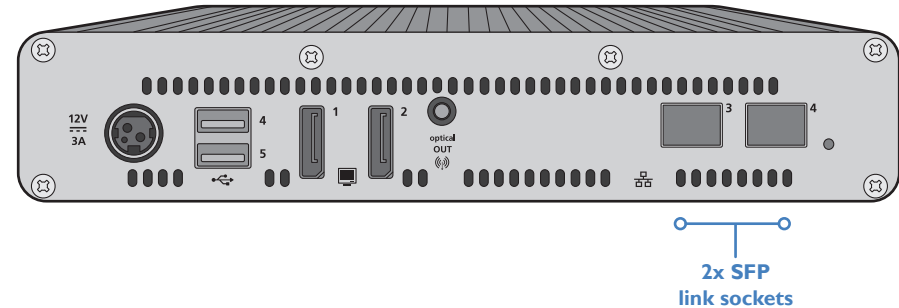
### Receiver - rear (ALIF4021 model)



### Transmitter - rear

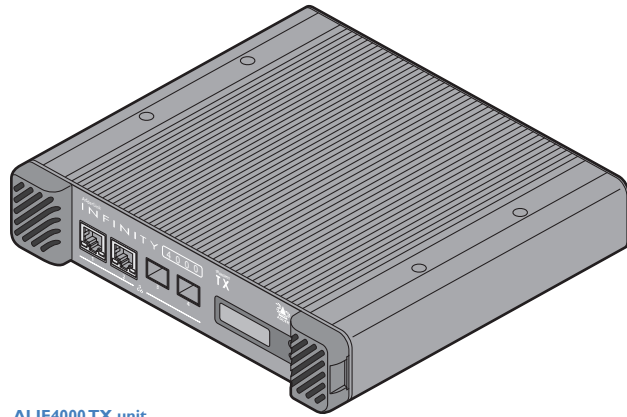


### Receiver - rear (ALIF4001 model)



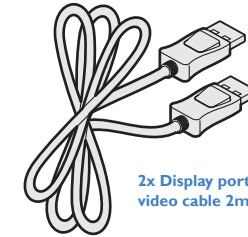
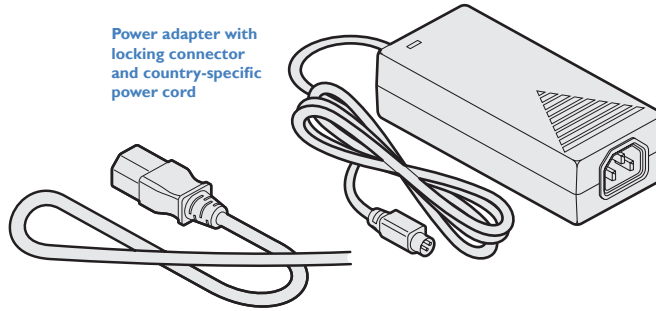
# SUPPLIED ITEMS

## ALIF4000 TX package

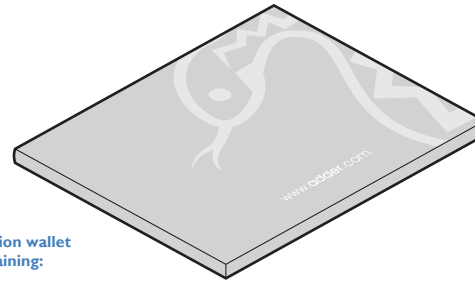


ALIF4000 TX unit

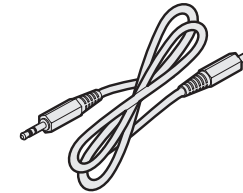
Power adapter with locking connector and country-specific power cord



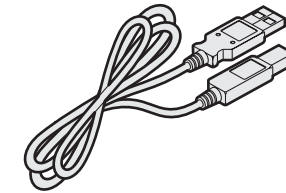
2x Display port video cable 2m



Information wallet containing:  
Four self-adhesive rubber feet  
Quick start guide  
Safety document

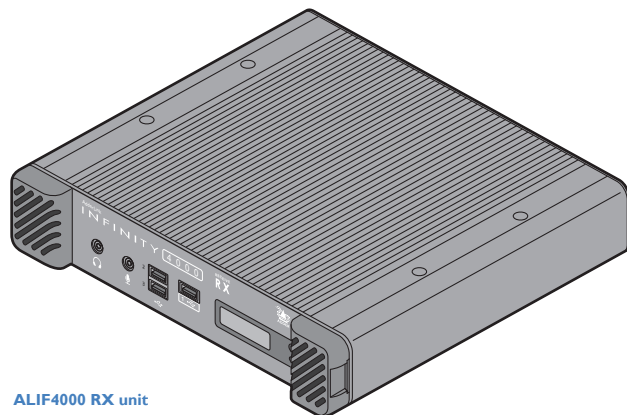


2x Audio cable 2m (3.5mm stereo jacks)

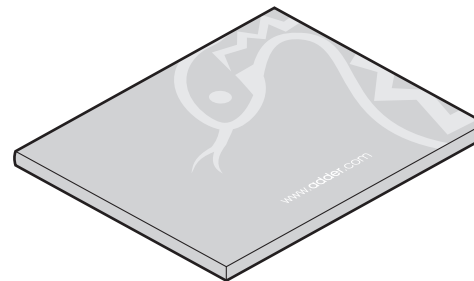


2x USB cable 2m (type A to B)  
Part number: VSC24

## ALIF4000 RX package

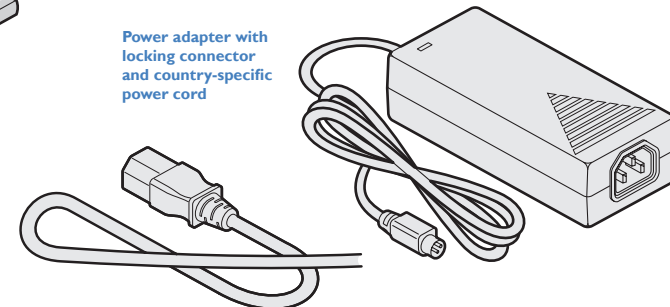


ALIF4000 RX unit



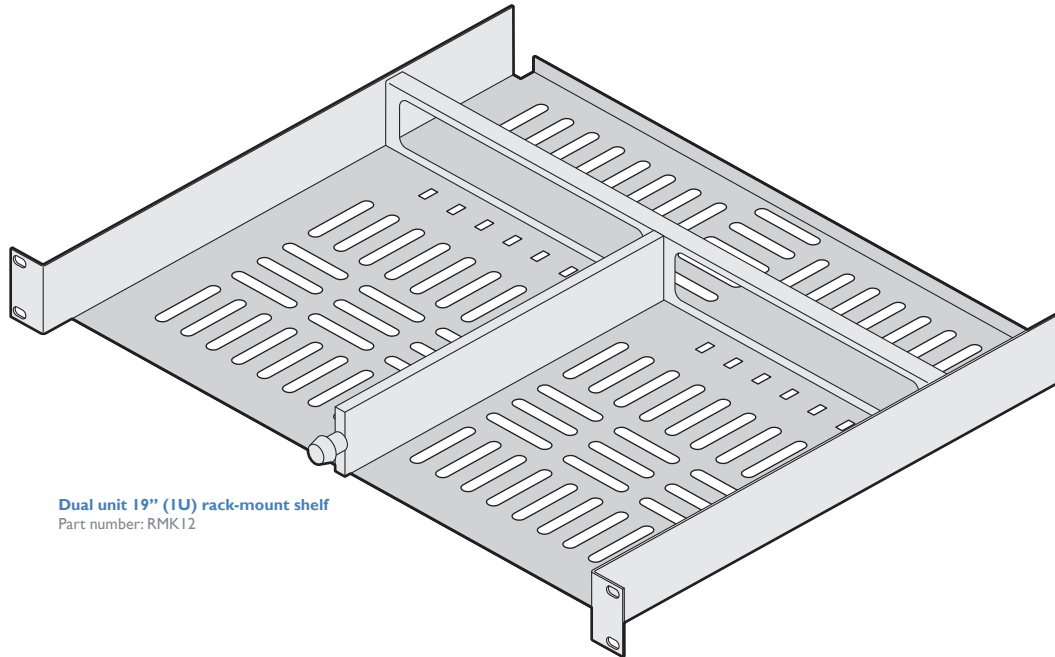
Information wallet containing:  
Four self-adhesive rubber feet  
Quick start guide  
Safety document

Power adapter with locking connector and country-specific power cord

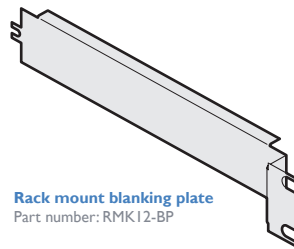




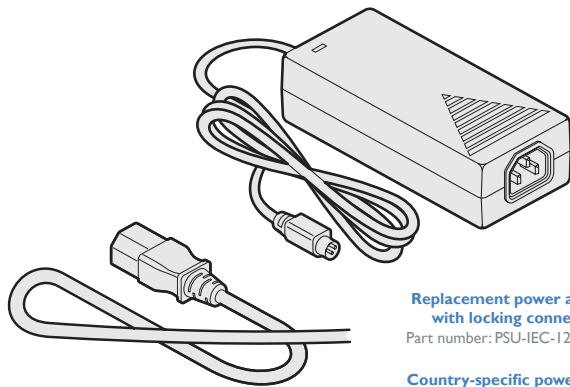
# OPTIONAL EXTRAS



**Dual unit 19" (1U) rack-mount shelf**  
Part number: RMK12

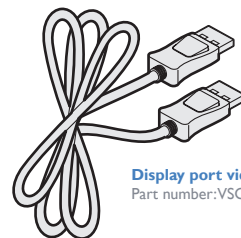


**Rack mount blanking plate**  
Part number: RMK12-BP

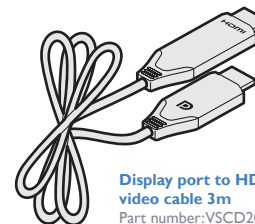


**Replacement power adapter with locking connector**  
Part number: PSU-IEC-12VDC-5A

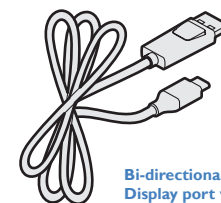
- Country-specific power cords**
- CAB-IEC-AUS (Australia)
  - CAB-IEC-EURO (Central Europe)
  - CAB-IEC-UK (United Kingdom)
  - CAB-IEC-USA (United States)
  - CAB-IEC-JP (Japan)
  - CAB-IEC-CN (China)



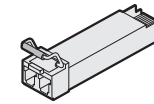
**Display port video cable 2m**  
Part number: VSCD10A



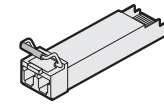
**Display port to HDMI 2.1 video cable 3m**  
Part number: VSCD20



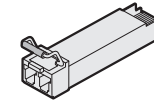
**Bi-directional USB type C to Display port video cable 2m**  
Part number: VSCD21



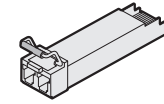
**1GbE single mode fiber SFP module\***  
Part number: SFP-SM-LC



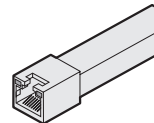
**10GbE single mode fiber SFP module**  
Part number: SFP-SM-LC-10G



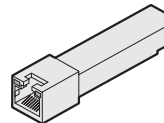
**1GbE multi mode fiber SFP module**  
Part number: SFP-MM-LC



**10GbE multi mode fiber SFP module**  
Part number: SFP-MM-LC-10G



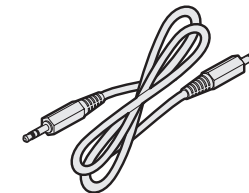
**1GbE fixed rate copper SFP module\***  
Part number: SFP-CATX-RJ45



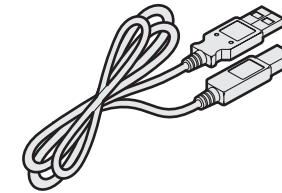
**10, 5, 2.5 and 1GbE multi-rate copper SFP module**  
Part number: SFP-CATX-MR

Please refer to the table in [Appendix G](#) for information about fiber modules and cables.

\* Software version v5.05 or later required.



**Audio cable 2m (3.5mm stereo jacks)**  
Part number: VSC22



**USB cable 2m (type A to B)**  
Part number: VSC24

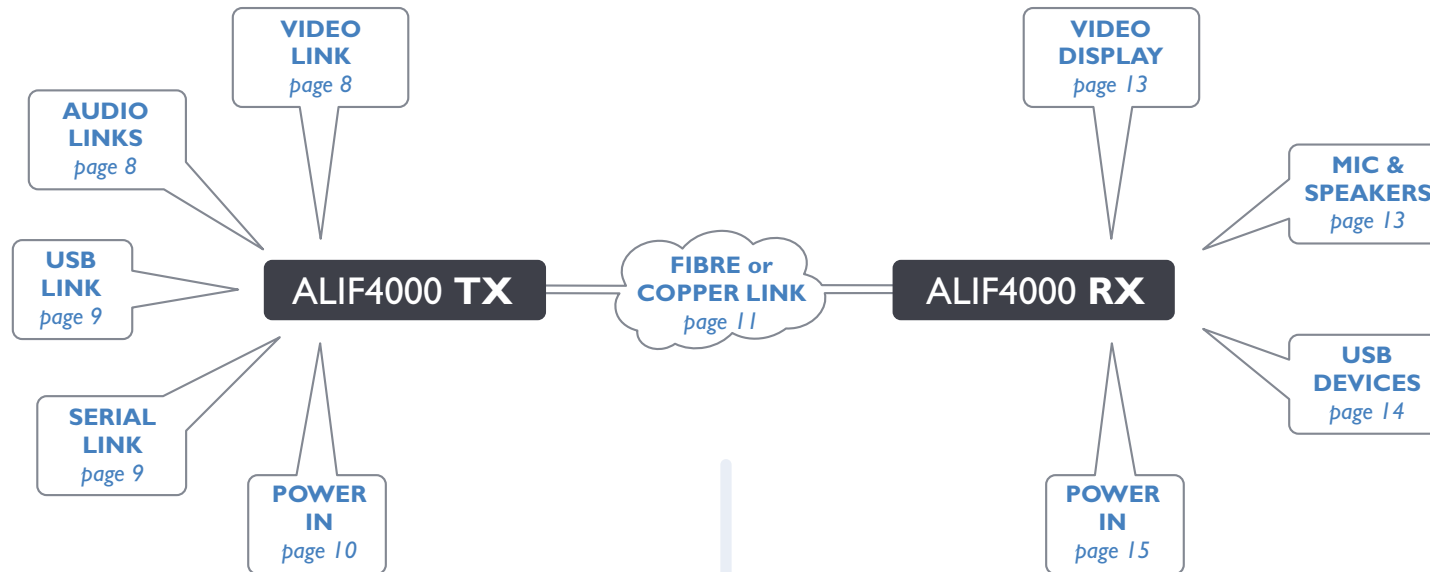
## CONNECTIONS

Installation involves linking the ALIF4000 TX unit to various ports on the host computer, while the ALIF4000 RX unit is attached to your peripherals (collectively known as the Console):

## MOUNTING

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

**IMPORTANT:** When mounting the ALIF units (and their power adapters), ensure that the vents are not obscured and that there is sufficient airflow. The operating temperature range is 0 to 50°C (32 to 122°F) and must not be exceeded.



Note: RS232 connections are supported when a USB to serial adaptor is used.

Click a connection to see details

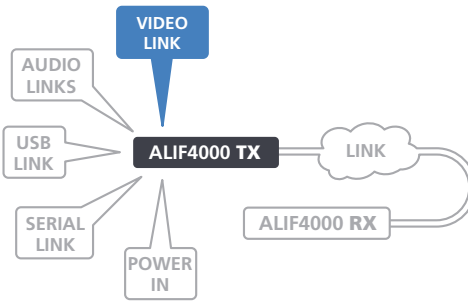
Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

**IMPORTANT:** When using an ADDERLink™ INFINITY 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 AIM server. If necessary, perform a [factory reset](#) on each ALIF unit. Please also see [Appendix C - Tips for success when networking ALIF units](#)

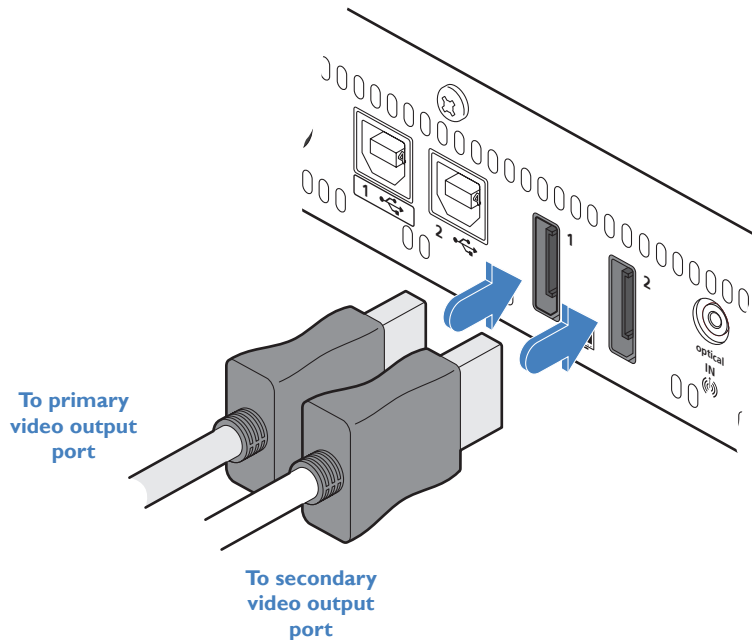
## TX video links

The TX unit supports two DisplayPort connections, each up to 5K 5120 pixels by 2880, 2160 or 1440, with refresh rates of 30, 50 and 60Hz respectively and at dynamic ranges of SDR8, SDR10 or HDR10 (ie 24-bit per pixel standard dynamic range, 30-bpp standard dynamic range, or 30-bpp high dynamic range). Digital audio, with support for stereo, 5.1 surround or 7.1 surround sound, is also supported via the DisplayPort connections.



### To make a video link

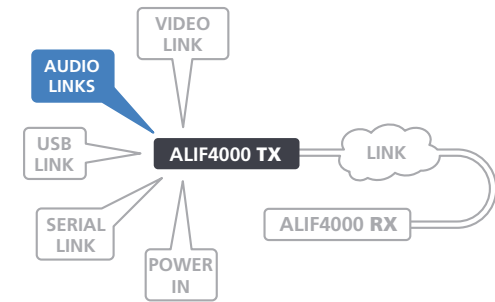
- 1 Connect your digital video link cable(s) to the DisplayPort socket(s) on the TX unit rear panel:



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

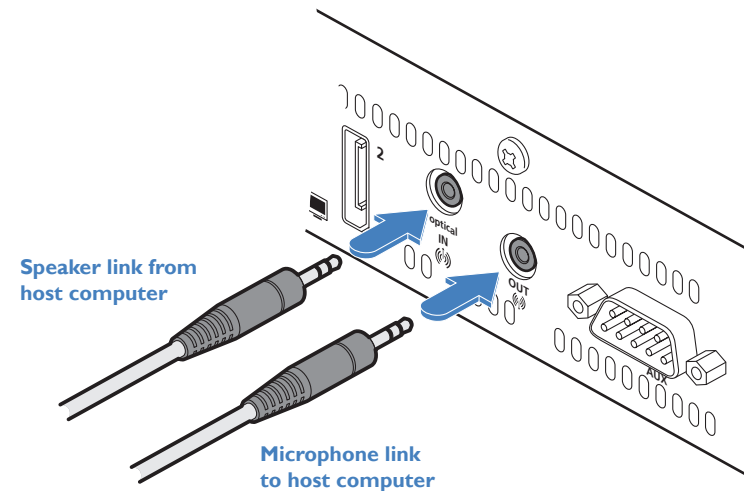
## TX analog audio links

The TX unit supports two way stereo analog audio so that you can use a remote microphone as well as speakers. Digital audio is handled separately via the DisplayPort connectors. See [Appendix B - Support for analog and digital audio](#) for details.



### To make audio links

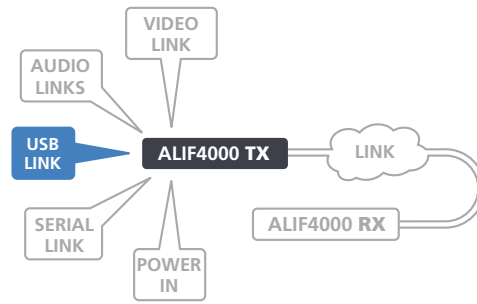
- 1 Connect an audio link cable between the **optical IN** socket on the TX unit rear panel and the speaker output socket of the host computer.



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

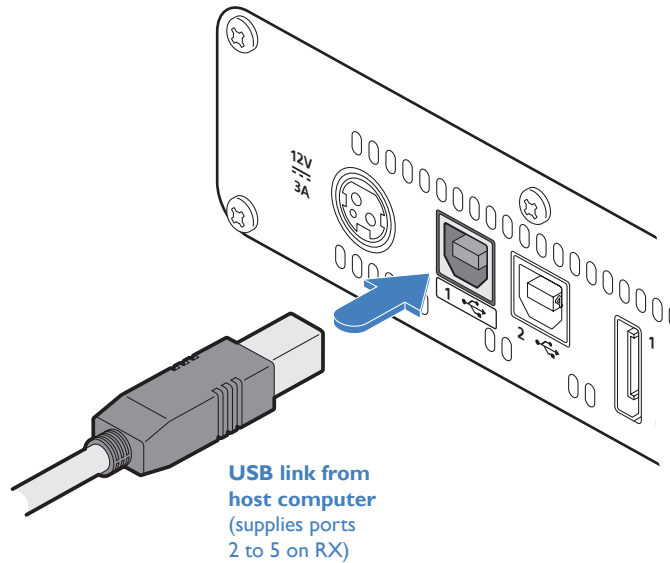
## TX USB links

The TX unit has two USB type B sockets on the rear panel. Port 2 is not currently used.



### To make a USB link

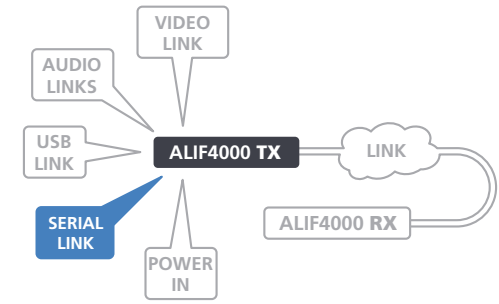
- 1 Connect the type B connector of the supplied USB cable to the USB port 1 on the TX unit rear panel.



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

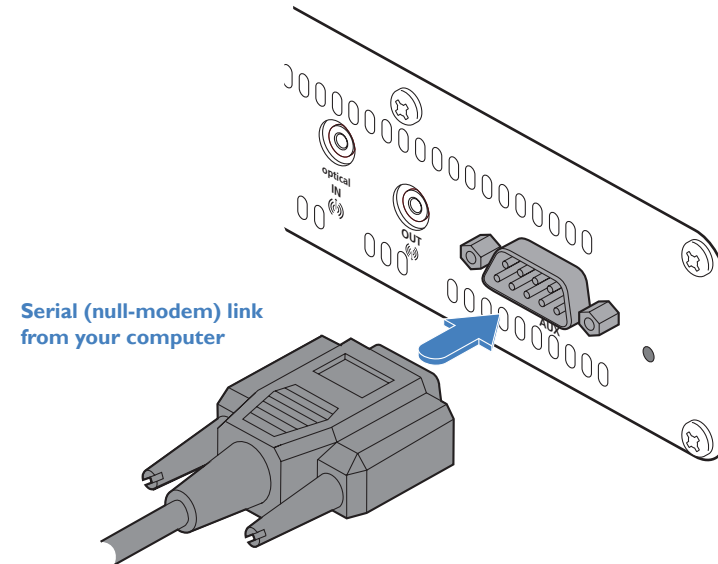
## TX AUX (serial) port

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. A third-party USB-to-serial adaptor is required at each RX unit (that is required to make a serial link).



### To connect the AUX port

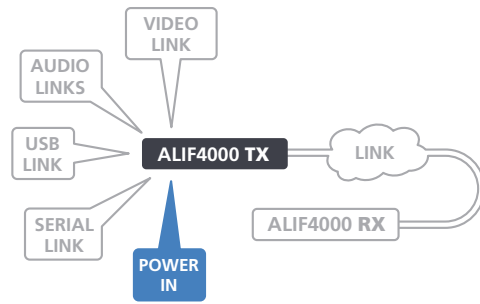
- 1 Connect a suitable serial 'null-modem' cable (see [Appendix F](#) for pin-out) between a vacant serial port on your computer and the AUX port on the right hand side of the ALIF rear panel.



- 2 At the required RX unit(s), use a USB-to-serial adaptor connected to one of the USB ports.

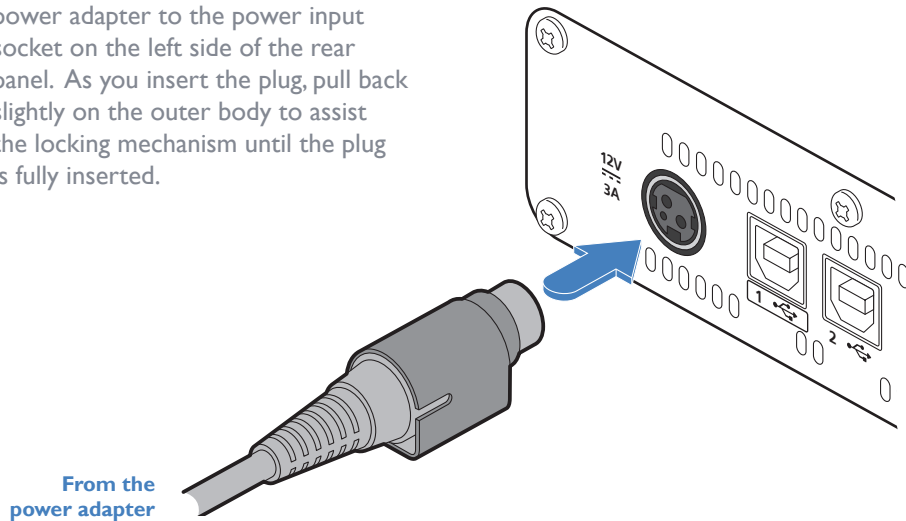
## TX power in

Each unit is supplied with a power adapter and country-specific power cord. The supplied power adapter uses a locking-type plug to help prevent accidental disconnection; please follow the instructions shown on the right when disconnecting a power adapter.

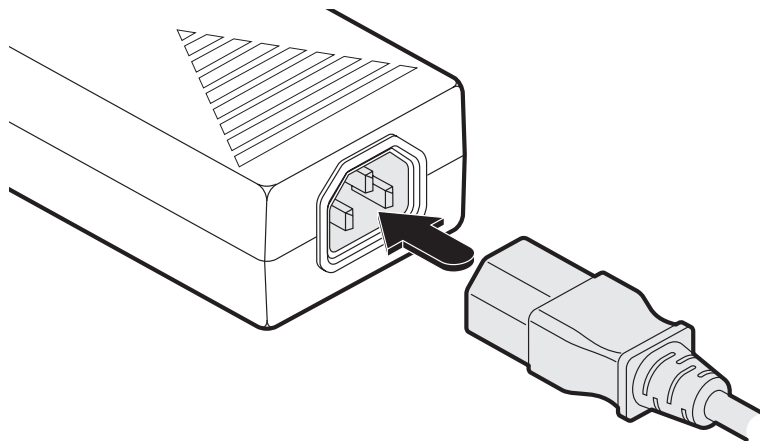


### To connect the power adapter

1 Attach the output plug of the supplied power adapter to the power input socket on the left side of the rear panel. As you insert the plug, pull back slightly on the outer body to assist the locking mechanism until the plug is fully inserted.



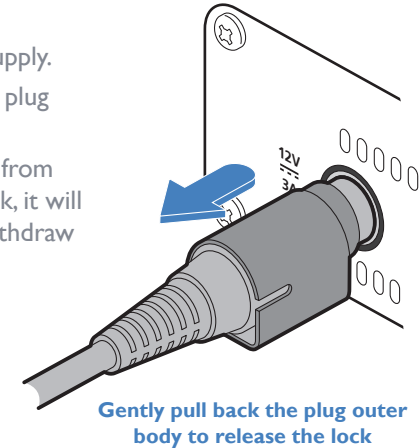
2 Insert the IEC connector of the supplied country-specific power cord to the socket of the power adapter.



3 Connect the power cord to a nearby mains supply socket.

### To disconnect the power adapter

- 1 Isolate the power adapter from the mains supply.
- 2 Grasp the outer body of the power adapter plug where it connects with the node.
- 3 Gently pull the body of the outer plug away from the node. As the body of the plug slides back, it will release from the socket and you can fully withdraw the whole plug.



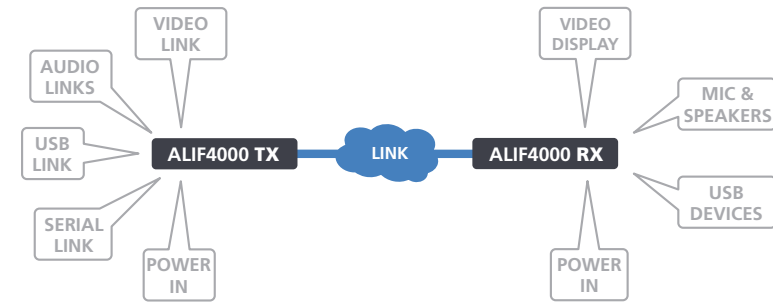
**IMPORTANT:** Please read and adhere to the electrical safety information given within the Safety information booklet provided with this product. In particular, do not use an unearthed power socket or extension cable.

*Note:* The unit and the power adapter 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 50 degrees Centigrade. Do not place the products in contact with equipment whose surface temperature exceeds 50 degrees Centigrade.

## TX/RX high speed links

ALIF4000 units can be either connected directly to each other or via a high speed (up to 10GbE) network. There are three main ways to make high speed links:

- Using the in-built CATx port(s) for connections up to 1GbE (ALIF4021 only, see below),
  - Allows high video resolutions but with reduced frame rates. Use both CATx ports in combination for teaming to mitigate the relatively slow data rate and improve video quality.*
- Using the SFP port(s) with optional CATx module(s) for connections up to 10GbE (see next page),
  - Single or dual 10GbE links will allow full resolution and high frame rate video to be transferred. Slower links may be subject to varying frame rates, depending on the video content and CODEC settings. Dual links to provide teaming will help a great deal, particularly with slower connection speeds.*
- Using the SFP port(s) with optional fiber (FCoE) module(s) for connections up to 10GbE (see next page),
  - Single or dual 10GbE links will allow full resolution and high frame rate video to be transferred. Dual links to provide teaming will help a great deal, particularly with slower connection speeds.*



### Optional SFP module types

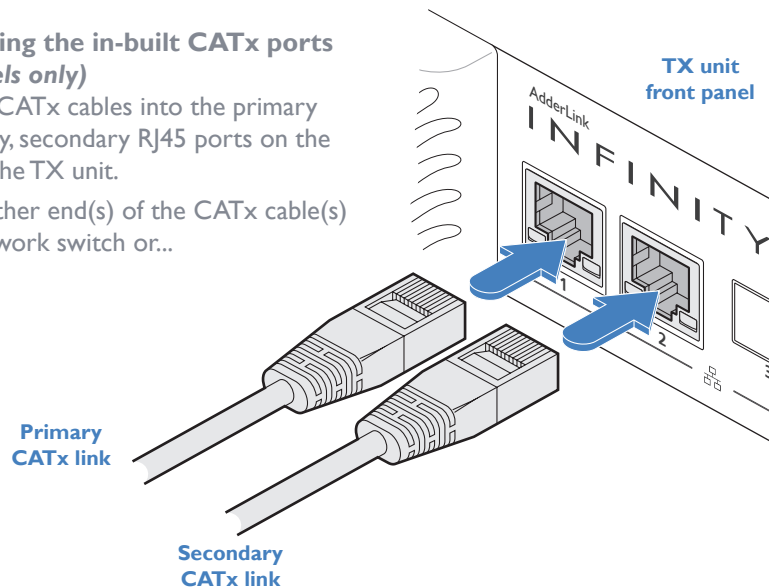
- SFP-CATX-RJ45 for use with CAT5e (and above) cable (1GbE)\*.
- SFP-CATX-MR for use with CAT5e (and above) cable (10, 5, 2.5 and 1GbE).
- SFP-SM-LC modules require OS1 or OS2 single mode fiber (1GbE)\*.
- SFP-SM-LC-10G modules require OS1 or OS2 single mode fiber (10GbE).
- SFP-MM-LC modules require OM1, OM2, OM3 or OM4 multi-mode fiber (1GbE).
- SFP-MM-LC-10G modules require OM1, OM2, OM3 or OM4 multi-mode fiber (10GbE).

See [Appendix G](#) for further details about SFP modules and cable lengths.

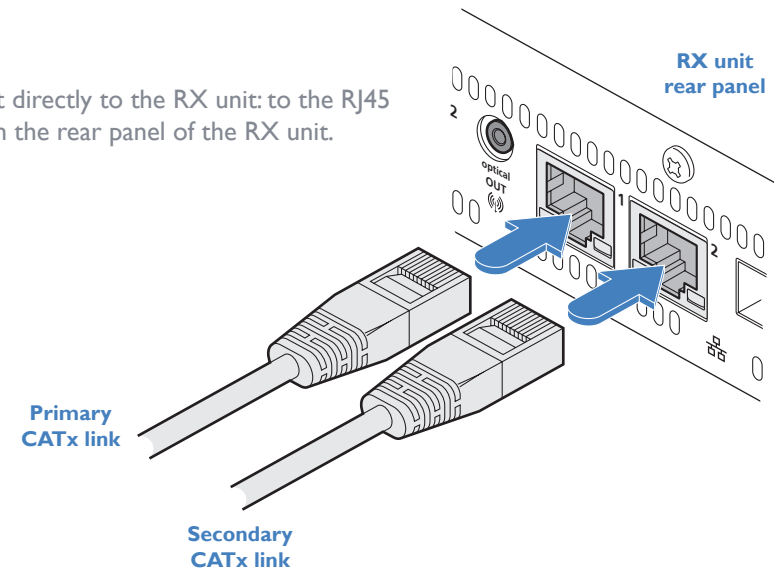
\* Software version v5.05 or later required.

### To link units using the in-built CATx ports (ALIF4021 models only)

- 1 Insert suitable CATx cables into the primary and, if necessary, secondary RJ45 ports on the front panel of the TX unit.
- 2 Connect the other end(s) of the CATx cable(s) to either a network switch or...



... connect directly to the RX unit: to the RJ45 port(s) on the rear panel of the RX unit.



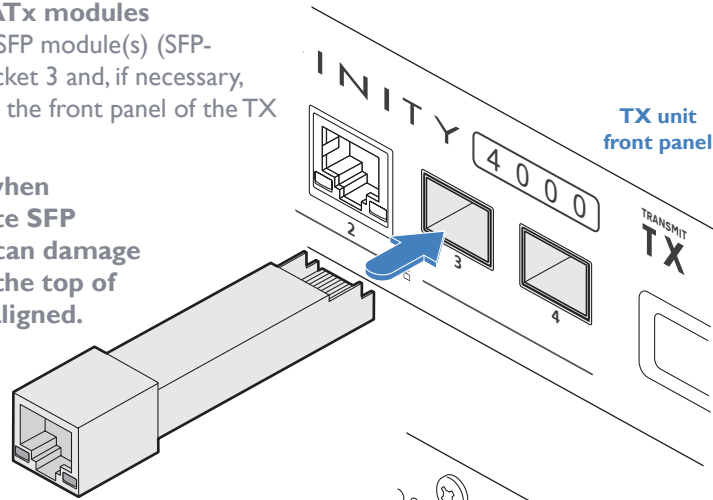


### To link units via CATx modules

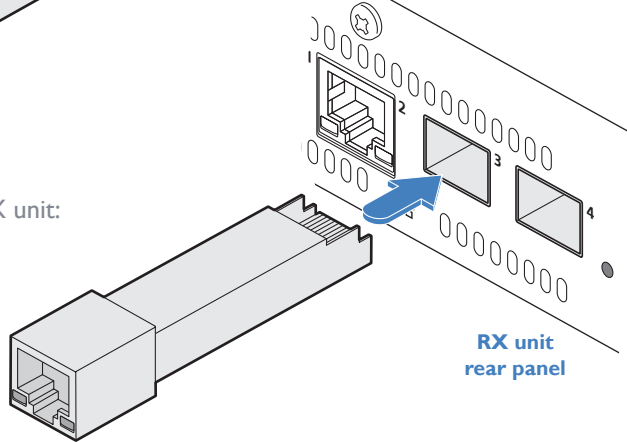
1 Insert the optional SFP module(s) (SFP-CATX-MR) into socket 3 and, if necessary, socket 4 located on the front panel of the TX unit...

**Note:** Take care when inserting multirate SFP modules as they can damage the metal tab at the top of the socket if misaligned.

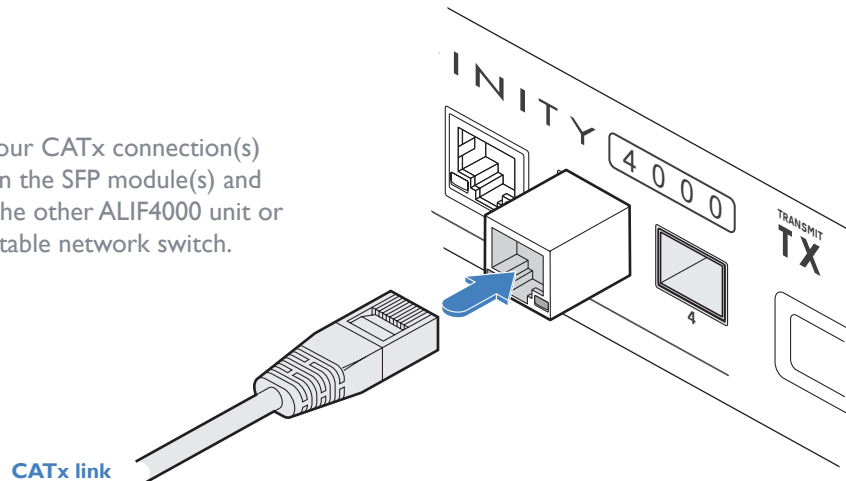
CATx SFP module



...and the rear panel of the RX unit:



2 Make your CATx connection(s) between the SFP module(s) and either the other ALIF4000 unit or to a suitable network switch.

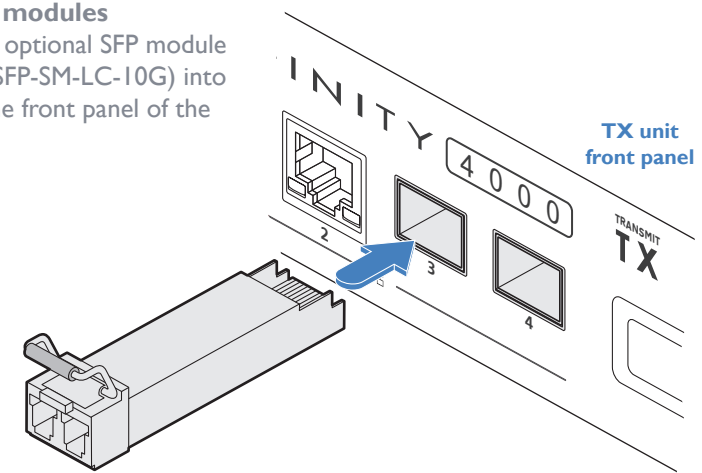


CATx link

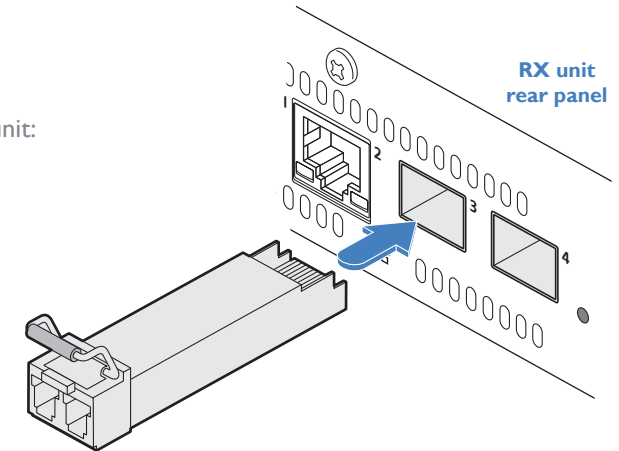
### To link units via fiber modules

1 Insert the appropriate optional SFP module (SFP-MM-LC-10G or SFP-SM-LC-10G) into socket 3 located on the front panel of the TX unit...

Fiber SFP module

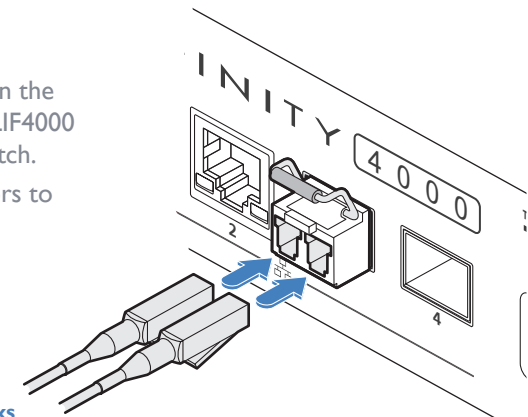


...and the rear panel of the RX unit:



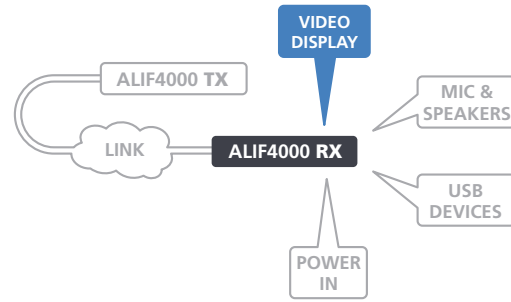
2 Make your fiber connection(s) between the SFP module(s) and either the other ALIF4000 unit or to a suitable fiber network switch.  
3 Close the latch over the link connectors to lock them into place.

Transmit and receive fiber links



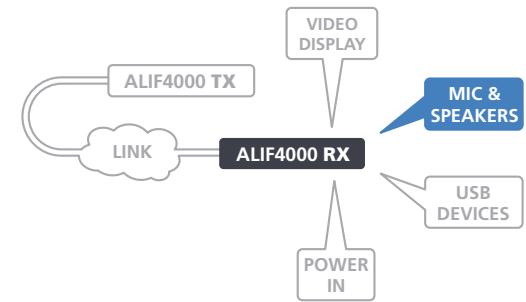
## RX video display

The RX unit supports two DisplayPort connections, each up to 5K 5120 pixels by 2880, 2160 or 1440, with refresh rates of 30, 50 and 60Hz respectively. Digital audio, with support for stereo, 5.1 surround or 7.1 surround sound, is also supported via the DisplayPort connections.



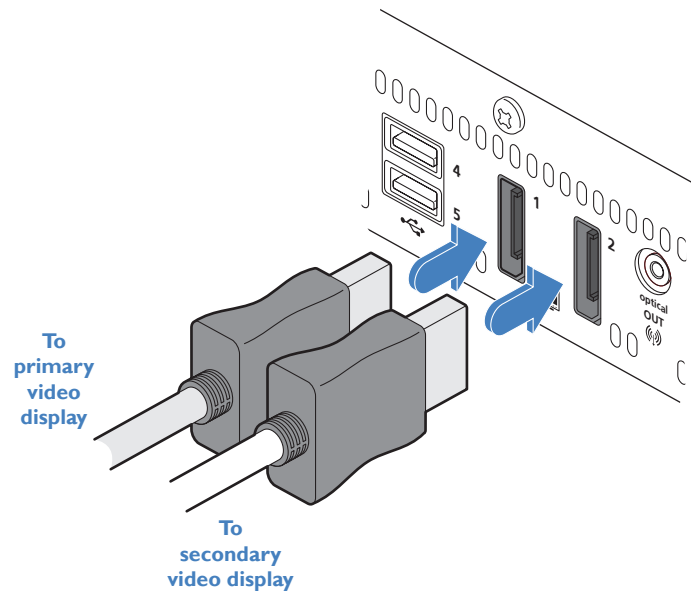
## RX microphone & speakers

The RX unit can support a microphone as well as speakers providing the necessary connections have been made between the TX unit and the host computer. Digital audio is handled separately via the DisplayPort connectors. See [Appendix B - Support for analog and digital audio](#) for details.





### To connect video displays

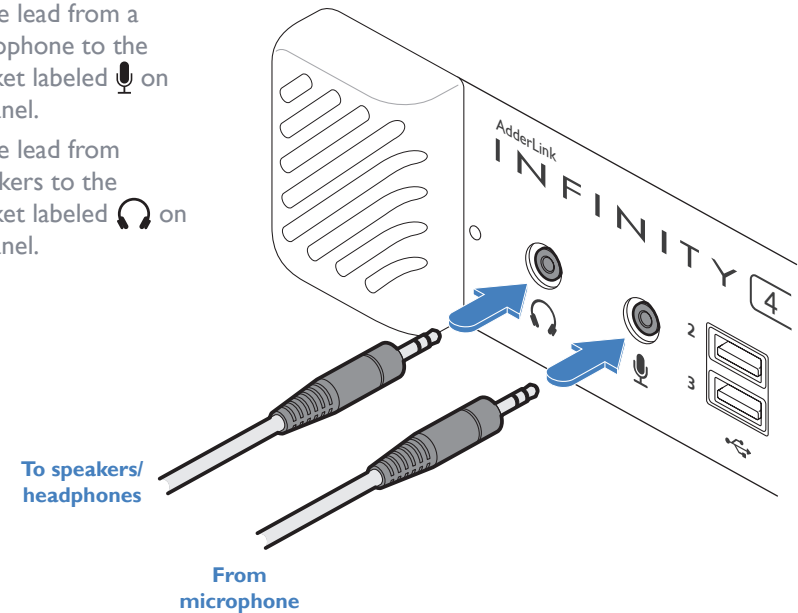
- 1 Connect the lead from the primary video display to the DisplayPort socket marked '1' on the RX unit rear panel:



- 2 If required, connect the lead from the second video display to the DisplayPort socket marked '2' on the RX unit rear panel.

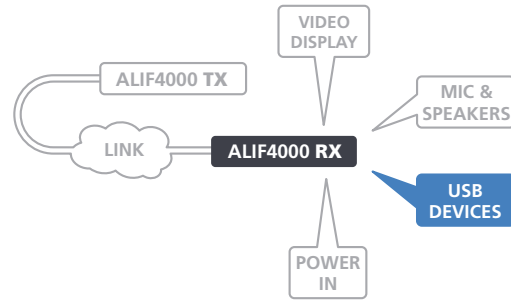
### To connect a microphone (or line in) and/or speakers

- 1 Connect the lead from a mono microphone to the 3.5mm socket labeled  on the front panel.
- 2 Connect the lead from stereo speakers to the 3.5mm socket labeled  on the front panel.



## RX USB devices

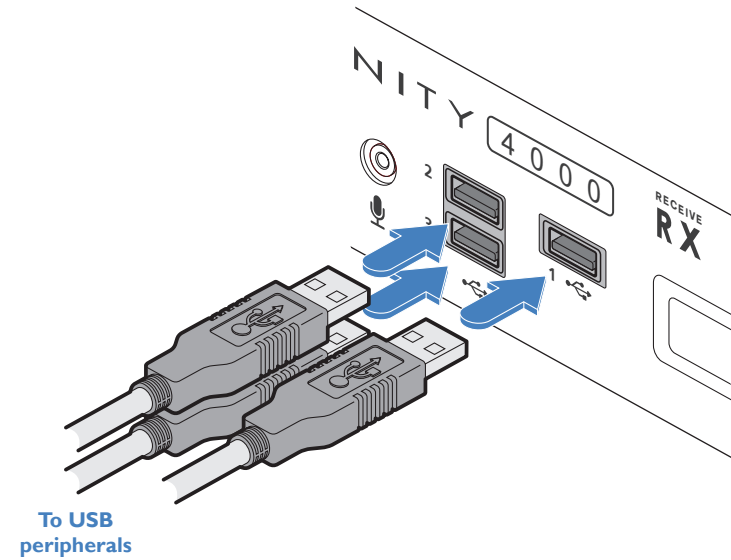
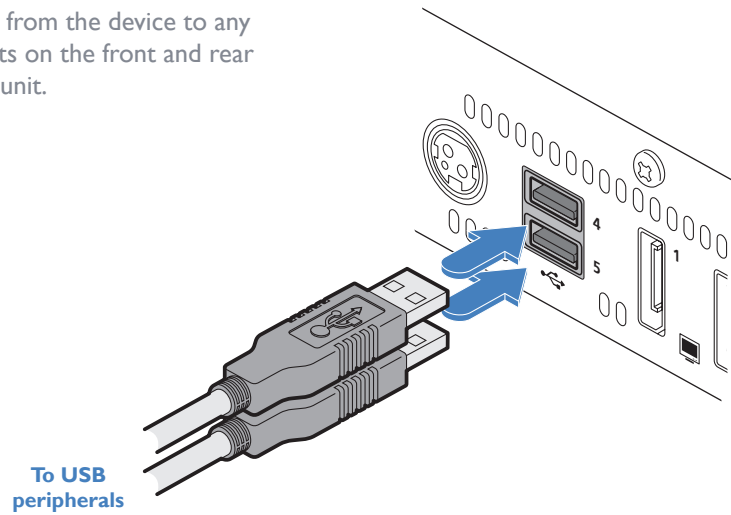
The ALIF RX unit has five USB ports (three on the front panel and two on the rear) to which peripherals may be connected.



To connect more than five 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 USB devices

- 1 Connect the lead from the device to any of the USB sockets on the front and rear panels of the RX unit.

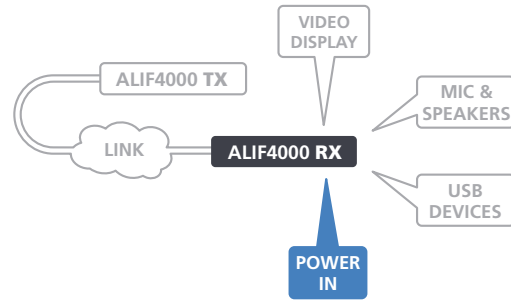


### RS232 serial support

To support RS232 serial connections, use a third-party USB-to-serial adaptor connected to any of the USB ports from 2 to 5. The serial connection will be replicated at the serial port on the connected ALIF4000 TX unit.

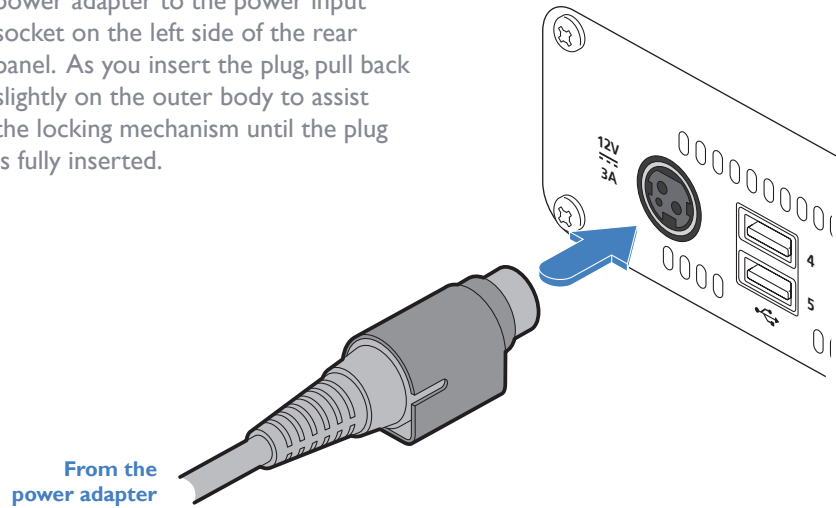
## RX power in

Each unit is supplied with a power adapter and country-specific power cord. The supplied power adapter uses a locking-type plug to help prevent accidental disconnection; please follow the instructions shown on the right when disconnecting a power adapter.

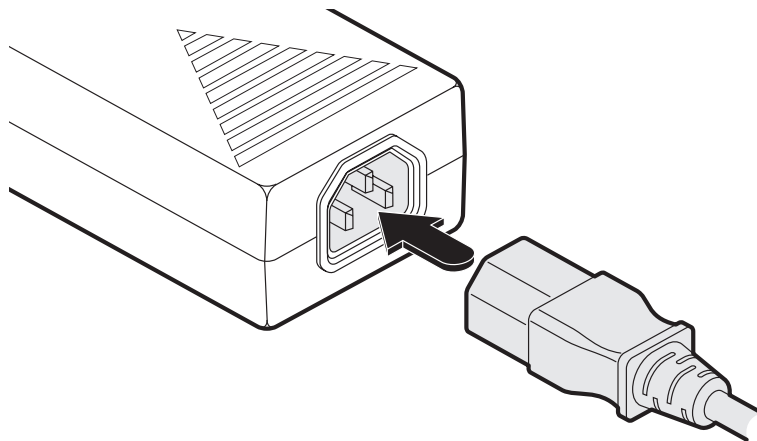


### To connect the power adapter

1 Attach the output plug of the supplied power adapter to the power input socket on the left side of the rear panel. As you insert the plug, pull back slightly on the outer body to assist the locking mechanism until the plug is fully inserted.



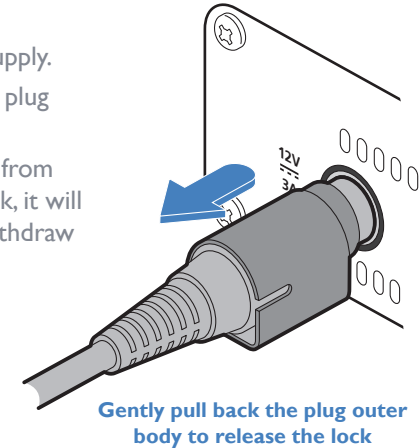
2 Insert the IEC connector of the supplied country-specific power cord to the socket of the power adapter.



3 Connect the power cord to a nearby mains supply socket.

### To disconnect the power adapter

- 1 Isolate the power adapter from the mains supply.
- 2 Grasp the outer body of the power adapter plug where it connects with the node.
- 3 Gently pull the body of the outer plug away from the node. As the body of the plug slides back, it will release from the socket and you can fully withdraw the whole plug.




**IMPORTANT:** Please read and adhere to the electrical safety information given within the Safety information booklet provided with this product. In particular, do not use an unearthed power socket or extension cable.

*Note:* The unit and the power adapter 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 50 degrees Centigrade. Do not place the products in contact with equipment whose surface temperature exceeds 50 degrees Centigrade.

# Configuration

## ALIF4000 CONFIGURATION VIA WEB PAGES

Each ALIF4000 unit hosts its own internal set of web pages which contain all configuration details and settings (see also *Start of Life, shown right*). You will need to use a computer connected to the same network as each ALIF4000 unit to access the web pages. Additionally, on the console attached to the ALIF4000 RX unit, you can access its configuration details via the On Screen Display (OSD) by pressing **CTRL + ALT + C** (or by tapping the  icon on the touchscreen) - see page 25.

### To manually configure ALIF4000 units via their web pages

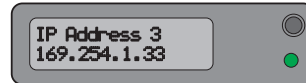
Run a web browser on your computer and enter the IP address of the required ALIF4000 unit:

The default addresses (if using ports 1 or 3) are **TX:** https://169.254.1.33  
**RX:** https://169.254.1.32

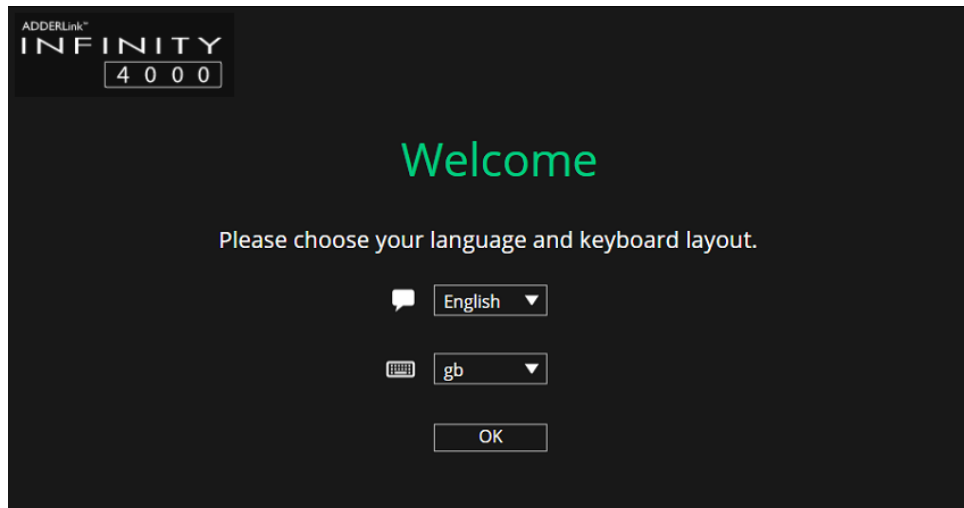
The default addresses (if using ports 2 or 4) are **TX:** https://169.254.1.43  
**RX:** https://169.254.1.42

If the IP address of a unit has been changed, you can either:

- Discover the unit's main IP address by pressing the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* (or *IP Address 4*).
- Alternatively, providing it is appropriate to do so, perform a manual factory reset (see next page) to restore the default address.



The opening page should be displayed:



For explanations of the options within each page, please see [Appendix A](#).

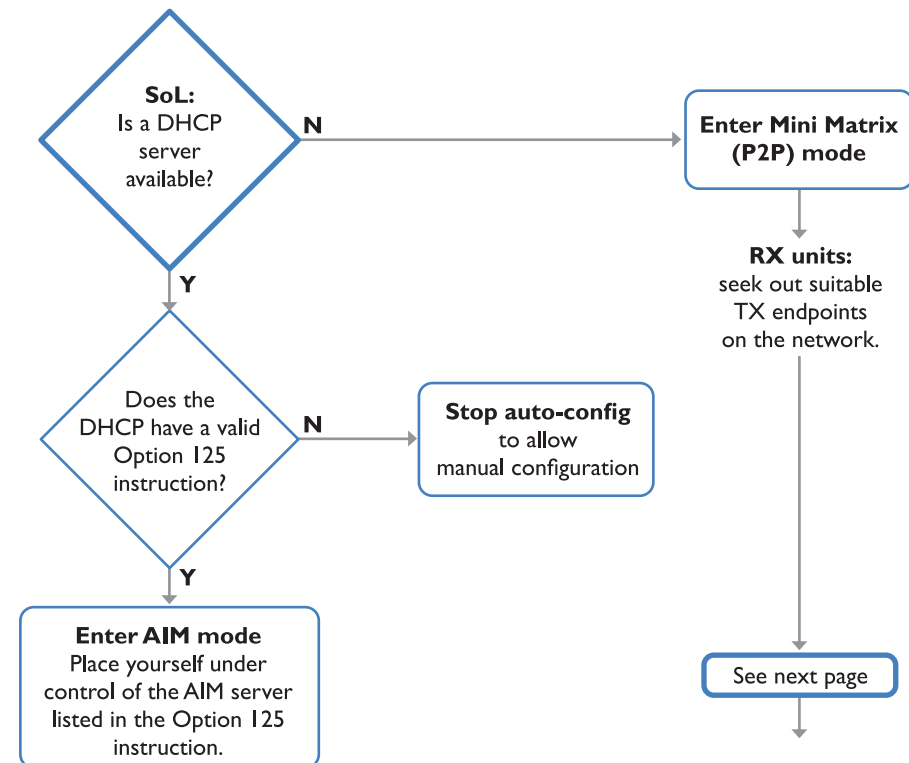
## Start of Life: AIM or Point to Point configuration

To streamline initial configuration processes, all ALIF4000 units employ a Start of Life (SoL) procedure when they are in an unconfigured state; either because they are new or because they have undergone a factory reset.

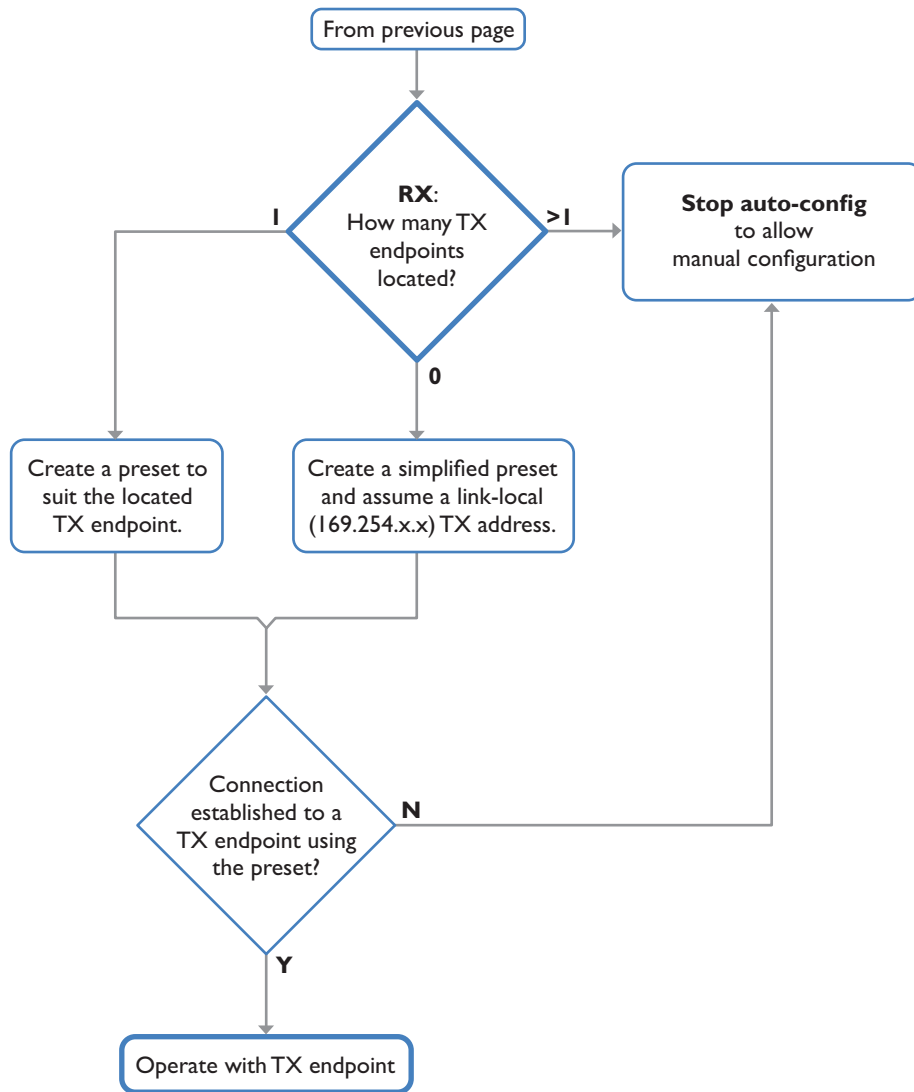
When an unconfigured ALIF4000 unit boots, its SoL procedure will guide it to automatically determine which of two modes it should adopt:

- AIM mode** - place itself into the control of a specific AIM server on the network, whereupon the ALIF4000 will be assigned suitable configuration details to fit within the network of similar units.
- Mini Matrix (P2P) mode** - place itself into Point to Point (P2P) mode to allow manual configuration of links with other ALIF units.

The SoL procedure follows this basic logic flow to determine the correct mode:



## Start of Life configuration (continued)



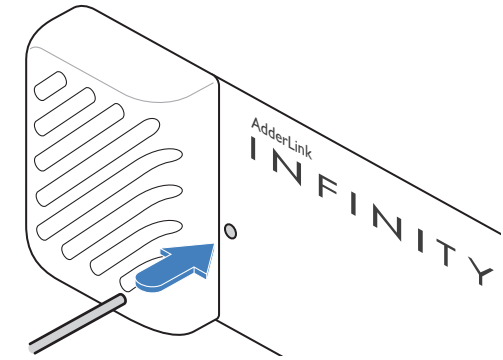
Once the mode has been set to AIM control, an ALIF4000 will remain operating that way until it undergoes a [factory reset](#). If set to Mini Matrix (P2P) mode, an ALIF4000 will remain thus until it undergoes a factory reset or is discovered by an AIM server.

## PERFORMING A MANUAL FACTORY RESET

A factory reset returns ALIF4000 unit to its default configuration.

### To perform a manual factory reset

- 1 Power on the ALIF4000 unit.
- 2 Use a long narrow implement (e.g. a straightened-out paper clip) to press-and-hold the recessed reset button on the front panel for roughly ten seconds, until the status indicator turns **blue** (Note: alternating red/green indications will occur during the ten second period while the button is still pressed).
- 3 Release the reset switch. The indicator will change to **red** for a short while (less than ten seconds) and then back to **blue** while ALIF4000 unit performs the reset and should then change to an alternative color, usually **orange** initially, signifying that the operation is complete.



*Note: If you are performing a factory reset and intend to disconnect the power immediately after the reset, you must wait at least 30 seconds after you have released the reset button for it to complete the process.*

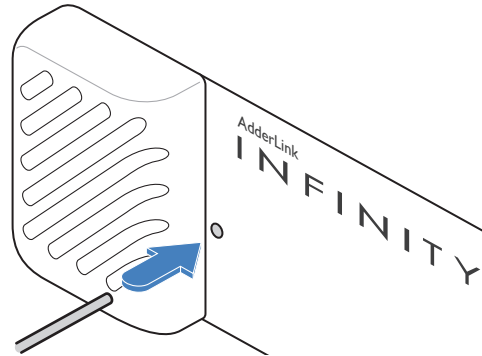


## PLACING THE DEVICE INTO RECOVERY MODE

Recovery mode may allow an ALIF4000 unit to be diagnosed or upgraded in the event of the main mode being non-operational.

### To boot the device into recovery mode


- 1 Power on the ALIF4000 unit.
- 2 Use a long narrow implement (e.g. a straightened-out paper clip) to press-and-hold the recessed reset button on the front panel (for less than ten seconds) until the status indicator starts alternating **red/green**. *Note: A solid **blue** indication will occur after the ten second period.*
- 3 Release the reset switch. The indicator will change to **red** for a short while (less than ten seconds) and then alternating **red/green** signifying that the device is in recovery mode. *Note: If the indicator turns **blue**, then a factory reset has been performed instead, the device will not be in recovery mode and the operation will need to be attempted again.*

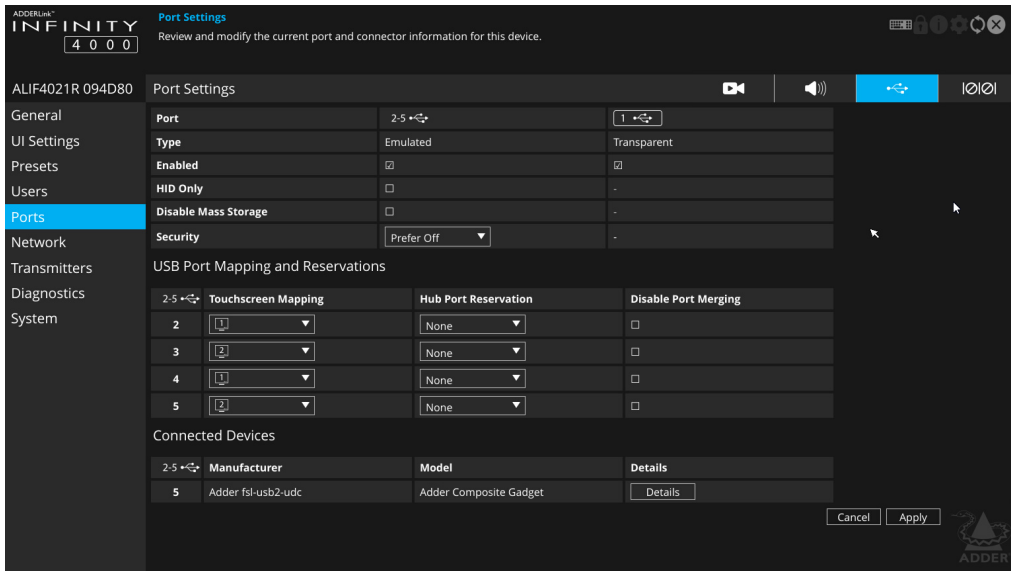


## CONFIGURING DUAL TOUCHSCREENS

When a single touchscreen is used with an ALIF RX, it should operate correctly as soon as the USB link is made between the screen and the ALIF RX. However, if two touchscreens are installed it may be necessary to instruct the ALIF RX which screen to correctly attribute to each USB input.

### To attribute dual touchscreens

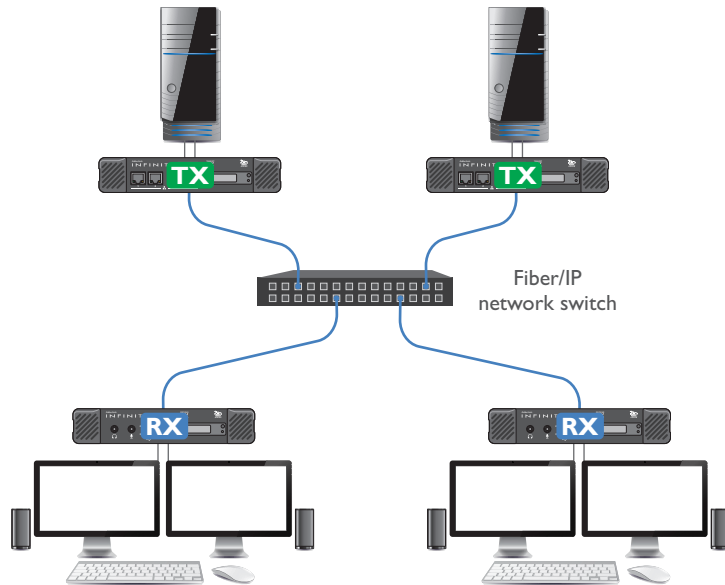
- 1 Access the Configuration pages on the ALIF RX - see page 25.
- 2 Click the Ports entry from the list of pages on the left side.
- 3 Click the USB page icon:  to display the following:



- 4 In the USB Port Mapping and Reservations section, match the primary touchscreen to the port number (2 -5) that its USB cable is connected to.
- 5 Repeat step 4 for the secondary touchscreen.
- 6 Click the Apply button and exit from the configuration pages.

## CREATING AN UNMANAGED MATRIX

Although ALIF units are most often organised and managed by a central AIM server, it is possible to create small networks of ALIF units, most often in matrix arrangements, ie multiple TX and RX units which can freely cross-connect.



This method of connection works well for small numbers of TX and RX units, but will become more difficult to manage as more units are attached. The maximum number of TX sources that can be made available to any RX is 16.

### To create an unmanaged matrix

1 Connect ALIF4000 TX and RX units (with their various hosts and peripherals) to a suitable switch, as described in the Installation section - see page 9.

*Note: If any device was previously managed by AIM, then it will need to be given a factory reset before continuing with this procedure. There must not be an AIM connected on the matrix network otherwise, when such devices undergo a factory reset, they will automatically revert to AIM control.*

You now need to perform the following procedure on each ALIF RX in turn:

- 2 Access the Configuration pages - see page 25.
- 3 Click the Transmitters option from the list on the left side. This page will list all of the available TX units which are not under AIM control. See page 37.
- 4 Click the Presets option from the list on the left side. Use this page to add each TX unit to the list of presets for the RX that you are editing. See page 32.

### To use the matrix

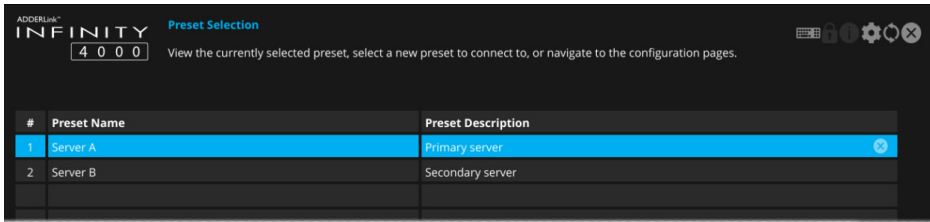
- On each RX, use the OSD to access the required TX units in the usual manner. See page 25.

## CREATING AND EDITING PRESETS

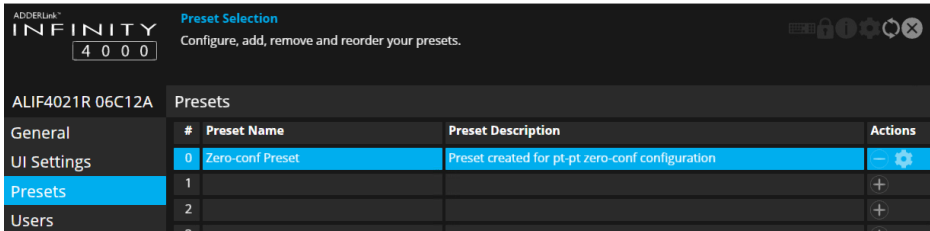
Presets allow you to create shortcuts from any ALIF receivers to any available ALIF transmitters. These are particularly useful when using an ALIF installation that is not under AIM control.

### To access the Preset configuration page

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the icon on the touchscreen.
- 2 The Preset Selection page will be displayed:



- 3 Click/tap the icon in the top right corner.
- 4 Choose the Presets option from the list on the left side of the screen. This page will show the same list of presets, but with options to add () or edit () entries:

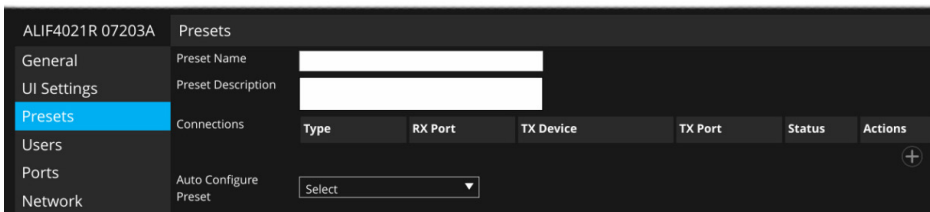


### To remove a preset

- 1 Access the Preset configuration page as discussed above.
- 2 In the Actions column, click the icon for the entry that you wish to remove.

### To add a preset

- 1 Access the Preset configuration page as discussed above.
- 2 Click the icon on the right hand side of the list to display the configuration page:



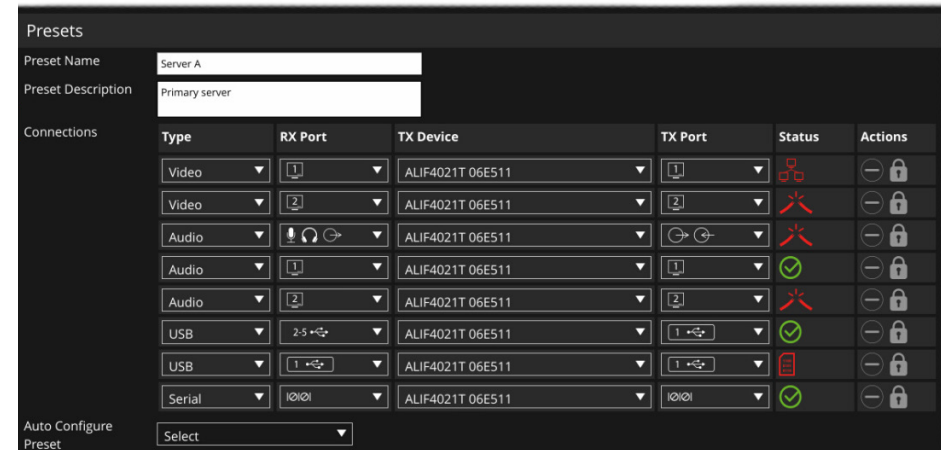
- 3 Enter a name and description for the new preset.

4 You can now choose how to configure your new preset - Auto or Custom:

- **Auto** - Click the Auto Configure Preset drop down and choose the ALIF transmitter that you wish to connect with. All of the supported default connections will be configured (on a 1-to-1 basis) between the receiver and chosen transmitter. Click the Apply button.
- **Custom** - Configure individual connections (useful when unusual cross connections are required).
  - 1 Click the icon on the right side to add a new connection entry.
  - 2 Check that the correct ALIF4000 TX is shown in the TX Device column. Click and change this entry, if required.
  - 3 In the Type column, click the Select option (highlighted in red) and choose the type of connection: Video, Audio, USB or Serial.
  - 4 Click the RX Port drop down and choose the required port.
  - 5 Click the TX Port drop down and choose the port that you wish the current RX port to connect with. If only one option is available it will be auto-selected.
  - 6 Repeat steps 1 to 5 for each of the required ports.
  - 7 Click the Apply button.

### To edit a preset

- 1 Access the Preset configuration page as discussed left.
- 2 In the Actions column, click the icon for the preset entry you wish to edit. An editable list of connections will be shown, together with their status representations:



- 3 Make your changes as required and then click the Apply button to save.

### To re-order presets

- 1 Access the Preset configuration page as discussed left.
- 2 Click and drag a preset to the required position within the list.

For more information about the options and status indications, see page 32.

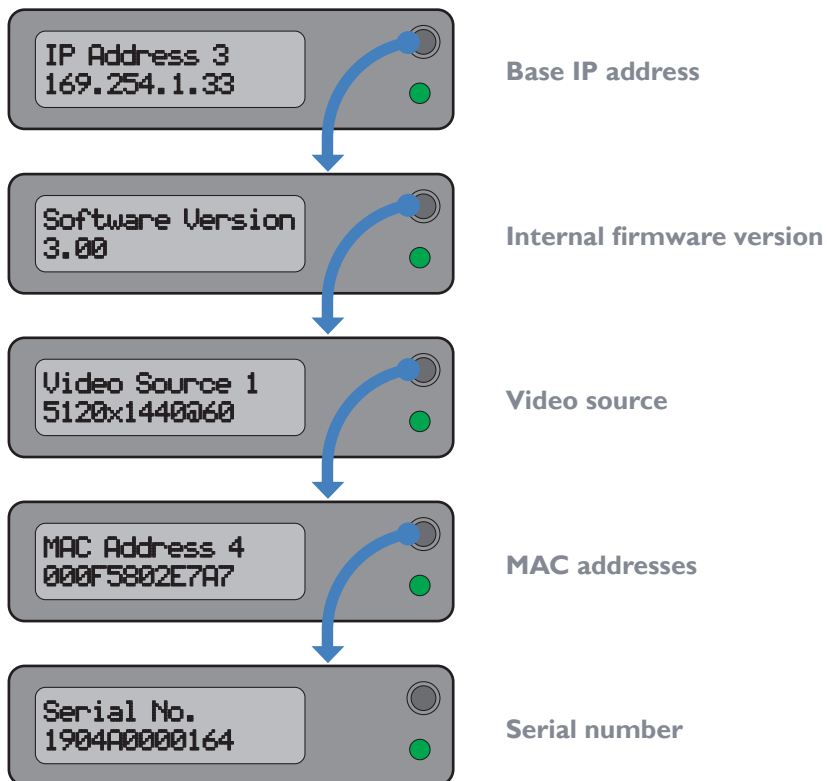
In operation, many ALIF4000 installations require no intervention once configured. The TX and RX units take care of all connection control behind the scenes so that you can continue to work unhindered.

## FRONT PANEL INDICATIONS

The front panel of each ALIF4000 unit features an OLED information screen plus a single indicator capable of producing numerous color and flash patterns to provide a useful guide to operation.

### OLED screen

Press and release the button to wake the OLED screen and begin showing information. Press the button repeatedly to change between subjects:



### Indicator color and flash patterns

The single front panel indicator uses varying color and flashing patterns to signal key status:

Off	No power.
Green	All services present as compared to the configuration required.
Amber	Running but video, USB or network link missing (or not connected to another ALIF unit).
Red	Booting before processor loaded or failed.
Blue	Factory reset mode active.
Red/green flash	Booting into factory recovery mode.
Green/blue flash	Upgrade mode active.
Fast green flash	Identify mode active.

## USING THE ON SCREEN DISPLAY

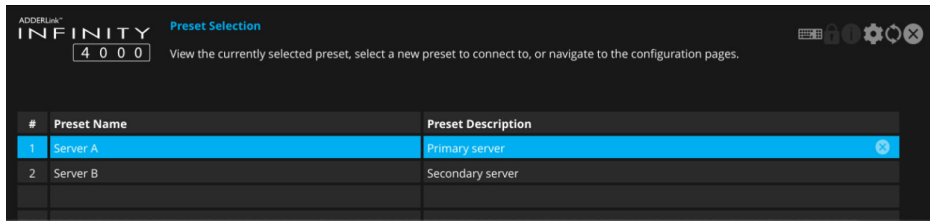
The OSD provides a quick and easy way to access ALIF transmitters as well as configuration details.

### To access the OSD


1 On the console of your ALIF4000 RX unit, either:

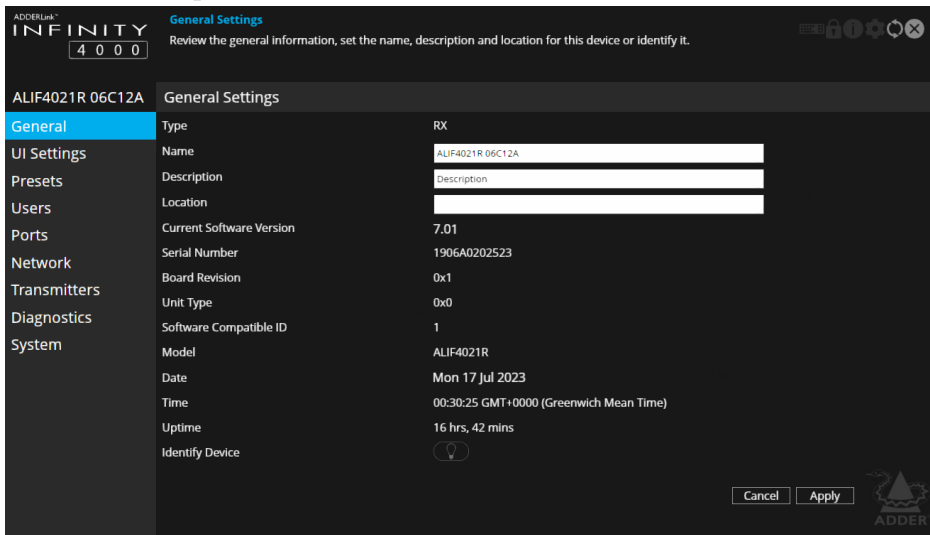
- Press **CTRL + ALT + C** on the keyboard,  
or
- Tap the  icon\* on the touchscreen.

2 The Preset Selection page will be displayed:



3 On the preset page, either

- Click/tap a preset entry to connect with the required ALIF TX,  
or
- Click/tap the  icon to enter the first Configuration page:



For explanations of the options within each page, please see [Appendix A](#).

### To use the OSD keyboard (when using a touchscreen)

1 Access the OSD as discussed left.

2 Tap the  icon in the top right corner:

3 The OSD keyboard will be displayed to assist you when entering text and numerics:



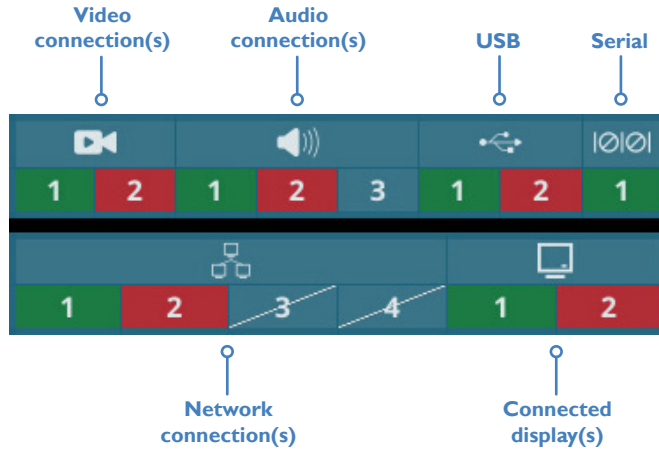
### To hide the OSD keyboard

1 Tap the  icon in the top right corner.

\* To move the  icon on your touchscreen, tap and hold it until it changes color and then drag it to the best position.



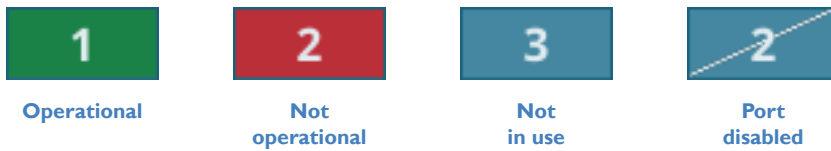
## PORT STATUS POPUPS



These useful status indicators will be displayed in the top left corner (or elsewhere according to UI Settings) of the primary console display:

- Whenever the OSD is in use,
- If any issues occur with one or more ports (when the OSD is not in use).

The status of each port will be shown as follows:



# Further information



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

- Getting assistance - see right
- [Appendix A](#) - Configuration pages
- [Appendix B](#) - Support for analog and digital audio
- [Appendix C](#) - Tips for success when networking ALIF units
- [Appendix D](#) - Troubleshooting
- [Appendix E](#) - Glossary
- [Appendix F](#) - RS232 'null-modem' cable pinout
- [Appendix G](#) - Fiber modules and cables
- [Appendix H](#) - Using the optional ALIF4000 rack shelf
- [Appendix I](#) - Open source licenses

## GETTING ASSISTANCE

If you are still experiencing problems after checking the information contained within this guide, then please refer to the Support section of our website:

[www.adder.com](http://www.adder.com)

INSTALLATION

CONFIGURATION

OPERATION

FURTHER  
INFORMATION


INDEX

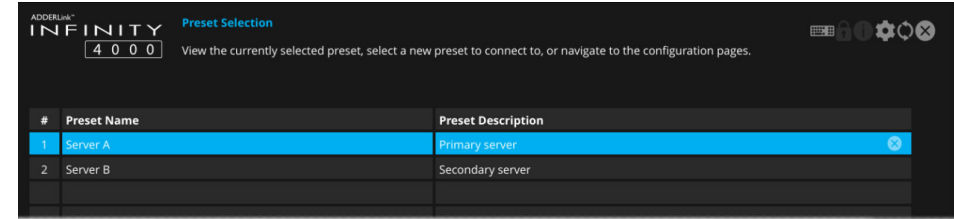
## APPENDIX A - Configuration pages


This section covers the web page configuration for the ALIF4000 units:

- [RX - General Information](#)
- [RX - UI Settings](#)
- [RX - Presets](#)
- [RX - Users](#)
- [RX - Ports](#)
- [RX - Network](#)
- [RX - Transmitters](#)
- [RX - Diagnostics and Statistics](#)
- [RX - System](#)
- [TX - General Information](#)
- [TX - UI Settings](#)
- [TX - Users](#)
- [TX - Ports](#)
- [TX - Network](#)
- [TX - Diagnostics and Statistics](#)
- [TX - System](#)


### To access the OSD

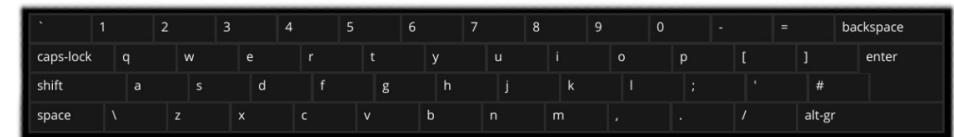
- 1 On the console of your ALIF4000 RX unit, either:
  - Press **CTRL + ALT + C** on the keyboard,
  - or
  - Tap the  icon\* on the touchscreen.
- 2 The Preset Selection page will be displayed:



- 3 On the preset page, either
  - Click/tap a preset entry to connect with the required ALIFTX,
  - or
  - Click/tap the  icon to enter the first Configuration page:

### To use the OSD keyboard (when using a touch screen)

- 1 Access the OSD as discussed on page 25.
- 2 Tap the  icon in the top right corner of the screen.
- 3 The OSD keyboard will be displayed to assist you when entering text and numerics:





### To hide the OSD keyboard

- 1 Tap the  icon in the top right corner.

## RX - General Information

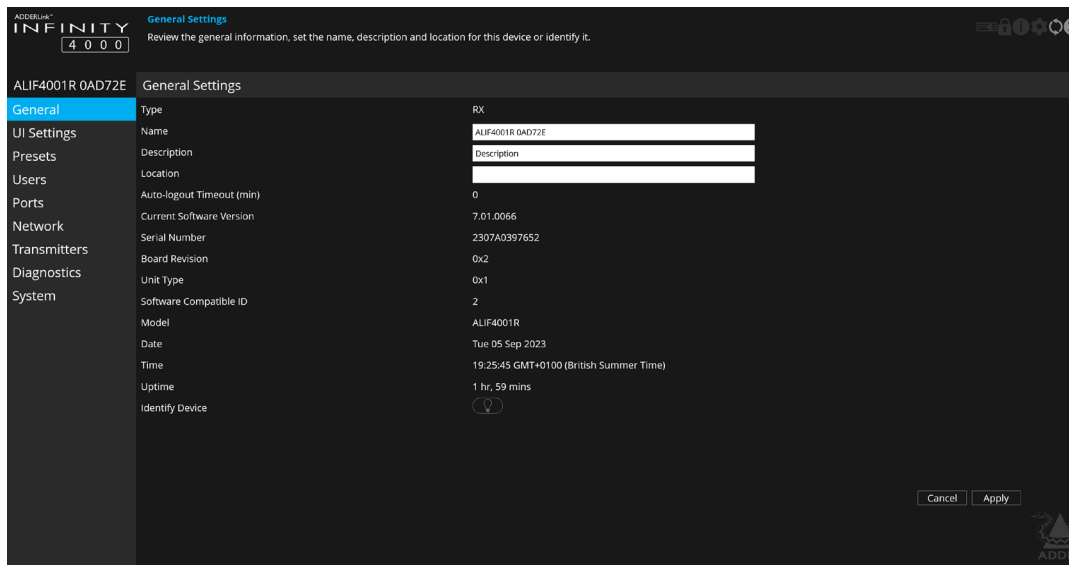
### To get here


You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 If necessary, click the **General** link.

### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 If necessary, click the **General** link.



General Settings	
Type	RX
Name	ALIF4001R 0AD72E
Description	Description
Location	
Auto-logout Timeout (min)	0
Current Software Version	7.01.0056
Serial Number	2307A0397652
Board Revision	0x2
Unit Type	0x1
Software Compatible ID	2
Model	ALIF4001R
Date	Tue 05 Sep 2023
Time	19:25:45 GMT+0100 (British Summer Time)
Uptime	1 hr, 59 mins
Identify Device	

### General Information

**Type** - States whether the device is a transmitter (TX) or a receiver (RX).

**Name** - Name details that you can alter to distinguish this unit from all others. Not shown when operating under AIM server control.

**Description** - Allows you to optionally add a description of the device. Useful when many ALIF units are being used. Not shown when operating under AIM server control.

**Location** - Allows you to optionally add a description of the device's location. Useful when many ALIF units are being used. Not shown when operating under AIM server control.

**Auto-logout Timeout** - Determines the period of inactivity (in minutes) after which the configuration page should automatically log out.

**Current Software Version** - Displays the version number of the currently installed (and active) internal software.

**Serial Number** - Displays the fixed serial number of the device.

**Board Revision** - Displays the revision number of the device's main circuit board.

**Unit Type** - Used for Adder technical support purposes, this entry shows a code depicting the type of the main circuit board.

**Software Compatible ID** - Used for Adder technical support purposes, this entry shows the software compatible ID of the main circuit board.

**Model** - Displays the model number of the device.

**Date and Time** - Displays the current date and time used by the device when this page was last loaded (select refresh icon to update).



**Uptime** - Shows the time period for which the device has currently been running since the last time this page was loaded (select refresh icon to update).

**Identify Device** - When clicked, this button will cause the indicator on the front panel of the device to flash to assist with identification when multiple units are installed in the same area. A popup dialog will also be displayed on screen showing all relevant identification details. Click the Cancel button to stop the identification process or click the OK button to close the popup (and then click the Identify Device button when you're ready to cancel this operation).

## RX - UI Settings

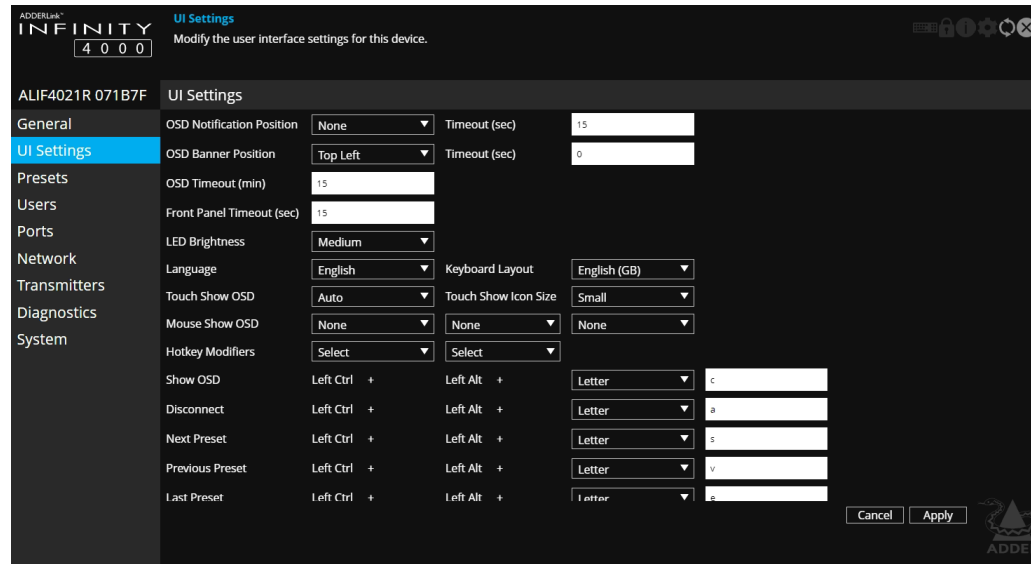
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **UI Settings** link.

### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 Click the **UI Settings** link.



### UI Settings

**OSD Notification Position (plus Timeout)** - Determines the location and persistence of notifications issued on users' screens.

**OSD Banner Position (plus Timeout)** - Determines the location and persistence of banners (a banner is a popup showing the current preset/channel name) displayed on users' screens.

**OSD Timeout** - Determines the period (in minutes) of inactivity that should elapse before the OSD is closed.

**Front Panel Timeout** - Determines the period of inactivity (in seconds) that should elapse before the front panel display should return to a blank state.

**LED brightness** - Determines the brightness of the front panel LED indicator.

The following entries are also editable when the unit is not under AIM control:

**Language** - Determines the language used for all text labels within the configuration pages.

**Keyboard Layout** - Determines the appropriate keyboard layout for use with the configuration pages.

**Touch Show OSD** - (When touch screens are used) Determines whether the Show OSD icon is displayed continually, not at all or automatically.

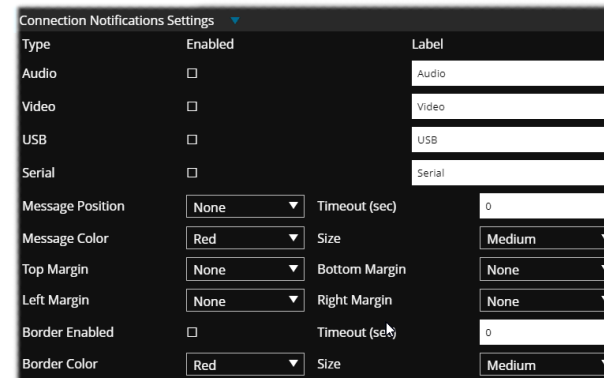
**Touch Show Icon Size** - (When touch screens are used) Determines the size of the Show OSD icon. Options range from Small to Very Large.

**Mouse Show OSD** - Determines the mouse button press combination that should be used to call the OSD.

**Hotkey Modifiers** - Determines the special modifier keys that will be used to form the basis of all the hotkey functions listed below.

**Show OSD... ..Last Preset** - These entries determine the hotkey letters required (together with the modifier keys selected above) to enact various presets and modes. Not shown when operating under AIM server control.

**Connection Notification Settings** - A collection of settings that can be used to configure the visual appearance, location, and timeout for notifications. Click the arrow to reveal the available options:



**Enabled tick box** - enables/disables connection notification messages for each connection type.

**Label** - defines the text label to use in the notification messages in place of the "%type%" token - see "Connection Notification Messages" on next page.

**Position** - "None" = All Connection notifications messages are disabled (regardless of enabled settings above). All other values for this setting enable the messages for the given connection types above that are enabled.

**Timeout** - 0 = no timeout, messages remain on screen indefinitely (unless user "clicks" on them to clear them using the mouse when OSD is onscreen). Any other value sets the duration in seconds that a given notification message remains on screen.

**Message Colour** - set the colour of the notification messages.

**Size** - set the size of the notification messages.

**Margins (top,right,bottom,left)** - each can be set to None, Small, Medium or Large to determine an offset that will be applied to the notification messages dependent on their displayed position.

**Border Enabled** - enable/disable border. If enabled, then a border is drawn around the whole screen (only on the video head that shows the OSD) when any preset connection is in an error state/status.

**Border Colour** - set the border colour to use.

**Size** - width of border to use.

**Connection Notification Messages** - These settings are used to configure the message text for each possible connection state or status, and can be customised as required to give different descriptions (or in different languages) as needed. Click the arrow to reveal the available options:

Connection Notification Messages ▾	
Disconnected	%type% to %sinkId% from %sourceId% disconnected
Connecting	%type% to %sinkId% from %sourceId% connecting
Connected	%type% to %sinkId% from %sourceId% connected
Incompatible Version	%type% to %sinkId% from %sourceId% has an incompatible version
Incompatible Security Settings	%type% to %sinkId% from %sourceId% has incompatible security settings
Bad Authorisation	%type% to %sinkId% from %sourceId% has incorrect authorization credentials
Bad Association	%type% to %sinkId% from %sourceId% has failed to associate
Source In Rma	TX device is operating in <u>RMA</u> mode
Source In Recovery	TX device is operating in <u>RECOVERY</u> mode
Source Not Supported	%type% to %sinkId% from %sourceId% - source port is not supported by the TX
Too Many Connections	%type% to %sinkId% from %sourceId% failed due to too many connections at the TX
Source Disabled	%type% to %sinkId% from %sourceId% failed as the port is disabled at the TX
Source Port Not Connected	%type% to %sinkId% from %sourceId% is not connected at the TX
No Source	%type% to %sinkId% from %sourceId% has no input signal at the TX
Source Out Of Range	%type% to %sinkId% from %sourceId% has an unsupported input signal at the TX
Source Out Of Resources	%type% to %sinkId% from %sourceId% has insufficient resources at the TX
Insufficient Bandwidth	%type% to %sinkId% from %sourceId% has insufficient network bandwidth
Encoding Stopped	%type% to %sinkId% from %sourceId% has stopped encoding at the TX
Port Not Connected	%type% to %sinkId% from %sourceId% is not connected at the RX
No Data	%type% to %sinkId% from %sourceId% is not receiving data from the TX
Out Of Range	%type% to %sinkId% from %sourceId% is not supported at the RX
Out Of Resources	%type% to %sinkId% from %sourceId% is out of resources at the RX
Decoding Stopped	%type% to %sinkId% from %sourceId% has stopped decoding at the RX




The %type%, %sinkId% and %sourceId% entries are special tokens that are replaced when the notification is generated:

- %type% will be replaced with the connection type *Label* entry defined above in Connection Notification Settings.
- %sinkId% will be replaced with the connection type's destination port number on the RX, eg. for the secondary video head connection this would be "2".
- %sourceId% will be replaced by the connection type's TX source port number, eg. for the Primary Video head this would be "1".




## RX - Presets

### To get here

You can access this page in two ways, however, the first method is not available if the module is under AIM control:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 If necessary, click the **Presets** link.
- 4 Either add a new preset (click ) or click  to edit an existing one.





### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3 or 1 (or IP Address 4 or 2)* and use that address.
- 3 Click the  icon in the top right corner.
- 4 If necessary, click the **Presets** link.
- 5 Either add a new preset (click ) or click  to edit an existing one.

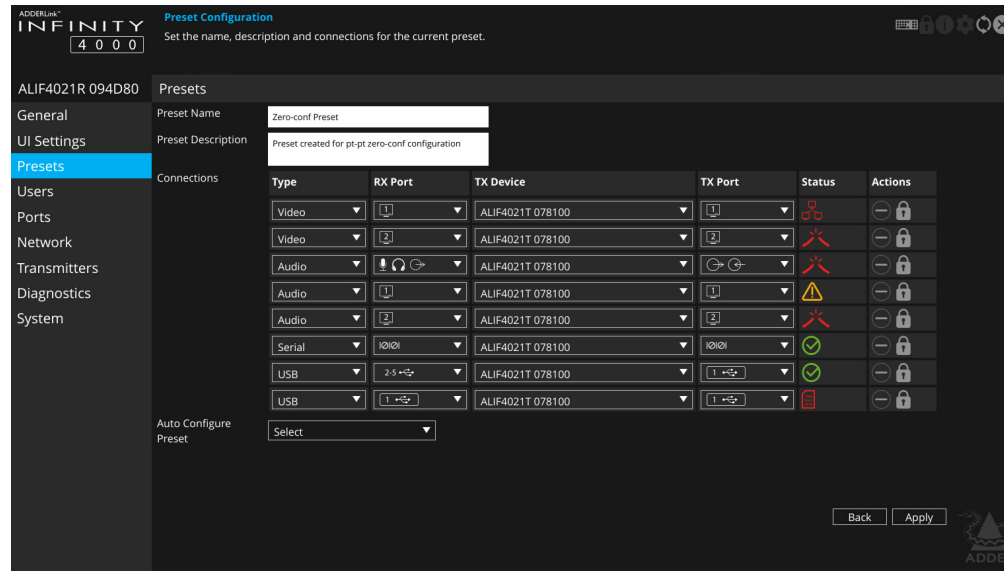
### Preset Information

This page lists the details and connection status for the current channel/preset which the receiver is using. Under AIM control this lists the connection details for the channel that the RX is currently connected to.

Each row details one type of connection which has been made. It lists the output port on the RX and the source port from the TX which it is connected to, as well as the name of the device it is connected to.







-  Click this icon in the *Actions* column to remove a particular row of connections from the list.
-  Click this icon to manually set the password for the specified device so that it has the necessary permission to access the appropriate channel on the selected transmitter. In most connections, the access passwords for all the peripherals will be set collectively during the initial linking between the receiver and transmitter. The  links given here provide an alternative method as backup.
-  Click this icon to add a new connection to the list.

**Auto Configure Preset** - Select to automatically create a new set of connection presets from the selected TX.



### Analog and digital audio








ALIF4000 units support both analog and digital audio connections from the host PC. Although originating from possibly the same audio source, these two connections are switched completely separately and cannot be mixed. In the connections table, the two types are represented thus:








- **Analog** audio ( at RX only connects to ( at TX.
- **Digital** audio ( or ) at RX only connect to ( or ) at TX.

For more details, please see [Support for analog and digital audio](#).

### Status

The following icons may be shown within the Status column:

-  The connection is fully operational.
-  A connection has not been established.
-  The control protocol version is incompatible/unsupported between the peer and this device.
-  The control protocol security settings are incompatible/unsupported between the peer and this device.
-  The connection failed the authorisation stage (most likely a bad password).
-  The connection is established but there is no input signal being received from the peer device.
-  The connection has an invalid or unsupported input source signal peer device (audio and video connections only), or
  - The connection is currently out of resources at the peer device, or
  - There is insufficient network bandwidth to support the requested data for this connection.



-  The encoding of the source data at the peer has stopped (due to an error or fault).
-  There is no input device available on the port for this connection (eg. no PC connected).
-  There is no output device available on the port for this connection (eg. no monitor connected).
-  There is no data currently being received by the device.
-  The video data for the connection produces an output signal that is out of range for the capabilities of this device, or the appliance connected to this device, or
  - The device is currently out of resources to process the video data for this connection.
-  The audio data for the connection produces an output signal that is out of range for the capabilities of this device, or the appliance connected to this device, or
  - The device is currently out of resources to process the audio data for this connection.
-  The decoding of the data at this device has stopped (due to an error or fault).



## RX - Users

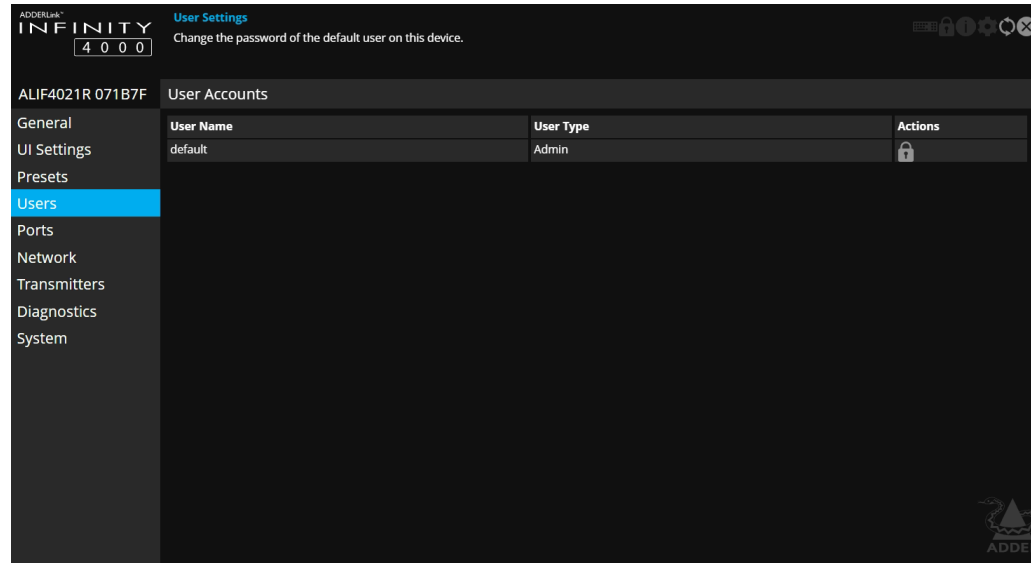
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Users** link.


### OR

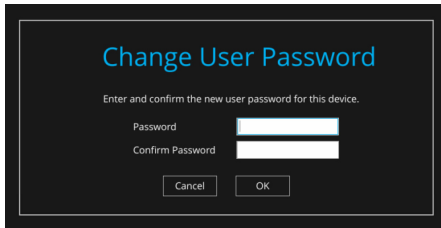
- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3 or 1 (or IP Address 4 or 2)* and use that address.
- 3 Click the **Users** link.



### User accounts

This page allows you to change the password for the admin user.

Click the  icon to display the following dialog:



Change User Password

Enter and confirm the new user password for this device.

Password

Confirm Password



Cancel OK

Enter and confirm the current and new admin password and click OK.

## RX - Ports

### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Ports** link.

### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 Click the **Ports** link.



### Video Ports

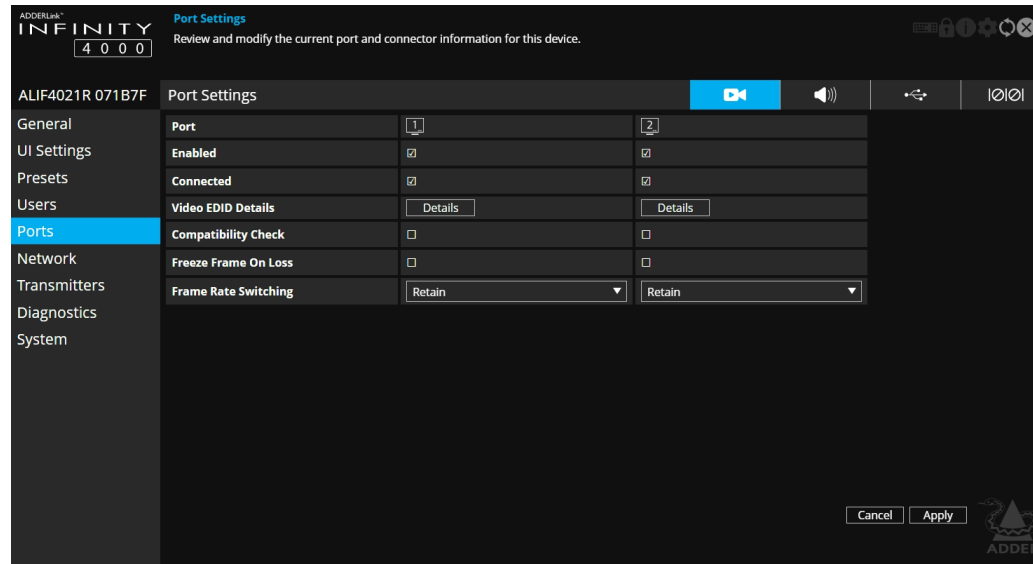
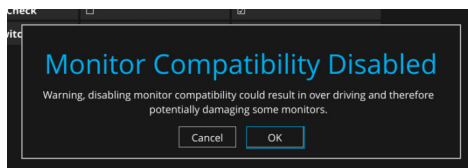
This page provides basic information about the two video ports located on the RX unit.

**Enabled** - Confirms whether each video port is enabled or disabled.

**Connected** - Confirms whether functioning video displays are connected to the two video ports.

**Video EDID Details** - Click the Details button to show a popup for the connected video display. EDID details listed include: *Manufacturer, model, serial number, manufacture date, EDID version as well as supported (and preferred) EDID modes, maximum bits per color, encodings, colorimetry and dynamic range masterings supported by the monitor. Note: EDID modes that are supported by the monitor but not by the device will be greyed out. In cases where a resolution reported by the video display is supported, but at a lower frame rate than the display calls for, such entries will be shown in italics.*

**Compatibility Check** - **WARNING: Disabling this option can result in damage to display monitors in certain circumstances.** When ticked this option confirms video compatibility between the source and display device, (such as the video display's maximum resolution, bpp, SDR/HDR, etc.) and prevents signals being sent that the video display can't support. When unticked, signals will always be sent regardless of video display's declared capabilities. If you untick the option, the following warning will be displayed:



**Freeze Frame On Loss** - If disabled (default), video will blank when a video connection error occurs. If enabled, video will freeze (or remain blank if no video yet received) when error occurs. Video will resume once error clears. Video will blank if frozen and connection is terminated (eg. different preset selected). A coloured border and messages can be added in the Connection Notification Settings - see page 30.

**Frame Rate Switching** - Determines the strategy to use for the frame rate when switching resolutions. Similar in function to the *Match Frame Rate* setting on AIM servers:

**Force 60** - The frame rate is always forced to be 60Hz unless the Compatibility check option is on and the monitor does not indicate it supports 60Hz.

**Retain** - When switching to the same resolution with a potentially different frame rate, it will retain the current frame.

**Auto** - The frame rate always changes to match the mode it is connected to.



### Audio Ports

This page provides basic information about the analog and digital audio ports located on the RX unit.

**Enabled** - Confirms whether the audio ports are enabled or disabled.

**Connected** - Confirms whether devices are connected to respective ports.

**Gain** - (Analog audio only) Determines the microphone amplification level:  
**None** - no device connected on this port.

**Mic** - standard gain for normal microphone input devices.

**Mic boost** - 20dB boost to volume for microphone input devices.

**Audio EDID Details** - Click the Details button to show a popup listing the audio capabilities of the device connected to that DP port. Unsupported formats will be greyed out.

**Compatibility Check** - When ticked, the RX will not output audio on this port if it is not compatible with the attached device's audio capabilities. If unticked, audio will be output regardless of the attached device's capabilities. For example, if an attached device supports 2 channel stereo but the incoming stream is 6 channels, turning this off may allow L & R audio output to work - if the attached device can cope, but other channels will be lost (ie. there is no down-mix support).



### USB Ports

This page provides basic information about the USB ports numbered 2 to 5 inclusive, located on the RX unit. USB port 1 is transparent and its devices are not listed.

**Type** - Identifies the type of the USB port. Port 1 on the front of the RX is Transparent, 2-3 on the front, 4-5 on the back are the Emulated ports.

**Enabled** - Confirms whether the USB ports are enabled or disabled.

**HID Only** - (For emulated USB ports only) When ticked, all ports are limited to supporting Human Interface Devices only, such as keyboards and mice.

**Disable Mass Storage** - When ticked, this option prevents the use of USB mass storage devices on the receiver unit. This could be useful in situations where smart card readers need to be used for security purposes but the use of USB drives need to be prevented.

**Security** - (For emulated USB ports only) Controls whether USB data is encrypted. *On* forces always on, *Off* forces always off and *Prefer off* will be off unless the TX requests it.

continued

## RX - Ports (continued)

**USB Port Mapping and Reservations** - This section is useful when multiple touchscreens are in use and allows you to match each USB port input to the correct touchscreen.

**Connected Devices** - This section lists all connected devices with manufacturer and model details where reported. Click the Details button against each device to view further information, such as the Device Type, Protocol Version, Speed and Max Power Consumption.



### Serial Port



This page provides basic information about the serial option port located on the RX unit.

**Enabled** - Confirms whether the serial port is enabled or disabled. Disabling the serial port (or excluding it from the preset connection list) allows an attached USB-serial adapter to instead be used over the USB connection to the TX, rather than the explicit serial connection.

## RX - Network

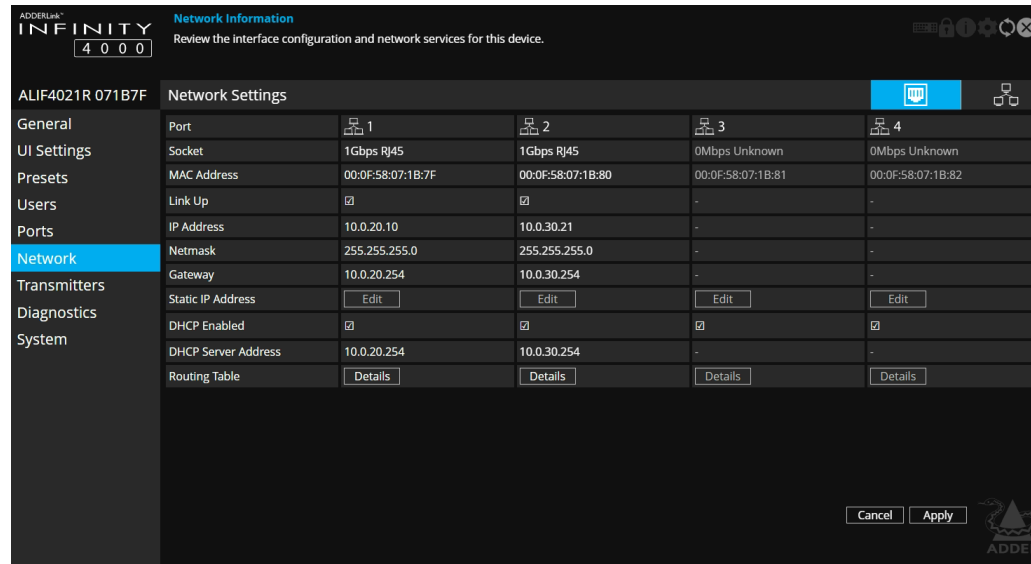
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Network** link.

### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 Click the **Network** link.



Note: ALIF4001 models will list only two ports on this page.



### Port Settings

This page provides numerous network details for each of the installed ports on the RX unit.

**Socket** - Details each operational network socket and what connection speeds they have established. Sockets 3 and 4 are determined by the SFP modules plugged into them.

**MAC Address** - Displays the unique, fixed hardware identification number for each port.

**Link Up** - Indicates whether the link state of this network interface is up. This should be the case if the device is connected to a functioning network.

**IP Address** - This shows the IP address in use, which can be obtained via DHCP, a static IP or a link local (zero-config).

**Netmask** - The netmask of this network interface. The device can function in a network zero-config state which does not require the setting of a static netmask.

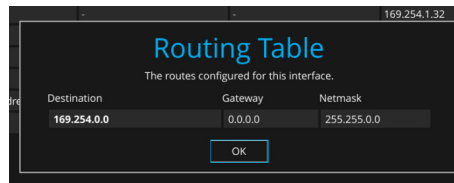
**Gateway** - The gateway address of this network interface. The device can function in a network zero-config state which does not require the setting of a static gateway.

**Static IP Address** - When the 'DHCP enabled' option (below) is unchecked, click on 'Edit' to enter/edit a static IP Address, Netmask and Gateway for the unit.

**DHCP Enabled** - When ticked, the corresponding port will derive its IP Address, Netmask and Gateway details from the DHCP server listed in the field below.

**DHCP Server Address** - Indicates the server that provided the DHCP details.

**Routing Table** - Click on 'Details' to show the routing table entries corresponding to this network interface. In it are the destination address, gateway and netmask for the routes to particular network destinations.



### Network Information

**Default Domain** - Reserved for future use.

**Independent Networks** - When ticked, the ALIF4000 receiver will treat its two main network ports as independent routes to the transmitter(s) and not attempt to find secondary cross connections, which may not be possible due to the network topology. This setting will have no effect when ALIF4000 receivers link with ALIF4000 transmitters due to their use of auto discovery. However, when an ALIF4000 receiver links with other dual port ALIF transmitters (such as an ALIF2002T), enabling this option can prevent unnecessary delays due to the time taken looking for routes that are effectively network dead ends.

**Route of Last Resort** - In a multi-interface device such as this, the interface which is ticked will be used as the default whenever it is unclear which interface should be used for network traffic.

**Dynamic DNS Servers** - List of DNS server addresses obtained via DHCP.

**Static DNS Servers** - Lists DNS server addresses that have been manually configured.

**NTP Enabled** - When ticked, the unit will derive its time and date information from a suitable NTP server.

**NTP Key ID** - The ID of the key used for secure NTP.

**NTP Key Value** - The value of the key used for secure NTP as a hexadecimal string.

**Dynamic NTP Servers** - Lists NTP server addresses obtained via DHCP.

**Static NTP Servers** - Lists NTP server addresses that have been manually configured.

**AIM Enabled** - Indicates whether server management is enabled for this device.



**Dynamic AIM Servers** - Lists AIM server addresses obtained via DHCP.

**Static AIM Servers** - Lists management server addresses that have been manually configured.

## RX - Transmitters

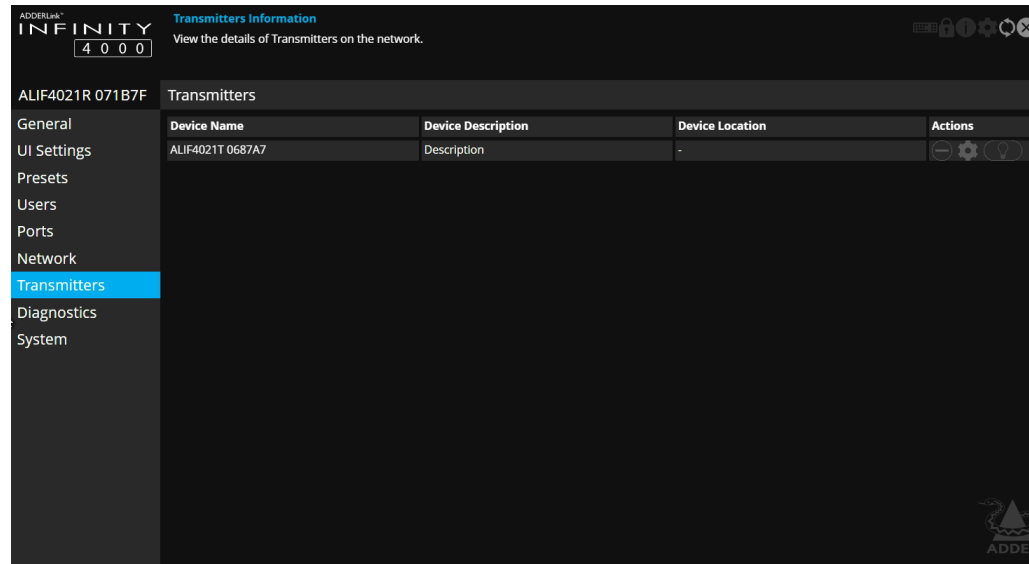
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** link.

### OR



- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 Click the **Transmitters** link.



ADDER<sup>INC.</sup> INFINITY 4000

Transmitters Information  
View the details of Transmitters on the network.

ALIF4021R 071B7F

Device Name	Device Description	Device Location	Actions
ALIF4021T 0687A7	Description	-	 



General  
UI Settings  
Presets  
Users  
Ports  
Network  
Transmitters  
Diagnostics  
System

ADDER

### Transmitters

This page lists the available transmitters on the network which aren't under AIM control - *Note: ALIF1xxxT and ALIF2xxxT units are generally not discoverable using this process, however, if the Start of Life process was able to connect point-to-point to an ALIF2xxx then it will have created a 'static' device entry and thus it will appear on this screen. However, the cog and light bulb icons will not function for the entry.*



In the Actions column you can perform the following functions for each listed transmitter:

- Click  to view the configuration page of the TX. When clicked, you will be directed to the General page for the chosen TX. See page 40.
- Click  to flash the front panel indicators on the transmitter to assist with identification.
- [When viewing TX pages] Click the X button in the top right corner to return to the RX pages.

## RX - Diagnostics and Statistics

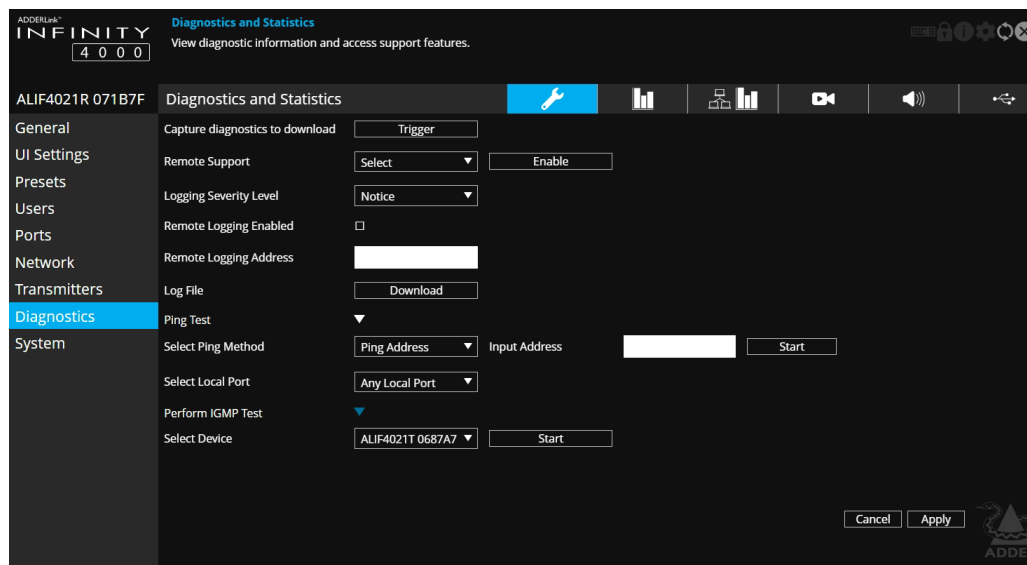
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Diagnostics** link.

### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 Click the **Diagnostics** link.



### Log Settings

This page provides numerous key diagnostic log settings.

**Capture diagnostics to download** - (Only shown when viewing this page using a PC browser). Request generation of a diagnostics dump file. This will then be downloaded by the host computer's browser; this is an encrypted diagnostics file which can be used by technical support to diagnose and fix an issue. If using the local OSD, then this will show 'Capture diagnostics to USB' and will download the same file onto a USB memory stick inserted into USB ports 2-5. *Note: When in point to point mode, you will need to plug in a USB flash drive and capture the logs to it.*

**Remote Support** - When using the Adder remote server, this option determines which port will be used. Multiple options are offered in case one or more ports are blocked by your firewall.

**Logging Severity Level** - Defines the level of messages that will be logged (according to RFC5424). Level 5 (*Notice: normal but significant condition*) is the default setting; ALIF4000 supports levels 1 to 7. Choosing levels 6 (*Informational*) or 7 (*Debug*) will cause larger numbers of lesser events to also be logged, with a potential impact to overall performance. These levels should only be used if working with the support team to diagnose a specific issue.

**Remote Logging Enabled** - Tick to send log files to the chosen *Remote Logging Address*.

**Remote Logging Address** - Enter a valid IP address for a syslog server on the local network where status logs can be sent.

**Log File** - If viewing this page using a browser: Click to download the log file to the host computer's browser. If viewing this page via the OSD, the log will be shown as a scrollable list.

**Ping Test** - Allows you to conduct a ping test to any selected address or device.

**Perform IGMP Test** - Allows you to conduct an IGMP test on connected devices, selectable from the drop-down list.



### Basic Graph

This page shows a real time graph with the following entries:



- **Received and Transmitted Bit Rates** - the values of these correspond to the bandwidth axis on the left.
- **Frame Rate** - for both heads. Values are labeled when they change and correspond to the axis on the right.
- **Codec** - for both heads. These represent the compression used: 1 is better than 4.
- **Dropped Packets** - for both heads. Values are labeled when they change and correspond to the axis on the right.

*Note: Use the Frame Rate and Dropped Packets tick box options to determine which is displayed at any given time.*



### Network Statistics

This page allows you to view current communication statistics and also to create graphs in real time.

**Capture and Graph Statistics** - When ticked, the page will create a real time graph plotting Received Bytes alongside Received Packets. After *Capture and Graph Statistics* is enabled, the *Show Legend* checkbox will show all other items that can be included on the plot. Click an item to tick and include it.



### Video Port Status and Statistics

This page provides wide ranging information for support purposes.



### Audio Port Status and Statistics

This page provides wide ranging information for support purposes.





### USB Port Status and Statistics

This page provides wide ranging information for support purposes. Currently only supported for transparent USB.

## RX - System

### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **System** link.

### OR

- 1 Connect a computer to the same network as the RX unit.
- 2 Run a web browser and enter the IP address of the RX unit: **https://169.254.1.32** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2, then the default address will be **https://169.254.1.42** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* or *1* (or *IP Address 4* or *2*) and use that address.
- 3 Click the **System** link.

### Software and System Operations

This page contains various indications and options related to the internal software of the unit.

*Note: The highlighted (and colored) entry is the version of software currently running.*

**Preferred Software Version** - The software version the device will boot into upon a reboot.

**Recovery Software Version** - The software version the device will boot into if placed into recovery mode.

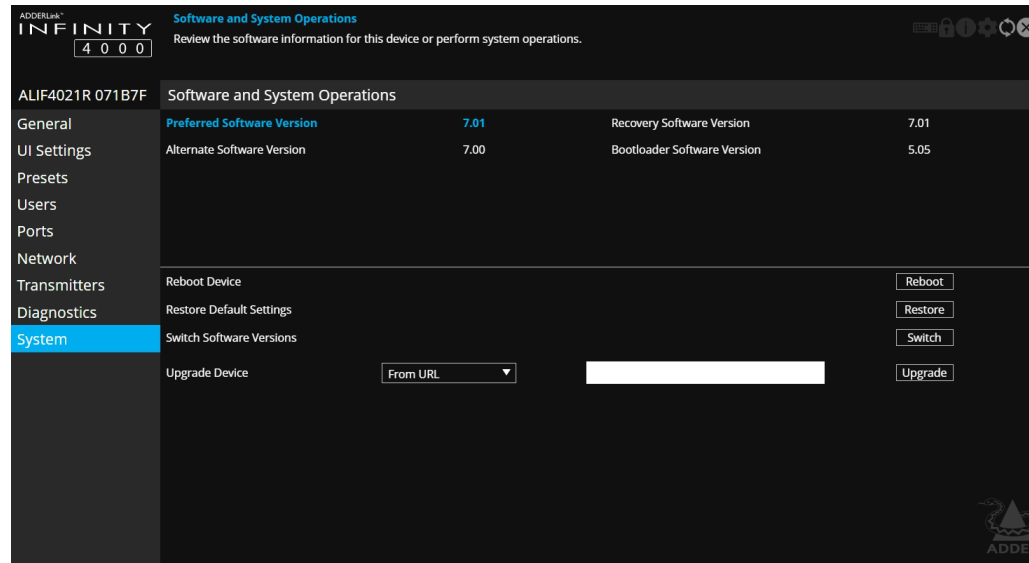
**Alternate Software Version** - The other (backup) version of software the device has available.

**Reboot Device** - Click the Reboot button to Reboot the device.

**Restore Default Settings** - Click the Restore button to restore the device to factory default settings.

**Switch Software Versions** - Click to switch to the listed 'Alternative Software Version'.

**Upgrade Device** - If viewing this page using a browser: Allows you to upgrade the firmware either from a trusted URL or from a locally stored file. Use the field to define the source and then click the Upgrade button.






General	Preferred Software Version	7.01	Recovery Software Version	7.01
UI Settings	Alternate Software Version	7.00	Bootloader Software Version	5.05
Presets				
Users				
Ports				
Network				
Transmitters	Reboot Device			<button>Reboot</button>
Diagnostics	Restore Default Settings			<button>Restore</button>
System	Switch Software Versions			<button>Switch</button>
	Upgrade Device	<input type="text" value="From URL"/>	<input type="text"/>	<button>Upgrade</button>



## TX - General Information

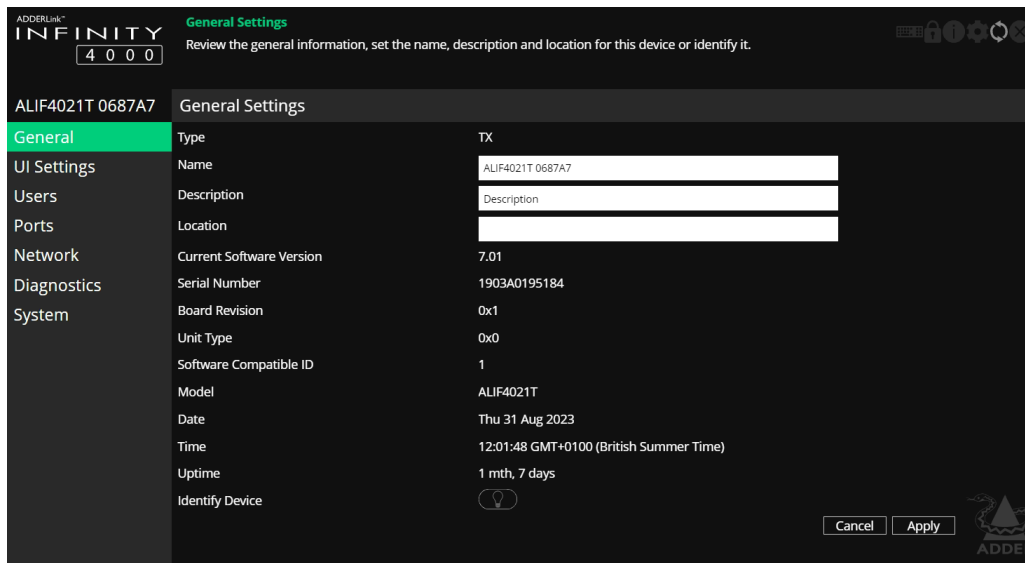
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 If necessary, click the **General** link.

### OR

- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3 (or IP Address 4)* and use that address.
- 3 If necessary, click the **General** link.



### General Information

**Type** - States whether the device is a transmitter (TX) or a receiver (RX).

**Name** - Name details that you can alter to distinguish this unit from all others. Not shown when operating under AIM server control.

**Description** - Allows you to optionally add a description of the device. Useful when many ALIF units are being used. Not shown when operating under AIM server control.

**Location** - Allows you to optionally add a description of the device's location. Useful when many ALIF units are being used. Not shown when operating under AIM server control.

**Current Software Version** - Displays the version number of the currently installed and running internal software (unit can have two different software versions installed at once).

**Serial Number** - Displays the fixed serial number of the device.

**Board Revision** - Displays the revision number of the device's main circuit board.

**Unit Type** - Used for Adder technical support purposes, this entry shows a code depicting the type of the main circuit board.

**Software Compatible ID** - Used for Adder technical support purposes, this entry shows the software compatible ID of the main circuit board.

**Model** - Displays the model number of the device.

**Date and Time** - Displays the current date and time used by the device when this page was last loaded (select refresh icon to update).

**Uptime** - Shows the time period for which the device has currently been running since the last time this page was loaded (select refresh icon to update).

**Identify Device** - When clicked, this button will cause the indicator on the front panel of the device to flash to assist with identification when multiple units are installed in the same area. A popup dialog will also be displayed on screen showing all relevant identification details. Click the Cancel button to stop the identification process or click the OK button to close the popup (and then click the Identify Device button when you're ready to cancel this operation).




**Access Password** - Sets the password that a RX device must provide in order to connect (video, audio, etc) to the TX

**Insecure Connections** - Controls whether the TX will accept insecure connections from RX devices. Insecure connections are those from older ALIF products where the security credentials are not implemented. Initially, the TX will default to 'auto' which allows it to decide the setting based on the type of device that first connects to it. Once a device has connected, the setting will be changed to either 'Allowed' or 'Disallowed'.

## TX - UI Settings

### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 Click the **UI Settings** link.

### OR

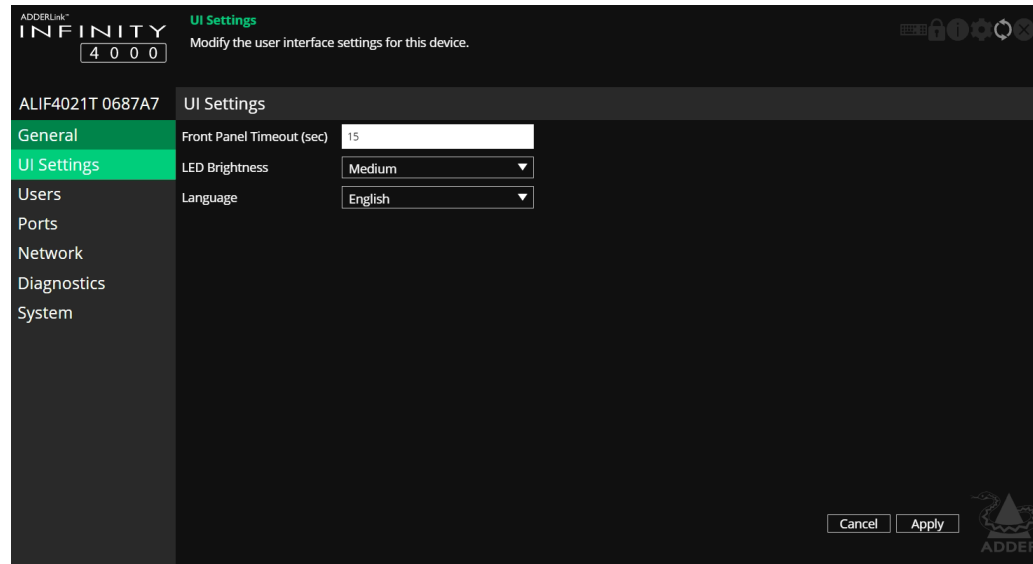
- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3 (or IP Address 4)* and use that address.
- 3 Click the **UI Settings** link.

### UI Settings

**Front Panel Timeout** - Determines the period of inactivity that should elapse before the front panel display should return to a blank state.

**LED brightness** - Determines the brightness of the front panel LED indicator.




**Language** - Determines the language used for all text labels within the configuration pages.



## TX - Users

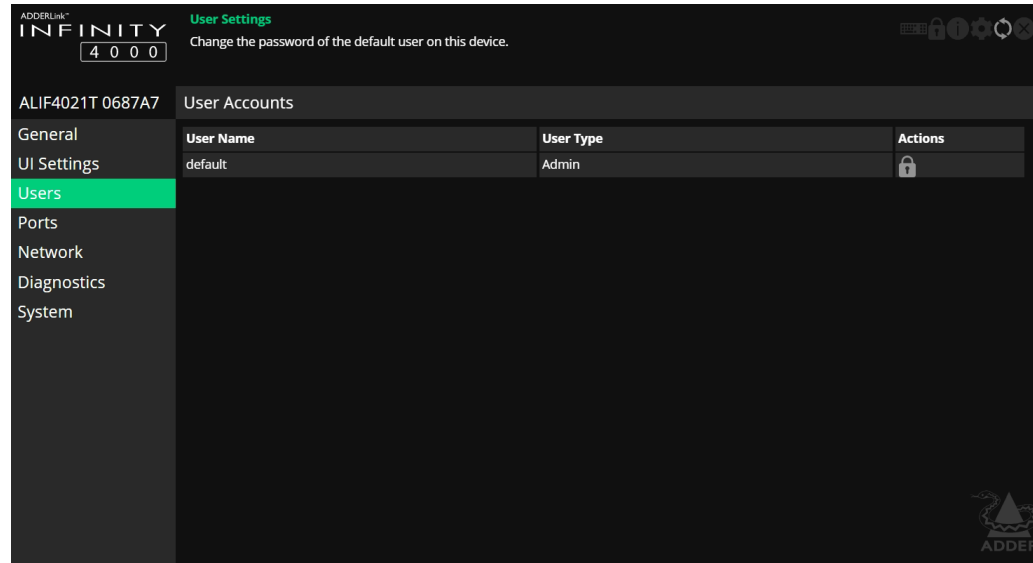
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 Click the **Users** link.


### OR

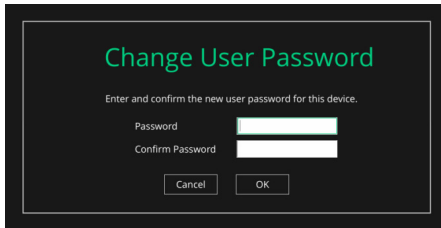
- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3 (or IP Address 4)* and use that address.
- 3 Click the **Users** link.



### User accounts

This page allows you to change the password for the admin user.

Click the  icon to display the following dialog:






Enter and confirm the current and new admin password and click OK.

## TX - Ports

### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 Click the **Ports** link.

### OR

- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* (or *IP Address 4*) and use that address.
- 3 Click the **Ports** link.



### Video Ports

This page provides basic information about the two video ports located on the TX unit.

**Enabled** - Confirms whether each video port is enabled or disabled.

**Connected** - Confirms whether functioning host video drivers are connected to the two video ports.

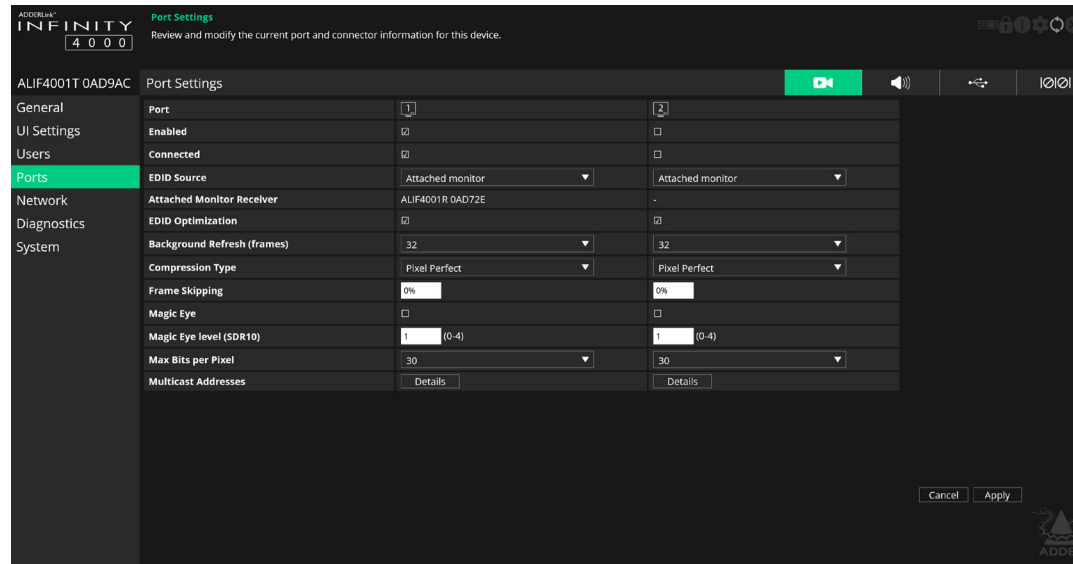
**EDID Source** - Lists the EDID mode currently being output on the two video connectors. An option called *Saved attached monitor* is available and will save that first RX's EDID in persistent storage and use that EDID forever (including over reboot, powercycle, etc) until it is cleared (see below) or a Fixed EDID is selected instead.

To save a monitor EDID and use it for that given video and/or audio port, select the *Saved Attached Monitor* option. The current Attached monitor EDID will be saved in persistent storage on the TX and used from now on by the TX until it is cleared (see below).

To clear the saved monitor EDID, either:

- Factory reset the TX
- Select "Attached Monitor" EDID on both the video and audio EDID Source settings for the same physical DP port.

For more information about how video and audio EDID data are derived, see [Support for analog and digital audio](#). Note: Fixed EDIDs were updated in v3.00 to add support for higher frame rates at each fixed EDID resolution. The default frame rate remains as given in the fixed EDID name (eg. 60), however, HD and higher resolutions will include higher rates which are supported at those resolutions. eg. 240Hz for 1920x1080p60.



**Dynamic Range** - This option is shown only when a fixed EDID is selected and allows you to determine a particular color depth and dynamic range. When set to HDR10, the transmitter will also declare support for the lower SDR8 and SDR10 modes. See page 4.

**Attached Monitor Receiver** - If the 'Attached monitor' option has been selected as the 'EDID Source', then this displays the name of the RX device that supplied the EDID currently being used.

**EDID Optimization** - When ticked, and if the *EDID source* option is set to 'Attached monitor'; upon connecting with a new receiver, the transmitter will compare the preferred video mode of the new monitor with the current video output from the host PC. Only if they differ will the transmitter present the new monitor's EDID to the host PC. This option speeds up switching as the host PC's graphics card does not have to go through a hotplug detect routine each time a new receiver is connected. If this setting is unticked, the transmitter will always present a new EDID to the host PC.

**Background Refresh (frames)** - The system will send all changing video as soon as it changes. In addition, it is possible to send unchanging video in the background, to overcome problems of lost network traffic. This control will configure how often a whole frame of video will be sent alongside changing video. In situations of frequently changing video, or high reliability networks, this value can be set to a higher number, or even set to disabled.

**Compression Type** - Allows you to select the compression method to best suit the nature of the video sources. Settings are: Pixel Perfect, Adaptive, Smoothest Video or Advanced (which allows you to set the maximum and minimum compression levels).

**Frame Skipping** - Frame Skipping involves 'missing 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%.

**Magic Eye** - When ticked, this feature increases performance and reduces network traffic if ALIF units are used with host computers that have dithered video output. It also improves performance if the video source is noisy.

**Magic Eye level (SDR10)** - Only active if Magic Eye is ticked. The default level of 1 is suitable for most sources. For Apple Macs with M-CPU's, level 4 may give the best results when using SDR10. In other cases, if SDR10 has no dithering but other color bit depths do, use level 0 to switch off Magic Eye for SDR10, but leave it on for all others (eg SDR8).

**Max Bits per Pixel** - Allows you to choose the maximum color bit depth that is passed through from the host computer to the ALIF4000 receivers and their connected video display(s). The options are 24-bits per pixel (Standard Dynamic Range) or 30-bits per pixel to support newer video displays that support the SDR10 and HDR10 (High Dynamic Range) standards. When set to 24, an incoming 30-bpp signal will be converted down to 24-bpp before being transmitted, most commonly used to ensure that all ALIF receivers are able to receive the video output. When set to 30, incoming 30-bpp will pass through unchanged, as will 24-bpp. See page 4.

**Multicast Addresses** - This section lists all video multicast IP addresses that have been configured. Setting the field to a blank (empty string) value will cause the system to automatically generate a default multicast address.

## TX - Ports (continued)



### Audio Ports

This page provides basic information about the audio ports located on the TX unit.

**Enabled** - Confirms whether the audio ports are enabled or disabled.

**Connected** - Confirms whether devices are connected to respective ports.

**EDID Source** - Determines which audio EDID should be used:

*Attached Monitor* - use the audio capabilities reported by the monitor.

*Saved Attached Monitor* - save the audio capabilities reported by the attached monitor EDID in persistent storage on the TX and use them until they are cleared (see below).

*None* - remove audio support from the EDID presented by the TX to the connected PC.

*2-, 6-, 8-Channel* - apply a generic audio EDID.

For more information about how video and audio EDID data are derived, see [Support for analog and digital audio](#).

To clear the saved monitor EDID, either:

- Factory reset the TX
- Select “Attached Monitor” EDID on both the video and audio EDID Source settings for the same physical DP port.

**Attached Monitor Receiver** - If the ‘Attached monitor’ option has been selected as the ‘EDID Source’, then this displays the name of the RX device that supplied the EDID currently being used.

**EDID Optimization** - When ticked, and if the *EDID source* option is set to ‘Attached monitor’; upon switching to a new receiver, the transmitter will compare the preferred audio mode of the new monitor/audio subsystem with the current video output from the host PC. Only if they differ will the transmitter present the new audio EDID to the host PC. This option speeds up switching as the host PC does not have to go through a hotplug detect routine each time a new receiver is connected. If this setting is unticked, the transmitter will always present a new EDID to the host PC.

For audio there is also an extra check. Because the audio stream may not always be active (whereas video always is); if there is currently no audio stream being output by the PC, the transmitter will compare the audio capabilities of the current EDID with the new EDID. If the new EDID’s capabilities are a subset of the current EDID’s, the existing one will be changed for the new one. For example, if the current EDID supports 8 channel audio and the new only supports 6, the new will be selected to ensure the host PC doesn’t attempt to output 8 channel audio to a device that can’t handle it.

**Multicast Addresses** - This section lists all audio multicast IP addresses that have been configured. Setting the field to a blank (empty string) value will cause the system to automatically generate a default multicast address.



### USB Ports

This page provides basic information about the USB ports located on the TX unit.

**Type** - Identifies the type of the USB port.

**Enabled** - Confirms whether the USB ports are enabled or disabled.

**Connected** - Confirms whether valid devices are connected to either USB port. *Note: As both USB ports share the same physical port, it is not possible to detect whether a specific port has a device connected.*

**Rate Limit** - This option allows you to place an upper limit on the bandwidth that can be consumed by the transparent USB subsystem as a whole. This can be useful in situations where the overall network bandwidth is quite low and high resolution video performance is being impacted by USB operation; particularly during large file transfers to or from a mass storage device inserted into the ALIF receiver. Using this option you can choose an appropriate USB bandwidth rate limit between 1 and 480Mbps.

**Reserved Ports** - Allows USB ports to be optionally reserved for use with particular devices. Once reserved, certain rules can be applied to them via the AdderLink Infinity Manager (AIM) application.

**Present Boot Keyboard** - When ticked, the TX unit will report 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 13 USB endpoints, therefore if all 13 endpoints are required elsewhere for USB devices (or a KVM switch only supports two HID devices) then it can be disabled by deselecting this option.

**Max Hub Size** - Using this option you can select whether the TX unit should report itself as a 13 or a 7 port USB hub. Some USB hosts are only able to support 7 port USB hubs. If this option is set to 7, then only 7 USB devices are supported by the PC.

**Security** - Controls whether USB data is encrypted. *On* forces always on, *Off* forces always off and *Prefer off* will be off unless the RX requests it.



### Serial Port

This page provides basic information about the serial option port located on the TX unit. These options are configurable via the AIM server.

**Enabled** - Confirms whether the serial port is enabled or disabled.

**Connected** - Confirms whether a valid serial device is connected to the port.

**Speed** - The ‘baud rate’ of the serial device.

**Data Bits** - The number of data bits to be used (5, 6, 7, or 8).




**Stop Bits** - The number of stop bits to be used (1 or 2).

**Parity** - The parity checking to be used (none, odd or even).

## TX - Network

### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 Click the **Network** link.

### OR

- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* (or *IP Address 4*) and use that address.
- 3 Click the **Network** link.



### Port Settings

This page provides numerous network details for each of the installed ports on the TX unit.

**Socket** - Details each operational network socket. Sockets 3 and 4 are determined by the SFP modules plugged into them.

**MAC Address** - Displays the unique, fixed hardware identification number for each port.

**Link Up** - Indicates whether the link state of this network interface is up. This should be the case if the device is connected to a functioning network.

**IP Address** - This shows the IP address in use, which can be obtained via DHCP, a static IP or a link local (zero-config).

**Netmask** - The netmask of this network interface. The device can function in a network zero-config state which does not require the setting of a static netmask.

**Gateway** - The gateway address of this network interface. The device can function in a network zero-config state which does not require the setting of a static gateway.

**Static IP Address** - When the 'DHCP enabled' option (below) is unchecked, click on 'Edit' to enter/edit a static IP Address, Netmask and Gateway for the unit.

**DHCP Enabled** - When ticked, the corresponding port will derive its IP Address, Netmask and Gateway details from the DHCP server listed in the field below.

**DHCP Server Address** - Indicates the server that provided the DHCP details.

Port	1	2	3	4
Socket	1Gbps RJ45	1Gbps RJ45	0Mbps Unknown	0Mbps Unknown
MAC Address	00:0F:58:06:87:A7	00:0F:58:06:87:A8	00:0F:58:06:87:A9	00:0F:58:06:87:AA
Link Up	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-
IP Address	10.0.20.11	10.0.30.20	-	-
Netmask	255.255.255.0	255.255.255.0	-	-
Gateway	10.0.20.254	10.0.30.254	-	-
Static IP Address	<input type="text"/> Edit	<input type="text"/> Edit	<input type="text"/> Edit	<input type="text"/> Edit
DHCP Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DHCP Server Address	10.0.20.254	10.0.30.254	-	-
Bandwidth Limit (Mbps)	950 (500-1000)	950 (500-1000)	10000 (500-10000)	10000 (500-10000)
Routing Table	<input type="button" value="Details"/>	<input type="button" value="Details"/>	<input type="button" value="Details"/>	<input type="button" value="Details"/>

**Bandwidth Limit** - This option can be used to set an upper limit (between 500 and 10000 Mbps aka 10Gbps) to the amount of the network bandwidth used on the physical interface. This could be useful if multiple devices share a common network link upstream; without a limit, the link could become overloaded and drop data.

**Routing Table** - Click on 'Details' to show the routing table entries corresponding to this network interface. In it are the destination address, gateway and netmask for the routes to particular network destinations:

Destination	Gateway	Netmask
10.0.20.0	0.0.0.0	255.255.255.0



### Network Settings

**Default Domain** - Reserved for future use.

**Route of Last Resort** - In a multi interface device such as this, the interface which is ticked will be used as the default whenever it is unclear which interface should be used for network traffic.

**Dynamic DNS Servers** - List of DNS server addresses obtained via DHCP.

**Static DNS Servers** - Lists DNS server addresses that have been manually configured.

**NTP Enabled** - When ticked, the unit will derive its time and date information from a suitable NTP server.

**NTP Key ID** - The ID of the key used for secure NTP.

**NTP Key Value** - The value of the key used for secure NTP as a hexadecimal string.

**Dynamic NTP Servers** - Lists NTP server addresses obtained via DHCP.

**Static NTP Servers** - Lists NTP server addresses that have been manually configured.

**AIM Enabled** - Indicates whether server management is enabled for this device.

**Dynamic AIM Servers** - Lists AIM server addresses obtained via DHCP.




**Static AIM Servers** - Lists management server addresses that have been manually configured.

Note: ALIF4001 models will list only two ports on this page.

# TX - Diagnostics and Statistics

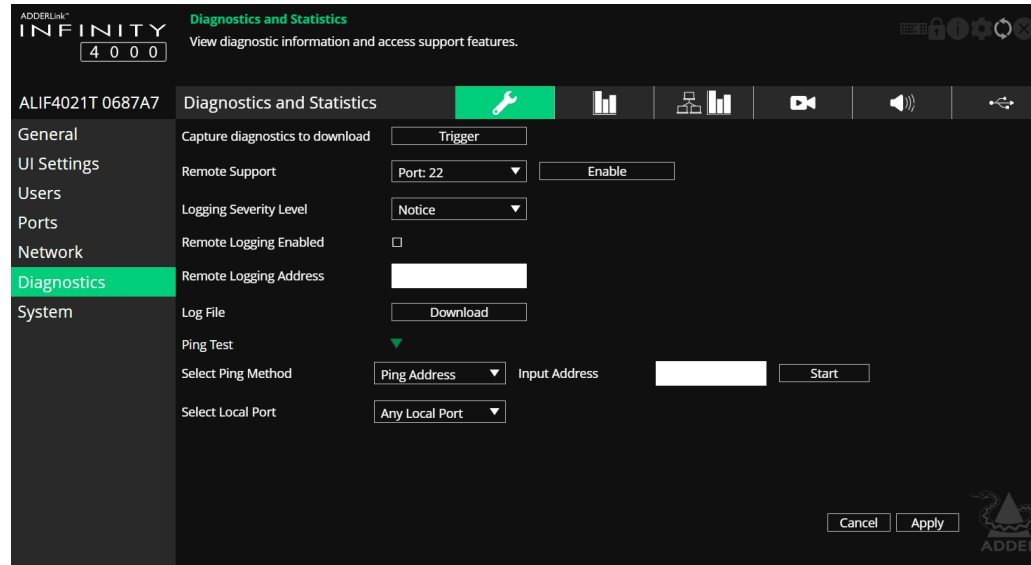
## To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 Click the **Diagnostics** link.

## OR

- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3* (or *IP Address 4*) and use that address.
- 3 Click the **Diagnostics** link.



## Log Settings

This page provides numerous key diagnostic log settings.

**Capture diagnostics to download** - (Only shown when viewing this page using a PC browser). Request generation of a diagnostics dump file. This will then be downloaded by the host computer's browser; this is an encrypted diagnostics file which can be used by technical support to diagnose and fix an issue.

**Remote Support** - When using the Adder remote server, this option determines which port will be used. Multiple options are offered in case one or more ports are blocked by your firewall. When the Enable button is clicked, it will indicate the password to be used.

**Logging Severity Level** - Defines the level of messages that will be logged (according to RFC5424). Level 5 (*Notice: normal but significant condition*) is the default setting; ALIF4000 supports levels 1 to 7. Choosing levels 6 (*Informational*) or 7 (*Debug*) will cause larger numbers of lesser events to also be logged, with a potential impact to overall performance. These levels should only be used if working with the support team to diagnose a specific issue.

**Remote Logging Enabled** - Tick to send log files to the chosen *Remote Logging Address*.

**Remote Logging Address** - Enter a valid IP address for a syslog server on the local network where status logs can be sent.

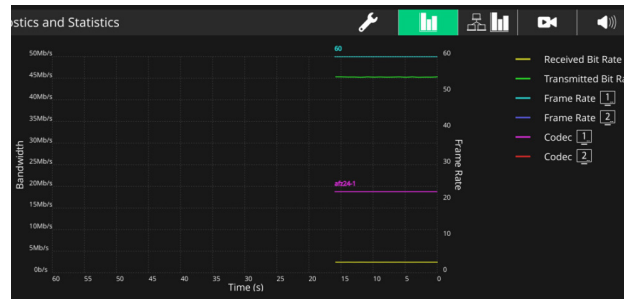
**Log File** - If viewing this page using a browser: Click to download the log file to the host computer's browser. If viewing this page via the OSD, the log will be shown as a scrollable list.

**Ping Test** - Provides a quick and easy way to check the link status to an ALIF RX. You can specify either an IP address or choose the device from a list. Click the Start button to begin; a summary of the results will be displayed.



## Basic Graph

This page shows a real time graph with the following entries:



- **Received and transmitted bit rates** - the values of these correspond to the bandwidth axis on the left.
- **Frame rate** - for both heads. Values are labeled when they change and correspond to the axis on the right.
- **Codec** - for both heads. These represent the compression used: 1 is better than 4.
- **Dropped packets** - for both heads. Values are labeled when they change and correspond to the axis on the right.



## Network Statistics

This page allows you to view current communication statistics and also to create graphs in real time.

**Capture and Graph Statistics** - When ticked, the page will create a real time graph plotting Received Bytes alongside Received Packets.

After *Capture and Graph Statistics* is enabled, the *Show Legend* checkbox will show all other items that can be included on the plot. Click an item to tick and include it.



## Video Port Status and Statistics

This page provides wide ranging information for support purposes.



## Audio Port Status and Statistics

This page provides wide ranging information for support purposes.



## USB Port Status and Statistics




This page provides wide ranging information for support purposes. Currently only supported for transparent USB.



## TX - System

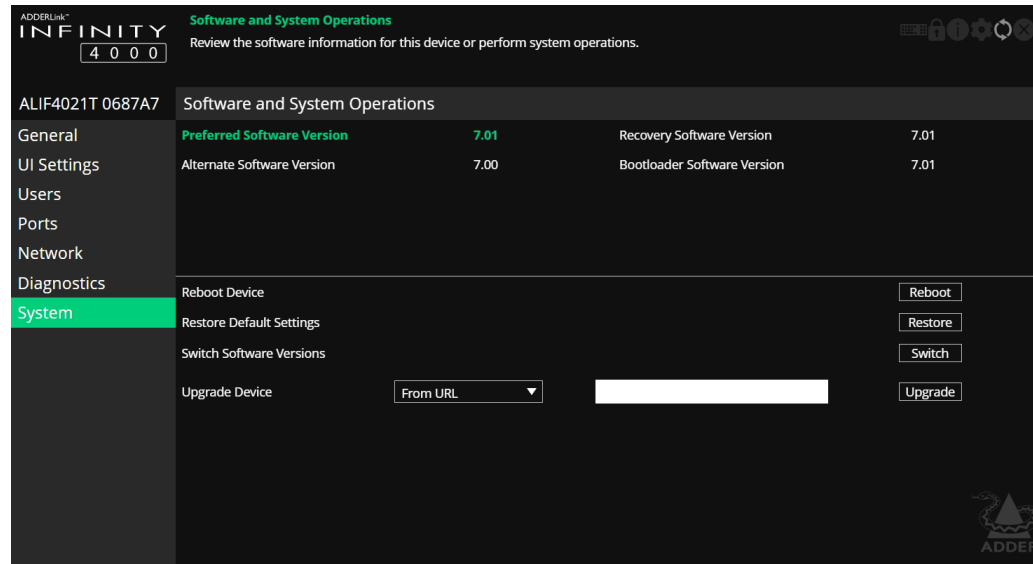
### To get here

You can access this page in two ways:

- 1 On the console keyboard attached to the RX unit, access the OSD by pressing **CTRL + ALT + C** or tap the touchscreen  icon. The Preset Selection page will be displayed.
- 2 Click the  icon in the top right corner.
- 3 Click the **Transmitters** option and then click the  icon for the required transmitter.
- 4 Click the **System** link.

### OR

- 1 Connect a computer to the same network as the TX unit.
- 2 Run a web browser and enter the IP address of the TX unit: **https://169.254.1.33** (this is the default address when using SFP port 3 or RJ45 port 1). If you are using SFP port 4 or RJ45 port 2 then the default address will be **https://169.254.1.43** If the IP address is unknown, press the small button on the front panel next to the OLED screen to reveal the value for *IP Address 3 (or IP Address 4)* and use that address.
- 3 Click the **System** link.



### Software and System Operations

This page contains various indications and options related to the internal software of the unit.

*Note: The highlighted (and colored) entry is the version of software currently running.*

**Preferred Software Version** - The software version the device will boot into upon a reboot.

**Recovery Software Version** - The software version the device will boot into if placed into recovery mode.

**Alternate Software Version** - The other (backup) version of software the device has available.

**Reboot Device** - Click the Reboot button to Reboot the device.

**Restore Default Settings** - Click the Restore button to restore the device to factory default settings.

**Switch Software Versions** - Click to switch to the listed 'Alternative Software Version'.

**Upgrade Device** - Allows you to upgrade the firmware either from a trusted URL or from a locally stored file. Use the field to define the source and then click the Upgrade button.

## APPENDIX B - Support for analog and digital audio

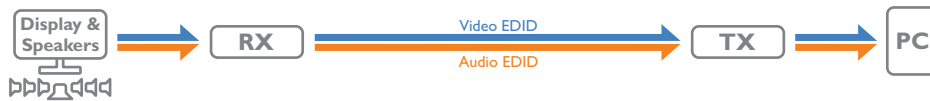
The ALIF4000 benefits from two different streams of audio signals:

- **Analog audio** - as would be output directly from the host PC's jack socket,
- **Digital audio** - as derived from the Host PC's DisplayPort video connection.

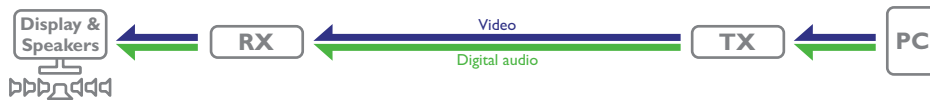
Even though the analog and digital outputs from a particular host PC might be carrying signals that originated from the same audio source, the two types are handled completely separately throughout the ALIF system and can never be mixed.

While standard analog audio will be limited to stereo only; digital audio offers the ability to send stereo or alternatively, surround sound in either the 5.1 or 7.1 varieties. In order for the host PC to know which variety of digital audio signal to send out, a valid definition of the requirement must be sent to the host PC. This is done as an audio sub-set of the EDID definition that is used to declare the video display capabilities/requirements.

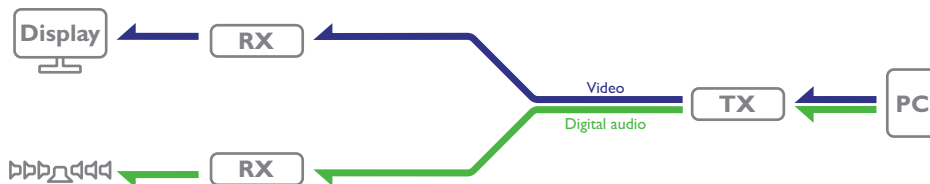
In the diagram below the display and speaker installation send their video and digital audio portions of the EDID (*Extended Display Identification Data*) definition via the ALIF4000 receiver and transmitter to the host PC:



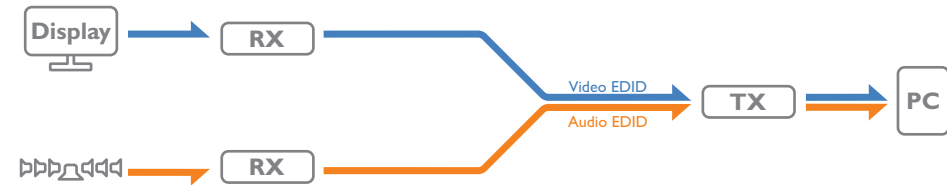
In response, the host PC begins sending video and audio signals that are appropriate for the receiving peripherals:



In the above case, the video and digital audio from the host PC are both sent to the same receiver. However, the flexibility of the ALIF system is such that peripherals and hosts can be mixed as required. For instance, the video feed could be sent to one receiver, while the digital audio is used by a set of speakers on a different receiver:



This presents an issue for the host PC and its ALIF4000 transmitter as they must now respond to separate EDID definitions from the video display on one receiver (which will probably also have its own EDID audio sub-set) and the EDID definition from the digital audio device on the other receiver:



To solve potential conflicts, the ALIF4000 transmitter uses a set of rules to determine how it mixes different EDID definitions. Firstly, for any connected video or digital audio devices, the ALIF system can consider each one using any of three selectable states:

- **Attached** - ALIF will interrogate the attached video/audio device to ascertain its exact capabilities/requirements.
- **Fixed** - ALIF will use a fixed definition (e.g 3840x2160p60 and 6-channel audio) to represent the video/audio device(s).
- **None** - No representation will be made for the device.

The above states are then combined by the ALIF4000 transmitter, as connections are made to the different devices, using the following rules:

Video EDID	Audio EDID	Action (taken by the TX as it feeds info to the PC)
Fixed	Fixed	Merge the video and audio EDID definitions.
Fixed/Attached	None	Send video EDID definition only.
Attached	Attached	Use whichever EDID definition is available first.
Attached/Fixed	Fixed/Attached	Wait for the <i>Attached</i> device to declare and then use its data to modify those of the <i>Fixed</i> device. <i>Note: The video EDID retains precedence for setting general items, such as serial no., manufacturer, etc.</i>

*Note: The analog audio is switched entirely separately to the digital audio feed.*

### Analog and digital audio specifications

- **Analog audio:** Line in/out - 2 channel 16bit 48KHz 1V RMS in / 1V RMS out
- **Digital audio (DisplayPort):**
  - Up to 8 audio channels,
  - Seven choices of sampling frequencies: 32, 44.1, 48, 88.2, 96, 176.4 or 192kHz.
  - Three choices of bit depth, using LPCM *Linear Pulse Code Modulation*: 16, 20 or 24bit,

## APPENDIX C - Tips for success when networking ALIF units

ALIF units use multiple strategies to minimize the amount of data that they send across networks. However, data overheads can be quite high, particularly when very high resolution video is being transferred, so it is important to take steps to maximize network efficiency and help minimize data output. The tips given in this section have been proven to produce very beneficial results.

### Summary of steps

- Choose the right kind of switch.
- Create an efficient network layout.
- Configure the switches and devices correctly.

### Choosing the right switch

[Layer 2](#) switches are what bind all of the hosts together in the subnet. However, they are all not created equally, so choose carefully. In particular look for the following:

- 10Gigabit ports,
- Support for [IGMP v2](#) (or v3) snooping,
- Support for [Jumbo frames](#) up to 9216-byte size,
- High bandwidth connections between switches, preferably Fiber Channel.
- Look for switches that perform their most onerous tasks (e.g. [IGMP snooping](#)) using multiple dedicated processors (ASICS).
- Ensure the maximum number of concurrent ‘snoopable groups’ the switch can handle meets or exceeds the number of ALIF transmitters that will be used to create multicast groups.
- Check the throughput of the switch: Full duplex, 10Gbps up- and down- stream speeds per port.
- Use the same switch make and model throughout a single subnet.
- You also need a [Layer 3](#) switch. Ensure that it can operate efficiently as an [IGMP Querier](#).

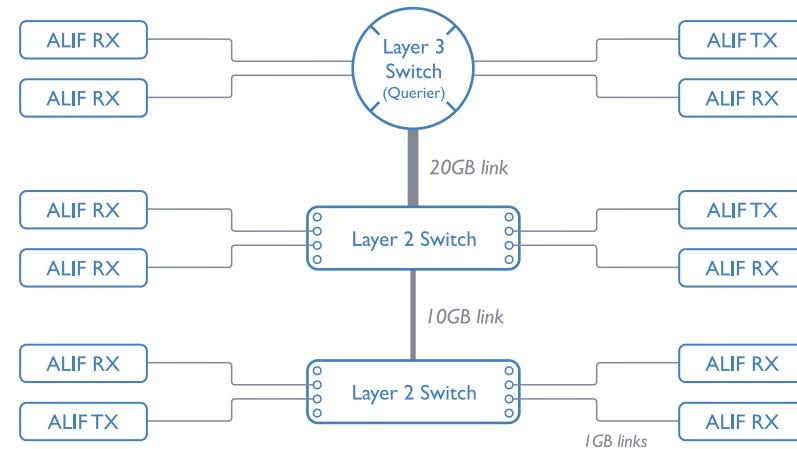
### Creating an efficient network layout

Network layout is vital. The use of [IGMP snooping](#) also introduces certain constraints, so take heed:

- Keep it flat. Use a basic line-cascade structure rather than a pyramid or tree arrangement.
- Keep the distances between the switches as short as possible.
- Ensure sufficient bandwidth between switches to eliminate bottlenecks.
- Where the AIM server is used to administer multiple ALIF transceivers, ensure the AIM server and all ALIF units reside in the same subnet.
- Do not use VGA to DisplayPort converters, instead replace VGA video cards in older systems with suitable DisplayPort replacements. Converters cause ALIF TX units to massively increase data output.
- Wherever possible, create a private network.

### The recommended layout

The layout shown below has been found to provide the most efficient network layout for rapid throughput when using IGMP snooping:



- 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 layout 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 importantly also enable portfast (only) 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, 2048 x 2048), 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](#).
  - Optimize the settings on the ALIF transmitters:
    - If moving video images are being shown frequently, then leave Frame Skipping 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 skipping percentage setting.
- Make changes to the ALIF transmitters one at a time, in small steps, and view typical 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 v2.1).

## 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 venetian 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 displayed 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.

### 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 \(aka Immediate Leave\)](#) 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](#), usually a layer 3 switch or multicast router.
- 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 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: AIM 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 AIM discovery. If you have a working network of ALIFs without AIM and then add AIM to the network, AIM 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 AIM 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 AIM server are located within the same subnet because AIM 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 AIM is attempting to locate ALIF units.

**Problem: Video performance is affected when using USB storage.**

This issue could be related to a relatively slow link connection speed being affected by high bandwidth data transfers to a USB storage device.

**Remedies:**

Try placing a limit on the bandwidth being used by the transparent USB ports. Via the OSD, link to the [TX - Ports](#) page, change to the *USB Ports* section and adjust the *Rate Limit* option.

**Problem: Following a firmware upgrade to 4.xx, the ALIF4000 units still cannot support SDR10 or HDR10 video signals.**

When an ALIF4000 unit is upgraded, it may not support the new 30-bits per pixel modes if manual changes had previously been made to the video configuration. This could mean that the Max Bits per Pixel setting may remain set to 24-bits, causing the unit to not support SDR10 and HDR10 signals.

**Remedies:**

Access the TX Ports configuration page and change the Max Bits per Pixel setting to '30'. See page 43.

## 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 spread 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 3](#) 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 IGMP Querier 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 operate 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 3](#) 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 (aka Immediate Leave)

When a device/host no longer wishes to receive a multicast transmission, it can issue 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 speed up performance considerably.

### 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 10Mbit/s to a current maximum of 100Gbit/s.

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 speed era (10Mbits/s) 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 payload 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' payload 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.



## 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 50 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:

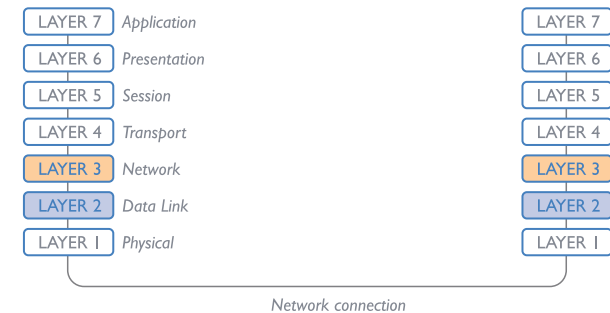
- **Store and forward** is the original method and requires the switch to save each entire data packet to buffer memory, run an error check and then forward if no error is found (or otherwise discard it).
- **Cut-through** was developed to address the latency issues suffered by some store and forward 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™ INFINITY 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 standardized way to categorize 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 8) 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.

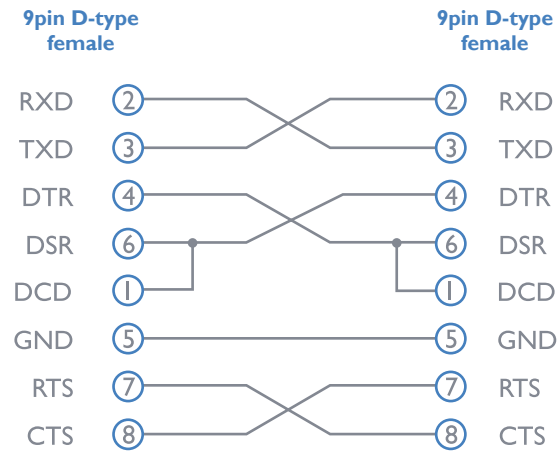
So why are Layer 2 and Layer 3 of particular importance when discussing ADDERLink™ INFINITY? Because the successful transmission of data relies upon fast and reliable passage through network switches – and most of these operate at either Layer 2 or Layer 3.

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 (by the sending system) includes the physical address of the intended recipient system, i.e. the unique MAC address (for example, 09:f8:33:d7:66:12) 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 - Null modem cable pinout

### RS232 'null-modem' cable pin-out



## APPENDIX G - Fiber/copper modules and cables

To suit your installation layout, fiber and copper modules are available for the ALIF4000 units to support various fiber optic and CATx cables. The specifications for all are summarized in this table:

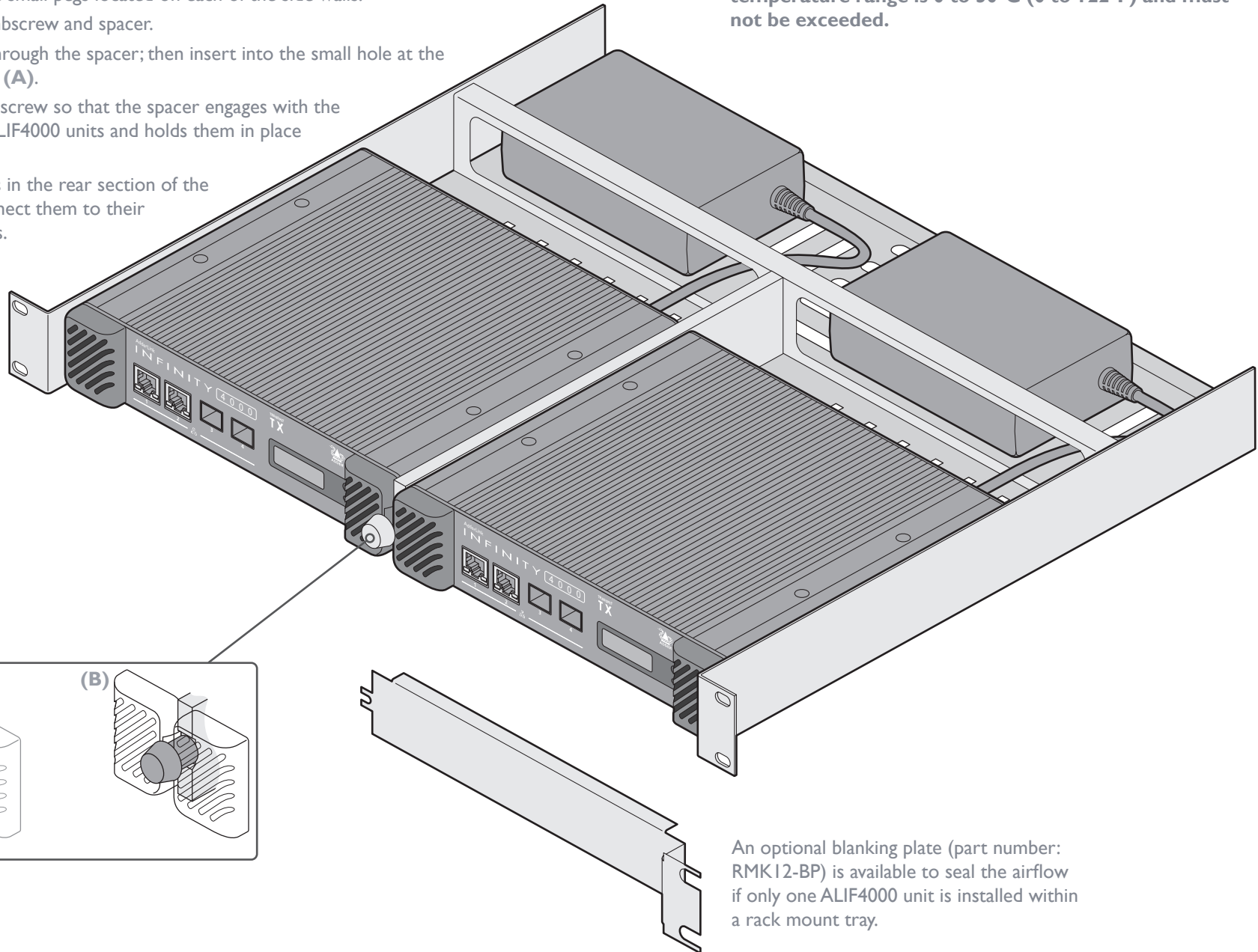
Name	Fiber size	Type	Coding		Distance at 1Gbps	Adder part number for SFP module	Distance at 10Gbps	Adder part number for 10Gbps SFP modules
			Normal applications	Suggested print nomenclature				
OM1	(62.5/125)	Multimode (TIA-492AAAA)	Orange	62.5/125	220m	SFP-MM-LC	2-26m	SFP-MM-LC-10G
OM2	(50/125)	Multimode (TIA-492AAAB)	Orange	50/125	550m	“	2-26m	“
OM3	(50/125)	Multimode (850 nm Laser-optimized) (TIA-492AAAC)	Aqua	850 LO 50 /125	550m	“	2-82m	“
OM4	(50/125)	Multimode (850 nm Laser-optimized) (TIA-492AAAC)	Aqua	850 LO 50 /125	550m	“	2-300m	“
OS1 and OS2	(9/125)	Single-mode (TIA-492C000 / TIA-492E000)	Yellow	SM/NZDS, SM	20km	SFP-SM-LC	10Km	SFP-SM-LC-10G
CATx	n/a	Multi-rate CAT5e and above	n/a	n/a	100m	SFP-CATX-RJ45	See below	SFP-CATX-MR

Speed	Cable type	Distance
10GbE	CAT 6	30m
100MbE to 5GbE	CAT 5e and above	100m

## APPENDIX H - Using the optional ALIF4000 rack shelf

- 1 Install the empty ALIF4000 rack mount tray into your 19" rack frame and fully secure it.
- 2 Place an ALIF4000 unit into each side of the rack mount tray so that their rear panels butt up against the small pegs located on each of the side walls.
- 3 Locate the supplied thumbscrew and spacer.
- 4 Insert the thumbscrew through the spacer; then insert into the small hole at the end of the center divider (A).
- 5 Gently tighten the thumbscrew so that the spacer engages with the inner edges of the two ALIF4000 units and holds them in place (B).
- 6 Place the power adapters in the rear section of the rack mount tray and connect them to their respective ALIF4000 units.
- 7 Make all other necessary connections to the ALIF4000 units.

**IMPORTANT:** When mounting the ALIF units (and their power adapters), ensure that the vents are not obscured and that there is sufficient airflow. The operating temperature range is 0 to 50°C (0 to 122°F) and must not be exceeded.



An optional blanking plate (part number: RMK12-BP) is available to seal the airflow if only one ALIF4000 unit is installed within a rack mount tray.

# APPENDIX I - OPEN SOURCE LICENSES

The software included in this product contains copyrighted software that is licensed under the GNU General Public License (GPL) v2. You may obtain the complete Corresponding Source Code from Adder for a period of three years after the last shipment of this product, which will be no earlier than 2028, by contacting support@adder.com or writing to:

Attn:ACD/Open Source Request,  
Adder Technology Ltd,  
Saxon Way, Bar Hill,  
Cambridge, CB23 8SL,  
United Kingdom

Please write "Source for product XXXXXXXX" in the subject line, where XXXXXXXX is the model and version number.

This offer is valid to anyone in receipt of this information.

```
dtc
u-boot-socfpga
linux/linux-socfpga
busybox
termcap
util-linux
libcap
systemd
iproute2
e2fsprogs
dbus-1
freetype
qt5
libpbe
```

A complete copy of the GNU General Public License v2 license text is included at the end of this file.

This product includes binaries that are derived from the open source community. The modules listed below are licenced under the GNU Lesser General Public License v2.1 and must be provided, in source form, on request:

```
kmod
systemd
libdaemon
avahi
glib
libgpg-error
libgcrypt
gnutls
libmicrohttpd
strace
```

A complete copy of the GNU Lesser General Public License v2.1 license text is included at the end of this file.

This product includes binaries that are derived from the open source community. The modules listed below are licenced under the GNU Lesser General Public License v3 and must be provided, in source form, on

request:

```
libunistring
gmp
nettle
```

A complete copy of the GNU Lesser General Public License v3 license text is included at the end of this file.

This product includes binaries that are derived from the open source community. The modules listed below are licenced under the Mozilla Public License Version 2.0 and must be provided, in source form, on request:

```
dhcp
libjvt
```

A complete copy of the Mozilla Public License Version 2.0 license text is included at the end of this file.

In addition to the GPL modules listed, this product also includes binaries derived from 3rd party open sources that have their own license requirements. Each module is listed below with their required Copyright statement and distribution conditions.

```
-----
-
- Module: freebsd-libc
-
-----
```

```
# @(#)COPYRIGHT 8.2 (Berkeley) 3/21/94
```

All of the documentation and software included in the 4.4BSD and 4.4BSD-Lite Releases is copyrighted by The Regents of the University of California.

Copyright 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994  
The Regents of the University of California. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:

This product includes software developed by the University of California, Berkeley and its contributors.

4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The Institute of Electrical and Electronics Engineers and the American National Standards Committee X3, on Information Processing Systems have given us permission to reprint portions of their documentation.

In the following statement, the phrase "this text" refers to portions of the system documentation.

Portions of this text are reprinted and reproduced in electronic form in the second BSD Networking Software Release, from IEEE Std 1003.1-1988, IEEE Standard Portable Operating System Interface for Computer Environments (POSIX), copyright C 1988 by the Institute of Electrical and Electronics Engineers, Inc. In the event of any discrepancy between these versions and the original IEEE Standard, the original IEEE Standard is the referee document.

In the following statement, the phrase "This material" refers to portions of the system documentation.

This material is reproduced with permission from American National Standards Committee X3, on Information Processing Systems. Computer and Business Equipment Manufacturers Association (CBEMA), 311 First St., NW, Suite 500, Washington, DC 20001-2178. The developmental work of Programming Language C was completed by the X3J11 Technical Committee.

The views and conclusions contained in the software and documentation are those of the authors and should not be interpreted as representing official policies, either expressed or implied, of the Regents of the University of California.

```
-----
-
- Module: openssl
-
-----
```

## LICENSE ISSUES

=====

The OpenSSL toolkit stays under a double license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts.

```
OpenSSL License
-----
```

```
/* =====
==
```

```
* Copyright (c) 1998-2019 The OpenSSL Project. All rights reserved.
```

```
*
* Redistribution and use in source and binary forms, with or without
* modification, are permitted provided that the following conditions
* are met:
```

```
*
* 1. Redistributions of source code must retain the above copyright
* notice, this list of conditions and the following disclaimer.
```

```
*
* 2. Redistributions in binary form must reproduce the above copyright
* notice, this list of conditions and the following disclaimer in
* the documentation and/or other materials provided with the
* distribution.
```

```
*
* 3. All advertising materials mentioning features or use of this
* software must display the following acknowledgement:
* "This product includes software developed by the OpenSSL Project
* for use in the OpenSSL Toolkit. (http://www.openssl.org)"
*
```

\* 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.

\* 5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.

\* 6. Redistributions of any form whatsoever must retain the following acknowledgment:  
\* "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

\* THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====  
==  
\* This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).  
\*/

Original SSLeay License

/\* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)  
\* All rights reserved.

\* This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).  
\* The implementation was written so as to conform with Netscapes SSL.  
\* This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

\* Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed.  
\* If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used.  
\* This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

\* Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

\* 1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.  
\* 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.  
\* 3. All advertising materials mentioning features or use of this software must display the following acknowledgement:  
\* "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)"  
\* The word 'cryptographic' can be left out if the rouines from the library being used are not cryptographic related :-).  
\* 4. If you include any Windows specific code (or a derivative thereof) from

\* the apps directory (application code) you must include an acknowledgement:  
\* "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

\* THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

\* The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence  
\* [including the GNU Public Licence.]  
\*/

-----  
-  
- Module: libcvt  
-  
-----

Copyright (c) 2001, Andy Ritger aritger@nvidia.com  
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

o Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.  
o Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.  
o Neither the name of NVIDIA nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This program is based on the Generalized Timing Formula (GTF TM)  
Standard Version: 1.0, Revision: 1.0

The GTF Document contains the following Copyright information:

Copyright (c) 1994, 1995, 1996 - Video Electronics Standards Association. Duplication of this document within VESA member companies for review purposes is permitted. All other rights

reserved.

While every precaution has been taken in the preparation of this standard, the Video Electronics Standards Association and its contributors assume no responsibility for errors or omissions, and make no warranties, expressed or implied, of functionality of suitability for any purpose. The sample code contained within this standard may be used without restriction.

-----  
-  
- Module: libdrm  
-  
-----

Copyright 1999, 2000 Precision Insight, Inc., Cedar Park, Texas.  
Copyright 2000 VA Linux Systems, Inc., Sunnyvale, California.  
All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL PRECISION INSIGHT AND/OR ITS SUPPLIERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

-----

Copyright (c) 2007-2008 Tungsten Graphics, Inc., Cedar Park, Texas.  
Copyright (c) 2007-2008 Dave Airlie <airlied@linux.ie>  
Copyright (c) 2007-2008 Jakob Bornecrantz <wallbraker@gmail.com>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

-----  
-  
- Module: libbpcap  
-  
-----



Copyright (c) 1999 - 2005 NetGroup, Politecnico di Torino (Italy).  
Copyright (c) 2005 - 2010 CACE Technologies, Davis (California).  
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the Politecnico di Torino, CACE Technologies nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes software developed by the University of California, Lawrence Berkeley Laboratory and its contributors.  
This product includes software developed by the Kungliga Tekniska H gskolan and its contributors.

This product includes software developed by Yen Yen Lim and North Dakota State University.

Portions Copyright (c) 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997 The Regents of the University of California. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes software developed by the University of California, Berkeley and its contributors."
4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE INSTITUTE AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Portions Copyright (c) 1983 Regents of the University of California. All rights reserved.

Redistribution and use in source and binary forms are permitted provided that the above copyright notice and this paragraph are duplicated in all such forms and that any documentation, advertising materials, and other materials related to such distribution and use acknowledge that the software was developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Portions Copyright (c) 1995, 1996, 1997 Kungliga Tekniska H gskolan (Royal Institute of Technology, Stockholm, Sweden). All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes software developed by the Kungliga Tekniska H gskolan and its contributors."
4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE INSTITUTE AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE INSTITUTE OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Portions Copyright (c) 1997 Yen Yen Lim and North Dakota State University. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes software developed by Yen Yen Lim and North Dakota State University"
4. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF

ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Portions Copyright (c) 1993 by Digital Equipment Corporation.

Permission to use, copy, modify, and distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies, and that the name of Digital Equipment Corporation not be used in advertising or publicity pertaining to distribution of the document or software without specific, written prior permission.

THE SOFTWARE IS PROVIDED "AS IS" AND DIGITAL EQUIPMENT CORP. DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL DIGITAL EQUIPMENT CORPORATION BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Portions Copyright (C) 1995, 1996, 1997, 1998, and 1999 WIDE Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the project nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE PROJECT AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE PROJECT OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Portions Copyright (c) 1996 Juniper Networks, Inc. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that:  
(1) source code distributions retain the above copyright notice and this paragraph in its entirety,  
(2) distributions including binary code include the above copyright notice and this paragraph in its entirety in the documentation or other materials provided with the distribution. The name of Juniper Networks may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Portions Copyright (c) 2001 Daniel Hartmeier All rights reserved.





Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTOR "AS IS"

AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR CONTRIBUTORS BE

LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Portions Copyright 1989 by Carnegie Mellon.

Permission to use, copy, modify, and distribute this program for any purpose and without fee is hereby granted, provided that this copyright and permission notice appear on all copies and supporting documentation, the name of Carnegie Mellon not be used in advertising or publicity pertaining to distribution of the program without specific prior permission, and notice be given in supporting documentation that copying and distribution is by permission of Carnegie Mellon and Stanford University. Carnegie Mellon makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

- Module: libupnp

Copyright (c) 2000-2003 Intel Corporation  
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- \* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- \* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- \* Neither name of Intel Corporation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL INTEL OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

- Module: zlib

Copyright notice:

(C) 1995-2022 Jean-loup Gailly and Mark Adler

This software is provided 'as-is', without any express or implied warranty. In no event will the authors be held liable for any damages arising from the use of this software.

Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the following restrictions:

1. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgment in the product documentation would be appreciated but is not required.
2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.
3. This notice may not be removed or altered from any source distribution.

Jean-loup Gailly      Mark Adler  
jloup@zip.org        madler@alumni.caltech.edu

- Module: pcre2

PCRE2 LICENCE

PCRE2 is a library of functions to support regular expressions whose syntax and semantics are as close as possible to those of the Perl 5 language.

Releases 10.00 and above of PCRE2 are distributed under the terms of the "BSD" licence, as specified below, with one exemption for certain binary redistributions. The documentation for PCRE2, supplied in the "doc" directory, is distributed under the same terms as the software itself. The data in thetestdata directory is not copyrighted and is in the public domain.

The basic library functions are written in C and are freestanding. Also included in the distribution is a just-in-time compiler that can be used to optimize pattern matching. This is an optional feature that can be omitted when the library is built.

THE BASIC LIBRARY FUNCTIONS

Written by:    Philip Hazel  
Email local part: Philip.Hazel  
Email domain: gmail.com

Retired from University of Cambridge Computing Service,  
Cambridge, England.

Copyright (c) 1997-2022 University of Cambridge  
All rights reserved.

PCRE2 JUST-IN-TIME COMPILATION SUPPORT

Written by:    Zoltan Herczeg  
Email local part: hzmester  
Email domain: freemail.hu

Copyright(c) 2010-2022 Zoltan Herczeg  
All rights reserved.

STACK-LESS JUST-IN-TIME COMPILER

Written by:    Zoltan Herczeg  
Email local part: hzmester  
Email domain: freemail.hu

Copyright(c) 2009-2022 Zoltan Herczeg  
All rights reserved.

THE "BSD" LICENCE

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- \* Redistributions of source code must retain the above copyright notices, this list of conditions and the following disclaimer.
- \* Redistributions in binary form must reproduce the above copyright notices, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- \* Neither the name of the University of Cambridge nor the names of any contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS"

AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

EXEMPTION FOR BINARY LIBRARY-LIKE PACKAGES

The second condition in the BSD licence (covering binary redistributions) does not apply all the way down a chain of software. If binary package A includes PCRE2, it must respect the condition, but if package B is software that includes package A, the condition is not imposed on package B unless it uses PCRE2 independently.

End

- Module: libev

All files in libev are  
Copyright (c)2007,2008,2009,2010,2011,2012,2013 Marc Alexander Lehmann.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

\* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

\* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
-
- Module: libaes
-
-----
```

Copyright (c) 1998-2008, Brian Gladman, Worcester, UK. All rights reserved.

#### LICENSE TERMS

The redistribution and use of this software (with or without changes) is allowed without the payment of fees or royalties provided that:

1. source code distributions include the above copyright notice, this list of conditions and the following disclaimer;
2. binary distributions include the above copyright notice, this list of conditions and the following disclaimer in their documentation;
3. the name of the copyright holder is not used to endorse products built using this software without specific written permission.

#### DISCLAIMER

This software is provided 'as is' with no explicit or implied warranties in respect of its properties, including, but not limited to, correctness and/or fitness for purpose.

```
-----
-
- Module: libgcrypt
-
-----
```

Additional license notices for Libgcrypt.      \*.- org \*.-

This file contains the copying permission notices for various files in the Libgcrypt distribution which are not covered by the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL).

These notices all require that a copy of the notice be included in the accompanying documentation and be distributed with binary distributions of the code, so be sure to include this file along with any binary distributions derived from the GNU C Library.

#### \* BSD\_3Clause

For files:  
 - cipher/sha256-avx-amd64.S  
 - cipher/sha256-avx2-bmi2-amd64.S  
 - cipher/sha256-ssse3-amd64.S  
 - cipher/sha512-avx-amd64.S  
 - cipher/sha512-avx2-bmi2-amd64.S  
 - cipher/sha512-ssse3-amd64.S  
 - cipher/sha512-ssse3-i386.c

```
##+begin_quote
Copyright (c) 2012, Intel Corporation
```

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

\* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

\* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

\* Neither the name of the Intel Corporation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY INTEL CORPORATION "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL INTEL CORPORATION OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
##+end_quote
```

For files:  
 - random/jitterentropy-base.c  
 - random/jitterentropy.h  
 - random/rndjent.c (plus common Libgcrypt copyright holders)

```
##+begin_quote
* Copyright Stephan Mueller <smueller@chronox.de>, 2013
*
```

```
* License
* =====
*
```

```
* Redistribution and use in source and binary forms, with or without
* modification, are permitted provided that the following conditions
* are met:
```

```
* 1. Redistributions of source code must retain the above copyright
* notice, and the entire permission notice in its entirety,
* including the disclaimer of warranties.
```

```
* 2. Redistributions in binary form must reproduce the above copyright
* notice, this list of conditions and the following disclaimer in the
* documentation and/or other materials provided with the distribution.
```

```
* 3. The name of the author may not be used to endorse or promote
* products derived from this software without specific prior
* written permission.
```

```
*
```

```
* ALTERNATIVELY, this product may be distributed under the terms of
* the GNU General Public License, in which case the provisions of the GPL are
* required INSTEAD OF the above restrictions. (This clause is
* necessary due to a potential bad interaction between the GPL and
```

\* the restrictions contained in a BSD-style copyright.)

```
*
```

```
* THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESS OR IMPLIED
* WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
* OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ALL OF
* WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE
* LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
* CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT
* OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR
* BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF
* LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE
* USE OF THIS SOFTWARE, EVEN IF NOT ADVISED OF THE POSSIBILITY OF SUCH
* DAMAGE.
```

```
##+end_quote
```

For files:  
 - cipher/cipher-gcm-ppc.c

```
##+begin_quote
Copyright (c) 2006, CRYPTOGAMS by <appro@openssl.org>
All rights reserved.
```

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

\* Redistributions of source code must retain copyright notices, this list of conditions and the following disclaimer.

\* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

\* Neither the name of the CRYPTOGAMS nor the names of its copyright holder and contributors may be used to endorse or promote products derived from this software without specific prior written permission.

ALTERNATIVELY, provided that this notice is retained in full, this product may be distributed under the terms of the GNU General Public License (GPL), in which case the provisions of the GPL apply INSTEAD OF those given above.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDER AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
##+end_quote
```

```
* X License
```

For files:  
 - install.sh

```
##+begin_quote
Copyright (C) 1994 X Consortium
```

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in

all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE X CONSORTIUM BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of the X Consortium shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from the X Consortium.

##+end\_quote

\* Public domain

For files:  
- cipher/arcfour-amd64.S

##+begin\_quote

Author: Marc Bevand <bevand\_m (at) epita.fr>  
Licence: I hereby disclaim the copyright on this code and place it in the public domain.

##+end\_quote

\* OCB license |

For files:  
- cipher/cipher-ocb.c

##+begin\_quote

OCB is covered by several patents but may be used freely by most software. See <http://web.cs.ucdavis.edu/~rogaway/ocb/license.htm>. In particular license | is suitable for Libgcrypt: See <http://web.cs.ucdavis.edu/~rogaway/ocb/license1.pdf> for the full license document; it basically says:

License | License for Open-Source Software Implementations of OCB (Jan 9, 2013)

Under this license, you are authorized to make, use, and distribute open-source software implementations of OCB. This license terminates for you if you sue someone over their open-source software implementation of OCB claiming that you have a patent covering their implementation.

License for Open Source Software Implementations of OCB  
January 9, 2013

| Definitions

1.1 Licensor means Phillip Rogaway.

1.2 Licensed Patents means any patent that claims priority to United States Patent Application No. 09/918,615 entitled Method and Apparatus for Facilitating Efficient Authenticated Encryption, and any utility, divisional, provisional, continuation, continuations-in-part, reexamination, reissue, or foreign counterpart patents that may issue with respect to the aforesaid patent application. This includes, but is not limited to, United States Patent No. 7,046,802; United States Patent No. 7,200,227; United States Patent No. 7,949,129; United States Patent No. 8,321,675; and any patent that issues out of United States Patent Application No. 13/669,114.

1.3 Use means any practice of any invention claimed in the Licensed Patents.

1.4 Software Implementation means any practice of any invention claimed in the Licensed Patents that takes the form of software executing on

a user-programmable, general-purpose computer or that takes the form of a computer-readable medium storing such software. Software Implementation does not include, for example, application-specific integrated circuits (ASICs), field-programmable gate arrays (FPGAs), embedded systems, or IP cores.

1.5 Open Source Software means software whose source code is published and made available for inspection and use by anyone because either (a) the source code is subject to a license that permits recipients to copy, modify, and distribute the source code without payment of fees or royalties, or (b) the source code is in the public domain, including code released for public use through a CC0 waiver. All licenses certified by the Open Source Initiative at [opensource.org](http://opensource.org) as of January 9, 2013 and all Creative Commons licenses identified on the [creativecommons.org](http://creativecommons.org) website as of January 9, 2013, including the Public License Fallback of the CC0 waiver, satisfy these requirements for the purposes of this license.

1.6 Open Source Software Implementation means a Software Implementation in which the software implicating the Licensed Patents is Open Source Software. Open Source Software Implementation does not include any Software Implementation in which the software implicating the Licensed Patents is combined, so as to form a larger program, with software that is not Open Source Software.

2 License Grant

2.1 License. Subject to your compliance with the terms of this license, including the restriction set forth in Section 2.2, Licensor hereby grants to you a perpetual, worldwide, non-exclusive, non-transferable, non-sublicenseable, no-charge, royalty-free, irrevocable license to practice any invention claimed in the Licensed Patents in any Open Source Software Implementation.

2.2 Restriction. If you or your affiliates institute patent litigation (including, but not limited to, a cross-claim or counterclaim in a lawsuit) against any entity alleging that any Use authorized by this license infringes another patent, then any rights granted to you under this license automatically terminate as of the date such litigation is filed.

3 Disclaimer

YOUR USE OF THE LICENSED PATENTS IS AT YOUR OWN RISK AND UNLESS REQUIRED BY APPLICABLE LAW, LICENSOR MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY

KIND CONCERNING THE LICENSED PATENTS OR ANY PRODUCT EMBODYING ANY LICENSED PATENT, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. IN NO EVENT WILL LICENSOR BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN CONTRACT, TORT OR OTHERWISE, ARISING FROM OR RELATED TO ANY USE OF THE LICENSED PATENTS, INCLUDING, WITHOUT LIMITATION, DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR SPECIAL DAMAGES, EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES PRIOR TO SUCH AN OCCURRENCE.

##+end\_quote

-----  
-  
- Module: jansson  
-----

Copyright (c) 2009-2020 Petri Lehtinen <petri@digip.org>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in

all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

-----  
-  
- Module: mtdev  
-----

mtdev - Multitouch Protocol Translation Library (MIT license)

Copyright (C) 2010 Henrik Rydberg <rydberg@euromail.se>  
Copyright (C) 2010 Canonical Ltd.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

-----  
-  
- Module: libevdev  
-----

SPDX-License-Identifier: MIT

Copyright 2013 Red Hat, Inc.  
Copyright 2013 David Herrmann <dh.herrmann@gmail.com>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL

THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

The following license is from a Linux kernel header file and there is no GPL code this package links to.

Copyright (c) 1999-2002 Vojtech Pavlik

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License version 2 as published by the Free Software Foundation.

```
-----
- Module: libinput
-
-----
```

Copyright 2006-2009 Simon Thum  
 Copyright 2008-2012 Kristian H gsborg  
 Copyright 2010-2012 Intel Corporation  
 Copyright 2010-2011 Benjamin Franzke  
 Copyright 2011-2012 Collabora, Ltd.  
 Copyright 2013-2014 Jonas dahl  
 Copyright 2013-2015 Red Hat, Inc.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS"; WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

libinput ships a copy of the GPL-licensed Linux kernel's linux/input.h header file. [1] This does not make libinput GPL.

This copy is provided to provide consistent behavior regardless which kernel version libinput is compiled against. The header is used during compilation only, libinput does not link against GPL libraries.

[1] <https://gitlab.freedesktop.org/libinput/libinput/blob/main/include/linux/input.h>

```
-----
- Module: tcpdump
-
-----
```

License: BSD

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The names of the authors may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Some files in this package are licensed under the 4-clause BSD license, the copyright on most of them belongs to The Regents of the University of California. Since the license was retroactively changed in 1999 to remove the advertising clause, they are effectively under the 3-clause license even if the text of the license in the files hasn't been updated. See the following document for more details:

<ftp://ftp.cs.berkeley.edu/pub/4bsd/README.Impt.License.Change>

Other files under the 4-clause BSD license and whose copyright doesn't belong to the The Regents of the University of California are listed below:

- print-802\_11.c, Copyright (c) 2001 Fortress Technologies and Charlie Lenah
- print-aodv.c, Copyright (c) 2003 Bruce M. Simpson
- print-ascii.c, Copyright (c) 1997, 1998 The NetBSD Foundation, Inc.
- print-cnfp.c, Copyright (c) 1998 Michael Shalayeff
- print-gre.c, Copyright (c) 2002 Jason L. Wright
- print-mobile.c, Copyright (c) 1998 The NetBSD Foundation, Inc.
- print-sunatm.c, Copyright (c) 1997 Yen Yen Lim and North Dakota State University
- print-telnet.c, Copyright (c) 1997, 1998 The NetBSD Foundation, Inc.
- print-timed.c, Copyright (c) 2000 Ben Smithurst

```
-----
- Module: ntp
-
-----
```

The following copyright notice applies to all files collectively called the Network Time Protocol Version 4 Distribution. Unless specifically declared otherwise in an individual file, this entire notice applies as if the text was explicitly included in the file.

```
*****
*
* Copyright (c) University of Delaware 1992-2015
*
* Permission to use, copy, modify, and distribute this software and
* its documentation for any purpose with or without fee is hereby
* granted, provided that the above copyright notice appears in all
* copies and that both the copyright notice and this permission
* notice appear in supporting documentation, and that the name
* University of Delaware not be used in advertising or publicity
* pertaining to distribution of the software without specific,
* written prior permission. The University of Delaware makes no
* representations about the suitability this software for any
* purpose. It is provided "as is" without express or implied
* warranty.
*
*****

Content starting in 2011 from Harlan Stenn, Danny Mayer, and Martin
Burnicki is:
*****
*
* Copyright (c) Network Time Foundation 2011-2017
*
* All Rights Reserved
*
```

```
*****
*
* Redistribution and use in source and binary forms, with or without
* modification, are permitted provided that the following conditions
* are met:
*
* 1. Redistributions of source code must retain the above copyright
* notice, this list of conditions and the following disclaimer.
*
* 2. Redistributions in binary form must reproduce the above
* copyright notice, this list of conditions and the following
* disclaimer in the documentation and/or other materials provided
* with the distribution.
*
* THIS SOFTWARE IS PROVIDED BY THE AUTHORS "AS IS" AND ANY EXPRESS
* OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED
* WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
* ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE
* LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
* CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT
* OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR
* BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF
* LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE
* USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH
* DAMAGE.
*****
```

The following individuals contributed in part to the Network Time Protocol Distribution Version 4 and are acknowledged as authors of this work.

1. [1] Takao Abe <takao\_abe@xurb.jp> Clock driver for J1Y receivers
2. [2] Mark Andrews <mark\_andrews@isc.org> Leitch atomic clock controller
3. [3] Bernd Altmeier <altmeier@atsoft.de> hopf Elektronik serial line and PCI-bus devices
4. [4] Viraj Bais <vbais@mailman1.intel.com> and [5] Clayton Kirkwood <kirkwood@striderfm.intel.com> port to Windows NT 3.5
5. [6] Michael Barone <michael.barone@lmco.com> GPSVME fixes
6. [7] Karl Berry <karl@owl.hq.ileaf.com> syslog to file option
7. [8] Greg Brackley <greg.brackley@bigfoot.com> Major rework of WINNT port. Clean up recvbuf and iosignal code into separate modules.
8. [9] Marc Brett <Marc.Brett@westgeo.com> Magnavox GPS clock driver
9. [10] Piete Brooks <Piete.Brooks@cl.cam.ac.uk> MSF clock driver, Trimble PARSE support
10. [11] Nelson B Bolyard <nelson@bolyard.me> update and complete broadcast and crypto features in snpt
11. [12] Jean-Francois Boudreault <Jean-Francois.Boudreault@viagenie.qc.ca> IPv6 support
12. [13] Reg Clemens <reg@dwf.com> Oncore driver (Current maintainer)
13. [14] Steve Clift <clift@ml.csiro.au> OMEGA clock driver
14. [15] Casey Crellin <casey@csc.co.za> vxWorks (Tornado) port and help with target configuration
15. [16] Sven Dietrich <sven\_dietrich@trimble.com> Palisade reference clock driver, NT adj. residuals, integrated Greg's Winnt port.
16. [17] John A. Dundas III <dundas@salt.jpl.nasa.gov> Apple A/UX port
17. [18] Torsten Duwe <duwe@immd4.informatik.uni-erlangen.de> Linux port
18. [19] Dennis Ferguson <dennis@mrbill.canet.ca> foundation code for NTP Version 2 as specified in RFC-1119
19. [20] John Hay <jhay@icomtek.csiro.co.za> IPv6 support and testing
20. [21] Dave Hart <davehart@davehart.com> General maintenance, Windows port interpolation rewrite
21. [22] Claas Hilbrecht <neoclock4x@linum.com> NeoClock4X clock driver
22. [23] Glenn Hollinger <glenn@herald.usask.ca> GOES clock driver
23. [24] Mike Iglesias <iglesias@uci.edu> DEC Alpha port
24. [25] Jim Jagielski <jim@jagubox.gsfc.nasa.gov> A/UX port
25. [26] Jeff Johnson <jbj@chatham.usdesign.com> massive prototyping overhaul
26. [27] Hans Lambermont <Hans.Lambermont@nl.origin-it.com> or [28] <H.Lambermont@chello.nl> ntpswep
27. [29] Poul-Henning Kamp <phk@FreeBSD.ORG> Oncore driver (Original author)
28. [30] Frank Kardel [31] <kardel(at)ntp(dot)org> PARSE <GENERIC> (driver 14 reference clocks), STREAMS modules for PARSE, support scripts, syslog cleanup, dynamic interface handling
29. [32] Johannes Maximilian Kuehn <kuehn@ntp.org> Rewrote snpt to

- comply with NTPv4 specification, ntpd saveconfig
- 30. [33]William L. Jones <jones@hermes.chpc.utexas.edu> RS/6000 AIX modifications, HPLUX modifications
- 31. [34]Dave Katz <dkatz@cisco.com> RS/6000 AIX port
- 32. [35]Craig Leres <leres@ee.lbl.gov> 4.4BSD port, ppsclock, Magnavox GPS clock driver
- 33. [36]George Lindholm <lindholm@ucs.ubc.ca> SunOS 5.1 port
- 34. [37]Louis A. Mamakos <louie@ni.umd.edu> MD5-based authentication
- 35. [38]Lars H. Mathiesen <thorinn@dku.dk> adaptation of foundation code for Version 3 as specified in RFC-1305
- 36. [39]Danny Mayer <mayer@ntp.org> Network I/O, Windows Port, Code Maintenance
- 37. [40]David L. Mills <mills@udel.edu> Version 4 foundation, precision kernel; clock drivers: 1, 3, 4, 6, 7, 11, 13, 18, 19, 22, 36
- 38. [41]Wolfgang Moeller <moeller@gwdg1.dnet.gwdg.de> VMS port
- 39. [42]Jeffrey Mogul <mogul@pa.dec.com> ntptrace utility
- 40. [43]Tom Moore <tmooore@fiaveli.daytonoh.nrc.com> i386 svr4 port
- 41. [44]Kamal A Mostafa <kamal@whence.com> SCO OpenServer port
- 42. [45]Derek Mulcahy <derek@toybox.demon.co.uk> and [46]Damon Hart-Davis <d@hd.org> ARCRON MSF clock driver
- 43. [47]Rob Neal <neal@ntp.org> Bancomm reflclock and config/parse code maintenance
- 44. [48]Rainer Pruy <Rainer.Pruy@informatik.uni-erlangen.de> monitoring/trap scripts, statistics file handling
- 45. [49]Dirce Richards <dirce@zk3.dec.com> Digital UNIXV4.0 port
- 46. [50]Wilfredo Sanchez <wsanchez@apple.com> added support for NetInfo
- 47. [51]Nick Sayer <mrapple@quack.kfu.com> SunOS streams modules
- 48. [52]Jack Sasportas <jack@innovativeinternet.com> Saved a Lot of space on the stuff in the html/pic/ subdirectory
- 49. [53]Ray Schnitzler <schnitz@unipress.com> Unixware I port
- 50. [54]Michael Shields <shields@tembel.org> USNO clock driver
- 51. [55]Jeff Steinman <jss@pebbles.jpl.nasa.gov> Datum PTS clock driver
- 52. [56]Harlan Stenn <harlan@pfc.com> GNU automake/autoconfigure makeover, various other bits (see the ChangeLog)
- 53. [57]Kenneth Stone <ken@sdd.hp.com> HP-UX port
- 54. [58]Ajit Thyagarajan <ajit@ee.udel.edu> IP multicast/anycast support
- 55. [59]Tomoaki TSURUOKA <tsuruoka@nc.fukuoka-u.ac.jp> TRAK clock driver
- 56. [60]Brian Utterback <brian.utterback@oracle.com> General codebase, Solaris issues
- 57. [61]Loganaden Velvindron <loganaden@gmail.com> Sandboxing (libseccomp) support
- 58. [62]Paul A Vixie <vixie@vix.com> TrueTime GPS driver, generic TrueTime clock driver
- 59. [63]Ulrich Windl <Ulrich.Windl@rz.uni-regensburg.de> corrected and validated HTML documents according to the HTML DTD

## COPYRIGHT NOTICE, DISCLAIMER, and LICENSE

-----  
PNG Reference Library License version 2

- \* Copyright (c) 1995-2019 The PNG Reference Library Authors.
- \* Copyright (c) 2018-2019 Cosmin Truta.
- \* Copyright (c) 2000-2002, 2004, 2006-2018 Glenn Randers-Pehrson.
- \* Copyright (c) 1996-1997 Andreas Dilger.
- \* Copyright (c) 1995-1996 Guy Eric Schalnat, Group 42, Inc.

The software is supplied "as is", without warranty of any kind, express or implied, including, without limitation, the warranties of merchantability, fitness for a particular purpose, title, and non-infringement. In no event shall the Copyright owners, or anyone distributing the software, be liable for any damages or other liability, whether in contract, tort or otherwise, arising from, out of, or in connection with the software, or the use or other dealings in the software, even if advised of the possibility of such damage.

Permission is hereby granted to use, copy, modify, and distribute this software, or portions hereof, for any purpose, without fee, subject to the following restrictions:

1. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgment in the product documentation would be appreciated, but is not required.
2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.
3. This Copyright notice may not be removed or altered from any source or altered source distribution.

-----  
PNG Reference Library License version 1 (for libpng 0.5 through 1.6.35)

libpng versions 1.0.7, July 1, 2000, through 1.6.35, July 15, 2018 are Copyright (c) 2000-2002, 2004, 2006-2018 Glenn Randers-Pehrson, are derived from libpng-1.0.6, and are distributed according to the same disclaimer and license as libpng-1.0.6 with the following individuals added to the list of Contributing Authors:

Simon-Pierre Cadieux  
Eric S. Raymond  
Mans Rullgard  
Cosmin Truta  
Gilles Vollant  
James Yu  
Mandar Sahastrabuddhe  
Google Inc.  
Vadim Barkov

and with the following additions to the disclaimer:

There is no warranty against interference with your enjoyment of the library or against infringement. There is no warranty that our efforts or the library will fulfill any of your particular purposes or needs. This library is provided with all faults, and the entire risk of satisfactory quality, performance, accuracy, and effort is with the user.

Some files in the "contrib" directory and some configure-generated files that are distributed with libpng have other copyright owners, and are released under other open source licenses.

libpng versions 0.97, January 1998, through 1.0.6, March 20, 2000, are Copyright (c) 1998-2000 Glenn Randers-Pehrson, are derived from libpng-0.96, and are distributed according to the same disclaimer and license as libpng-0.96, with the following individuals added to the

## list of Contributing Authors:

Tom Lane  
Glenn Randers-Pehrson  
Willem van Schaik

libpng versions 0.89, June 1996, through 0.96, May 1997, are Copyright (c) 1996-1997 Andreas Dilger, are derived from libpng-0.88, and are distributed according to the same disclaimer and license as libpng-0.88, with the following individuals added to the list of Contributing Authors:

John Bowler  
Kevin Bracey  
Sam Bushell  
Magnus Holmgren  
Greg Roelofs  
Tom Tanner

Some files in the "scripts" directory have other copyright owners, but are released under this license.

libpng versions 0.5, May 1995, through 0.88, January 1996, are Copyright (c) 1995-1996 Guy Eric Schalnat, Group 42, Inc.

For the purposes of this copyright and license, "Contributing Authors" is defined as the following set of individuals:

Andreas Dilger  
Dave Martindale  
Guy Eric Schalnat  
Paul Schmidt  
Tim Wegner

The PNG Reference Library is supplied "AS IS". The Contributing Authors and Group 42, Inc. disclaim all warranties, expressed or implied, including, without limitation, the warranties of merchantability and of fitness for any purpose. The Contributing Authors and Group 42, Inc. assume no liability for direct, indirect, incidental, special, exemplary, or consequential damages, which may result from the use of the PNG Reference Library, even if advised of the possibility of such damage.

Permission is hereby granted to use, copy, modify, and distribute this source code, or portions hereof, for any purpose, without fee, subject to the following restrictions:

1. The origin of this source code must not be misrepresented.
2. Altered versions must be plainly marked as such and must not be misrepresented as being the original source.
3. This Copyright notice may not be removed or altered from any source or altered source distribution.

The Contributing Authors and Group 42, Inc. specifically permit, without fee, and encourage the use of this source code as a component to supporting the PNG file format in commercial products. If you use this source code in a product, acknowledgment is not required but would be appreciated.

-----  
- Module: libxkbcommon  
-----  
Copyright 2009-2012, 2016 Daniel Stone  
Copyright 2012 Ran Benita <ran234@gmail.com>  
Copyright 2010, 2012 Intel Corporation

-----  
- Module: libjpeg  
-----  
This software is based in part on the work of the Independent JPEG Group.

-----  
- Module: libpng  
-----



Copyright 2008, 2009 Dan Nicholson  
Copyright 2010 Francisco Jerez <currojerez@riseup.net>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Copyright 1985, 1987, 1988, 1990, 1998 The Open Group

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the names of the authors or their institutions shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from the authors.

Copyright (c) 1993, 1994, 1995, 1996 by Silicon Graphics Computer Systems, Inc.

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of Silicon Graphics not be used in advertising or publicity pertaining to distribution of the software without specific prior written permission. Silicon Graphics makes no representation about the suitability of this software for any purpose. It is provided "as is" without any express or implied warranty.

SILICON GRAPHICS DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SILICON

GRAPHICS BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Copyright 1987, 1988 by Digital Equipment Corporation, Maynard, Massachusetts.

All Rights Reserved

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of Digital not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission.

DIGITAL DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, IN NO EVENT SHALL DIGITAL BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Copyright (C) 2011 Joseph Adams <joeyadams3.14159@gmail.com>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Copyright 1996 by Joseph Moss  
Copyright (C) 2002-2007 Free Software Foundation, Inc.  
Copyright (C) Dmitry Golubev <lastguru@mail.ru>, 2003-2004  
Copyright (C) 2004, Gregory Mokhin <mokhin@bog.msu.ru>  
Copyright (C) 2006 Erdal Ronah

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of the copyright holder(s) not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. The copyright holder(s) makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

THE COPYRIGHT HOLDER(S) DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, IN NO EVENT SHALL THE COPYRIGHT HOLDER(S) BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Copyright (c) 1996 Digital Equipment Corporation

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL DIGITAL EQUIPMENT CORPORATION BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of the Digital Equipment Corporation shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from Digital Equipment Corporation.

Copyright 1996, 1998 The Open Group

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation.

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE OPEN GROUP BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of The Open Group shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from The Open Group.

Copyright 2004-2005 Sun Microsystems, Inc. All rights reserved.



Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Copyright (c) 1996 by Silicon Graphics Computer Systems, Inc.

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of Silicon Graphics not be used in advertising or publicity pertaining to distribution of the software without specific prior written permission. Silicon Graphics makes no representation about the suitability of this software for any purpose. It is provided "as is" without any express or implied warranty.

SILICON GRAPHICS DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SILICON GRAPHICS BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Copyright (c) 1996 X Consortium

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE X CONSORTIUM BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of the X Consortium shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from the X Consortium.

Copyright (C) 2004, 2006 var Arnfj r Bjarmason <avarab@gmail.com>

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation.

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE OPEN GROUP BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

Copyright (C) 1999, 2000 by Anton Zinoviev <anton@lml.bas.bg>

This software may be used, modified, copied, distributed, and sold, in both source and binary form provided that the above copyright and these terms are retained. Under no circumstances is the author responsible for the proper functioning of this software, nor does the author assume any responsibility for damages incurred with its use.

Permission is granted to anyone to use, distribute and modify this file in any way, provided that the above copyright notice is left intact and the author of the modification summarizes the changes in this header.

This file is distributed without any expressed or implied warranty.

-----  
-  
- Module: icu  
-  
-----

UNICODE, INC. LICENSE AGREEMENT - DATA FILES AND SOFTWARE

See Terms of Use <<https://www.unicode.org/copyright.html>> for definitions of Unicode Inc. s Data Files and Software.

NOTICE TO USER: Carefully read the following legal agreement. BY DOWNLOADING, INSTALLING, COPYING OR OTHERWISE USING UNICODE INC.'S DATA FILES ("DATA FILES"), AND/OR SOFTWARE ("SOFTWARE"), YOU UNEQUIVOCALLY ACCEPT, AND AGREE TO BE BOUND BY, ALL OF THE TERMS AND CONDITIONS OF THIS AGREEMENT. IF YOU DO NOT AGREE, DO NOT DOWNLOAD, INSTALL, COPY, DISTRIBUTE OR USE THE DATA FILES OR SOFTWARE.

COPYRIGHT AND PERMISSION NOTICE

Copyright 1991-2022 Unicode, Inc. All rights reserved. Distributed under the Terms of Use in <https://www.unicode.org/copyright.html>.

Permission is hereby granted, free of charge, to any person obtaining a copy of the Unicode data files and any associated documentation (the "Data Files") or Unicode software and any associated documentation (the "Software") to deal in the Data Files or Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Data Files or Software, and to permit persons to whom the Data Files or Software are furnished to do so, provided that either

(a) this copyright and permission notice appear with all copies of the Data Files or Software, or  
(b) this copyright and permission notice appear in associated Documentation.

THE DATA FILES AND SOFTWARE ARE PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE DATA FILES OR SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in these Data Files or Software without prior written authorization of the copyright holder.

-----  
Third-Party Software Licenses

This section contains third-party software notices and/or additional terms for licensed third-party software components included within ICU libraries.

-----  
ICU License - ICU 1.8.1 to ICU 57.1

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1995-2016 International Business Machines Corporation and others All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, provided that the above copyright notice(s) and this permission notice appear in all copies of the Software and that both the above copyright notice(s) and this permission notice appear in supporting documentation.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

All trademarks and registered trademarks mentioned herein are the property of their respective owners.

-----  
Chinese/Japanese Word Break Dictionary Data (cjdikt.txt)

# The Google Chrome software developed by Google is licensed under  
# the BSD license. Other software included in this distribution is  
# provided under other licenses, as set forth below.  
#

```
# The BSD License
# http://opensource.org/licenses/bsd-license.php
# Copyright (C) 2006-2008, Google Inc.
#
# All rights reserved.
#
# Redistribution and use in source and binary forms, with or without
# modification, are permitted provided that the following conditions are met:
#
# Redistributions of source code must retain the above copyright notice,
# this list of conditions and the following disclaimer.
# Redistributions in binary form must reproduce the above
# copyright notice, this list of conditions and the following
# disclaimer in the documentation and/or other materials provided with
# the distribution.
# Neither the name of Google Inc. nor the names of its
# contributors may be used to endorse or promote products derived from
# this software without specific prior written permission.
#
# THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND
# CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES,
# INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF
# MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
# DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE
# LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
# CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF
# SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR
# BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF
# LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING
# NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS
# SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
#
# The word list in cjdct.txt are generated by combining three word lists
# listed below with further processing for compound word breaking. The
# frequency is generated with an iterative training against Google web
# corpora.
#
# * Libtabe (Chinese)
# - https://sourceforge.net/project?group_id=1519
# - Its license terms and conditions are shown below.
#
# * IPADIC (Japanese)
# - http://chasen.aist-nara.ac.jp/chasen/distribution.html
# - Its license terms and conditions are shown below.
#
# -----COPYING.libtabe ---- BEGIN-----
#
# /*
# * Copyright (c) 1999 TaBE Project.
# * Copyright (c) 1999 Pai-Hsiang Hsiang.
# * All rights reserved.
# *
# * Redistribution and use in source and binary forms, with or without
# * modification, are permitted provided that the following conditions
# * are met:
# *
# * . Redistributions of source code must retain the above copyright
# * notice, this list of conditions and the following disclaimer.
# * . Redistributions in binary form must reproduce the above copyright
# * notice, this list of conditions and the following disclaimer in
# * the documentation and/or other materials provided with the
# * distribution.
# * . Neither the name of the TaBE Project nor the names of its
# * contributors may be used to endorse or promote products derived
# * from this software without specific prior written permission.
# *
# * THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND
# CONTRIBUTORS
# * "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
# * LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS
# * FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE
# * REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT,
# * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
# * (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
# * SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
# * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
# * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
# * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
# * OF THE POSSIBILITY OF SUCH DAMAGE.
# */
#
# Copyright 1996 Chih-Hao Tsai @ Beckman Institute,
# University of Illinois
# c-tsai4@uiuc.edu http://casper.beckman.uiuc.edu/~c-tsai4
#
# -----COPYING.libtabe-----END-----
#
# -----COPYING.ipadic-----BEGIN-----
#
# Copyright 2000, 2001, 2002, 2003 Nara Institute of Science
# and Technology. All Rights Reserved.
#
# Use, reproduction, and distribution of this software is permitted.
# Any copy of this software, whether in its original form or modified,
# must include both the above copyright notice and the following
# paragraphs.
#
# Nara Institute of Science and Technology (NAIST),
# the copyright holders, disclaims all warranties with regard to this
# software, including all implied warranties of merchantability and
# fitness, in no event shall NAIST be liable for
# any special, indirect or consequential damages or any damages
# whatsoever resulting from loss of use, data or profits, whether in an
# action of contract, negligence or other tortious action, arising out
# of or in connection with the use or performance of this software.
#
# A large portion of the dictionary entries
# originate from ICOT Free Software. The following conditions for ICOT
# Free Software applies to the current dictionary as well.
#
# Each User may also freely distribute the Program, whether in its
# original form or modified, to any third party or parties, PROVIDED
# that the provisions of Section 3 ("NO WARRANTY") will ALWAYS appear
# on, or be attached to, the Program, which is distributed substantially
# in the same form as set out herein and that such intended
# distribution, if actually made, will neither violate or otherwise
# contravene any of the laws and regulations of the countries having
# jurisdiction over the User or the intended distribution itself.
#
# NO WARRANTY
#
# The program was produced on an experimental basis in the course of the
# research and development conducted during the project and is provided
# to users as so produced on an experimental basis. Accordingly, the
# program is provided without any warranty whatsoever, whether express,
# implied, statutory or otherwise. The term "warranty" used herein
# includes, but is not limited to, any warranty of the quality,
# performance, merchantability and fitness for a particular purpose of
# the program and the nonexistence of any infringement or violation of
# any right of any third party.
#
# Each user of the program will agree and understand, and be deemed to
# have agreed and understood, that there is no warranty whatsoever for
# the program and, accordingly, the entire risk arising from or
# otherwise connected with the program is assumed by the user.
#
# Therefore, neither ICOT, the copyright holder, or any other
# organization that participated in or was otherwise related to the
# development of the program and their respective officials, directors,
# officers and other employees shall be held liable for any and all
# damages, including, without limitation, general, special, incidental
# and consequential damages, arising out of or otherwise in connection
# with the use or inability to use the program or any product, material
# or result produced or otherwise obtained by using the program,
# regardless of whether they have been advised of, or otherwise had
# knowledge of, the possibility of such damages at any time during the
# project or thereafter. Each user will be deemed to have agreed to the
# foregoing by his or her commencement of use of the program. The term
# "use" as used herein includes, but is not limited to, the use,
# modification, copying and distribution of the program and the
# production of secondary products from the program.
#
# In the case where the program, whether in its original form or
# modified, was distributed or delivered to or received by a user from
# any person, organization or entity other than ICOT, unless it makes or
# grants independently of ICOT any specific warranty to the user in
# writing, such person, organization or entity, will also be exempted
# from and not be held liable to the user for any such damages as noted
# above as far as the program is concerned.
#
# -----COPYING.ipadic-----END-----
#
#-----
Lao Word Break Dictionary Data (laodict.txt)
# Copyright (C) 2016 and later: Unicode, Inc. and others.
# License & terms of use: http://www.unicode.org/copyright.html
# Copyright (c) 2015 International Business Machines Corporation
# and others. All Rights Reserved.
#
# Project: https://github.com/rober42539/lao-dictionary
# Dictionary: https://github.com/rober42539/lao-dictionary/laodict.txt
# License: https://github.com/rober42539/lao-dictionary/LICENSE.txt
# (copied below)
#
# This file is derived from the above dictionary version of Nov 22, 2020
# -----
# Copyright (C) 2013 Brian Eugene Wilson, Robert Martin Campbell.
# All rights reserved.
#
# Redistribution and use in source and binary forms, with or without
# modification, are permitted provided that the following conditions are met:
#
```



```
# Redistributions of source code must retain the above copyright notice, this
# list of conditions and the following disclaimer.Redistributions in binary
# form must reproduce the above copyright notice, this list of conditions and
# the following disclaimer in the documentation and/or other materials
# provided with the distribution.
```

```
# THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS
# "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
# LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS
# FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE
# COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT,
# INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
# (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
# SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
# HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
# STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
# ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
# OF THE POSSIBILITY OF SUCH DAMAGE.
```

```
# -----
```

#### Burmese Word Break Dictionary Data (burmesedict.txt)

```
# Copyright (c) 2014 International Business Machines Corporation
# and others.All Rights Reserved.
```

```
# This list is part of a project hosted at:
# github.com/kanyawtchey/myanmar-karen-word-lists
```

```
# -----
```

```
# Copyright (c) 2013, LeRoy Benjamin Sharon
# All rights reserved.
```

```
# Redistribution and use in source and binary forms, with or without
# modification, are permitted provided that the following conditions
# are met:Redistributions of source code must retain the above
# copyright notice, this list of conditions and the following
# disclaimer. Redistributions in binary form must reproduce the
# above copyright notice, this list of conditions and the following
# disclaimer in the documentation and/or other materials provided
# with the distribution.
```

```
# Neither the name Myanmar Karen Word Lists, nor the names of its
# contributors may be used to endorse or promote products derived
# from this software without specific prior written permission.
```

```
# THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND
# CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES,
# INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF
# MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
# DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS
# BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL,
# EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED
# TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
# DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON
# ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR
# TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF
# THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
# SUCH DAMAGE.
```

```
# -----
```

#### Time Zone Database

ICU uses the public domain data and code derived from Time Zone Database for its time zone support.The ownership of the TZ database is explained in BCP 175:Procedure for Maintaining the Time Zone Database section 7.

```
# 7. Database Ownership
```

```
# The TZ database itself is not an IETF Contribution or an IETF
```

```
# document. Rather it is a pre-existing and regularly updated work
# that is in the public domain, and is intended to remain in the
# public domain. Therefore,BCPs 78 [RFC5378] and 79 [RFC3979] do
# not apply to the TZ Database or contributions that individuals make
# to it. Should any claims be made and substantiated against the TZ
# Database, the organization that is providing the IANA
# Considerations defined in this RFC, under the memorandum of
# understanding with the IETF, currently ICANN, may act in accordance
# with all competent court orders. No ownership claims will be made
# by ICANN or the IETF Trust on the database or the code. Any person
# making a contribution to the database or code waives all rights to
# future claims in that contribution or in the TZ Database.
```

```
# -----
```

#### Google double-conversion

Copyright 2006-2011, the V8 project authors.All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- \* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- \* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- \* Neither the name of Google Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

```
THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS
"AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR
A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT
OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT
LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
(INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE
OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
```

```
# -----
```

File: aclocal.m4 (only for ICU4C)  
Section: pkg.m4 - Macros to locate and utilise pkg-config.

```
Copyright 2004 Scott James Remnant <scott@netsplit.com>.
Copyright 2012-2015 Dan Nicholson <dbn.lists@gmail.com>
```

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA 02111-1307, USA.

As a special exception to the GNU General Public License, if you distribute this file as part of a program that contains a configuration script generated by Autoconf, you may include it under the same distribution terms that you use for the rest of that program.

(The condition for the exception is fulfilled because ICU4C includes a configuration script generated by Autoconf, namely the `configure` script.)

```
# -----
```

File: config.guess (only for ICU4C)

This file is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, see <<https://www.gnu.org/licenses/>>.

As a special exception to the GNU General Public License, if you distribute this file as part of a program that contains a configuration script generated by Autoconf, you may include it under the same distribution terms that you use for the rest of that program. This Exception is an additional permission under section 7 of the GNU General Public License, version 3 ("GPLv3").

(The condition for the exception is fulfilled because ICU4C includes a configuration script generated by Autoconf, namely the `configure` script.)

```
# -----
```

File: install-sh (only for ICU4C)

Copyright 1991 by the Massachusetts Institute of Technology

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of M.I.T. not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. M.I.T. makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

```
# -----
```

```
-
- Module: dropbear
-
# -----
```

Dropbear contains a number of components from different sources, hence there are a few licenses and authors involved.All licenses are fairly non-restrictive.

The majority of code is written by Matt Johnston, under the license below.

Portions of the client-mode work are (c) 2004 Mihnea Stoenescu, under the same license:

```
Copyright (c) 2002-2020 Matt Johnston
Portions copyright (c) 2004 Mihnea Stoenescu
All rights reserved.
```

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

=====

LibTomCrypt and LibTomMath are written by Tom St Denis and others, see libtomcrypt/LICENSE and libtommath/LICENSE.

=====

sshpty.c is taken from OpenSSH 3.5p1,  
Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland  
All rights reserved

"As far as I am concerned, the code I have written for this software can be used freely for any purpose. Any derived versions of this software must be clearly marked as such, and if the derived work is incompatible with the protocol description in the RFC file, it must be called by a name other than "ssh" or "Secure Shell"."

=====

loginrec.c  
loginrec.h  
atomicio.h  
atomicio.c  
and strlcat() (included in util.c) are from OpenSSH 3.6.1p2, and are licensed under the 2 point BSD license.

loginrec is written primarily by Andre Lucas, atomicio.c by Theo de Raadt.

strlcat() is (c) Todd C. Miller

=====

Import code in keyimport.c is modified from PuTTY's import.c, licensed as follows:

PuTTY is copyright 1997-2003 Simon Tatham.

Portions copyright Robert de Bath, Joris van Rantwijk, Delian Delchev, Andreas Schultz, Jeroen Massar, Wez Furlong, Nicolas Barry, Justin Bradford, and CORE SDI S.A.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND,

EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

=====

curve25519.c:

Modified TweetNaCl version 20140427, a self-contained public-domain C library.  
<https://tweetnacl.cr.yp.to/>

Contributors (alphabetical order)  
Daniel J. Bernstein, University of Illinois at Chicago and Technische Universiteit Eindhoven  
Bernard van Gastel, Radboud Universiteit Nijmegen  
Wesley Janssen, Radboud Universiteit Nijmegen  
Tanja Lange, Technische Universiteit Eindhoven  
Peter Schwabe, Radboud Universiteit Nijmegen  
Sjaak Smetsers, Radboud Universiteit Nijmegen

Acknowledgments

This work was supported by the U.S. National Science Foundation under grant 1018836. "Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

This work was supported by the Netherlands Organisation for Scientific Research (NWO) under grant 639.073.005 and Veni 2013 project 13114.

-----  
-  
- Module: libcurl  
-  
-----

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1996 - 2022, Daniel Stenberg, <daniel@haxx.se>, and many contributors, see the THANKS file.

All rights reserved.

Permission to use, copy, modify, and distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN

NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

-----  
-  
- Module: ssmpp  
-  
-----

Copyright (C) 2005, 2006 Stig Venaas <venaas@uninett.no>

Permission to use, copy, modify, and distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

-----  
-  
- Module: fonts  
-  
-----

Fonts are (c) Bitstream (see below). DejaVu changes are in public domain. Glyphs imported from Arev fonts are (c) Tavmjong Bah (see below)

Bitstream Vera Fonts Copyright

Copyright (c) 2003 by Bitstream, Inc. All Rights Reserved. Bitstream Vera is a trademark of Bitstream, Inc.

Permission is hereby granted, free of charge, to any person obtaining a copy of the fonts accompanying this license ("Fonts") and associated documentation files (the "Font Software"), to reproduce and distribute the Font Software, including without limitation the rights to use, copy, merge, publish, distribute, and/or sell copies of the Font Software, and to permit persons to whom the Font Software is furnished to do so, subject to the following conditions:

The above copyright and trademark notices and this permission notice shall be included in all copies of one or more of the Font Software typefaces.

The Font Software may be modified, altered, or added to, and in particular the designs of glyphs or characters in the Fonts may be modified and additional glyphs or characters may be added to the Fonts, only if the fonts are renamed to names not containing either the words "Bitstream" or the word "Vera".

This License becomes null and void to the extent applicable to Fonts or Font Software that has been modified and is distributed under the "Bitstream Vera" names.

The Font Software may be sold as part of a larger software package but no copy of one or more of the Font Software typefaces may be sold by itself.

THE FONT SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF COPYRIGHT, PATENT, TRADEMARK, OR OTHER RIGHT. IN NO EVENT SHALL BITSTREAM OR THE GNOME FOUNDATION BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, INCLUDING ANY GENERAL, SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF THE USE OR INABILITY TO USE THE FONT SOFTWARE OR FROM OTHER DEALINGS IN THE FONT SOFTWARE.

Except as contained in this notice, the names of GNOME, the GNOME Foundation, and Bitstream Inc., shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Font Software without prior written authorization from the GNOME Foundation or Bitstream Inc., respectively. For further information, contact: fonts at gnome dot org.

Arev Fonts Copyright

Copyright (c) 2006 by Tavmjong Bah. All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining

a copy of the fonts accompanying this license ("Fonts") and associated documentation files (the "Font Software"), to reproduce and distribute the modifications to the Bitstream Vera Font Software, including without limitation the rights to use, copy, merge, publish, distribute, and/or sell copies of the Font Software, and to permit persons to whom the Font Software is furnished to do so, subject to the following conditions:

The above copyright and trademark notices and this permission notice shall be included in all copies of one or more of the Font Software typefaces.

The Font Software may be modified, altered, or added to, and in particular the designs of glyphs or characters in the Fonts may be modified and additional glyphs or characters may be added to the Fonts, only if the fonts are renamed to names not containing either the words "Tavmjong Bah" or the word "Arev".

This License becomes null and void to the extent applicable to Fonts or Font Software that has been modified and is distributed under the "Tavmjong Bah Arev" names.

The Font Software may be sold as part of a larger software package but no copy of one or more of the Font Software typefaces may be sold by itself.

THE FONT SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF COPYRIGHT, PATENT, TRADEMARK, OR OTHER RIGHT. IN NO EVENT SHALL TAVMJONG BAH BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, INCLUDING ANY GENERAL, SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF THE USE OR INABILITY TO USE THE FONT SOFTWARE OR FROM OTHER DEALINGS IN THE FONT SOFTWARE.

Except as contained in this notice, the name of Tavmjong Bah shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Font Software without prior written authorization from Tavmjong Bah. For further information, contact: tavmjong @ free .fr.

=====

Apache License  
Version 2.0, January 2004  
<http://www.apache.org/licenses/>

## TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

### 1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical

transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

- (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
- (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
- (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

(d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor; and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

## END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets “[]” replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same “printed page” as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the “License”); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an “AS IS” BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

```
-----  
-  
- Modules: dtc u-boot-socfpga linux/linux-socfpga busybox termcap  
util-linux libcap systemd iproute2 e2fsprogs dbus-1 freetype qt5 libpbp  
-----
```

#### GNU GENERAL PUBLIC LICENSE Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.,  
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA  
Everyone is permitted to copy and distribute verbatim copies  
of this license document, but changing it is not allowed.

#### Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

#### GNU GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The “Program”, below, refers to any such program or work, and a “work based on the Program” means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term “modification”.) Each licensee is addressed as “you”.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
- You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
- If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program,

and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

- Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
- Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
- Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the

Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

#### NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER

EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

#### END OF TERMS AND CONDITIONS

##### How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>
```

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA.

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) year name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Lesser General Public License instead of this License.

```
-----
-
- Modules: kmod systemd libdaemon avahi glib libgpg-error libgrypt gnutils
libmicrohttpd strace
-----
```

#### GNU LESSER GENERAL PUBLIC LICENSE Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.  
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA  
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

#### Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a



restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the “Lesser” General Public License because it does less to protect the user’s freedom than the ordinary General Public License. It also provides other free software developers less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is less protective of the users’ freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a “work based on the library” and a “work that uses the library”. The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

#### GNU LESSER GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called “this License”). Each licensee is addressed as “you”.

A “library” means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The “Library”, below, refers to any such software library or work which has been distributed under these terms. A “work based on the Library” means either the Library or any derivative work under copyright law; that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term “modification”.)

“Source code” for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library’s complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a “work that uses the Library”. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a “work that uses the Library” with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a “work that uses the library”. The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a “work that uses the Library” uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a “work that uses the Library” with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer’s own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one

of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not

signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status

of all derivatives of our free software and of promoting the sharing and reuse of software generally.

## NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY; TO THE EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

## END OF TERMS AND CONDITIONS

### How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the library's name and a brief idea of what it does.>  
Copyright (C) <year> <name of author>
```

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library 'Frob' (a library for tweaking knobs) written by James Random Hacker.

```
<signature of Ty Coon>, 1 April 1990  
Ty Coon, President of Vice
```

That's all there is to it!

-

- Modules: libunistring gmp nettle

-

GNU LESSER GENERAL PUBLIC LICENSE  
Version 3, 29 June 2007

Copyright (C) 2007 Free Software Foundation, Inc. <<https://fsf.org/>>  
Everyone is permitted to copy and distribute verbatim copies  
of this license document, but changing it is not allowed.

This version of the GNU Lesser General Public License incorporates  
the terms and conditions of version 3 of the GNU General Public  
License, supplemented by the additional permissions listed below.

0. Additional Definitions.

As used herein, "this License" refers to version 3 of the GNU Lesser  
General Public License, and the "GNU GPL" refers to version 3 of the GNU  
General Public License.

"The Library" refers to a covered work governed by this License,  
other than an Application or a Combined Work as defined below.

An "Application" is any work that makes use of an interface provided  
by the Library, but which is not otherwise based on the Library.  
Defining a subclass of a class defined by the Library is deemed a mode  
of using an interface provided by the Library.

A "Combined Work" is a work produced by combining or linking an  
Application with the Library. The particular version of the Library  
with which the Combined Work was made is also called the "Linked  
Version".

The "Minimal Corresponding Source" for a Combined Work means the  
Corresponding Source for the Combined Work, excluding any source code  
for portions of the Combined Work that, considered in isolation, are  
based on the Application, and not on the Linked Version.

The "Corresponding Application Code" for a Combined Work means the  
object code and/or source code for the Application, including any data  
and utility programs needed for reproducing the Combined Work from the  
Application, but excluding the System Libraries of the Combined Work.

1. Exception to Section 3 of the GNU GPL.

You may convey a covered work under sections 3 and 4 of this License  
without being bound by section 3 of the GNU GPL.

2. Conveying Modified Versions.

If you modify a copy of the Library, and, in your modifications, a  
facility refers to a function or data to be supplied by an Application  
that uses the facility (other than as an argument passed when the  
facility is invoked), then you may convey a copy of the modified  
version:

a) under this License, provided that you make a good faith effort to  
ensure that, in the event an Application does not supply the  
function or data, the facility still operates, and performs  
whatever part of its purpose remains meaningful, or

b) under the GNU GPL, with none of the additional permissions of  
this License applicable to that copy.

3. Object Code Incorporating Material from Library Header Files.

The object code form of an Application may incorporate material from  
a header file that is part of the Library. You may convey such object  
code under terms of your choice, provided that, if the incorporated  
material is not limited to numerical parameters, data structure  
layouts and accessors, or small macros, inline functions and templates  
(ten or fewer lines in length), you do both of the following:

a) Give prominent notice with each copy of the object code that the  
Library is used in it and that the Library and its use are  
covered by this License.

b) Accompany the object code with a copy of the GNU GPL and this license  
document.

4. Combined Works.

You may convey a Combined Work under terms of your choice that,  
taken together, effectively do not restrict modification of the  
portions of the Library contained in the Combined Work and reverse  
engineering for debugging such modifications, if you also do each of  
the following:

a) Give prominent notice with each copy of the Combined Work that  
the Library is used in it and that the Library and its use are  
covered by this License.

b) Accompany the Combined Work with a copy of the GNU GPL and this license  
document.

c) For a Combined Work that displays copyright notices during  
execution, include the copyright notice for the Library among  
these notices, as well as a reference directing the user to the  
copies of the GNU GPL and this license document.

d) Do one of the following:

0) Convey the Minimal Corresponding Source under the terms of this  
License, and the Corresponding Application Code in a form  
suitable for, and under terms that permit, the user to  
recombine or relink the Application with a modified version of  
the Linked Version to produce a modified Combined Work, in the  
manner specified by section 6 of the GNU GPL for conveying  
Corresponding Source.

1) Use a suitable shared library mechanism for linking with the  
Library. A suitable mechanism is one that (a) uses at run time  
a copy of the Library already present on the user's computer  
system, and (b) will operate properly with a modified version  
of the Library that is interface-compatible with the Linked  
Version.

e) Provide Installation Information, but only if you would otherwise  
be required to provide such information under section 6 of the  
GNU GPL, and only to the extent that such information is  
necessary to install and execute a modified version of the  
Combined Work produced by recombining or relinking the  
Application with a modified version of the Linked Version. (If  
you use option 4d0, the Installation Information must accompany  
the Minimal Corresponding Source and Corresponding Application  
Code. If you use option 4d1, you must provide the Installation  
Information in the manner specified by section 6 of the GNU GPL  
for conveying Corresponding Source.)

5. Combined Libraries.

You may place library facilities that are a work based on the  
Library side by side in a single library together with other library  
facilities that are not Applications and are not covered by this  
License, and convey such a combined library under terms of your  
choice, if you do both of the following:

a) Accompany the combined library with a copy of the same work based  
on the Library, uncombined with any other library facilities,  
conveyed under the terms of this License.

b) Give prominent notice with the combined library that part of it  
is a work based on the Library, and explaining where to find the  
accompanying uncombined form of the same work.

6. Revised Versions of the GNU Lesser General Public License.

The Free Software Foundation may publish revised and/or new versions  
of the GNU Lesser General Public License from time to time. Such new  
versions will be similar in spirit to the present version, but may  
differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the  
Library as you received it specifies that a certain numbered version  
of the GNU Lesser General Public License "or any later version"  
applies to it, you have the option of following the terms and  
conditions either of that published version or of any later version  
published by the Free Software Foundation. If the Library as you  
received it does not specify a version number of the GNU Lesser  
General Public License, you may choose any version of the GNU Lesser  
General Public License ever published by the Free Software Foundation.

If the Library as you received it specifies that a proxy can decide  
whether future versions of the GNU Lesser General Public License shall  
apply, that proxy's public statement of acceptance of any version is  
permanent authorization for you to choose that version for the  
Library.

-----  
-  
- Modules: dhcp libjvt  
-  
-----

Mozilla Public License Version 2.0

=====

1. Definitions

-----

1.1. "Contributor"  
means each individual or legal entity that creates, contributes to  
the creation of, or owns Covered Software.

1.2. "Contributor Version"  
means the combination of the Contributions of others (if any) used  
by a Contributor and that particular Contributor's Contribution.

1.3. "Contribution"  
means Covered Software of a particular Contributor.

1.4. "Covered Software"  
means Source Code Form to which the initial Contributor has attached  
the notice in Exhibit A, the Executable Form of such Source Code  
Form, and Modifications of such Source Code Form, in each case  
including portions thereof.

1.5. "Incompatible With Secondary Licenses"  
means

(a) that the initial Contributor has attached the notice described  
in Exhibit B to the Covered Software; or

(b) that the Covered Software was made available under the terms of  
version 1.1 or earlier of the License, but not also under the  
terms of a Secondary License.

1.6. "Executable Form"  
means any form of the work other than Source Code Form.

1.7. "Larger Work"  
means a work that combines Covered Software with other material, in  
a separate file or files, that is not Covered Software.

1.8. "License"  
means this document.

1.9. "Licensable"  
means having the right to grant, to the maximum extent possible,  
whether at the time of the initial grant or subsequently, any and



all of the rights conveyed by this License.

1.10. "Modifications" means any of the following:

- (a) any file in Source Code Form that results from an addition to, deletion from, or modification of the contents of Covered Software; or
- (b) any new file in Source Code Form that contains any Covered Software.

1.11. "Patent Claims" of a Contributor means any patent claim(s), including without limitation, method, process, and apparatus claims, in any patent Licensable by such Contributor that would be infringed, but for the grant of the License, by the making, using, selling, offering for sale, having made, import, or transfer of either its Contributions or its Contributor Version.

1.12. "Secondary License" means either the GNU General Public License, Version 2.0, the GNU Lesser General Public License, Version 2.1, the GNU Affero General Public License, Version 3.0, or any later versions of those licenses.

1.13. "Source Code Form" means the form of the work preferred for making modifications.

1.14. "You" (or "Your") means an individual or a legal entity exercising rights under this License. For legal entities, "You" includes any entity that controls, is controlled by, or is under common control with You. For purposes of this definition, "control" means (a) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (b) ownership of more than fifty percent (50%) of the outstanding shares or beneficial ownership of such entity.

## 2. License Grants and Conditions

### 2.1. Grants

Each Contributor hereby grants You a world-wide, royalty-free, non-exclusive license:

- (a) under intellectual property rights (other than patent or trademark) Licensable by such Contributor to use, reproduce, make available, modify, display, perform, distribute, and otherwise exploit its Contributions, either on an unmodified basis, with Modifications, or as part of a Larger Work; and
- (b) under Patent Claims of such Contributor to make, use, sell, offer for sale, have made, import, and otherwise transfer either its Contributions or its Contributor Version.

### 2.2. Effective Date

The licenses granted in Section 2.1 with respect to any Contribution become effective for each Contribution on the date the Contributor first distributes such Contribution.

### 2.3. Limitations on Grant Scope

The licenses granted in this Section 2 are the only rights granted under this License. No additional rights or licenses will be implied from the distribution or licensing of Covered Software under this License. Notwithstanding Section 2.1 (b) above, no patent license is granted by a Contributor:

- (a) for any code that a Contributor has removed from Covered Software; or

(b) for infringements caused by: (i) Your and any other third party's modifications of Covered Software, or (ii) the combination of its Contributions with other software (except as part of its Contributor Version); or

(c) under Patent Claims infringed by Covered Software in the absence of its Contributions.

This License does not grant any rights in the trademarks, service marks, or logos of any Contributor (except as may be necessary to comply with the notice requirements in Section 3.4).

### 2.4. Subsequent Licenses

No Contributor makes additional grants as a result of Your choice to distribute the Covered Software under a subsequent version of this License (see Section 10.2) or under the terms of a Secondary License (if permitted under the terms of Section 3.3).

### 2.5. Representation

Each Contributor represents that the Contributor believes its Contributions are its original creation(s) or it has sufficient rights to grant the rights to its Contributions conveyed by this License.

### 2.6. Fair Use

This License is not intended to limit any rights You have under applicable copyright doctrines of fair use, fair dealing, or other equivalents.

### 2.7. Conditions

Sections 3.1, 3.2, 3.3, and 3.4 are conditions of the licenses granted in Section 2.1.

## 3. Responsibilities

### 3.1. Distribution of Source Form

All distribution of Covered Software in Source Code Form, including any Modifications that You create or to which You contribute, must be under the terms of this License. You must inform recipients that the Source Code Form of the Covered Software is governed by the terms of this License, and how they can obtain a copy of this License. You may not attempt to alter or restrict the recipients' rights in the Source Code Form.

### 3.2. Distribution of Executable Form

If You distribute Covered Software in Executable Form then:

- (a) such Covered Software must also be made available in Source Code Form, as described in Section 3.1, and You must inform recipients of the Executable Form how they can obtain a copy of such Source Code Form by reasonable means in a timely manner, at a charge no more than the cost of distribution to the recipient; and
- (b) You may distribute such Executable Form under the terms of this License, or sublicense it under different terms, provided that the license for the Executable Form does not attempt to limit or alter the recipients' rights in the Source Code Form under this License.

### 3.3. Distribution of a Larger Work

You may create and distribute a Larger Work under terms of Your choice, provided that You also comply with the requirements of this License for the Covered Software. If the Larger Work is a combination of Covered Software with a work governed by one or more Secondary Licenses, and the Covered Software is not Incompatible With Secondary Licenses, this License permits You to additionally distribute such Covered Software under the terms of such Secondary License(s), so that the recipient of the Larger Work may, at their option, further distribute the Covered

Software under the terms of either this License or such Secondary License(s).

### 3.4. Notices

You may not remove or alter the substance of any license notices (including copyright notices, patent notices, disclaimers of warranty, or limitations of liability) contained within the Source Code Form of the Covered Software, except that You may alter any license notices to the extent required to remedy known factual inaccuracies.

### 3.5. Application of Additional Terms

You may choose to offer, and to charge a fee for, warranty, support, indemnity or liability obligations to one or more recipients of Covered Software. However, You may do so only on Your own behalf, and not on behalf of any Contributor. You must make it absolutely clear that any such warranty, support, indemnity, or liability obligation is offered by You alone, and You hereby agree to indemnify every Contributor for any liability incurred by such Contributor as a result of warranty, support, indemnity or liability terms You offer. You may include additional disclaimers of warranty and limitations of liability specific to any jurisdiction.

## 4. Inability to Comply Due to Statute or Regulation

If it is impossible for You to comply with any of the terms of this License with respect to some or all of the Covered Software due to statute, judicial order, or regulation then You must: (a) comply with the terms of this License to the maximum extent possible; and (b) describe the limitations and the code they affect. Such description must be placed in a text file included with all distributions of the Covered Software under this License. Except to the extent prohibited by statute or regulation, such description must be sufficiently detailed for a recipient of ordinary skill to be able to understand it.

## 5. Termination

5.1. The rights granted under this License will terminate automatically if You fail to comply with any of its terms. However, if You become compliant, then the rights granted under this License from a particular Contributor are reinstated (a) provisionally, unless and until such Contributor explicitly and finally terminates Your grants, and (b) on an ongoing basis, if such Contributor fails to notify You of the non-compliance by some reasonable means prior to 60 days after You have come back into compliance. Moreover, Your grants from a particular Contributor are reinstated on an ongoing basis if such Contributor notifies You of the non-compliance by some reasonable means, this is the first time You have received notice of non-compliance with this License from such Contributor, and You become compliant prior to 30 days after Your receipt of the notice.

5.2. If You initiate litigation against any entity by asserting a patent infringement claim (excluding declaratory judgment actions, counter-claims, and cross-claims) alleging that a Contributor Version directly or indirectly infringes any patent, then the rights granted to You by any and all Contributors for the Covered Software under Section 2.1 of this License shall terminate.

5.3. In the event of termination under Sections 5.1 or 5.2 above, all end user license agreements (excluding distributors and resellers) which have been validly granted by You or Your distributors under this License prior to termination shall survive termination.

```

*****
*                                     *
* 6. Disclaimer of Warranty           *
* -----                           *
*                                     *
* Covered Software is provided under this License on an "as is" *
* basis, without warranty of any kind, either expressed, implied, or *
* statutory, including, without limitation, warranties that the *

```

\* Covered Software is free of defects, merchantable, fit for a \*  
\* particular purpose or non-infringing. The entire risk as to the \*  
\* quality and performance of the Covered Software is with You. \*  
\* Should any Covered Software prove defective in any respect, You \*  
\* (not any Contributor) assume the cost of any necessary servicing, \*  
\* repair, or correction. This disclaimer of warranty constitutes an \*  
\* essential part of this License. No use of any Covered Software is \*  
\* authorized under this License except under this disclaimer. \*

\*\*\*\*\*

\*\*\*\*\*

\* 7. Limitation of Liability \*  
\* ----- \*  
\* \*  
\* Under no circumstances and under no legal theory, whether tort \*  
\* (including negligence), contract, or otherwise, shall any \*  
\* Contributor, or anyone who distributes Covered Software as \*  
\* permitted above, be liable to You for any direct, indirect, \*  
\* special, incidental, or consequential damages of any character \*  
\* including, without limitation, damages for lost profits, loss of \*  
\* goodwill, work stoppage, computer failure or malfunction, or any \*  
\* and all other commercial damages or losses, even if such party \*  
\* shall have been informed of the possibility of such damages. This \*  
\* limitation of liability shall not apply to liability for death or \*  
\* personal injury resulting from such party's negligence to the \*  
\* extent applicable law prohibits such limitation. Some \*  
\* jurisdictions do not allow the exclusion or limitation of \*  
\* incidental or consequential damages, so this exclusion and \*  
\* limitation may not apply to You. \*

\*\*\*\*\*

## 8. Litigation

-----

Any litigation relating to this License may be brought only in the courts of a jurisdiction where the defendant maintains its principal place of business and such litigation shall be governed by laws of that jurisdiction, without reference to its conflict-of-law provisions. Nothing in this Section shall prevent a party's ability to bring cross-claims or counter-claims.

## 9. Miscellaneous

-----

This License represents the complete agreement concerning the subject matter hereof. If any provision of this License is held to be unenforceable, such provision shall be reformed only to the extent necessary to make it enforceable. Any law or regulation which provides that the language of a contract shall be construed against the drafter shall not be used to construe this License against a Contributor.

## 10. Versions of the License

-----

### 10.1. New Versions

Mozilla Foundation is the license steward. Except as provided in Section 10.3, no one other than the license steward has the right to modify or publish new versions of this License. Each version will be given a distinguishing version number.

### 10.2. Effect of New Versions

You may distribute the Covered Software under the terms of the version of the License under which You originally received the Covered Software, or under the terms of any subsequent version published by the license steward.

### 10.3. Modified Versions

If you create software not governed by this License, and you want to

create a new license for such software, you may create and use a modified version of this License if you rename the license and remove any references to the name of the license steward (except to note that such modified license differs from this License).

### 10.4. Distributing Source Code Form that is Incompatible With Secondary Licenses

If You choose to distribute Source Code Form that is Incompatible With Secondary Licenses under the terms of this version of the License, the notice described in Exhibit B of this License must be attached.

#### Exhibit A - Source Code Form License Notice

-----

This Source Code Form is subject to the terms of the Mozilla Public License, v. 2.0. If a copy of the MPL was not distributed with this file, You can obtain one at <http://mozilla.org/MPL/2.0/>.

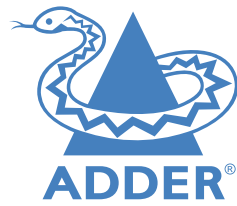
If it is not possible or desirable to put the notice in a particular file, then You may include the notice in a location (such as a LICENSE file in a relevant directory) where a recipient would be likely to look for such a notice.

You may add additional accurate notices of copyright ownership.

#### Exhibit B - "Incompatible With Secondary Licenses" Notice

-----

This Source Code Form is "Incompatible With Secondary Licenses", as defined by the Mozilla Public License, v. 2.0.



[www.adder.com](http://www.adder.com)

Documentation by:



[www.ctxd.com](http://www.ctxd.com)

© 2024 Adder Technology Limited  
All trademarks are acknowledged.  
Part No. MAN-ALIF4000-ADDER • Release 4.6

## A

- Adaptive 54
- addresses
  - default 18
- AIM mode 18
- Audio
  - analog and digital 48
- Audio EDID 48

## C

- Cable
  - null-modem 56
- CATx 13
- Configuration
  - browser-based utility 18
- Connections
  - network link 13
  - overview 9
  - RX audio 15
  - RX USB devices 16
  - RX video display 15
  - TX audio links 10
  - TX AUX port 11
  - TX power in 12
  - TX USB link 11
  - TX video link 10
- Connectors
  - overview 6
- Cut-through 54

## D

- Default address 18

## E

- EDID 48
- Extras 8

## F

- Factory reset 19
- Fast-Leave 53
- FCoE 13
- Forwarding modes 54
- Fragment-free 54
- Front panel 6
- Front panel indicators 24

## H

- HDR10 4
- High Dynamic Range 4

## I

- IGMP 53
  - fast-leave 53
  - querier 53
  - snooping 53
- Indicators 24
- IP addresses
  - default 18

## J

- Jumbo frames (packets) 53

## L

- Layers 2 and 3 54
- Local feed through 3
- LPCM 48

## M

- Matrix
  - unmanaged 22
- Mounting 9

## N

- Network address 18
- Network layout 49
- Network switch
  - choosing 49
- Null-modem cable
  - pin-out 56

## O

- OSI model 54

## P

- P2P mode 18
- Point to Point mode 18
- Presets
  - creating and editing 23

## Q

- Querier 53

## R

- Rear panel 6
- Recovery mode 20
- Reset 19
- RS232 serial 16

## S

- SDR 4
- SDR8/SDR10 4
- SFP port 13
- Snooping 53
- SoL 18
- Spanning Tree Protocol 54
- Specifications 5
- Start of Life 18
- Store and forward 54
- Switch
  - choosing 49
  - configuring 50

## T

- Touchscreen
  - dual configuration 21
  - OSD access 23,25,28
- Troubleshooting 27,51

## U

- USB-to-serial adaptor 16

## V

- Video EDID 48