ADDER®

AdderLink XDIP

User Guide

Experts in Connectivity Solutions | ADDER® | Extender Solutions

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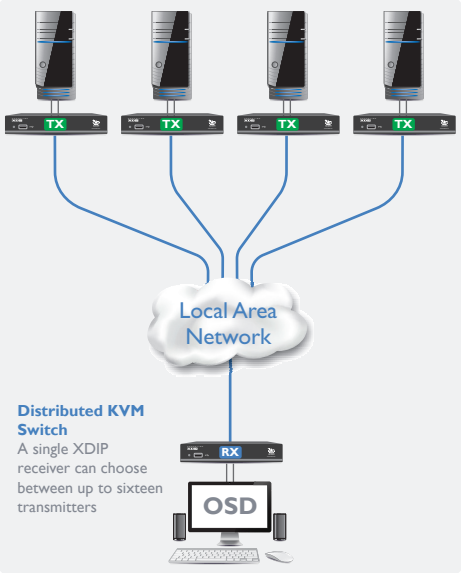
Introduction

WELCOME

Thank you for choosing the AdderLink XDIP extender nodes. At their simplest, AdderLink XDIPs are high resolution, low latency digital KVM extenders which will operate just as easily across a direct 100 meter CATx connection as they will across your standard 1GbE local network. However, there's much more to them than that.

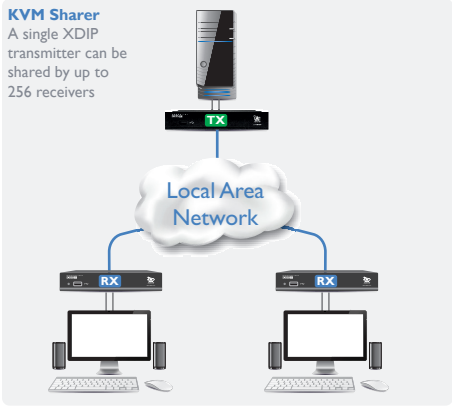
Many hosts, one console

XDIPs can form what might be termed a *Distributed KVM switch*, where you authorize a single XDIP receiver to access up to sixteen separate XDIP transmitters and their connected PC host systems:



Multiple consoles, one host

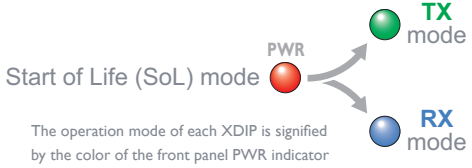
Alternatively, a different grouping of XDIPs can form a '*KVM Sharer*' to allow up to 256 receivers to access and control the resources of a single PC host system:



Remote controlled matrix configuration - *see next page*

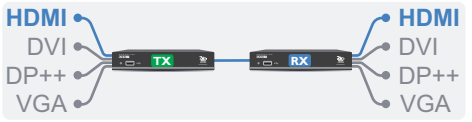
Transmitter or receiver? Your call

Every XDIP node arrives in *Start of Life* (SoL) mode: it's up to you to choose whether it becomes a transmitter or a receiver. This ensures that your small stock of nodes can efficiently meet your current requirements - and then be easily redistributed, in any order, to satisfy future issues too.



All HD video welcome

HDMI is the native video port on each node, however, using suitable third party converters you can connect DVI, dual-mode DisplayPort® (DP++) or VGA signals at either end of the links:

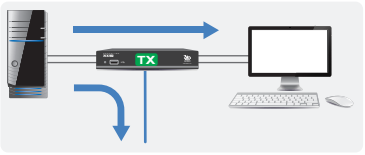


Power to perform: POE or adapter

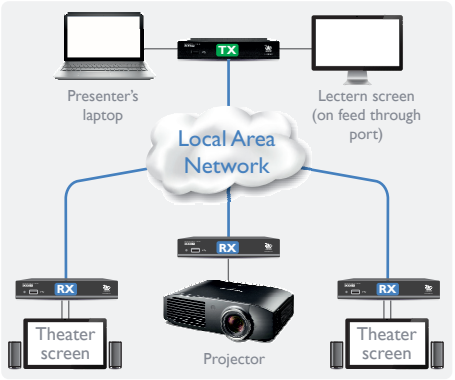
Efficiency is key to XDIP operation, sufficiently so that each node can comfortably function using only the Power over Ethernet (PoE) capabilities of your network. Where that's not an option, we also supply optional power adapters for local mains operation.

Feed through for flexibility

Every XDIP node features a *Feed through* port. This allows you to add a local console that can access both nearby and distant resources. When the local console is placed on an XDIP receiver, it will operate as its own KVM switch. Alternatively, when the local console is attached to an XDIP transmitter, it will also act as a video splitter:



A combined application of the *Feed through* and *KVM sharer* features could be used, for instance, to serve a lecture theater:



continued

Remote controlled matrix

XDIPs can also form an audio-visual matrix where multiple receivers access content from a choice of transmitters - all under external control. Such configurations are useful in distributed signage applications where a control system coordinates multiple displays (up to 256) and determines how each one derives its digital content.

There are two methods for remotely controlling an XDIP matrix:

- Method 1 - Using third party controller system, such as those supplied by Crestron™, AMX™ and many others, to issue commands through our RESTful API (see page 38),

  or

- Method 2 - Using the browser on a connected PC to access the receivers and using the resulting OSD menu (see page 32).

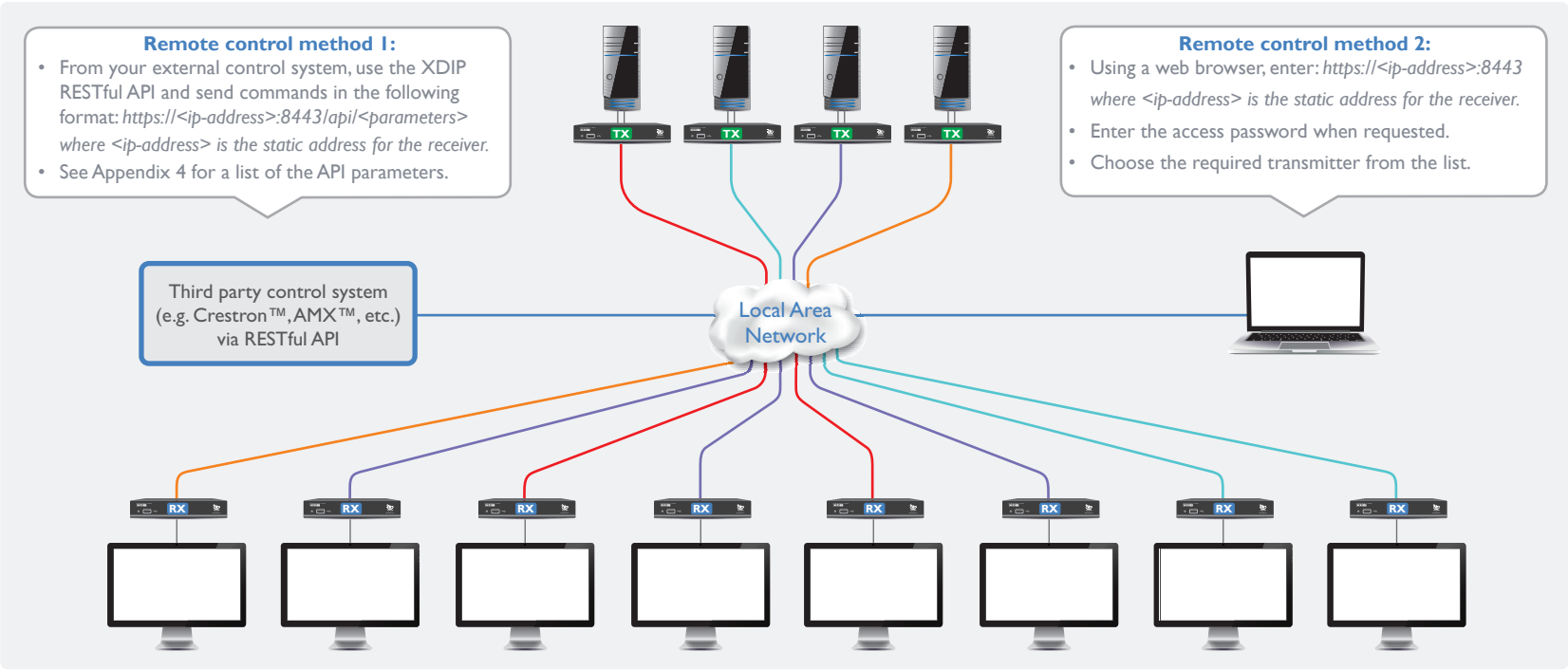
IMPORTANT: When using either method, you must first enable the remote control functionality on each receiver (this option is disabled by default).
See *Receiver > Advanced page* on page 24.

To ensure ease of configuration with third party controllers, the XDIP system is provided with a full REST API.
New features have been added to XDIP units to enable remote control matrix operation:

- Each XDIP module can be assigned a static IP address as well as its main (DHCP-provided) dynamic address, so that external systems have a separate, consistent control pathway.
- Each XDIP module has separate admin and access passwords; the latter providing selective access to content and switching controls.
- Full third-party switching support provided by REST API via the network connection. The YAML file for the API can be found at:

  https://support.adder.com/tiki/tiki-index.php?page=XDIP%3A+Using+the+API

Remote controlled matrix
An external control system or connected PC can determine how each receiver should derive its content, from a choice of up to eight transmitters.

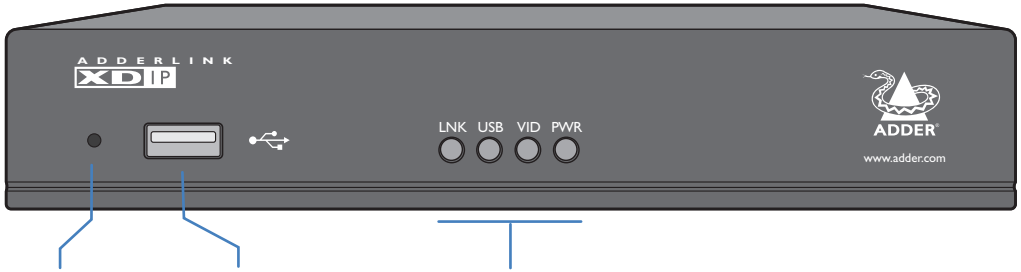


For details of the XDIP Public REST API, see Appendix 4 - XDIP API.

Note: The API control is contained within each receiver. Receivers operate as separate entities and they are all controlled independently.

ADDERLINK XDIP FEATURES

AdderLink XDIP nodes are contained within slimline metal casings measuring just 169 x 112 x 31mm.

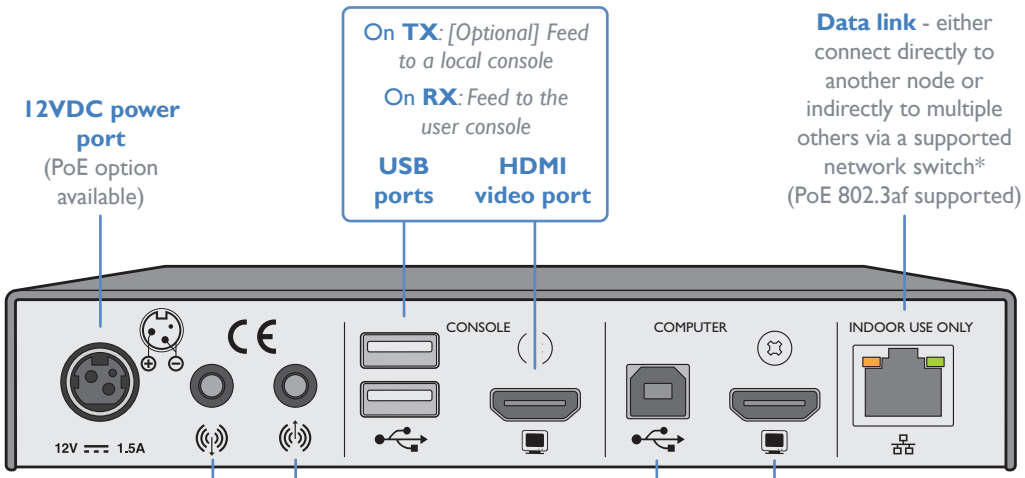


Recessed reset button See "Restoring a node" on page 20.

USB port Available for console use on receiver and transmitter nodes.

Status indicators
These provide visual confirmation of various system functions. See Indicators for further details.

LNK - indicates the presence of a valid data link.
USB and **VID** - indicate active USB and video connections.
PWR - indicates the presence of input power *(the color also indicates overall mode: **TX**: Green, **RX**: Blue, **Start of Life**: Red, **Recovery mode**:Yellow).*



12VDC power port (PoE option available)

On **TX**: *[Optional] Feed to a local console*
On **RX**: *Feed to the user console*
USB ports **HDMI video port**

Data link - either connect directly to another node or indirectly to multiple others via a supported network switch* (PoE 802.3af supported)

Audio line out jack **Audio line in jack**

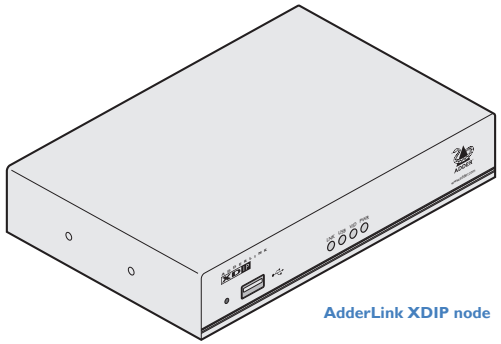
USB port **HDMI video port**
On **TX**: *Link to the main computer*
On **RX**: *[Optional] Link to a local computer*

* The network switch used must:

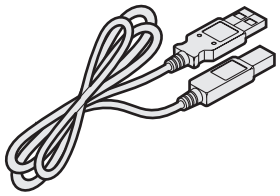
- Support 1Gb transfer rates.
- Support IGMP (Internet Group Management Protocol) to at least level 2 (preferably level 3).
- Have *IGMP Fast Leave* and *IGMP Snooping* enabled.

SUPPLIED ITEMS

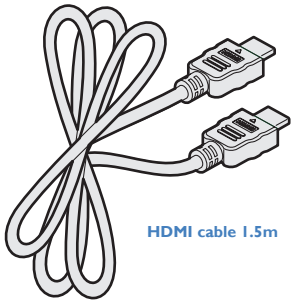
ALL VARIANTS INCLUDE:



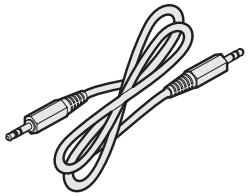
AdderLink XDIP node



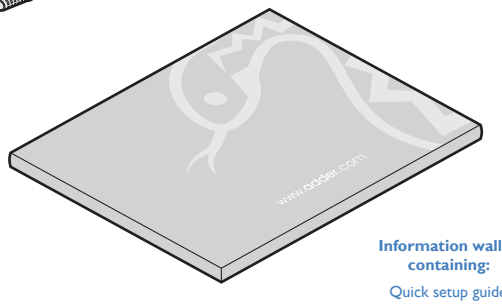
USB cable 2m (type A to B)



HDMI cable 1.5m



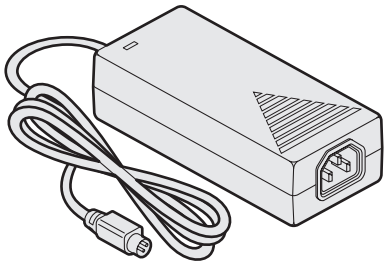
Audio cable 3m (3.5mm stereo jacks)

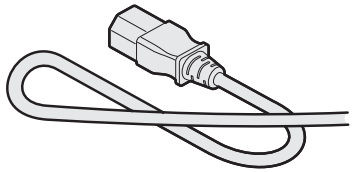


Information wallet containing:

Quick setup guide
Eight self-adhesive rubber feet
Safety document

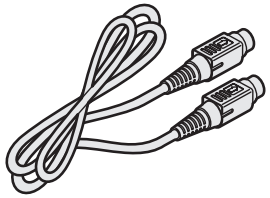
XDIP-IEC VARIANTS ALSO INCLUDE:





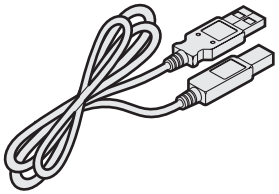
Power adapter with locking connector and country-specific power cord

XDIP-RED VARIANTS ALSO INCLUDE:

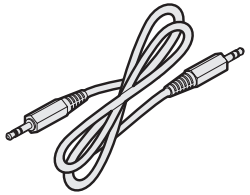


12VDC link cable (2m)
Part number:VSC48

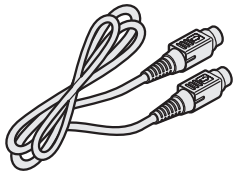
OPTIONAL EXTRAS



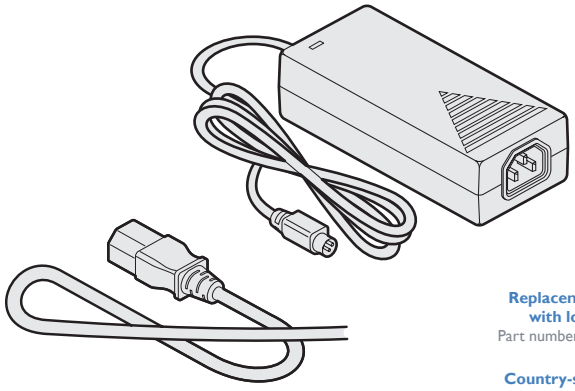
USB cable 2m (type A to B)
Part number:VSC24



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



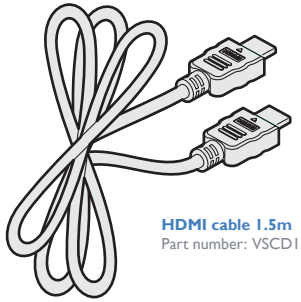
12VDC link cable (2m)
Part number:VSC48



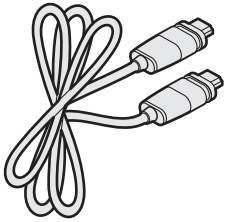
Replacement power adapter with locking connector
Part number: PSU-IEC-12VDC-1.5A

Country-specific power cords

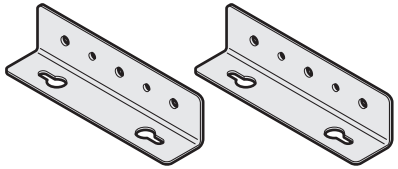
CAB-IEC-AUS	*(Australia)*
CAB-IEC-EURO	*(Central Europe)*
CAB-IEC-UK	*(United Kingdom)*
CAB-IEC-USA	*(United States)*
CAB-IEC-JAPAN	*(Japan)*



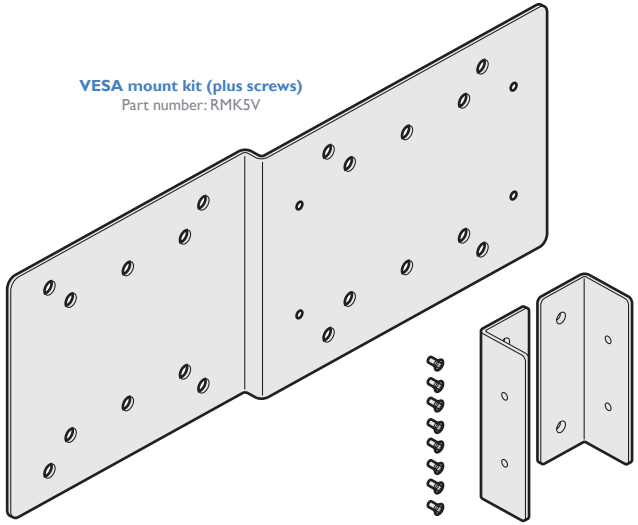
HDMI cable 1.5m
Part number: VSCD15



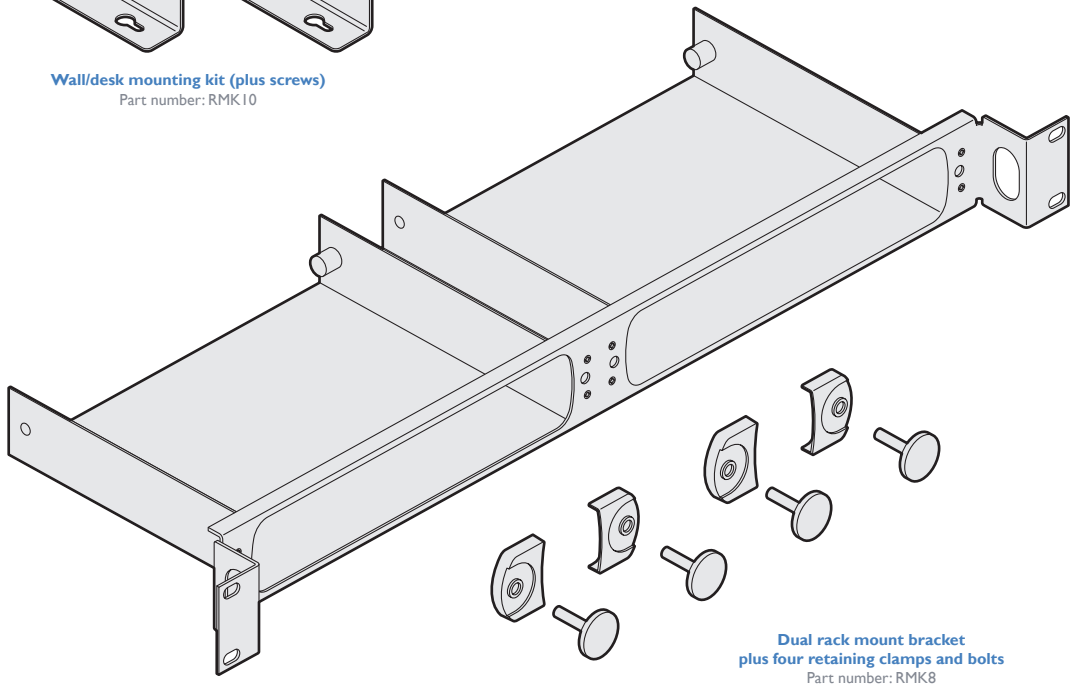
Lockable HDMI cable 1.5m
Part number:VSCD12



Wall/desk mounting kit (plus screws)
Part number: RMK10



VESA mount kit (plus screws)
Part number: RMK5V



Dual rack mount bracket plus four retaining clamps and bolts
Part number: RMK8

Installation

LOCATIONS

Please consider the following important points when planning the position of the AdderLink XDIP nodes:

- Situate the transmitter node close to the system to which it will be connected and near to a source of mains power (if powering will not take place via PoE through the network cable). Place the receiver node in similar close proximity to the peripherals that it will connect with, plus a source of mains power.
- Consult the precautions listed within the Safety information section.
- Connections do not need to be carried out in the order given within this guide, however, where possible connect the *power in* as a final step.

MOUNTING

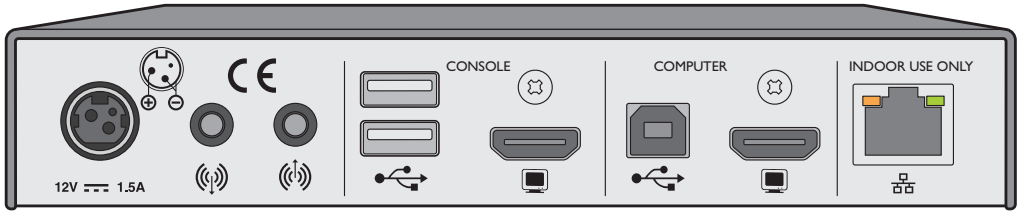
Before you begin making connections to the AdderLink XDIP nodes, it is advisable to first mount the nodes in place, either:

- On a horizontal surface using the supplied self adhesive feet, or
- On a vertical surface using the optional wall/desk mounting kit, or
- Within an optional rack mount bracket.

CONNECTIONS

Connections to each node will be determined by the nature of your installation as well as their intended transmitter or receiver designations.

All connections are grouped into five main areas:



Power connection

Audio connections

Console connections
(USB port also available on the front panel)

Computer connections

Link connection

The pages that follow discuss the various connections.

Computer connections

Computer connections are always made at the transmitter node, but can also optionally be made at the receiver node, where channel switching between local and remote computer sources is required.

Notes:

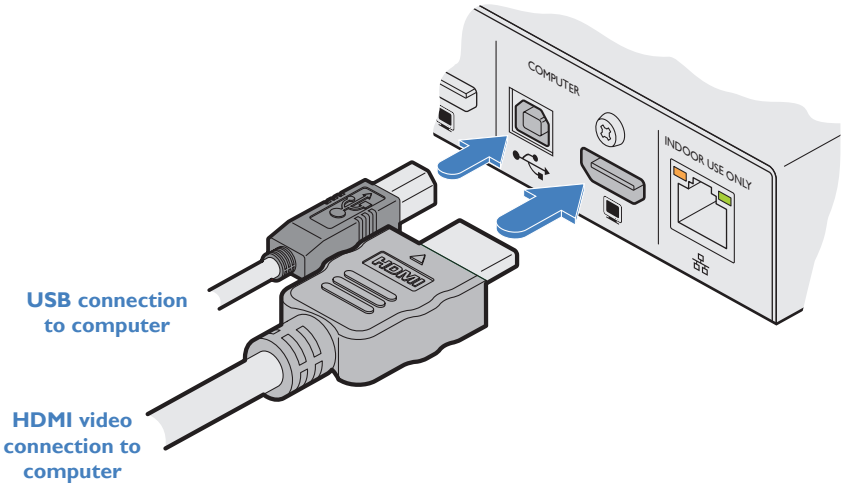
- *When a local computer is connected to a receiver node, it can only be accessed from that receiver, no other receivers can gain access to it.*
- *Video resolutions up to 1920 x 1200 @ 60Hz are supported.*
- *HDMI audio is not supported; please use the audio in/out ports to transfer audio signals.*

To make computer connections

1 Insert the supplied HDMI cable between the HDMI video socket (in the **COMPUTER** section) and the video output port on the computer.

HDMI offers the great advantage that it is a straightforward task to convert its signals to and from other common video formats (DisplayPort, DVI and VGA) - See page 9.

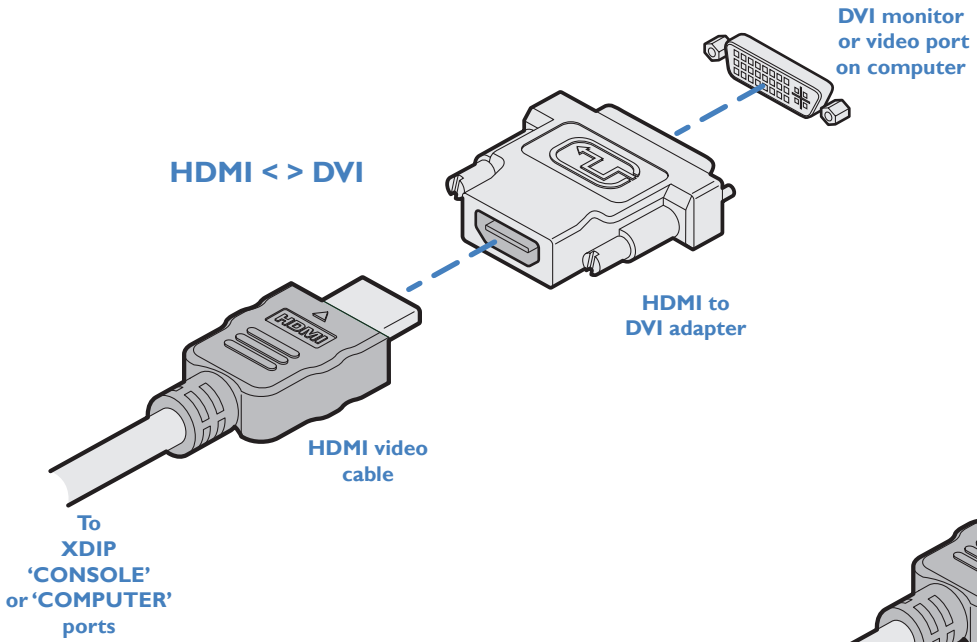
2 Insert the supplied USB type A to type B cable between the USB socket (in the **COMPUTER** section) and a vacant USB port on the computer.

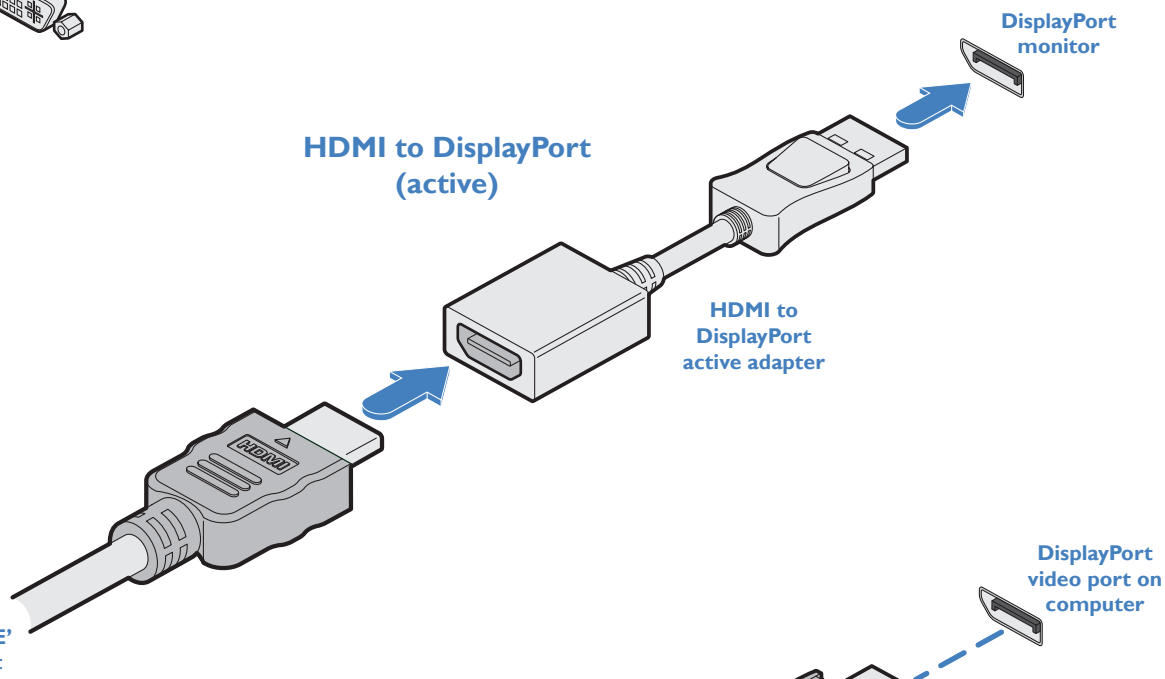


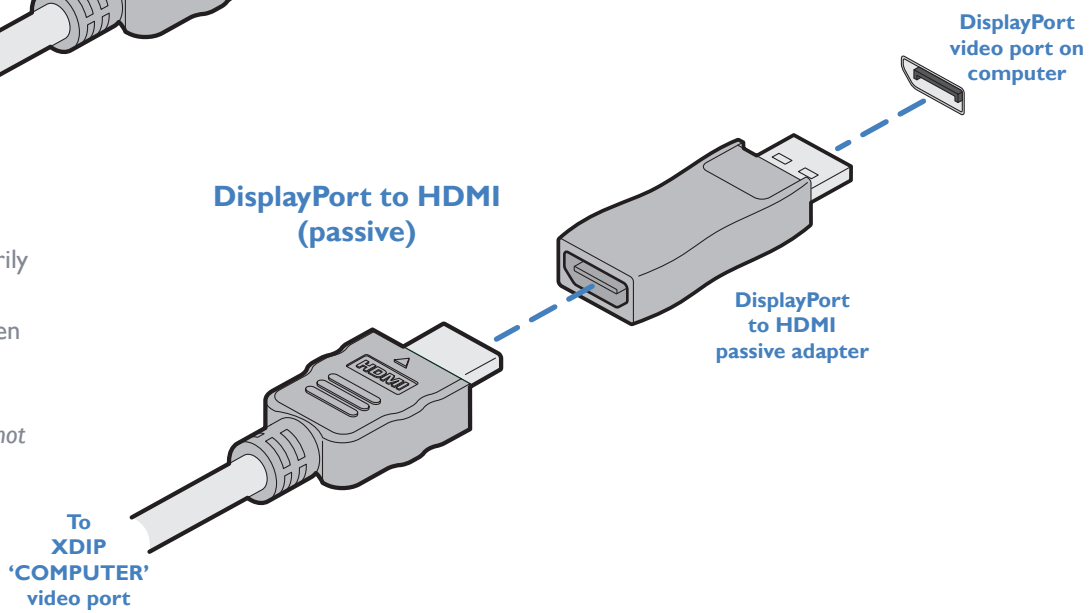
Video format conversion

One of the many advantages offered by the HDMI (High Definition Multimedia Interface) standard is the ease with which it can be converted into- and out of- numerous other video formats, including single link DVI-D, DisplayPort and VGA (see next page).

Note: HDMI conversion cables and adapters (apart from the Adder DVA) are not available from Adder, but are widely sold elsewhere.





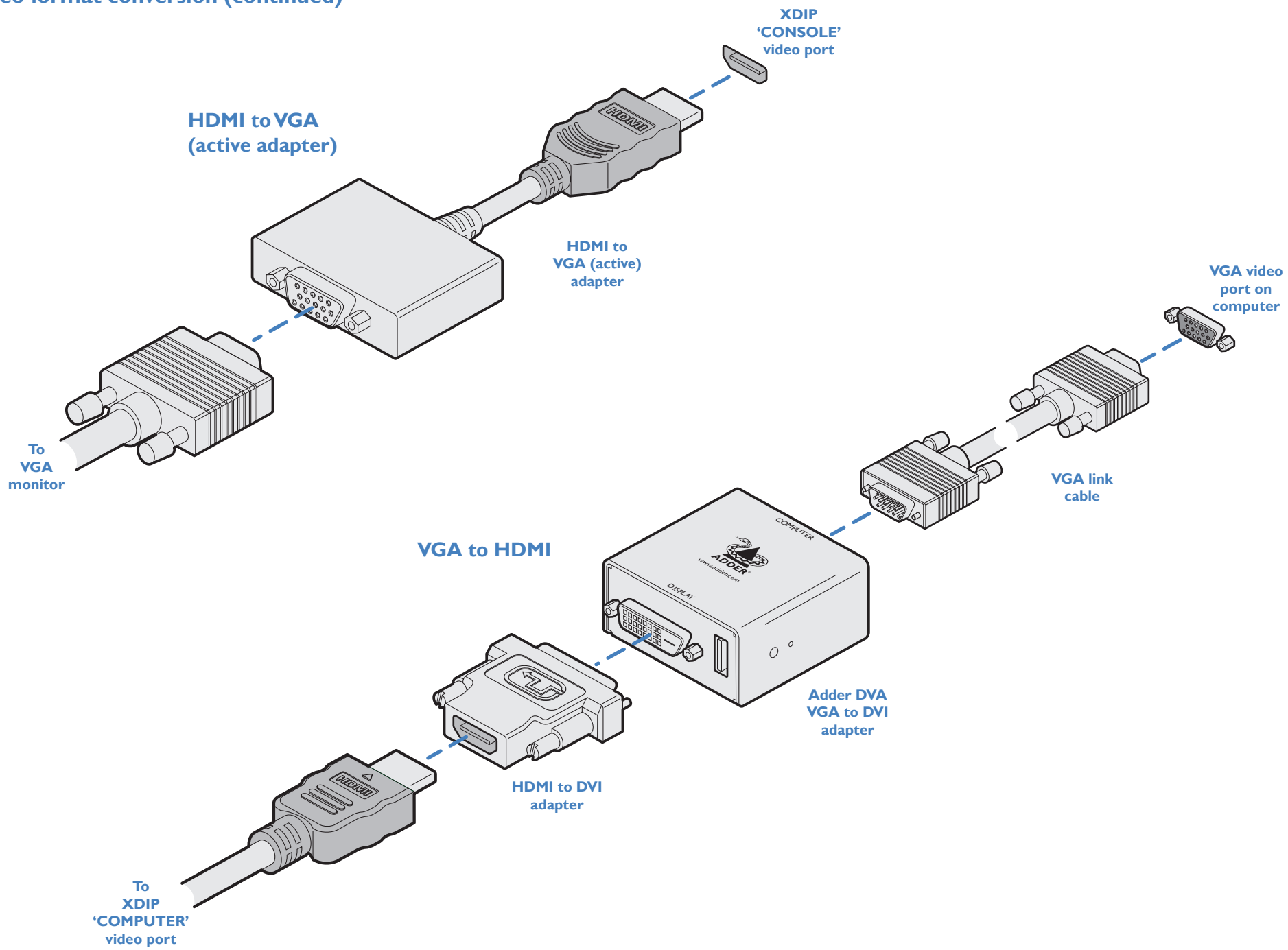


DisplayPort/HDMI adapters - active or passive?

The choice of whether to use an active or passive adapter depends primarily upon the signal source.

If your computer outputs *Dual-mode DisplayPort* (also known as DP++), then you can use a (cheaper) passive adapter to derive a *Single-link HDMI* feed.

Conversely, when converting from HDMI to DisplayPort (to use with a DisplayPort monitor), the adapter will always be active. *Note: Adapters are not bi-directional, specific models are required to go from DisplayPort to HDMI and vice versa.*


XDIP
'CONSOLE'
video port
HDMI to VGA
(active adapter)
HDMI to
VGA (active)
adapter
VGA video
port on
computer
To
VGA
monitor
VGA link
cable
VGA to HDMI
COMPUTER
DISPLAY
Adder DVA
VGA to DVI
adapter
HDMI to DVI
adapter
To
XDIP
'COMPUTER'
video port

Console connections

Console connections (video monitor and/or USB peripherals) are always made at the receiver node, but can also optionally be made at the transmitter node, if local control (or monitoring) of the computer is required in addition to remote control.

Notes:

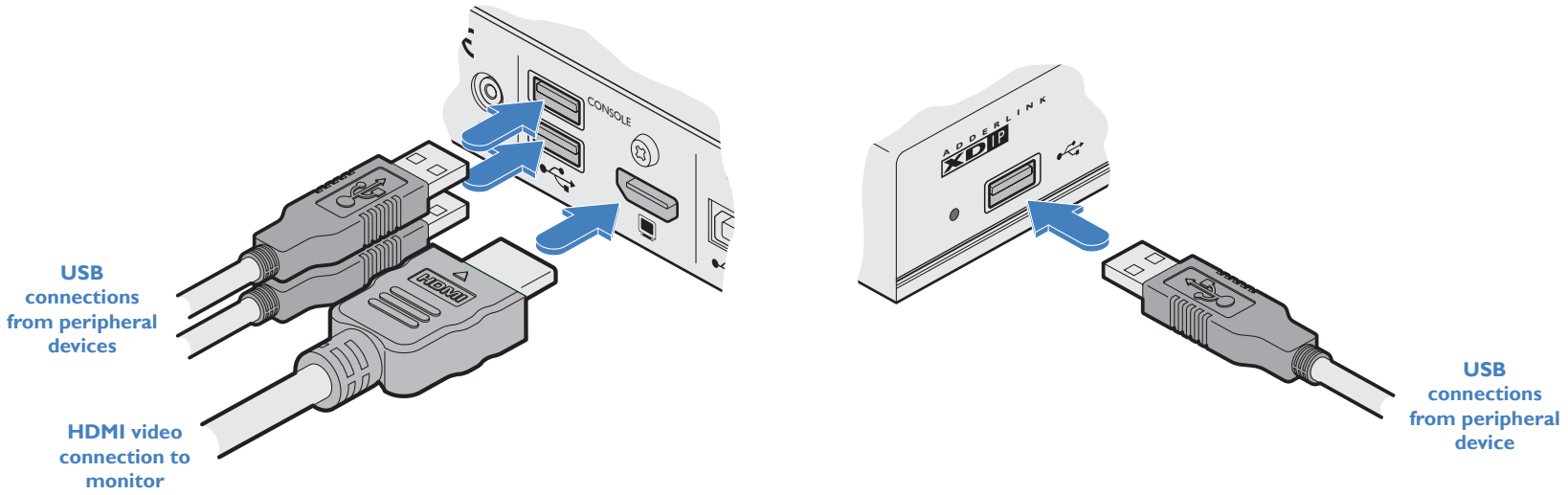
- *Video resolutions up to 1920 x 1200 @ 60Hz are supported.*
- *HDMI audio is not supported; please use the audio in/out ports to transfer audio signals.*

To make console connections

1 Insert the supplied HDMI cable between the HDMI video socket (in the **CONSOLE** section) and the video port on your monitor.

HDMI offers the great advantage that it is a straightforward task to convert its signals to and from other common video formats (DisplayPort, DVI and VGA) - See page 9.

2 Connect the USB leads from your mouse and keyboard to the two sockets on the rear panel. The single socket on the front panel is also available (all three USB ports operate in the same manner).



Audio connections

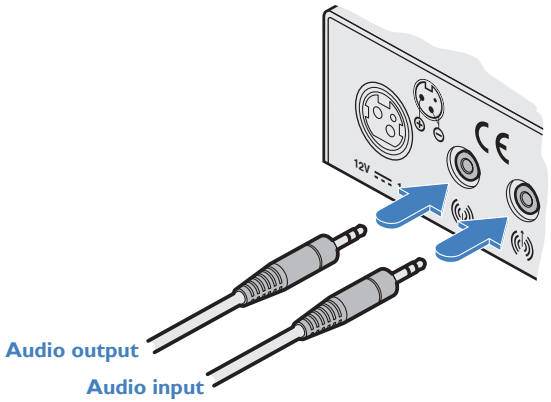
The transmitter and receiver nodes can transfer CD-quality stereo audio (16-bit sampling at 48kHz) in both directions. Headphones are supported up to 32 Ohms impedance.

Note: HDMI audio is not supported. Audio transfer is handled exclusively by the audio in/out ports.

To make audio connections

1 Connect your audio input (e.g. line out from the local computer, etc.) to the audio input (right hand) 3.5mm socket labeled on the rear panel.

2 Connect your audio output (e.g. speakers or headphones, etc.) to the audio output (left hand) 3.5mm socket labeled on the rear panel.



Link connection

As required, links between nodes can be made in two main ways, either:

- Directly between two nodes, using a single cable up to 100 meters in length, Minimum cable specification: CAT5e, S/FTP preferred,

  or

- Via a network switch to allow interaction between receiver/transmitter combinations.

  Minimum network switch specifications:

  - 1Gb transfer rates.
  - IGMP (Internet Group Management Protocol) to at least level 2 (preferably level 3) in order to allow efficient multicasting while keeping network bandwidth low.
  - IGMP Fast Leave and IGMP Snooping must be enabled.

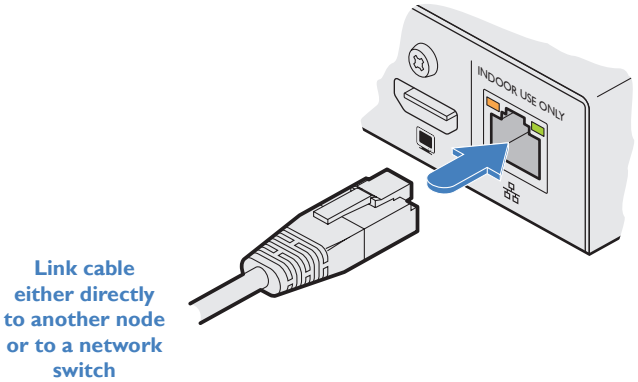
  Optional network switch specification:

  - PoE 802.3af - The nodes also support the Power over Ethernet standard to allow operation without separate power adapters when used with a supporting network switch.

To make a link connection

1 Insert a standard network cable into the socket on the far right of the rear panel.

2 Connect the other end of the cable either directly to another node, or to a suitable network switch.

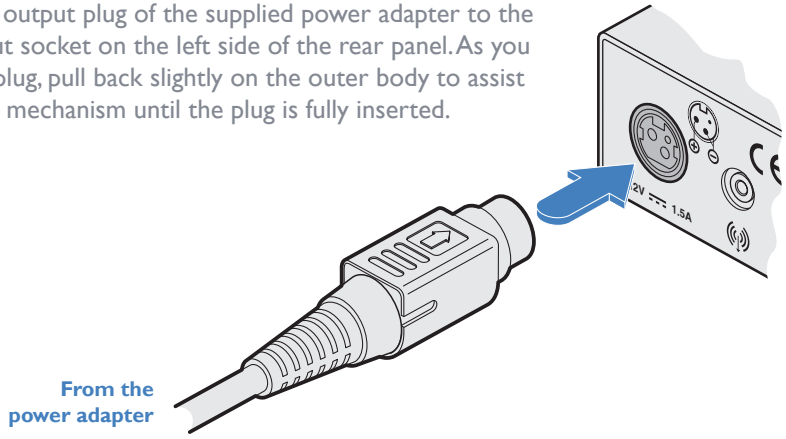


Power connection

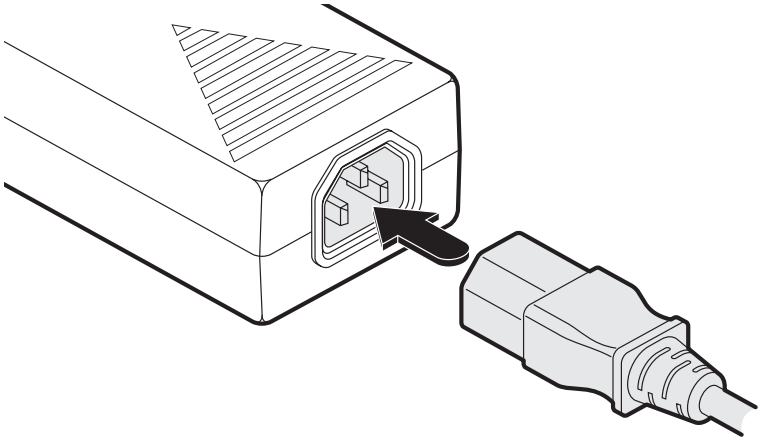
Each node can be powered using its supplied power adapter or alternatively via the Ethernet link connection, when used with network switches which support the PoE 802.3af standard. The power adapters supplied with the nodes use locking-type plugs to help prevent accidental disconnections; please follow 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.



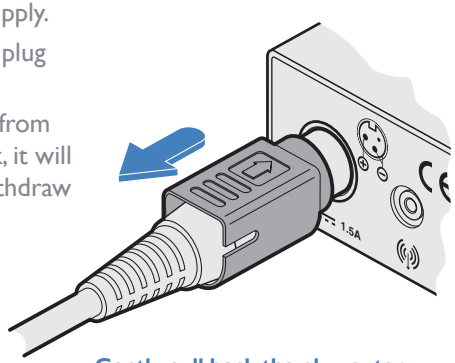
3 Connect the power cord to a nearby mains supply socket.

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 section of this guide. In particular, do not use an unearthed power socket or extension cable.

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

Configuration

INITIAL CONFIGURATION

To streamline the initial installation procedure, AdderLink XDIP nodes use a configuration wizard to guide you through the necessary stages. For the simplest installations, this may be all that is necessary to completely tailor the nodes to your requirements. However, for more complicated installations you may also need to access the main Admin menu (see page 21) once the initial configuration is complete.

AdderLink XDIP configuration is primarily driven via the receiver(s). During the initial configuration and subsequent post-installation alterations, a transmitter can be configured via a receiver, but not vice versa. Also, one receiver cannot configure another receiver. Where two or more receiver nodes will be required, run the wizard from the first receiver node and, once complete (including all transmitter nodes), move to the console of the next required receiver node and run the configuration wizard again from there. Transmitters configured in the first run can be associated with multiple receivers, as required.

Navigating the configuration wizard, OSD and Admin menu

The AdderLink XDIP user interface has been carefully designed to be easily navigated by either mouse, keyboard or a combination of both.

When using the mouse, you merely need to point and click on screen items. As the mouse hovers over a screen item, if it is clickable it will become highlighted.

When using the keyboard to navigate, use the following keys:

- ***Tab key*** - To move forward between sections.
- ***Shift + Tab keys*** - To move backward between sections.
- ***Arrow keys*** - To change between the options within a section.
- ***Enter key*** - To select the highlighted option.
- ***Esc key*** - To exit the current page.

On a receiver node, to display the OSD:

- Press CTRL + ALT + C *

Once the OSD is displayed, to enter the Admin menu:

- Select the ⚙ icon in the top right corner of the page.

To view explanatory text about the page that you are viewing:

- Click the ⓘ icon in the top right corner of the page.

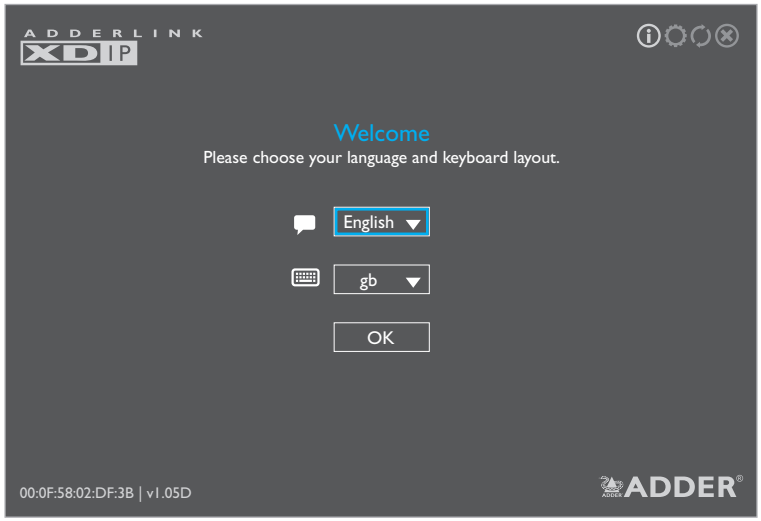
See page 31 for more details about keyboard navigation during operation.

** Note: The standard hotkey combinations can be changed. See page 22.*

To use the configuration wizard

Note: If you are creating a transmitter to add into an existing installation, skip to page 18.

1. Connect your various AdderLink XDIP nodes as discussed in the Installation section.
2. Power on all nodes. Nodes that are currently in their *Start of Life* state will show their front panel PWR indicators in red (configured transmitters show green while receivers show blue). To return a node to its Start of Life state, you need to *Restore* it, see page 20.
3. Using a monitor, keyboard and mouse connected to the *Console* ports of an intended receiver node, you should see the following opening page:



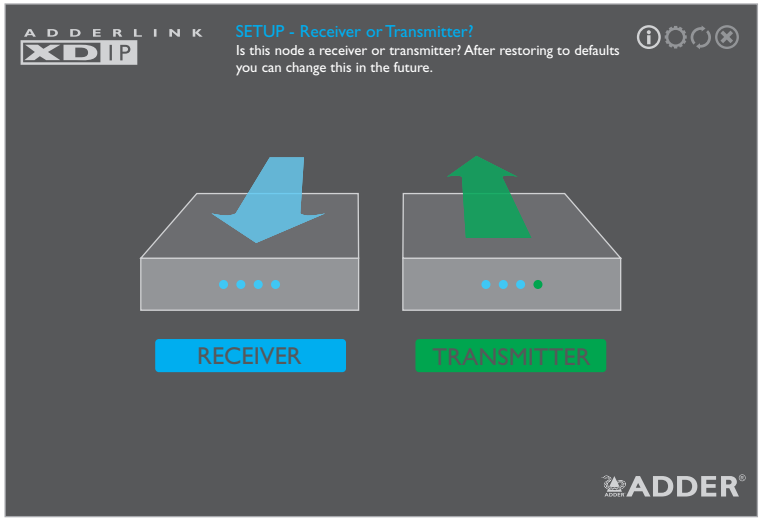
Note: The node's PWR indicator should be red at this stage. If not, restore the node to its default settings (see page 20).

4. If necessary, change the language and keyboard layout.
5. Click OK to continue.

continued

INITIAL CONFIGURATION (continued)

You will now be given a choice of turning this *Start of Life* node into either a receiver or a transmitter:

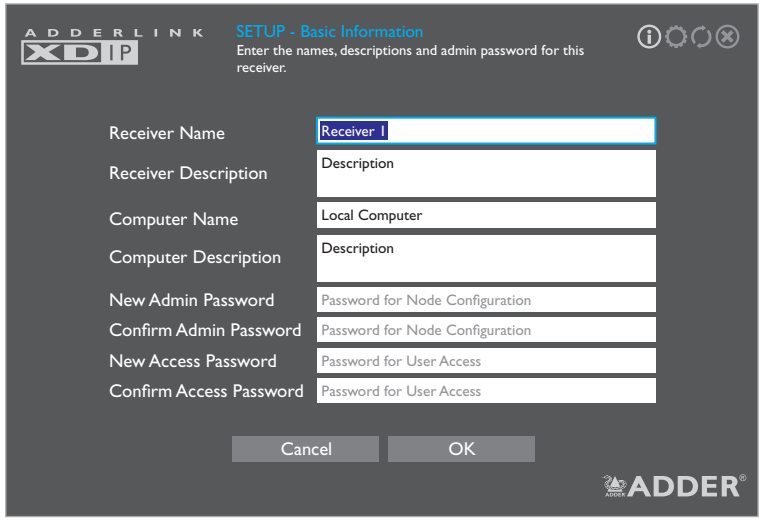


Note: When using the configuration wizard to create a full installation, it is quicker and more efficient to configure all transmitters via a node that will become a receiver, rather than configuring each of the intended transmitters separately.

6 Choose the required setting:

- If you are setting up a mixture of receiver(s) and transmitter(s), click the RECEIVER option.
- If you are creating a transmitter to add into an existing installation, click the TRANSMITTER option. See page 18.

If you chose the RECEIVER option, you will now be given the opportunity to enter details for the node to which your console peripherals are currently connected:



7 Enter the details for this receiver, including the admin password (required to administer the configuration details) and an access password (required for user access). The *Computer Name/Description* fields refer to a local computer connected directly to this receiver, if present.

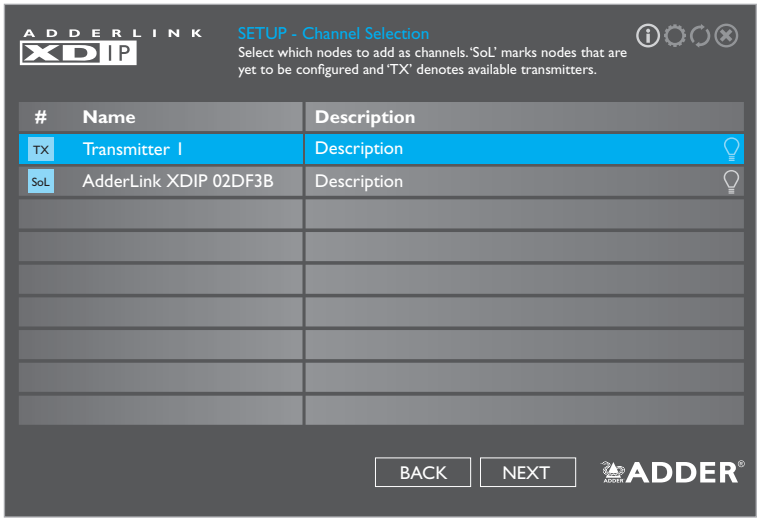
Note: Passwords can be left blank, but this is not recommended.

8 Click OK.

continued

INITIAL CONFIGURATION (continued)

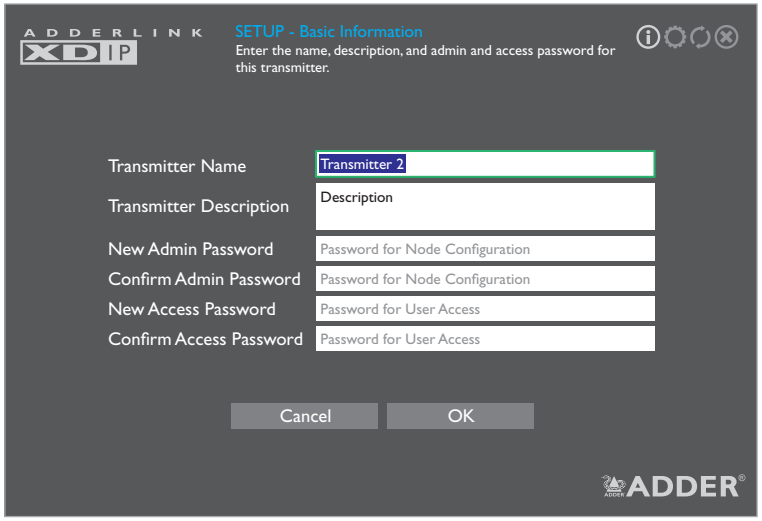
You will now see a list of all discovered nodes. If an entry shows ***SoL*** *(Start of Life)* then it is unconfigured (that node's PWR indicator will also show red). Otherwise, any discovered transmitter node, that is already configured, will show ***TX***:



Notes

- *If you are adding several nodes at once and need to identify a particular node, click the icon to flash the front panel indicators of the chosen node in the list.*
- *If nodes have been added since displaying the list, click the icon to refresh the list.*

9 Click an entry marked ***SoL*** to configure it as a transmitter:

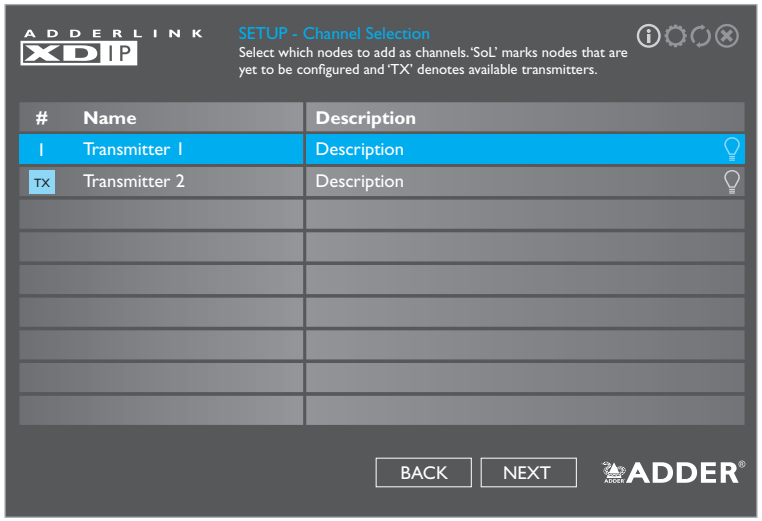


10 Enter the details for this transmitter, including two separate passwords:

- The *Admin Password* is required to administer the configuration details only,
- The *Access Password* allows you to restrict who is allowed to connect to this transmitter. When the Access Password is set, a user will be prompted to enter it when first attempting to add this transmitter node to their receiver node's channels list; if the Access Password is left blank, there will be no access restrictions.

Note: The Name and Description fields for each entry cannot be left blank.

11 Click OK. The discovered nodes will be again listed, showing any changes you have made to the name(s) and description(s):



12 Repeat steps 9 to 11 for each listed ***SoL*** node.

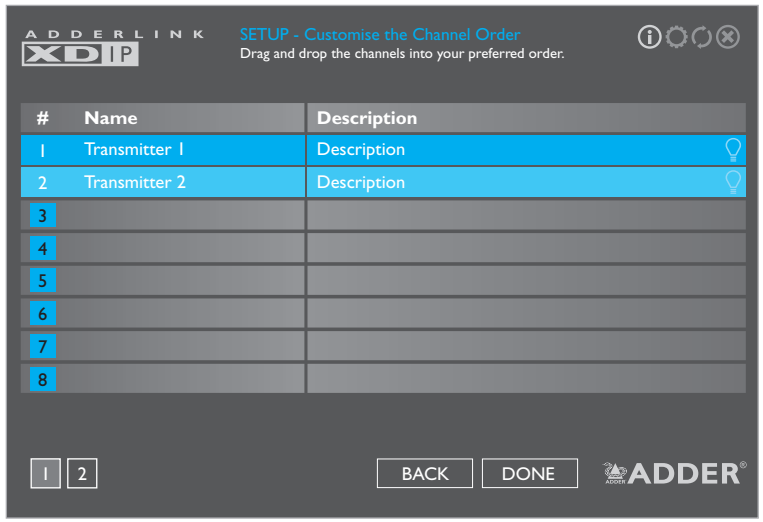
13 Ensure that all the transmitters (8 maximum), to which you wish to connect from this receiver, show a number in the left hand column. If an entry shows ***TX***, it is yet to be connected. Click on the entry to connect it with this receiver; if an access password is set on the transmitter, you will be asked to enter it. Once successfully connected, the ***TX*** for the entry will change to a number.

14 When all transmitters have been connected, click NEXT.

continued

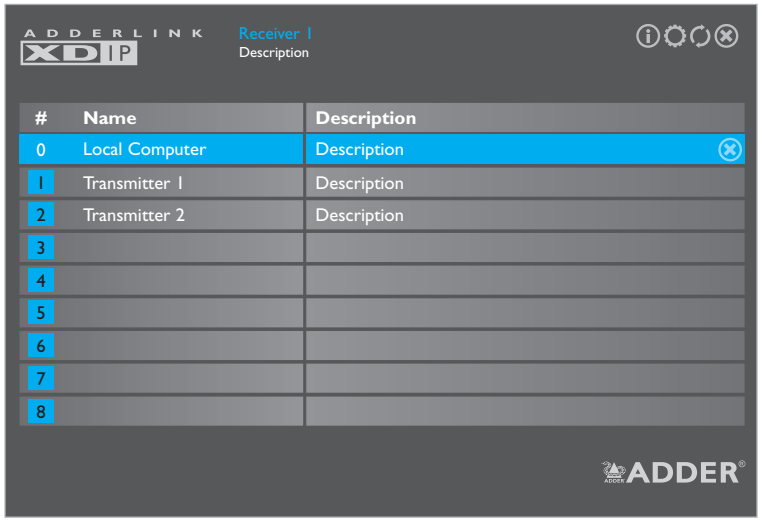
INITIAL CONFIGURATION (continued)

15 You can now optionally change the order of transmitters in the channel list. Click, hold and drag an entry to the required slot:



16 When all transmitters are in the required order, click DONE.

17 The receiver will now show the Channel List:



From here you can choose between a local computer (if connected to your receiver) or any of the associated transmitters. See page 31 for details about operation.

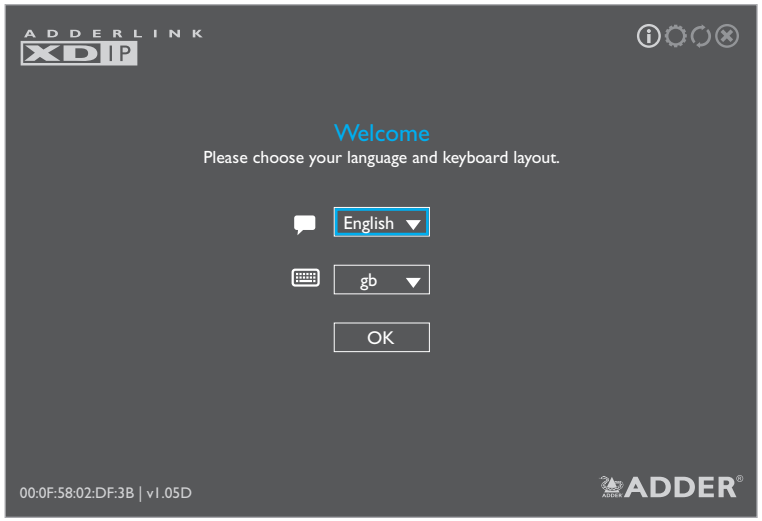
To add a new transmitter

Use this procedure to configure a new *Start of Life* node into a transmitter for inclusion within an existing installation:

1 Connect your console devices (video monitor, USB keyboard and/or mouse) plus power input to the new Start of Life node (as discussed in the Installation section).

For this procedure the new node can be configured either in isolation or fully linked into your XDIP installation, as required.

2 You should see the following opening page:

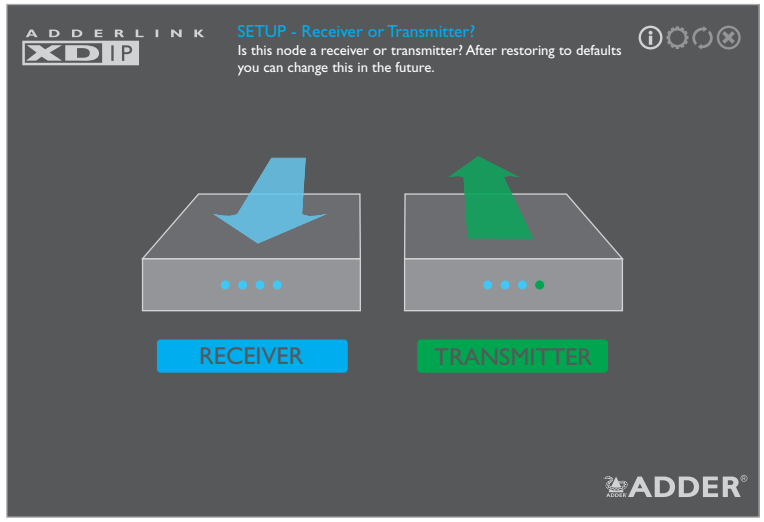


3 If necessary, change the language and keyboard layout.

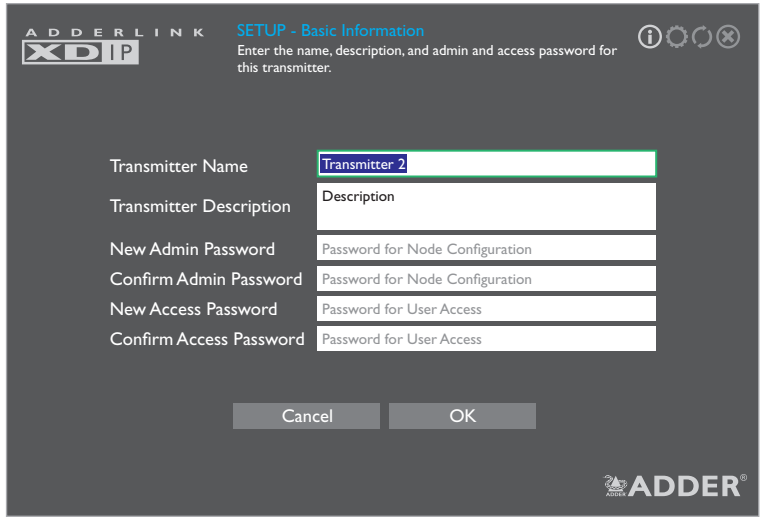
Note: The node's PWR indicator should be red at this stage. If not, restore the node to its default settings (see page 20).

4 Click OK to continue.

You will now be given a choice of turning this *Start of Life* node into either a receiver or a transmitter:



5 Click the TRANSMITTER option. You can now enter the details for the node to which your console peripherals are currently connected:



Alternative shortcut for adding a new transmitter

1 Connect your new node fully into the XDIP installation.
2 From a receiver, enter the OSD and then enter the Admin menu.
3 Choose the *Setup Channels* page and click the ⊕ icon in the lower right corner.
4 Click the new *SoL* entry in the list.
5 Configure the necessary transmitter details and click OK.
6 Click the *Back* button to return to the Channels List and, if necessary, adjust the position of the new transmitter within the list.
7 Click the ⊗ icon to exit to the OSD channel list.

continued

INITIAL CONFIGURATION (continued)

6 Enter the details for this transmitter, including two separate passwords:

- The *Admin Password* is required to administer the configuration details only,
- The *Access Password* allows you to restrict who is allowed to connect to this transmitter. When the Access Password is set, a user will be prompted to enter it when first attempting to add this transmitter node to their receiver node's channels list; if the Access Password is left blank, there will be no access restrictions.

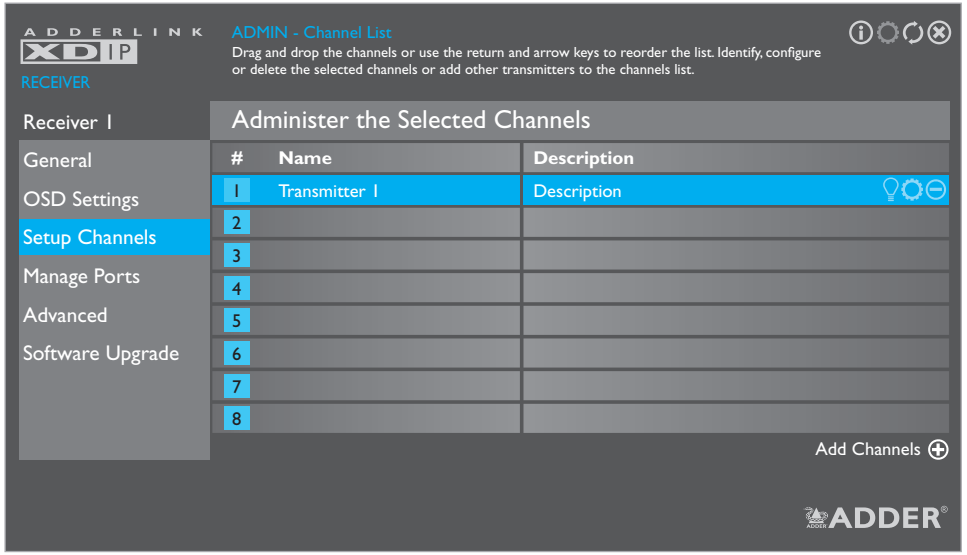
  The Access Password is also used by external systems when creating matrix control installations.

Note: The Name and Description fields for each entry cannot be left blank.

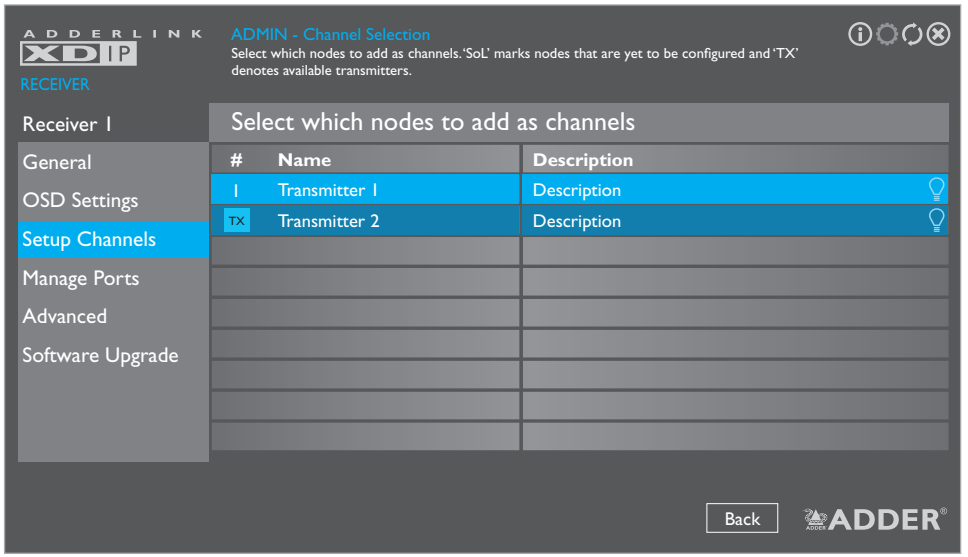
7 The basic configuration for this node is now complete but it still needs to be registered within the XDIP network. If the new node is not already physically linked into your XDIP installation, connect it now (see page 12).

8 Using the console peripherals connected to a receiver node within the installation, enter the receiver's OSD: Press CTRL + ALT + C *

9 Click the ⚙ icon in the top right corner and then choose the *Setup Channels* page:

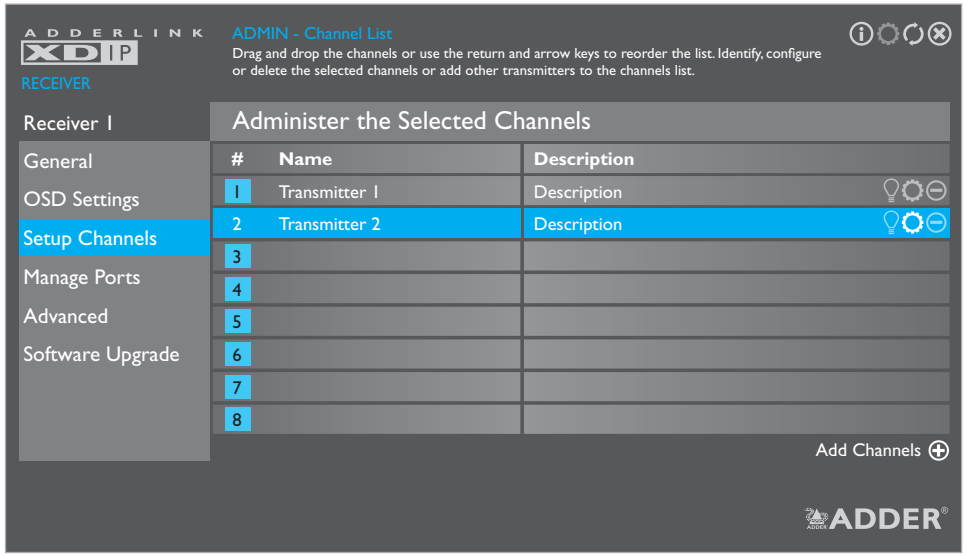


10 Click the ⊕ icon in the lower right corner to list all available transmitter (and *SoL*) nodes:



11 Move the highlight to your new node and select it so that the TX prefix becomes a channel number (the shade of the highlight will also change). Repeat this step for any other new nodes that need to be included.

12 Click the Back button to return to the Channel List:



Your new node is now integrated and ready to be selected. Click the ⊗ icon in the top right corner to exit from the Admin menu. See page 31 for details about Operation.

** Note: The standard hotkey combinations can be changed. See page 22.*

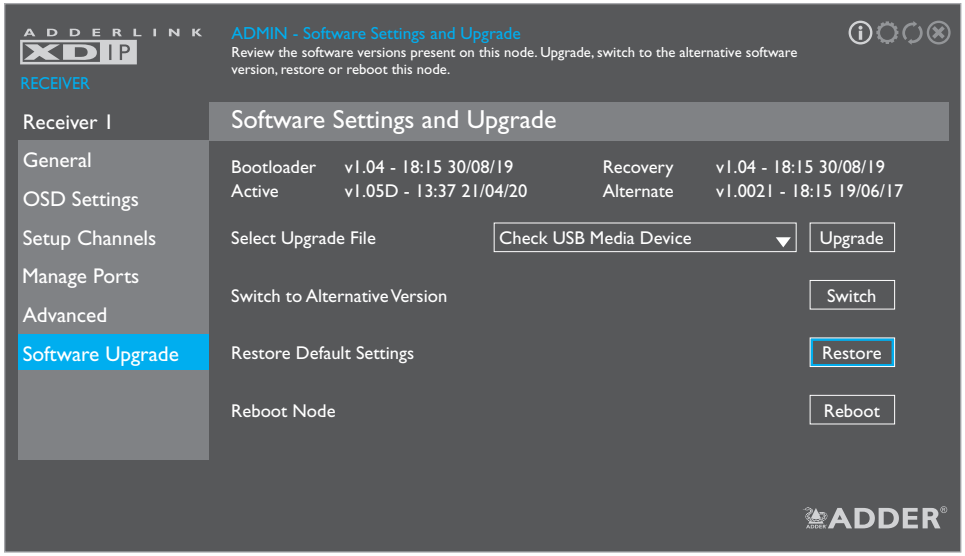
RESTORING A NODE

In order to obtain the full benefit of the configuration wizard when creating a new installation, it may be necessary to restore the default settings to your XDIP nodes.

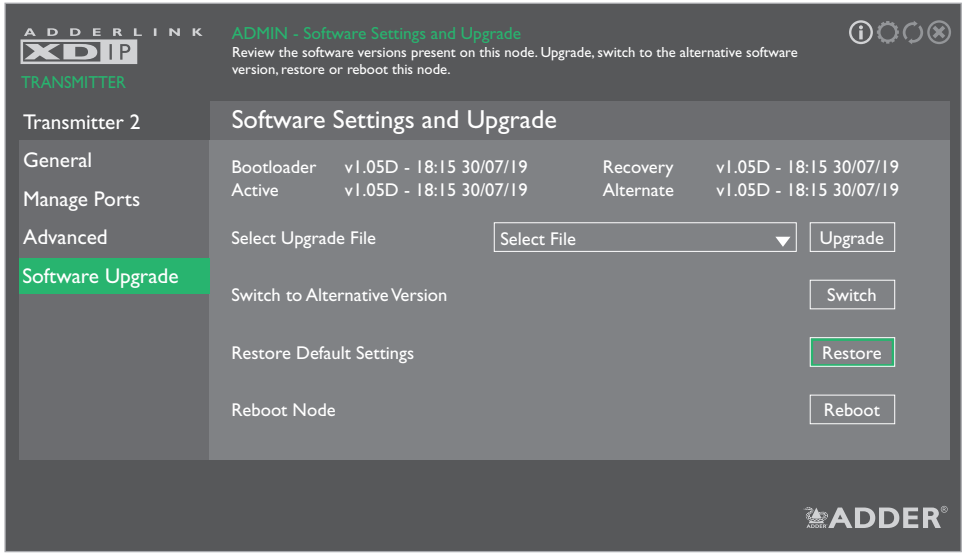
Note: A restore operation will reset all configuration settings and cannot be undone.

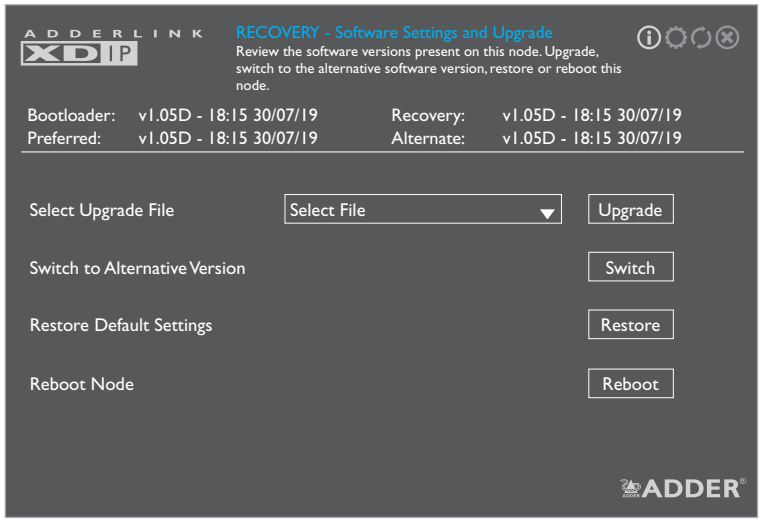
A restore operation can be invoked in various ways:

- *[Receivers]* Display the channel list and then click the ⚙ icon in the top right corner. If requested, enter the admin password and then choose the ***Software Upgrade*** page. Click the ***Restore*** button:



- *[Transmitters]* From any connected receiver node, display the channel list and then click the ⚙ icon in the top right corner. If requested, enter the admin password and then choose the Setup Channels page.
- Click the ⚙ icon shown next to the name of the transmitter that you wish to restore, then choose the ***Software Upgrade*** page and click the ***Restore*** button:





- *[Receivers or transmitters]* Use a narrow implement (such as a straightened out paper clip) to press and hold the recessed reset button on the front panel (while power is applied) for just over ten seconds until the front panel PWR indicator flashes; then release the button and wait for the node to reboot and display the Recovery page. Click the ***Restore*** button.

Notes:

- *The reset button is within the hole to the left of the USB socket.*
- *You will need a minimum of a monitor and either keyboard/mouse connected to the node being restored.*

ADMIN MENUS

Once an AdderLink XDIP installation has undergone its initial configuration, if necessary you can make further alterations using the Admin menu. An Admin menu is accessible via each receiver, wherein changes can be made to that receiver and/or any of the linked transmitters.

To enter the Admin menu

1 From any connected receiver node, enter the receiver's OSD: Press CTRL + ALT + C*

2 Click the ⚙ icon in the top right corner to display the receiver's General Settings page (see below), you will be requested to enter an admin password.

Most pages have an *Apply* button which must be clicked after making changes in order to save them. Alternatively, you can select the *Cancel* button to exit a page without retaining your latest changes.

To exit any Admin page, click the ⊗ icon in the top right corner.

To view the configuration details for a transmitter node, see page 27.

** Note: The standard hotkey combinations can be changed, see page 22*

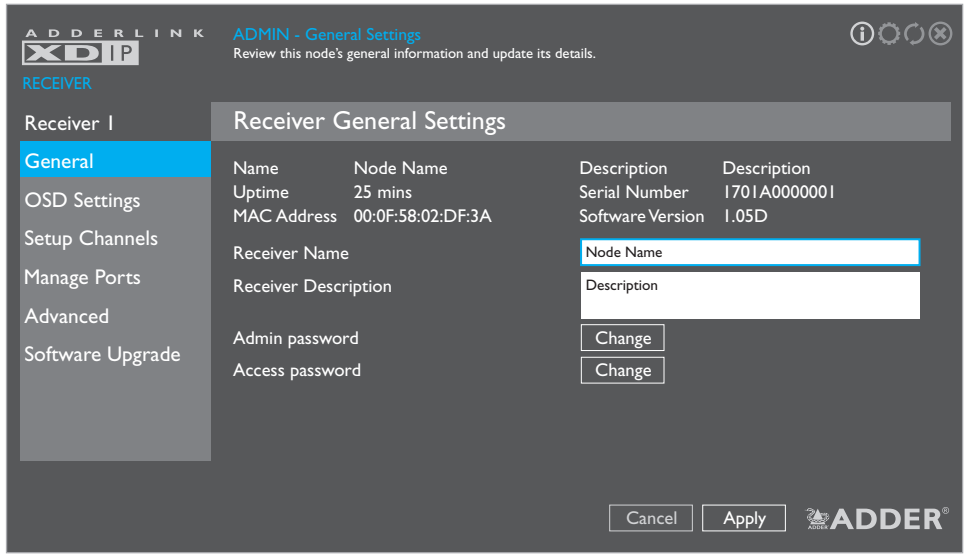
The various parts of the Admin menu are detailed on the following pages:

Receiver node		Transmitter node	
General Settings	*this page*	General Settings	*page 27*
OSD Settings	*page 22*	Manage Ports	*page 28*
Setup Channels	*page 27*	Advanced	*page 29*
Manage Ports	*page 23*	Software Upgrade	*page 30*
Advanced	*page 24*		
Software Upgrade	*page 26*		

Receiver node settings

General Settings page

When you enter the Admin Menu, the first page to be displayed will be the General Settings page for the receiver to which you are directly connected. This page provides basic information for this node:



Name and Description

These tags are useful for differentiation purposes when numerous nodes are being used. Use the *Receiver Name* and *Receiver Description* fields to change them.

Time and Date

These are shown only if access to an NTP server is available. The current time and date are frozen within this page and do not automatically update.

Serial Number

Shows the unique hardware identity applied to this node.

MAC Address

Shows the unique network identity applied to this node.

Software Version

Shows the current main version of internal firmware.

Receiver Name and Receiver Description

These fields allow you to change the name and description tags for this node.

Admin Password

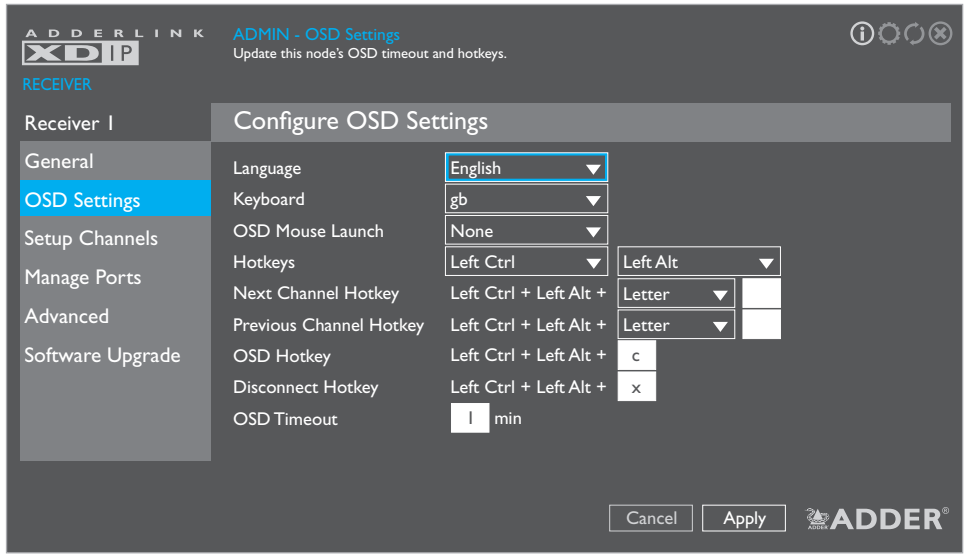
Allows you to change the administration password (that protects this menu).

Access Password

Allows you to change the password that restricts access to this node by transmitters and also external control systems.

OSD Settings page

This page contains all settings related directly to the On Screen Display menu:



Language

Determines the language used for all OSD menu text. Options are: English, Français, Español and Deutsch.

Keyboard

Determines the layout styles used for the keyboard attached to the receiver. Options include: gb, us, fr, de and es.

OSD Mouse Launch

Allows you to optionally choose mouse button combinations that will launch the OSD menu.

Hotkeys

Allows you to change the two main hotkeys which are used to indicate that you wish to communicate with the receiver itself rather than any of the connected computers.

Next and Previous Channel Hotkey

Allows you to define keyboard buttons which, when used together with the chosen main hotkeys, will move to the next or previous channel (based on the receiver node's channel list). Options include Tab, Backspace, Enter, Space, the arrow keys or any keyboard Letter (which needs to be defined in the white box on the right). *Note: If the Letter option is selected, but no letter is defined within the white box, then the functionality is disabled.*

OSD Hotkey

Defines the key which, when used together with the chosen main hotkeys, will display the OSD menu.

Disconnect Hotkey

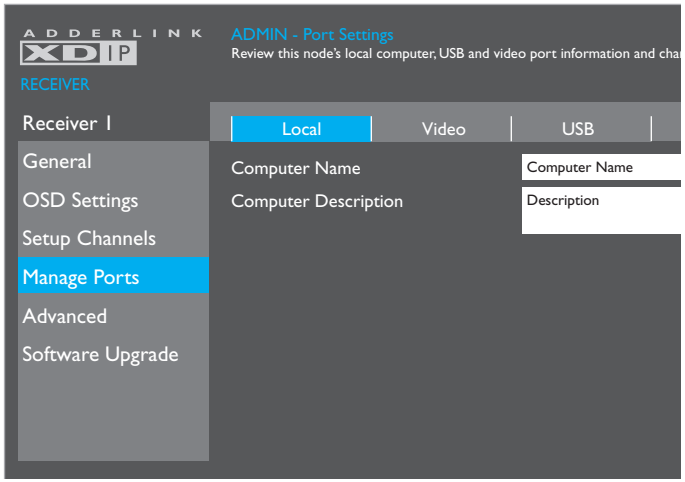
Defines the key which, when used together with the chosen main hotkeys, will disconnect the receiver from the currently chosen channel.

OSD Timeout

Defines the period of inactivity (in whole minutes) that should pass before the OSD menu is automatically exited (0 disables the OSD timeout). *Note:The automatic timeout from the Admin menu is fixed at 15 minutes.*

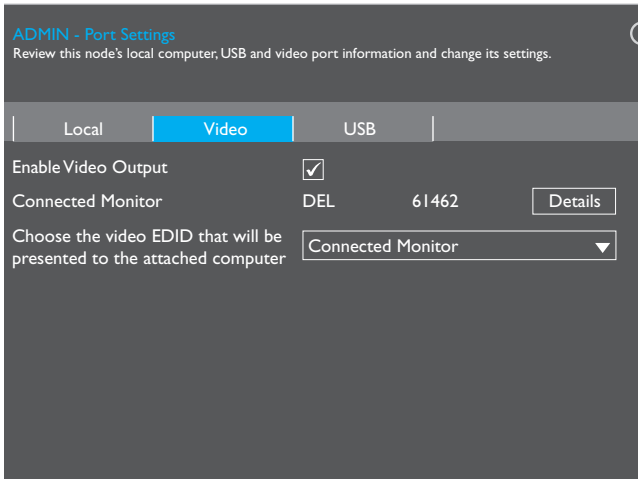
Manage Ports page

All settings within these pages relate to the video monitor, USB devices and/or local computer that are connected to this receiver node.



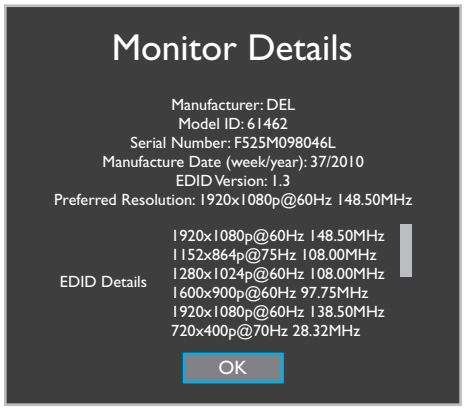
Computer Name and Computer Description

These tags are useful for differentiation purposes when numerous nodes are being used. These fields allow you to change the name and description tags for the computer that is directly attached to this receiver node (shown on the OSD as channel 0).



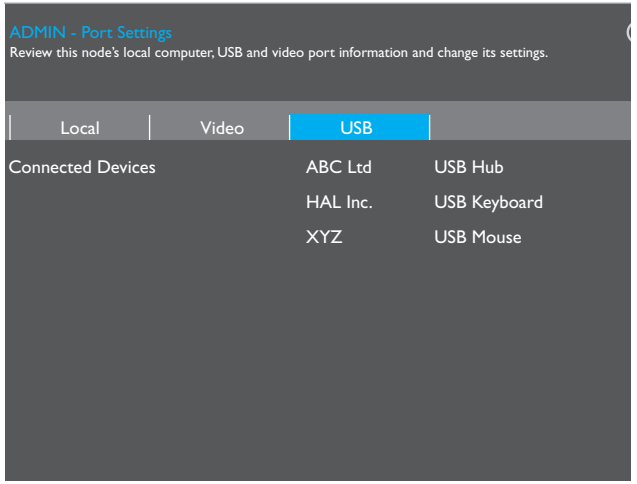
Connected Monitor

Lists the basic details for the monitor connected to the console video output of this receiver node. Click on the *Details* button to view more information about the connected video monitor:



Choose the video EDID....

Allows you to choose to rely upon the *Automatic* EDID configuration for the connected monitor or to manually select one of the listed modes.

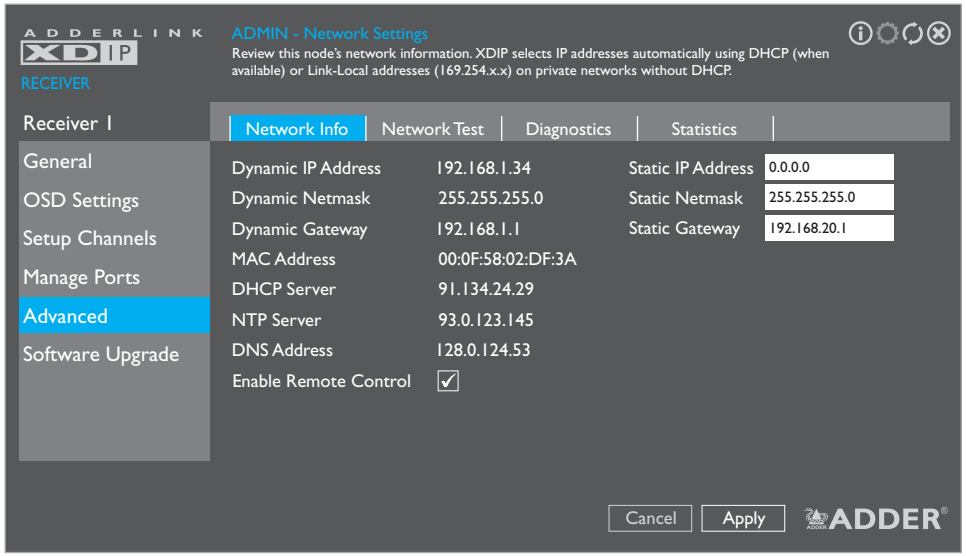


Connected Devices

Lists the USB devices which are currently connected to this receiver node. Click the *Details* button to view more information about the device.

Advanced page

The items within these pages relate to the network settings, network test, diagnostic tools and statistics for the chosen receiver node.



Dynamic IP details

Dynamic IP address details are configured automatically in either of two ways:

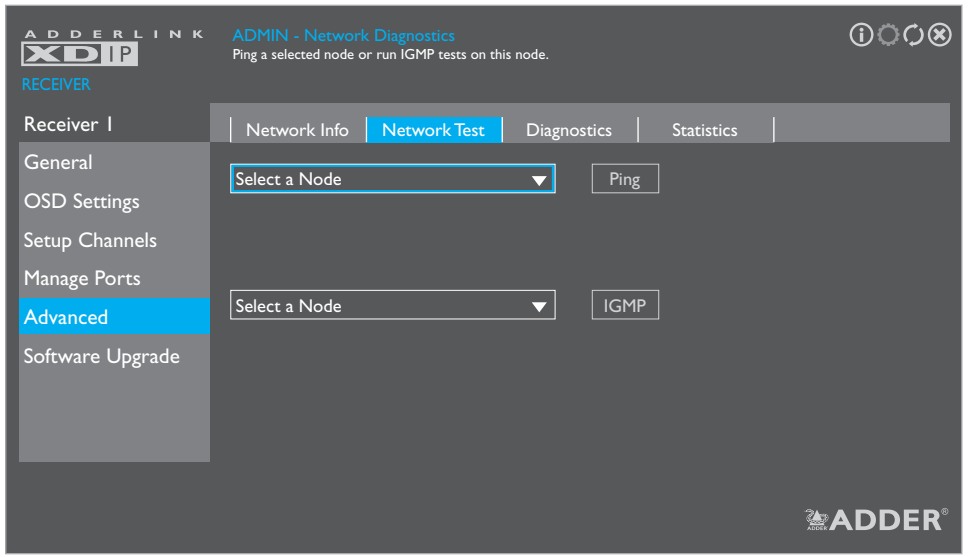
- With the use of a DHCP server, if one is available during configuration, or
- Using Link-Local addresses (169.254.x.x).

Static IP details

In addition to the main Dynamic IP address used by each receiver, a separate set of static IP address details are available for use when an XDIP installation will be externally controlled. The static IP address provide a consistent control channel into the receiver, protected by the Access Password.

Enable Remote Control

When ticked, this function allows the receiver to be controlled by external systems in order to coordinate the actions of multiple XDIP units; either using the Adder XDIP Public REST API or by web browser access to the OSD on the chosen receiver.
See pages 3, 32 and 38 for details.



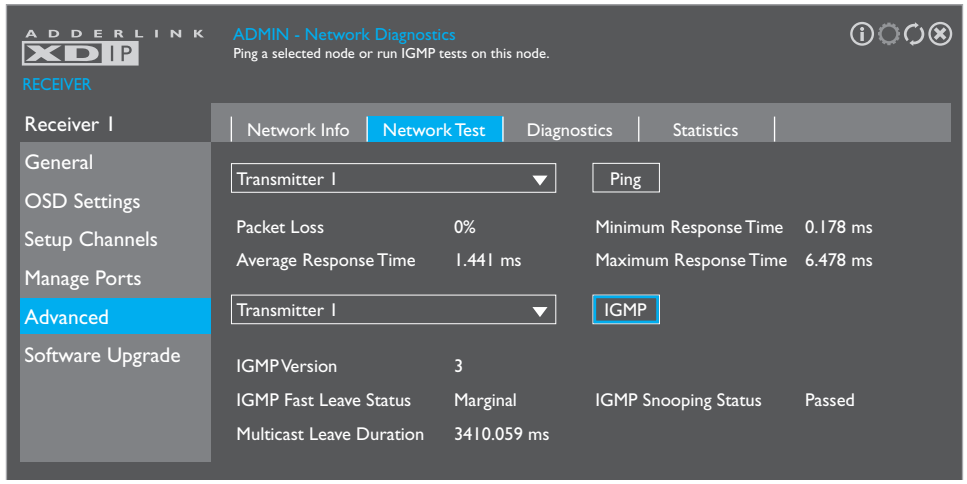
This page provides basic network testing tools to allow you to test and confirm the link between this receiver node and any chosen transmitter node.

Choose a node and click the Ping button to obtain packet loss and speed details.

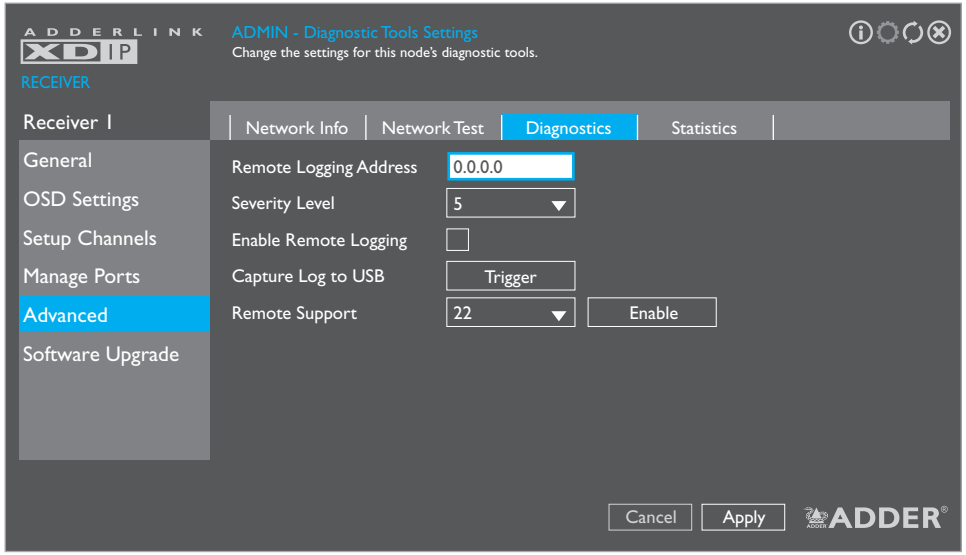
Choose a transmitter node and click the IGMP button to view test results.

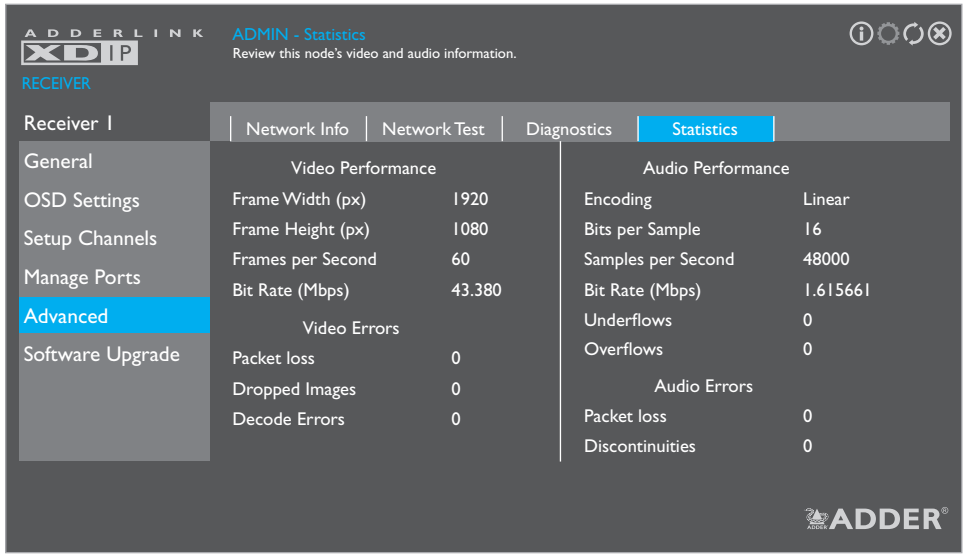
Note: IGMP Fast Leave and Snooping must be supported and enabled on your network switch, otherwise these tests will produce a 'Failed' result. A 'Marginal' result indicates that packets are still arriving after an allotted cut off period.

Results are provided in the manner shown below:



Advanced page (continued)





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

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; XDIP currently 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.

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

Capture Log to USB
Click the Trigger button to save the activity log to a local USB memory stick. The resulting compressed file can then be sent to Adder support when diagnosing an issue.

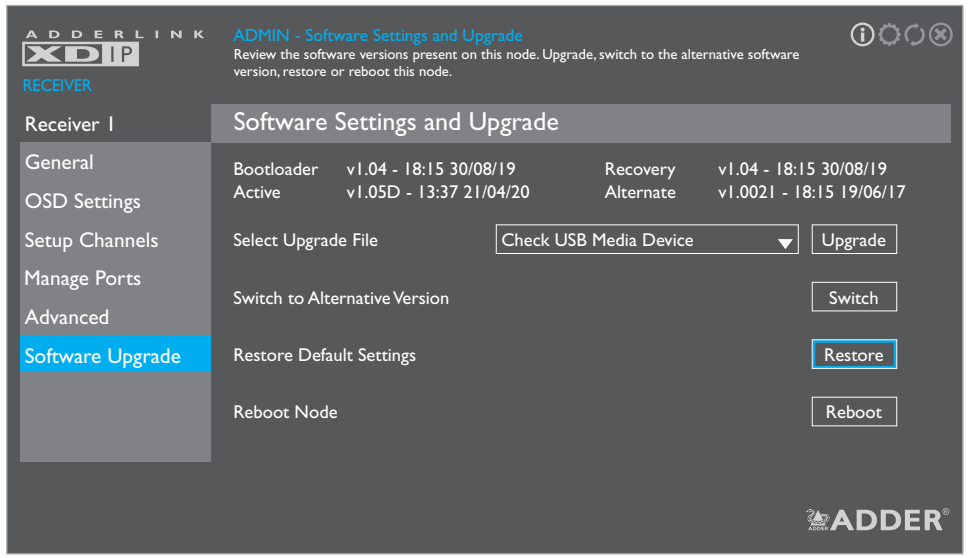
Remote Support
When using the Adder remote server, this option determines which port will be used. Multiple options are offered in case one or more ports are blocked by your firewall.

Note: This option should only be enabled when requested by Adder, for support purposes.

This page provides statistical details regarding the video and audio performance.

Software Upgrade page

The items within this page relate to the software settings, restore/reboot and firmware upgrade option for the chosen receiver node.



Supported file systems

When using USB memory sticks, the following file systems are supported:

- FAT
- NTFS
- Non-journaled HFS+

Firmware details

Lists the current and recovery *Bootloader* versions plus the *Active* image that is currently running as well as the *Alternate* (the previously active) image version details.

Select Upgrade File

Any valid firmware upgrade files held (only in the root menu) on a memory stick in one of the USB sockets will be listed here (if necessary click the ↻ icon to update after insertion). Select the required file name and click the *Upgrade* button. The new firmware will be made current and the pre-existing code moved to the recovery/alternate location.

Switch to Alternative Version

Allows you to change back to the previous firmware version that was running before the last upgrade.

Restore Default Settings

Click to restore this receiver to its default *Start of Life (SoL)* condition.

Note: A restore operation will reset all configuration settings and cannot be undone.

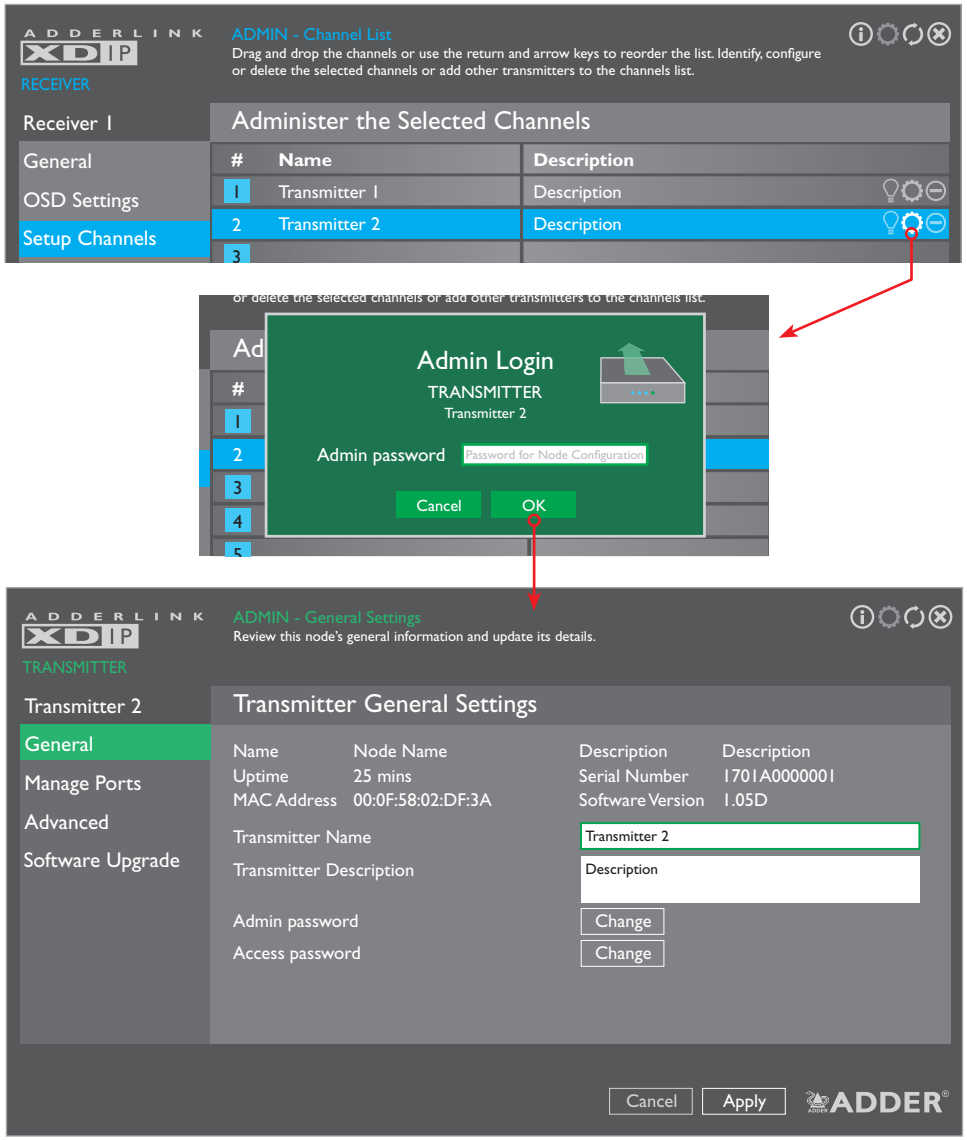
Reboot Node

Click to reboot this receiver.

Setup Channels page

Transmitter nodes can be configured via the Setup Channels page, accessible via any receiver. (Enter the receiver's OSD: Press CTRL + ALT + C*, click the ⚙ icon in the top right corner and then choose the *Setup Channels* page). Here you can:

- Change the channel order - drag and drop a node entry into the required slot (or use the arrow keys).
- Add a transmitter node to the list - click the ⊕ icon in the lower right corner.
- Flash the front panel indicators of any transmitter node - click the node's 💡 icon.
- Remove a transmitter node from the list - click the node's ⊖ icon.
- Configure a transmitter node - click the node's ⚙ icon:



Transmitter node settings

1 From any connected receiver node, enter the receiver's OSD: Press CTRL + ALT + C*, then click the ⚙ icon in the top right corner.

2 Choose the *Setup Channels* page and click the ⚙ icon shown next to the name of the transmitter that you wish to configure.

3 You will be requested to enter the admin password. The transmitter's *General Settings* page will be shown.

Note: All Admin menu pages related directly to transmitter configuration use a green highlight to match the color of the PWR indicator of nodes when they are in transmitter mode.

General Settings page

This page provides basic information for this node:

Name and Description

These tags are useful for differentiation purposes when numerous nodes are being used. Use the *Transmitter Name* and *Transmitter Description* fields to change them.

Time and Date

These are shown only if access to an NTP server is available. The current time and date are frozen within this page and do not automatically update.

Serial Number

Shows the unique hardware identity applied to this node.

MAC Address

Shows the unique network identity applied to this node.

Software Version

Shows the current main version of internal firmware.

Transmitter Name and Transmitter Description

These fields allow you to change the name and description tags for this node.

Admin Password

Allows you to change the administration password (that protects this menu).

Access Password

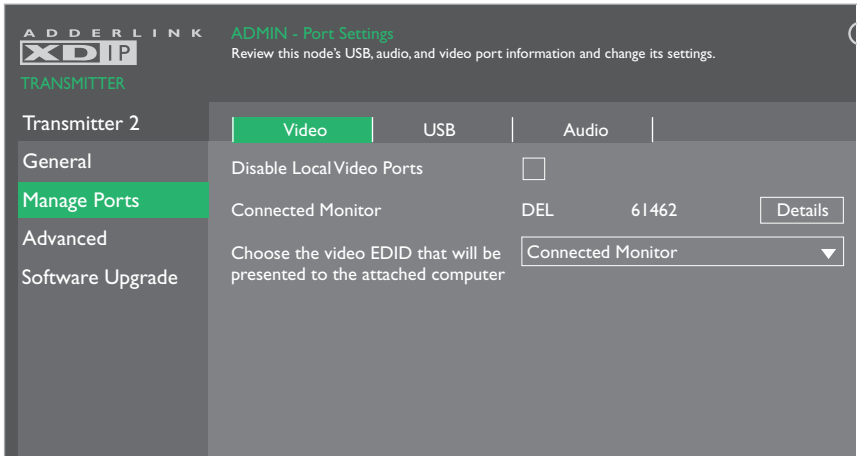
Allows you to change the password that restricts access to this node by receivers and also external control systems.

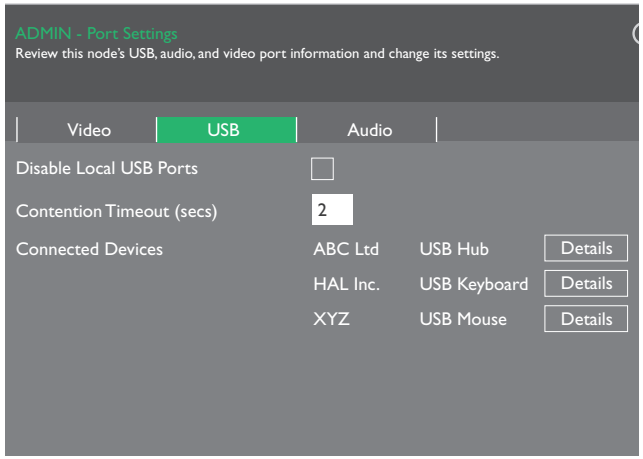
** Note: The standard hotkey combinations can be changed. See page 22.*

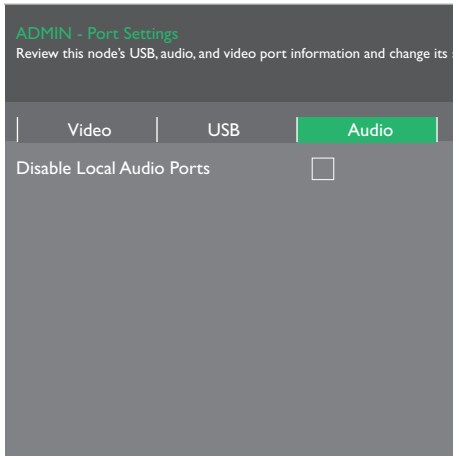
Manage Ports pages

***To access these pages**: From a receiver, enter the OSD menu: Press CTRL + ALT + C hotkeys, then click the ⚙ icon to show the Admin menu. Choose the Setup Channels page, click the ⚙ icon for the required transmitter node and then click the Manage Ports option. See page 27.*

All settings within these pages relate to the optional video monitor, USB devices and/or audio devices that are connected to the chosen transmitter node.





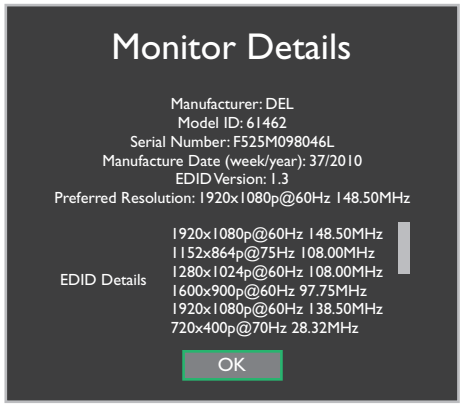


Disable Local Video Ports

Allows you to temporarily disable the video output to the optional console connection on the transmitter node.

Connected Monitor

Lists the basic details for the monitor connected to the console video output of the transmitter node. Click on the Details button to view more information about the connected video monitor:



Choose the video EDID....

Allows you to choose between the *Automatic* EDID configuration for the connected monitor or to choose one of the listed modes.

Disable Local USB Ports

Allows you to temporarily disable the USB signals to any devices optionally connected to the transmitter node.

Contention Timeout (secs)

USB links to the host computer are shared between multiple receivers in a first come first served manner. The first receiver to access a USB peripheral will be given control access, while all others are temporarily prevented, until the first receiver has completed its actions. The contention timeout is the time delay, after the last USB activity of the first receiver, before USB access becomes available again to all.

Connected Devices

Lists the USB devices which are currently connected to the transmitter node. Click the Details button to view more information about the device.

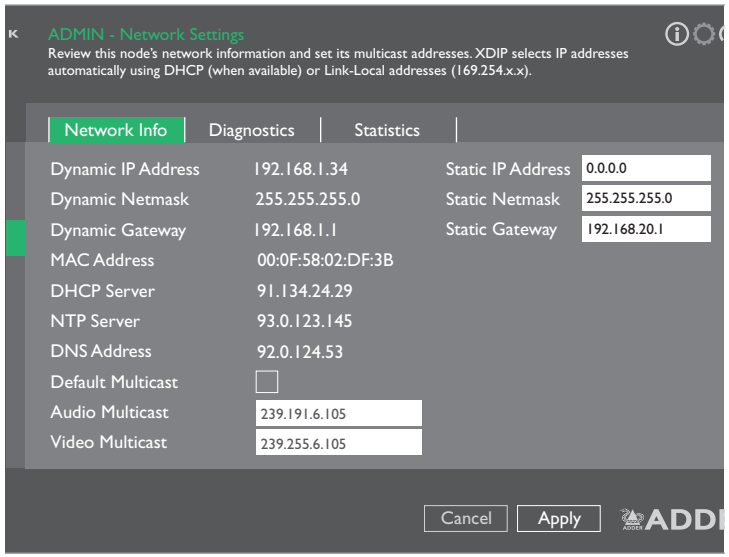
Disable Local Audio Ports

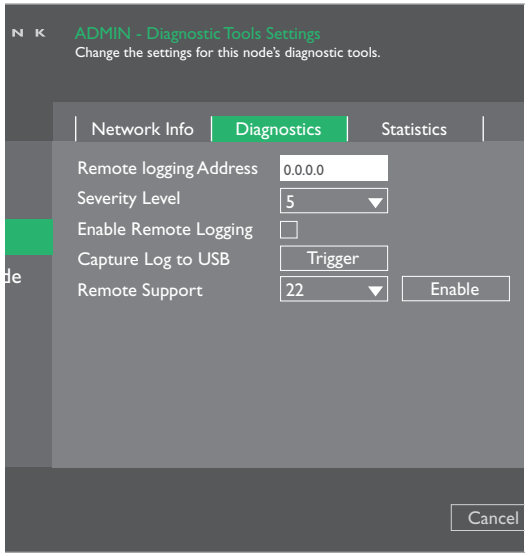
Allows you to disable the audio signals to devices optionally connected to the transmitter node.

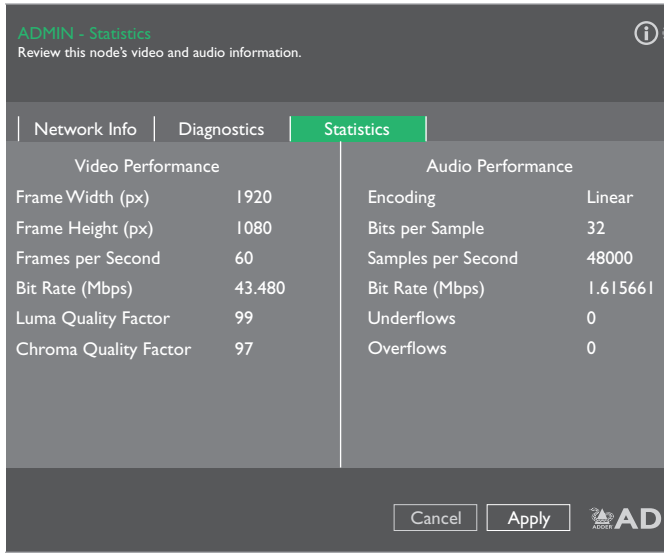
Advanced pages

***To access these pages**: From a receiver, enter the OSD menu: Press CTRL + ALT + C hotkeys, then click the ⚙ icon to show the Admin menu. Choose the Setup Channels page, click the ⚙ icon for the required transmitter node and then click the Advanced option.*
See page 27.

The items within these pages relate to the network settings, diagnostic tools and statistics for the chosen transmitter node.







Dynamic IP details

Dynamic IP address details are configured automatically in either of two ways:

- With the use of a DHCP server, if one is available during configuration, or
- Using Link-Local addresses (169.254.x.x).

Static IP details

In addition to the main Dynamic IP address used by each receiver, a separate set of static IP address details are available for use when an XDIP installation will be externally controlled. The static IP address provide a consistent control channel into the transmitter, protected by the Access Password.

Default Multicast

Tick this option and click the Apply button to re-apply the default Audio and Video Multicast addresses (as shown in the two fields below).

Remote Logging Address

Enter a valid IP address for a syslog server on the local network where status logs can be sent.

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; XDIP currently 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.

Enable Remote Logging

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

Capture Log to USB

Click the Trigger button to save the activity log to a local USB memory stick (must be plugged directly into a port on the transmitter node in question - not the receiver you are using for access). The resulting compressed file can then be sent to Adder support when diagnosing 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.

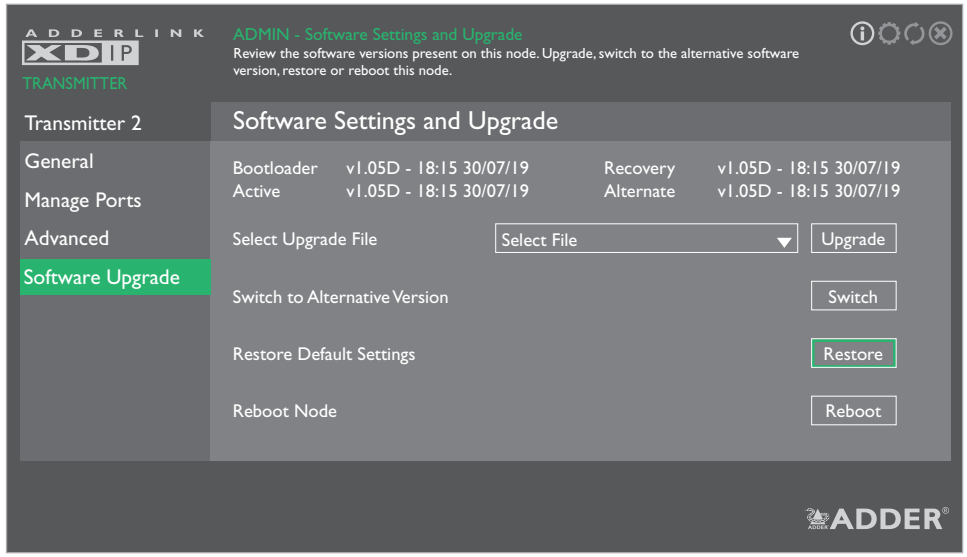
This page provides statistical details regarding the video and audio performance.

Note: Video statistics will only be available if no other receiver node is viewing the same video source.

Software Upgrade page

***To access this page**: From a receiver, enter the OSD menu: Press CTRL + ALT + C hotkeys, then click the ⚙ icon to show the Admin menu. Choose the Setup Channels page, click the ⚙ icon for the required transmitter node and then click the Software Upgrade option. See page 27.*

The items within this page relate to the software settings, restore/reboot and firmware upgrade option for the chosen transmitter node.



Supported file systems

When using USB memory sticks, the following file systems are supported:

- FAT
- NTFS
- Non-journaled HFS+

Firmware details

Lists the current and recovery *Bootloader* versions plus the *Active* image that is currently running as well as the *Alternate* (the previously active) image version details.

Select Upgrade File

Any valid firmware upgrade files held (only in the root menu) on a memory stick in one of the USB sockets, of the receiver node being used for access, will be listed here (if necessary click the ↻ icon to update after insertion). Select the required file name and click the Upgrade button. The new firmware will be made current and the pre-existing code moved to the recovery/alternate location.

Switch to Alternative Version

Allows you to change back to the previous firmware version that was running before the last upgrade.

Restore Default Settings

Click to restore this receiver to its default *Start of Life (SoL)* condition.

Note: A restore operation will reset all configuration settings and cannot be undone.

Reboot Node

Click to reboot this transmitter node.

Operation

AdderLink XDIP nodes provide great flexibility in operation, supporting a variety of connection topologies as discussed in the Introduction chapter (see page 2). Where switching between channels is required, user control is always centered upon the receiver node(s).

SWITCHING CHANNELS

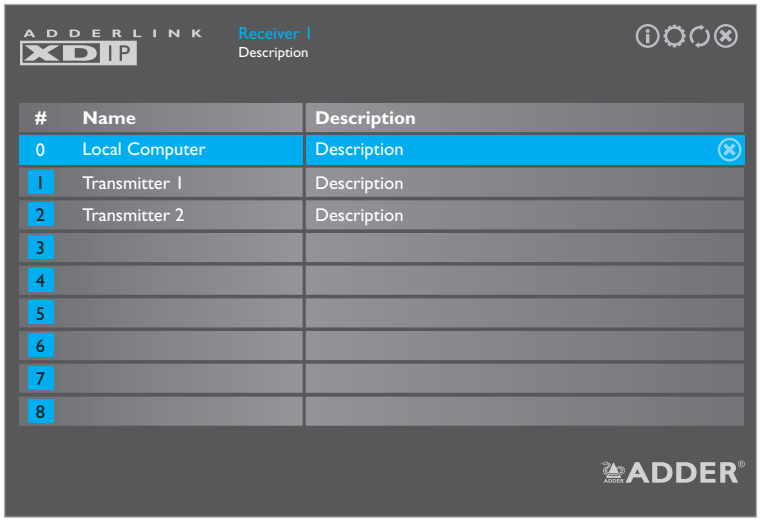
Switching channels from a receiver

To select a channel (using the channel list)

1 Using the console keyboard and/or mouse on your receiver node, either:

- Use the OSD hotkey: Press and hold CTRL and ALT, then press C *
- Use the mouse OSD launch (this needs to be pre-configured - see page 22).

The channel list page should be displayed:



2 Using the mouse, click the required entry (or use cursor up/down keys and Enter).

The channel list will disappear and the output of the chosen channel will be shown on your console monitor.

3 To change to another channel, repeat steps 1 and 2.

To disconnect from a channel (using the channel list)

To disconnect your console from the current channel, without switching to another:

1 Display the channel list (as above).

2 Click the ⊗ icon shown next to the currently selected channel.

To select a channel (using hotkeys)

The quickest way to switch between channels is to use hotkeys. This is where the order of transmitter nodes within the channel list really comes into play.

1 Press and hold the CTRL + ALT * keys,

2 Press the number of the required channel (1 to 8 for the transmitters, 0 for the local computer).

The output of the chosen channel will be shown on your console monitor.

To switch between channels (using hotkeys)

Before you can use this method, you will need to define which keys to use, see page 32. For the purposes of this example, we will assume that the letters L and K have been set for next and previous, respectively.

1 Press and hold the CTRL + ALT * keys,

2 Press L to change to the next available channel in the list or K to select the previous one.

To disconnect from a channel (using hotkeys)

To disconnect your console from the current channel, without switching to another:

1 Press and hold the CTRL + ALT, then press X *,

2 Press the number of the required channel (1 to 8 for the transmitters, 0 for the local computer).

** Note: The standard hotkey combinations can be changed, see next page*

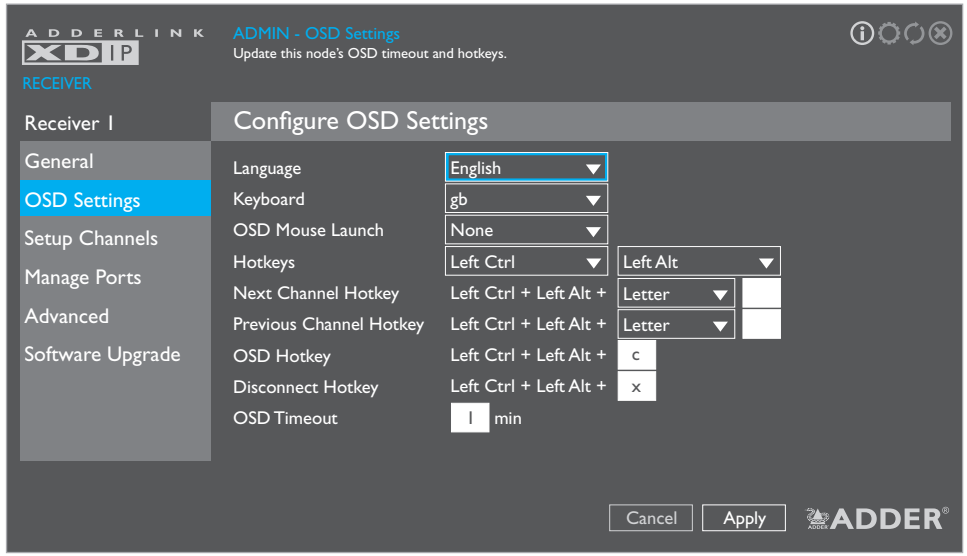
To set channel switching hotkeys

Hotkey combinations are possible that allow you to change channels without invoking the channel list. The necessary hotkey combinations are not set as standard, but can easily be done so from the OSD Settings page of the receiver's Admin menu.

1 Using the console keyboard and/or mouse on your receiver node, press CTRL + ALT + C *

2 Click the ⚙ icon in the top right corner to display the opening page of the receiver's Admin menu, you will be requested to enter a valid admin password.

3 Choose the OSD Settings option:



4 Configure the *Next Channel Hotkey* and *Previous Channel Hotkey* combinations.

Note: When using the Letter option, choose only standard alpha characters and avoid using the characters used for OSD and Disconnect hotkeys. If required, you can change the Letter option to Tab, Backspace, Enter, Space or any of the arrow keys.

Within this page you can also optionally change the main two hotkeys (Ctrl and Alt).

5 Click the *Apply* button and then the ⊗ icon in the top right corner (or press the Esc key on your keyboard) to exit.

Switching channels from an external system

XDIP installations can be externally controlled either by a control system or a PC connected to the XDIP network. This method is most often used when the XDIP modules form an audio-visual matrix, where multiple receivers access content from a choice of transmitters - see page 3.

When using an external system to control the actions of receivers, you will need to know the following for the receivers being accessed:

- The static IP addresses,
- The access passwords that have been assigned.

To switch channel using an external PC

1 From a PC connected to the XDIP network, use a web browser and enter the static IP address of the required receiver and the port 8443: ***https://<ip-address>:8443***

2 When requested, enter the access password for the receiver and click OK:

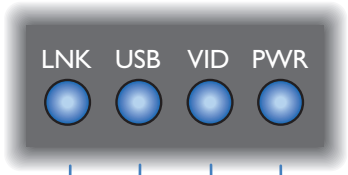
3 Select the required transmitter from the list.

INDICATORS

The transmitter and receiver nodes contain various indicators to provide you with status information. Both nodes have four red indicators on their front panels.

Front panel status indicators

The status indicators on the front panel of every node provide important feedback on current operation:



LNK
This indicator will be on for the receiver and transmitter nodes which have established a link.

USB
Indicates an active USB connection.

VID
Indicates an active video connection.

On transmitter nodes:
These indicators will be on when there's a local USB/video connection for the PC, regardless of whether a receiver node is connected.

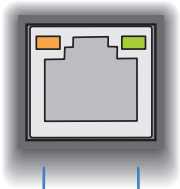
On receiver nodes:
These indicators will be on if there is a USB/video feed from a PC either at the connected transmitter node or at the local feed through port (i.e. channel 0) of the receiver node.

PWR
This indicator will be on when power is supplied to the node. Its color reflects the overall status of the node:

- Start of Life
- Transmitter
- Receiver
- Recovery mode: *the node is temporarily running recovery software with reduced functionality.*

Green and amber status indicators

The indicators on the link port of the node's rear panel provide link status information:



Amber
This indicator will flash when data is being transferred.

Green
This indicator will be on whenever there is a valid link between this node and another, or to a network switch.

Further information

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

- Getting assistance - see right
- Appendix 1 - IGMP
- Appendix 2 - Layers
- Appendix 3 - Link cable interference protection
- Appendix 4 - XDIP API
- Appendix 5 - 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

APPENDIX 1 - IGMP

Internet Group Management Protocol

Where an AdderLink XDIP transmitter node is required to stream video to two or more receiver nodes, multicasting is 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 XDIP nodes make use of IGMP v2 and v3 (v3 is used by default unless the XDIP nodes see v2 used by the network, in which case they will automatically drop down to IGMP v2) 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 (IGMP v2 or v3) 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.

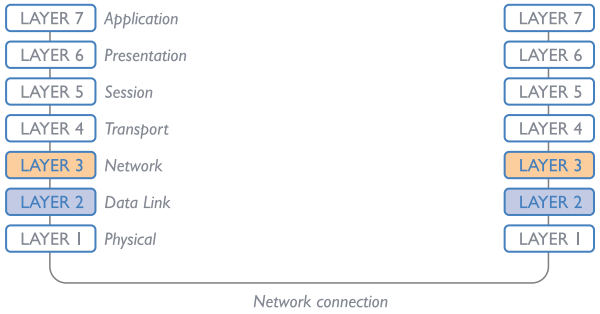
Where AdderLink XDIP nodes are connected directly to the switch (with no other devices on the same port) then enabling IGMP Fast-Leave mode means that switches can immediately remove receivers without going through a full checking procedure. Where multiple nodes are regularly joining and leaving multicasts,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

APPENDIX 2 - LAYERS

Layer 2 and Layer 3:The OSI model

When discussing network switches, the terms Layer 2 and Layer 3 are very often used. These refer to parts of the Open System Interconnection (OSI) model, a standardised way to 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 fibre, 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 XDIP? 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 3 - LINK CABLE INTERFERENCE PROTECTION

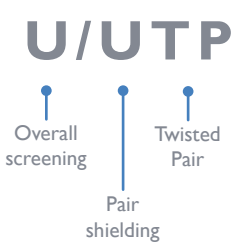
While the Category rating (e.g. CAT 5e, CAT 6a, CAT 7, etc.) determines the electrical performance of a cable, another vital part of the overall cable specification is its protection from interference. As cabling distances and data rates increase, so too does the susceptibility to interference, from both external and internal sources.

Proximity to other electromagnetic sources are the main external threat and these can be subdued using overall screening that surrounds all four of the cable pairs. However, interference is also possible from neighbouring twisted pairs within the same cable and this can be just as hazardous to data integrity. Such *crosstalk* is countered by shielding each cable pair separately.

Within each Category rating, you can specify different combinations of external screening and internal shielding to suit the environment into which the link is being placed.

Interference protection codes

Interference protection is classified in the following manner:



where

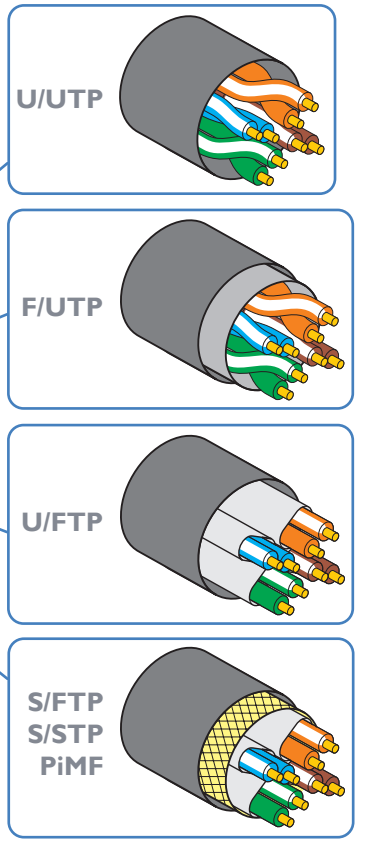
U = unshielded

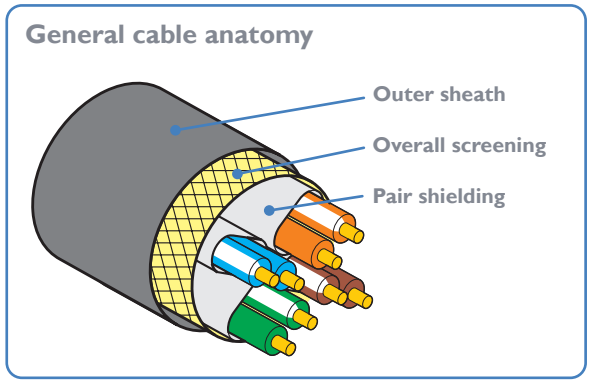
F = foil shielding

S = braided shielding

PiMF = Pairs in Metal Foil

Name	Overall Screening	Pair Shielding
U/UTP	✗	✗
F/UTP	✓	✗
U/FTP	✗	✓
S/FTP or S/STP or PiMF	✓	✓





APPENDIX 4 - XDIP API

Adder Technology XDIP Public REST API

The API gives the user the ability to control the channel a receiver is connected to, obtain all the necessary information relating to the connected channel and gain an authorization access token required to switch channels, given knowledge of the node's 'Access' password. It does not give the user the ability to change the channel configuration or any other part of the node's configuration, in order to do this a user must log in to the OSD directly and access the admin screen - which will require knowledge of the 'Admin' password.

Note: Before receivers can be controlled by external systems, the 'Enable Remote Control' option must be checked within the Advanced page of each receiver's configuration. See page 24.

YAML download

The YAML file for the API can be found at:

- https://support.adder.com/tiki/tiki-index.php?page=XDIP%3A+Using+the+API

API version 1.05

Schemes: HTTPS

- The API uses SSL/TLS version 1.2
- Commands are sent over port 8443, for example: https://<*ip-address*>:8443/api/<*parameters*>

Channels

/channels

Returns a list of channels configured in the system. For future use, each channel will have a list of nodes. Currently only one node is returned in this list.

Type: Get

Responses

200 OK
304 Not Modified
500 Operation Failed

/channels/{id}

Get details of a single channel.

Type: Get

Responses

200 OK
304 Not Modified
404 Channel Id Not In Supported Range
500 Operation Failed

/channels/connected

Get the channel this node is currently connected to.

Type: Get

Responses

200 OK
304 Not Modified
404 Channel Id Not In Supported Range
500 Operation Failed

/channels/{id}/switch

Switch node to the specified channel.

Type: Post

Parameters

id Channel Id. An id of 0x7fffffff will cause the receiver to disconnect from the current channel.

Authrorization Access / Admin JSON Web Token (JWT). Format 'Bearer JWT'.

Responses

204 Successful Operation (No Content)
401 Unauthorized. Invalid Access Credentials Provided.
404 Channel Id Not In Supported Range
500 Operation Failed

/channels/maximumAllowed

Get the maximum number of channels supported by this node.

Type: Get

Responses

200 OK
304 Not Modified
500 Operation Failed

/channels/status

Get the status for the currently selected channel.

Type: Get

Responses

200 OK
304 Not Modified
500 Operation Failed

Nodes

/nodes/{uuid}

Get details of a single node.

Type: Get

Parameters

uuid The node's unique identifier (or 'self' for the local node).

Responses

200 OK

304 Not Modified

404 UUID Not Found

500 Operation Failed

/nodes/selected

Returns a list and details of the configured Channel nodes.

Type: Get

Responses

200 OK

304 Not Modified

500 Operation Failed

Access

/nodes/self/access

Obtain an Access / Admin JSON Web Token (JWT).

Type: Post

Parameters

authData Password attributes.

Responses

200 OK

400 Invalid Content (Schema)

401 Unauthorized

404 UUID Not Found

500 Operation Failed

LocalComputer

/localComputer

Get information relating to the computer that is connected to this node.

Responses

200 OK

304 Not Modified

500 Operation Failed

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u-boot linux-arm-freescale busybox termcap util-linux udev e2fsprogs kobs-ng freetype glib dbus-1 qt5 libfftw

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kmod libalsa libgpg-error nettle libgcrypt gnutls libmicrohttpd libjwt libdaemon nss-mdns avahi

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Module: libcvt

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Module: openssl

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 *
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 *
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