

USER GUIDE

ACR1002DP-T

ACR1002DP-R

ACR1002FDP-T

ACR1002FDP-R

AGILITY ACR1002DP EXTENDERS

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT [BLACKBOX.COM](https://www.blackbox.com)



BLACK BOX

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

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

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INSTRUCCIONES DE SEGURIDAD

(NORMAS OFICIALES MEXICANAS ELECTRICAL SAFETY STATEMENT)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en librerías o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.



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CHAPTER 1: SPECIFICATIONS

TECHNICAL SPECIFICATIONS

OPERATING/STORAGE CONDITIONS

Operating temperature:	0 to 40°C / 32 to 104°F
Storage temperature:	0 to 40°C / 32 to 104°F
Storage and operating relative humidity:	10 to 90% non-condensing
Altitude:	< 2000m

POWER

External power:	12VDC, 1.5A
Typical power consumption:	7W

PHYSICAL

LOCAL UNIT - TRANSMITTER (TX)

Dimensions:	136mm/5.3" (w) x 150mm/5.9" (d) x 39mm/1.5" (h)
Weight:	0.8kg / 1.7 lbs

REMOTE UNIT - RECEIVER (RX)

Dimensions:	186mm/7.3" (w) x 150mm/5.9" (d) x 39mm/1.5" (h)
Weight:	1.1kg / 2.4 lbs

MATERIALS

Aluminium and steel construction

CONNECTORS

LOCAL UNIT - TRANSMITTER (TX)

Computer: 2x DisplayPort™ connections, 1x 3.5mm socket for Audio in, 1x USB Type B, 1x USB Type A for auxiliary connections, 1x 8p8c and 1x SFP for 1GbE network connections (2x SFP for ACR1002FDP variants)

REMOTE UNIT - RECEIVER (RX)

Desk: 2x DisplayPort™ connections, 1x 3.5mm socket for Audio out, 1x 3.5mm socket for headset/microphone, 4x USB Type A, 1x 8p8c and 1x SFP for 1GbE network connections (2x SFP for ACR1002FDP variants)

USB2.0 WITH CLASS CONTROL

Supports USB2.0 devices (low, full and high speed). Security feature allows the blocking of non-HID devices. Isochronous devices are not supported (e.g. USB audio or video devices)

VIDEO RESOLUTION

The system supports up to 1x 2560x1600@60Hz or 2x 1920x1200 @60Hz

AUDIO

USB audio 2 channel 16bit 48KHz (bi-directional)

ETHERNET

In-built support for 1GbE CATx*

Support for second CATx (up to 1GbE) or fiber (up to 1GbE) via SFP modules*

* ACR1002FDP variants have 2x SFP and no in-built CATx port

APPROVALS / COMPLIANCE

CE, UKCA, FCC, ICES, cULus

PRODUCT INFORMATION LABELS

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



CHAPTER 2: WELCOME

WELCOME

Thank you for choosing the Black Box Agility ACR1002DP high performance extenders, which offer dual-head video, audio and USB delivered over a single fiber connection. The extenders offer pixel-perfect color and accurate picture quality at up to 2560x1600@60Hz and USB2.0 with fast switching.

PRODUCT IN BRIEF

- In-built support for CATx links at speeds up to 1GbE with additional support for dual CATx or fiber at up to 1GbE using optional SFP modules (2x SFP for ACR1002FDP variants),
- Support for 1x 2560x1600@60Hz or 2x 1920x1200@60Hz,
- Bi-directional analog audio (with combined headset jack on the receiver),
- USB True Emulation for fast switching,
- Support for advance diagnostic and troubleshooting tools,
- Backwards compatibility with existing Agility range,
- Plug and play.

LINKING

Agility units can be linked in two mains ways: Direct or Networked.

DIRECT LINKING

Where Agility 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 - see page 24.

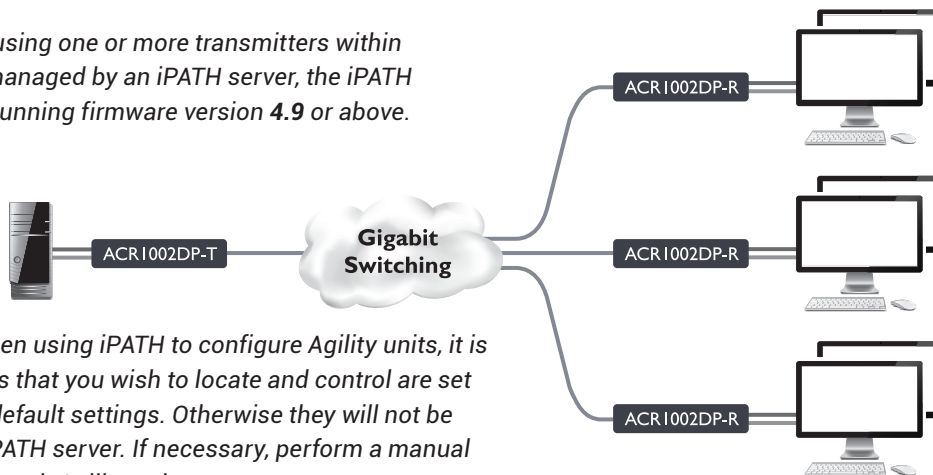


NETWORKED LINKING

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

- **Configuring networked units individually** - In the absence of an iPATH server, unallocated Agility units have the ability to locate each other. You can alter settings via the OSD on the console connected to the receiver by pressing **CTRL + ALT + C**.
- **Configuring networked units collectively** - The iPATH server allows you to configure, control and coordinate any number of transmitters and receivers from a single application.

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

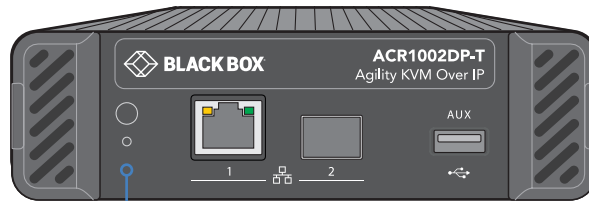


IMPORTANT: When using iPATH to configure Agility units, it is vital that all units that you wish to locate and control are set to their factory default settings. Otherwise they will not be located by the iPATH server. If necessary, perform a manual factory reset on each Agility unit.

AGILITY ACR1002DP (AND ACR1002FDP) FEATURES

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

AGILITY TRANSMITTER MODULE

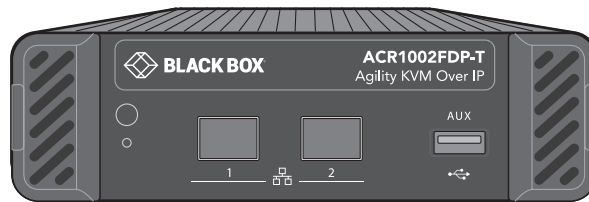


ACR1002DP-T model

Reset switch and status indicator

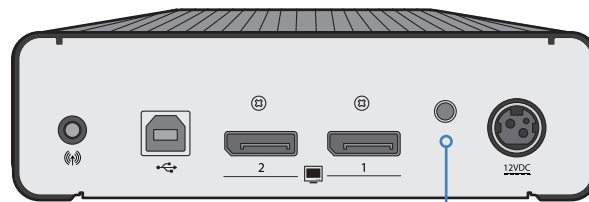
CATx and SFP link ports

USB AUX port (for use with USB-to-serial converters)



ACR1002FDP-T model

2 x SFP link ports



Analog audio in

USB

Secondary video in

Primary video in

Status indicator

Power in

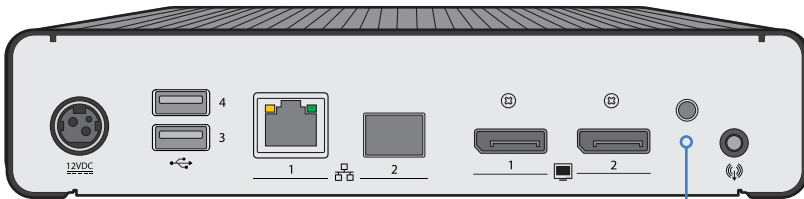
AGILITY RECEIVER MODULE



Reset
switch and status
indicator

Combined
analog audio
headphone/
mic/headset
port

USB
ports



ACR1002DP-R model

Power
in

USB
ports

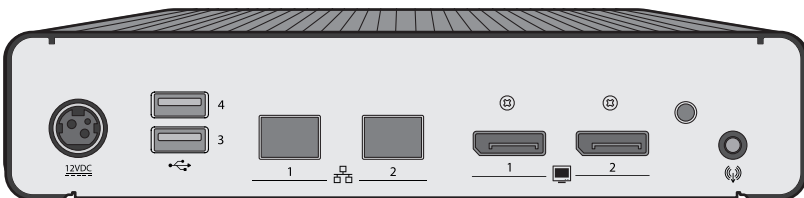
CATx and
SFP link ports

Primary
display

Secondary
display

Status
indicator

Analog
audio line
out



ACR1002FDP-R model

2 x SFP link
ports

CHAPTER 3: INSTALLATION

LOCATIONS

Please consider the following important points when planning the position of the modules:

- Situate the transmitter module close to the system to which it will be connected and near to a source of mains power. Place the receiver module in similar close proximity to the peripherals that it will connect with, plus a source of mains power.
- Consult the precautions listed within the supplied safety leaflet.
- Connections do not need to be carried out in the order given within this guide, however, where possible connect the *power in* as the final step.

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.

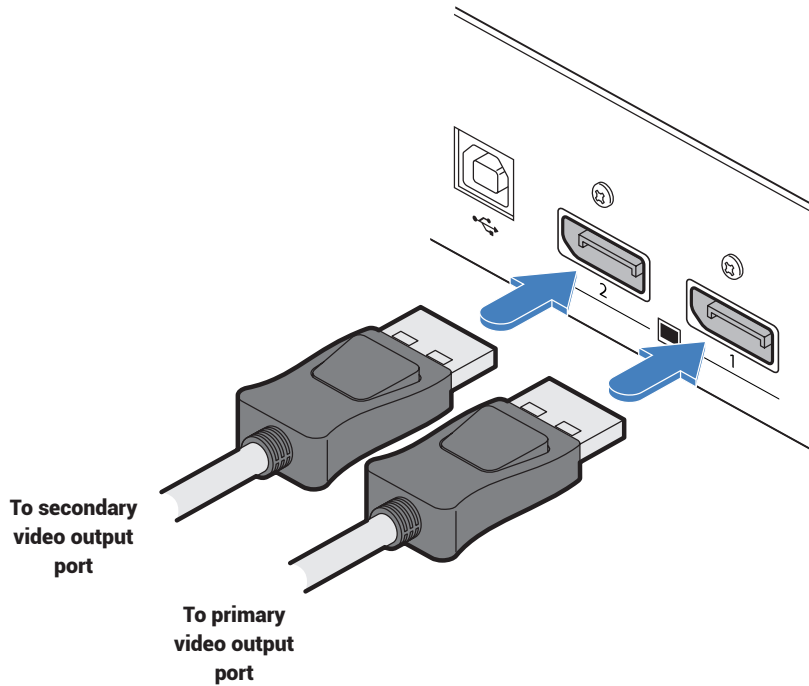


TRANSMITTER VIDEO LINK(S)

The transmitter supports a single DisplayPort™ connection at up to 2560x1600@60Hz or two connections, each up to 1920x1200@60Hz.

TO MAKE A VIDEO LINK

- 1 Connect your digital video link cable(s) to the DisplayPort socket(s) on the transmitter 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.

TRANSMITTER AUDIO LINKS

Audio is supported in the initial product release solely via the USB link with the host computer. In subsequent firmware updates further audio capabilities will be added.

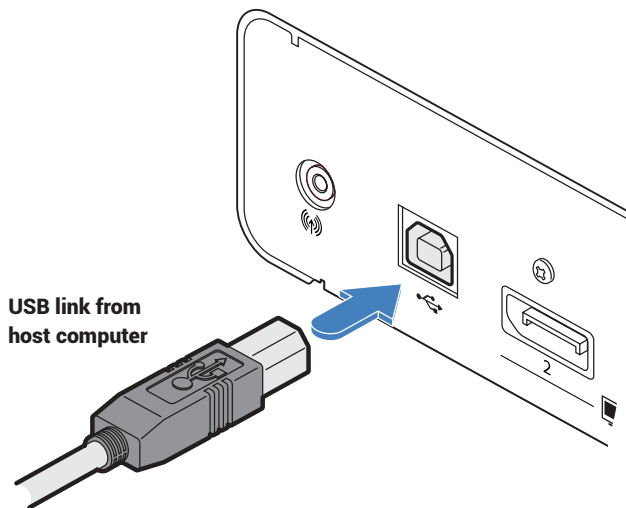
Conversion between the USB derived digital audio and the receiver compatible audio format audio is carried out at the transmitter.

TRANSMITTER USB LINKS

The transmitter has a USB type B socket on the rear panel to link with the host computer. Additionally, the unit also has a type A socket on the front panel to allow an optional USB-to-serial converter device to be attached.

TO MAKE A USB LINK

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



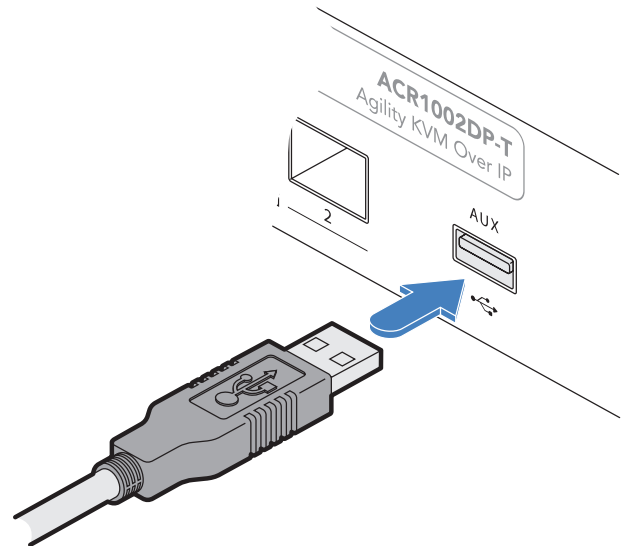
- 2 Connect the type A connector of the supplied cable to a vacant USB socket on the host computer.

RS232 SERIAL SUPPORT

To support RS232 serial connections, use third-party USB-to-serial adapters on both the transmitters and receivers.

TO ATTACH A USB-TO-SERIAL CONVERTER

- 1 If required, connect a USB-to-serial converter to the AUX port on the transmitter front panel.



- 2 Connect an accompanying USB-to-serial converter to a vacant USB socket on the receiver.

TRANSMITTER 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; follow the instructions shown on the right when disconnecting a power adapter.

TO CONNECT THE POWER ADAPTER

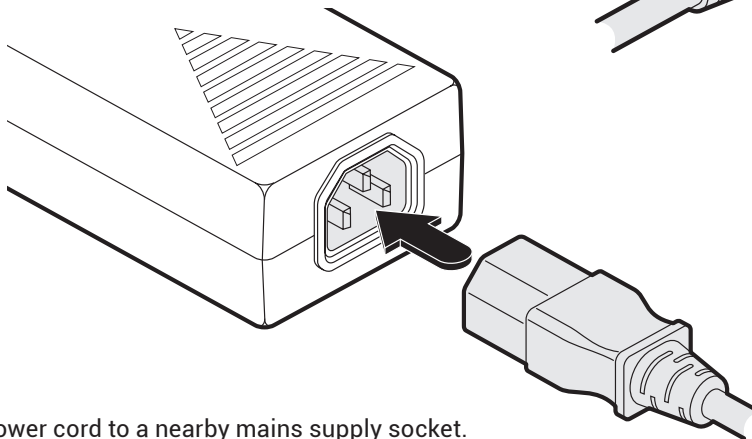
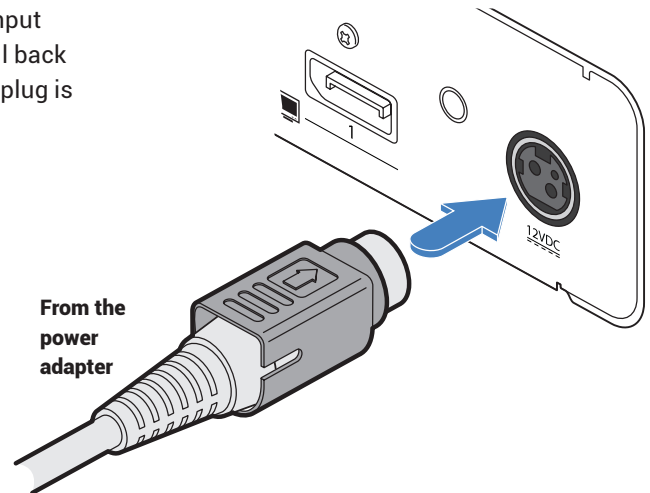
- 1 Attach the output plug of the supplied power adapter to the power input socket on the right side of the rear panel. As you insert the plug, pull back slightly on the outer body to assist the locking mechanism until the plug is fully inserted.

- 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.

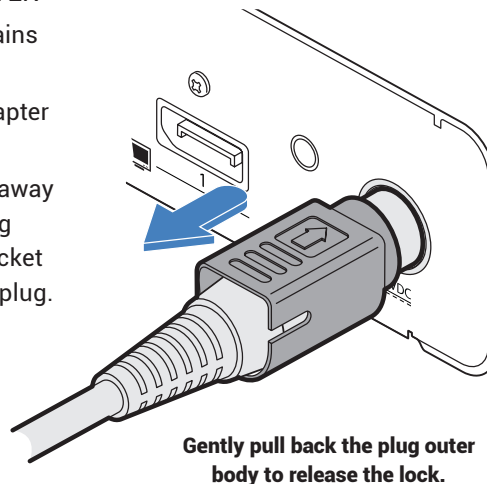
TO DISCONNECT THE POWER ADAPTER

- 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 supplied safety leaflet. In particular, do not use an unearthed power socket or extension cable.

Note: Both the modules 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 (104 degrees Fahrenheit). Do not place the products in contact with equipment whose surface temperature exceeds 40 degrees Centigrade (104 degrees Fahrenheit).



TRANSMITTER/RECEIVER HIGH SPEED LINKS

Agility units can be either connected directly to each other or via a high speed (up to 1GbE) network. Links can be made:

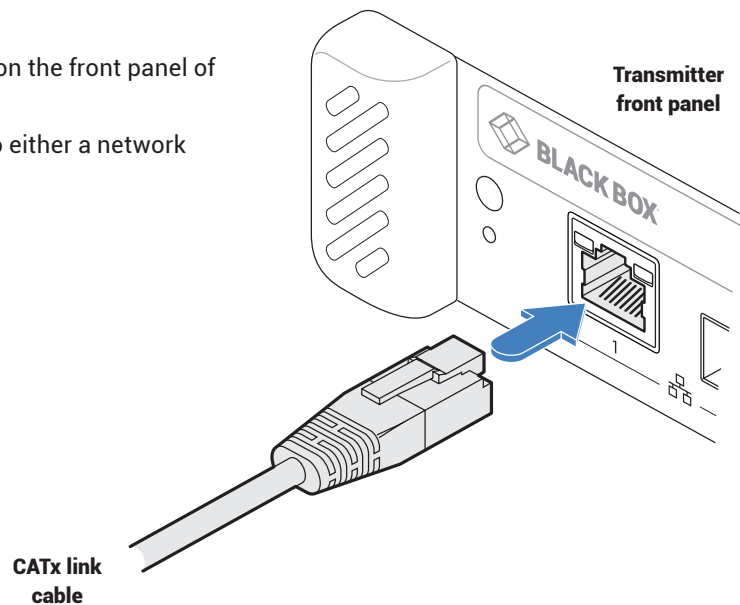
- Using the in-built CATx ports (see below),
- Using additional CATx connections within the SFP ports (see next page),
- Using the SFP ports with optional fiber (FCoE) modules (see page 16).
- Using the dual SFP ports with optional fiber (FCoE) modules on ACR1002FDP variants (see page 17).

TEAMING

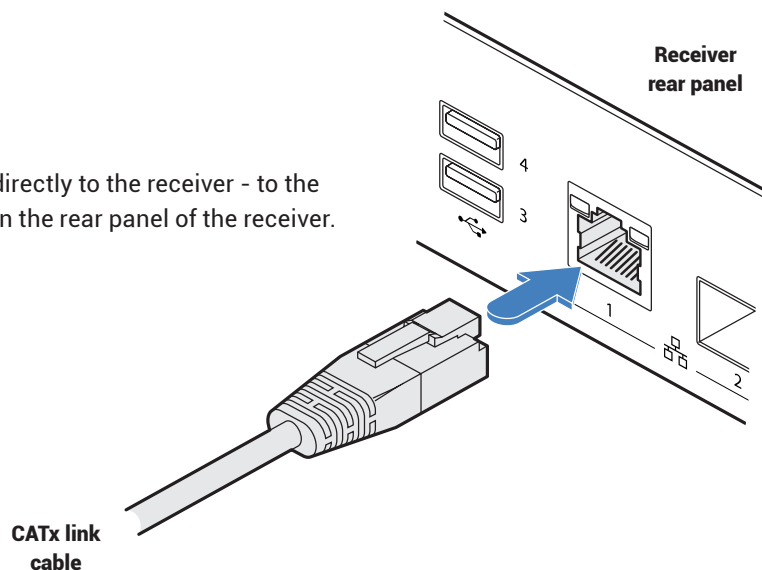
Agility units are ready to automatically invoke teaming whenever the CATx and SFP (with either CATx or fiber modules installed) ports are both used to link transmitters and receivers. Teaming potentially doubles the available bandwidth for video intensive applications and also provides redundancy in case one link is lost.

TO LINK USING THE IN-BUILT CATX PORT

- 1 Insert a suitable CATx cable into the RJ45 port on the front panel of the transmitter.
- 2 Connect the other end(s) of the CATx cable(s) to either a network switch or...

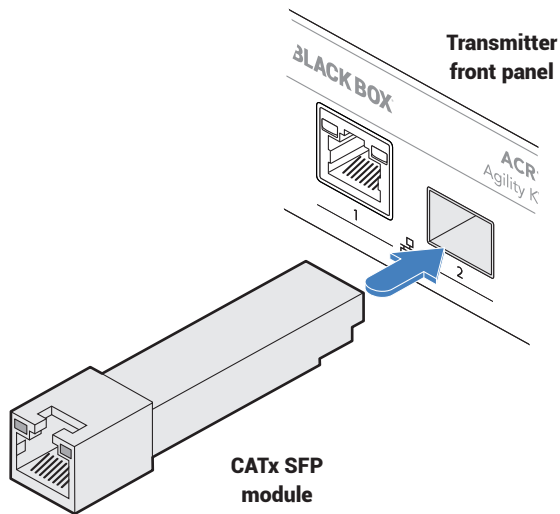


... connect directly to the receiver - to the RJ45 port on the rear panel of the receiver.

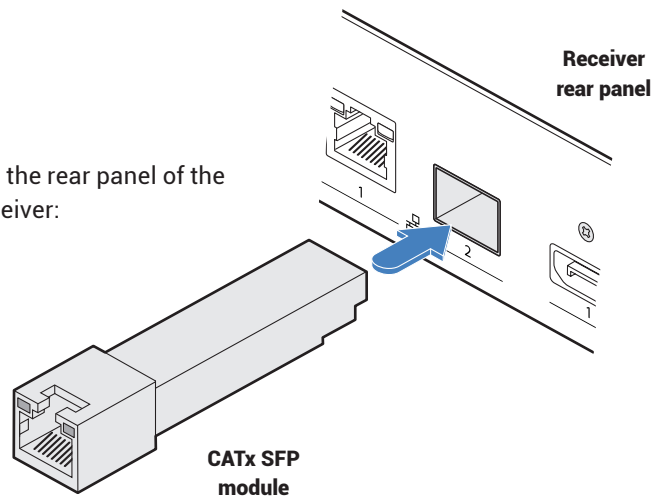


TO INSTALL ADDITIONAL CATX MODULES

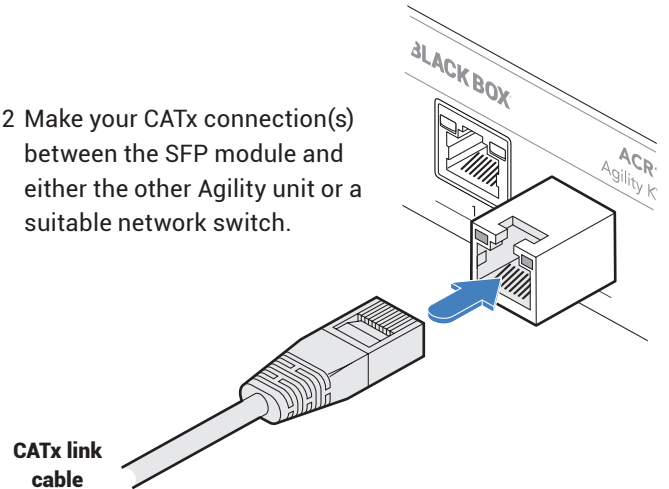
- 1 Insert the appropriate optional SFP module into socket 2 located on the front panel of the transmitter...



...and the rear panel of the receiver:

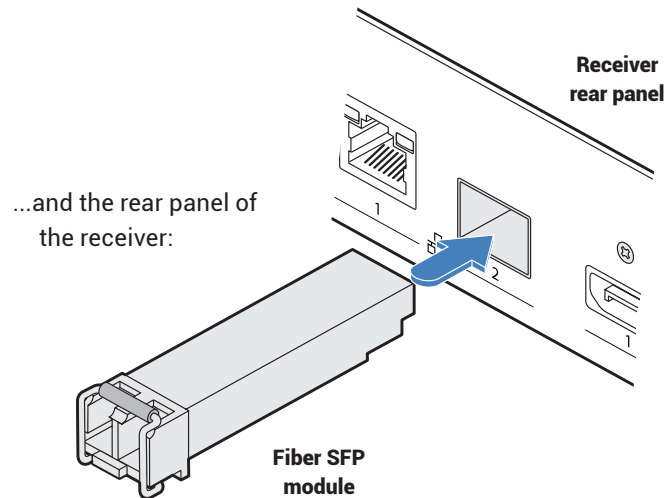
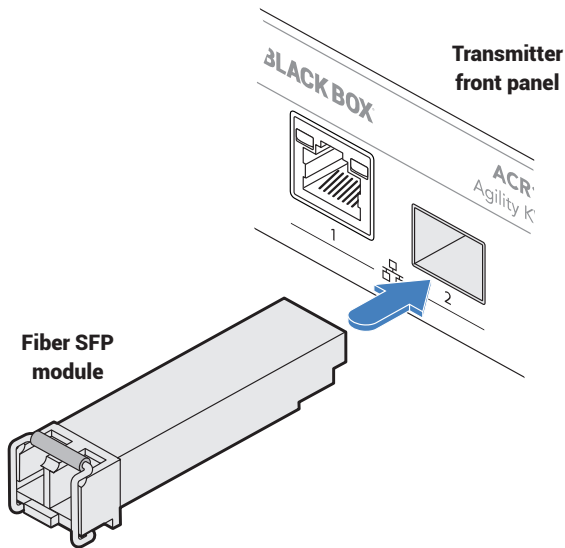


- 2 Make your CATx connection(s) between the SFP module and either the other Agility unit or a suitable network switch.



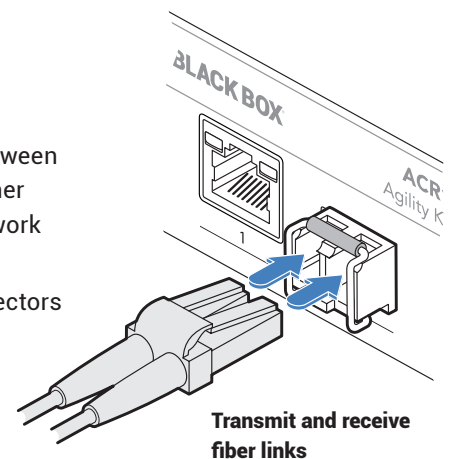
TO LINK AGILITY ACR1002DP UNITS VIA FIBER MODULES

1 Insert the appropriate optional SFP module into socket 2 located on the front panel of the transmitter...



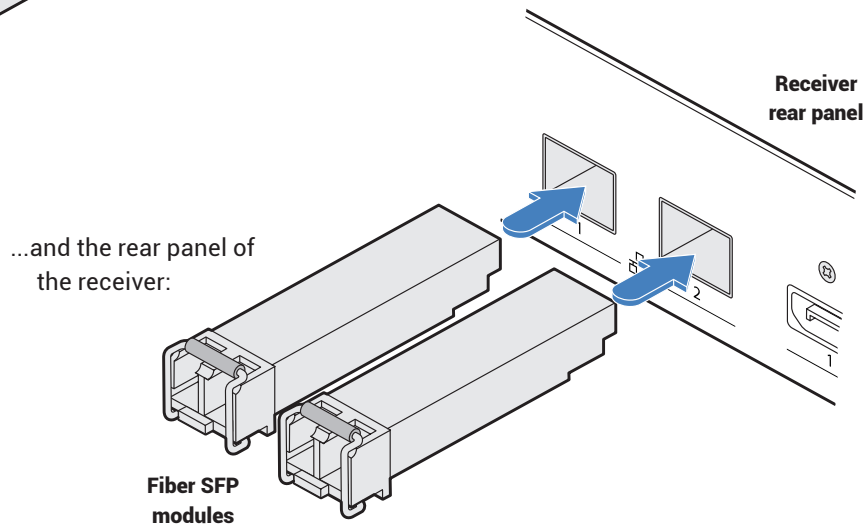
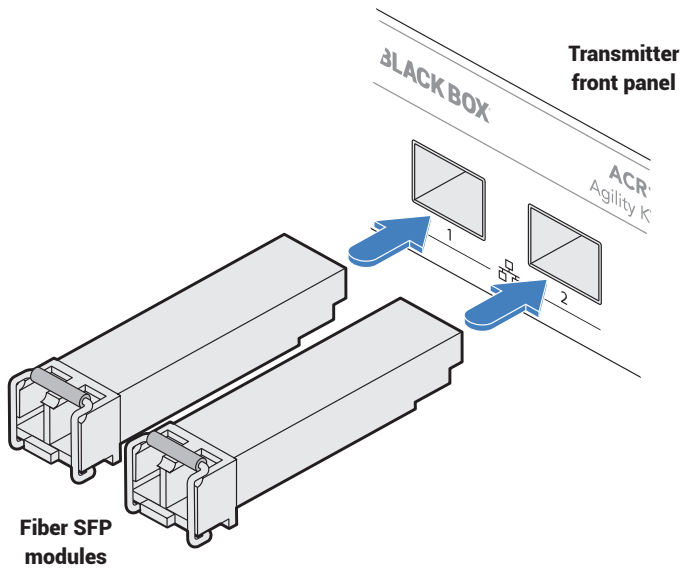
2 Make your fiber connection(s) between the SFP module and either the other Agility unit or a suitable fiber network switch.

3 Close the latch over the link connectors to lock them into place.

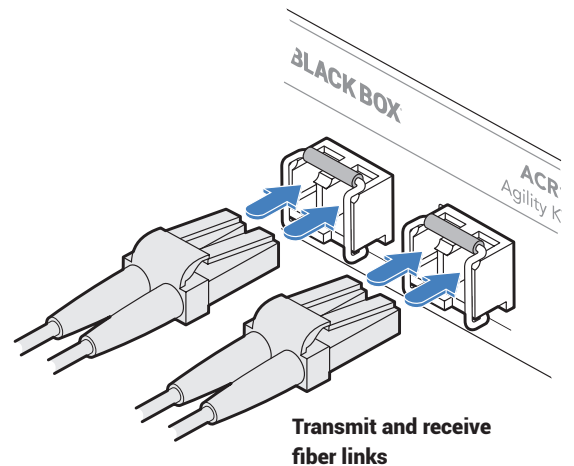


TO LINK AGILITY ACR1002FDP UNITS VIA FIBER MODULES

- 1 Insert the appropriate optional SFP modules into sockets 1 and 2 located on the front panel of the transmitter...



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

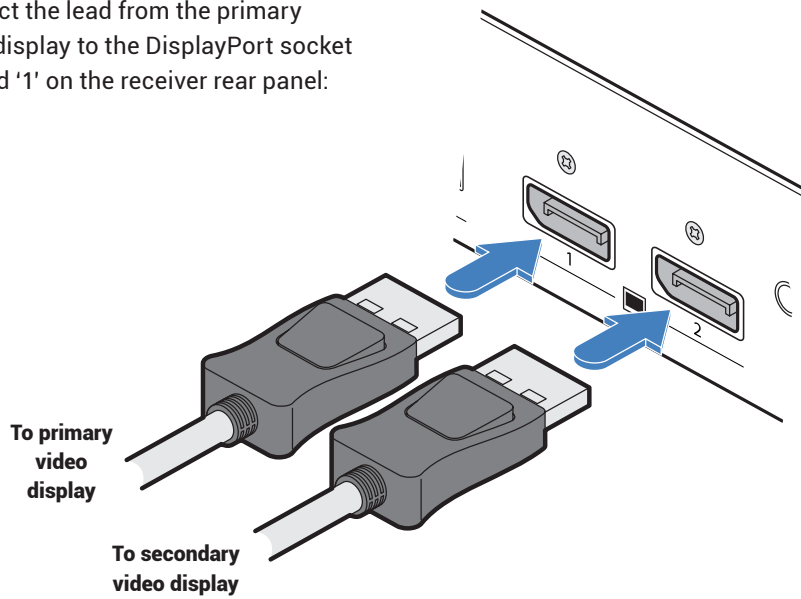


RECEIVER VIDEO DISPLAYS

The receiver supports a single DisplayPort™ connection at up to 2560x1600@60Hz or two connections, each up to 1920x1200@60Hz.

TO CONNECT VIDEO DISPLAYS

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




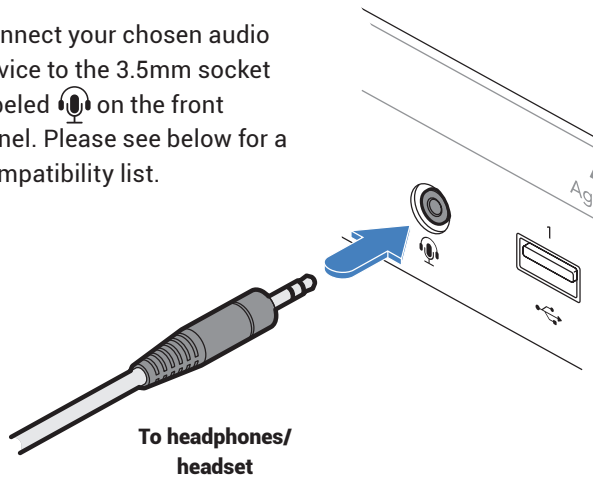
- 2 If required, connect the lead from the second video display to the DisplayPort socket marked '2' on the receiver rear panel.

RECEIVER AUDIO DEVICES

The receiver can support headphones and a mono microphone via its front panel jack socket. On the rear panel a line out jack socket can be used to drive powered speakers. A USB link must be made between the transmitter and the host computer for audio to operate.

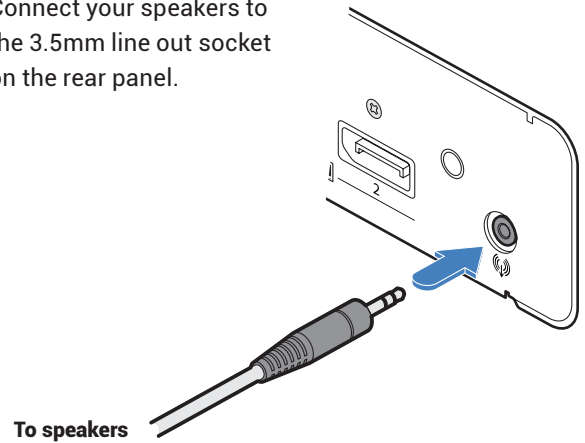
TO CONNECT HEADPHONES AND/OR HEADSETS

- 1 Connect your chosen audio device to the 3.5mm socket labeled  on the front panel. Please see below for a compatibility list.









TO CONNECT AMPLIFIED SPEAKERS

- 1 Connect your speakers to the 3.5mm line out socket on the rear panel.



HEADPHONE, HEADSET AND MICROPHONE SUPPORT

The combined jack socket can accommodate any standard stereo headphones; it can also support headsets which conform to the CTIA/AHJ standard. The lesser-used OMTP standard is not directly supported as its microphone and ground connections are swapped. If used, the audio may be distorted and/or the mic will not operate. Suitable OMTP to CTIA/AHJ converters are available.

	CTIA/AHJ standard	OMTP standard
	Audio left	Audio left
	Audio right	Audio right
	Ground	Microphone
	Microphone	Ground
TRRS	 Supported	 Not supported

SUPPORTED DEVICES

All standard headphones and some headsets are directly supported, others require a suitable converter. It can be difficult to distinguish different headset standards, however, some (but not all) CTIA/AHJ devices use white dividers on their jack plugs.

SUPPORTED

- Stereo headphones - Yes
- Mono microphone – Supported when used with an adapter
- CTIA/AHJ-compliant headset with mic - Yes
- CTIA/AHJ-compliant adapter with mic and headphones plugged in - Yes

NOT SUPPORTED

- OMTP-compliant headset with mic – Not supported directly
- OMTP-compliant adapter with headset plugged in – Not supported directly

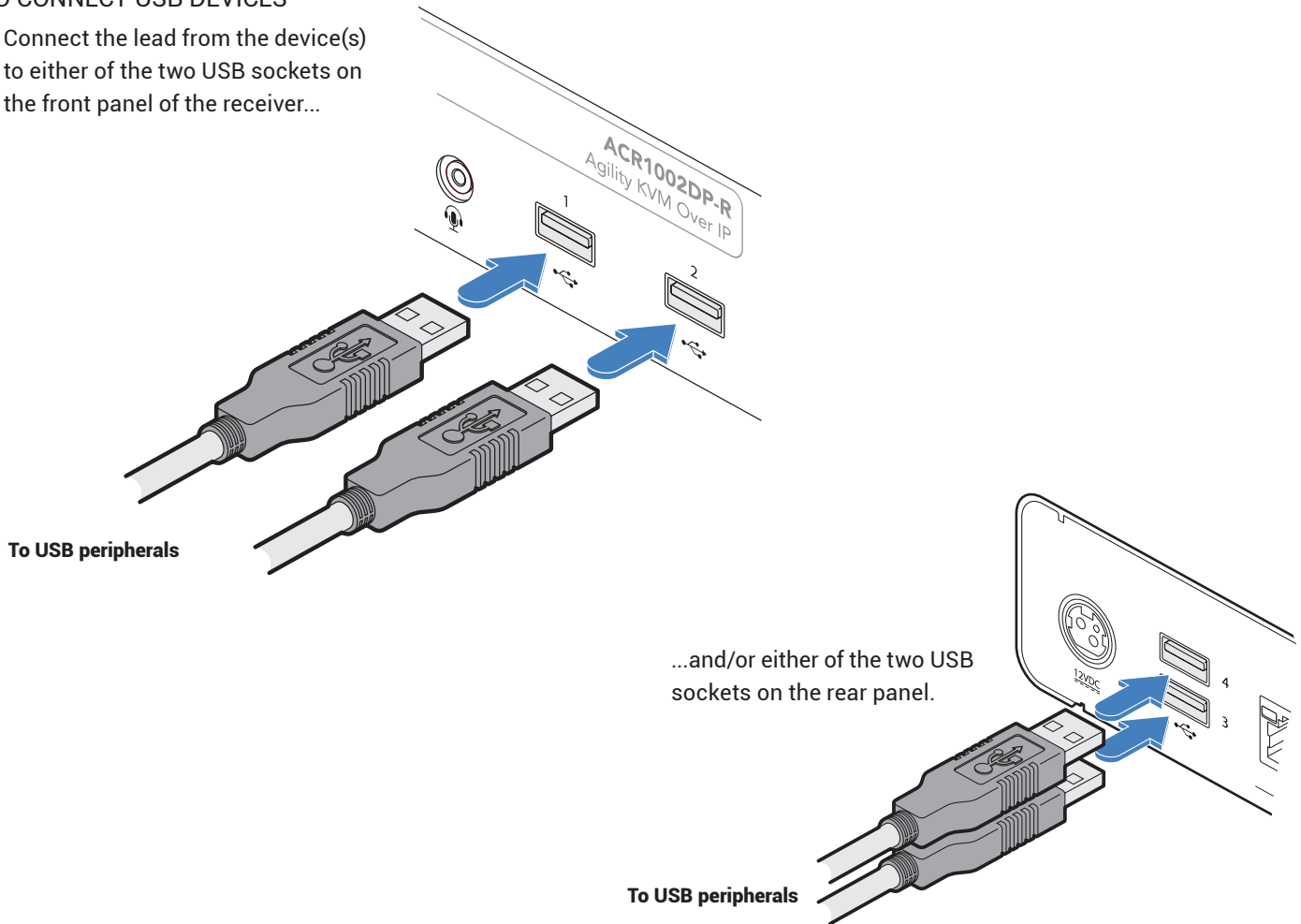
RECEIVER USB DEVICES

The receiver has two USB ports on the front panel to which peripherals may be connected.

To connect more than two peripherals, a USB hub 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(s) to either of the two USB sockets on the front panel of the receiver...



RS232 SERIAL SUPPORT

To support RS232 serial connections, use third-party USB-to-serial adapters on both the transmitter and receiver.

RECEIVER 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; follow the instructions shown on the right when disconnecting a power adapter.

TO CONNECT THE POWER ADAPTER

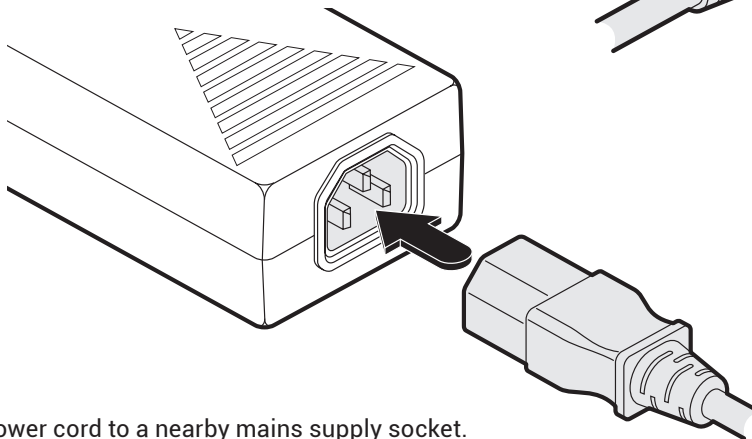
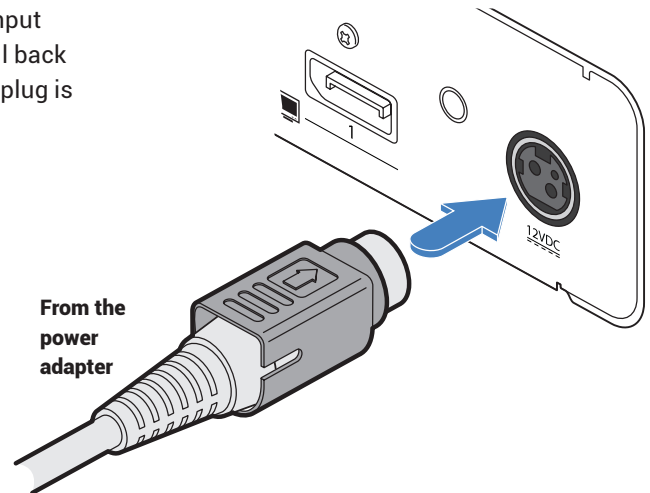
1 Attach the output plug of the supplied power adapter to the power input socket on the right side of the rear panel. As you insert the plug, pull back slightly on the outer body to assist the locking mechanism until the plug is fully inserted.

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.

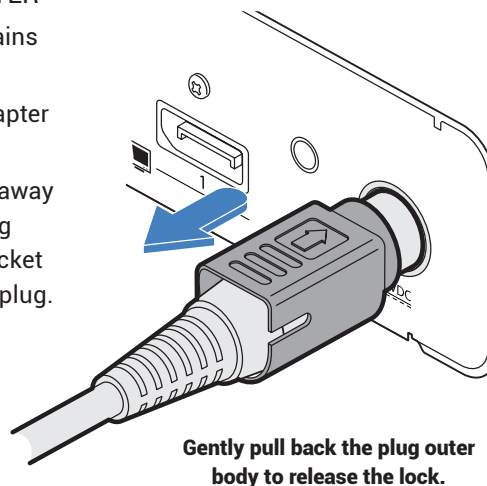
TO DISCONNECT THE POWER ADAPTER

- 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 supplied safety leaflet. In particular, do not use an unearthed power socket or extension cable.

Note: Both the modules 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 (104 degrees Fahrenheit). Do not place the products in contact with equipment whose surface temperature exceeds 40 degrees Centigrade (104 degrees Fahrenheit).



CHAPTER 4: CONFIGURATION

AGILITY CONFIGURATION VIA WEB PAGES

Each Agility 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 Agility unit to access the web pages. Additionally, on the console attached to the receiver, 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 30.

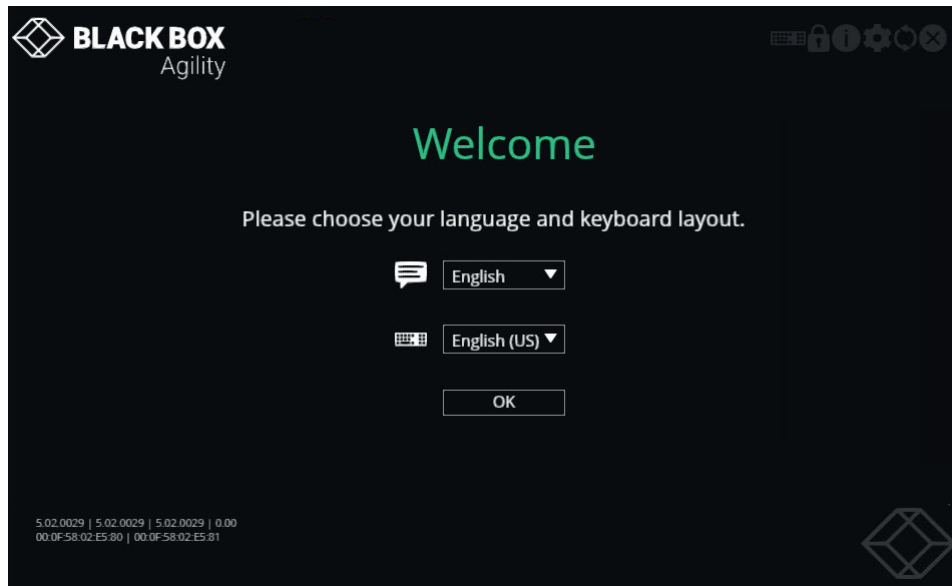
TO MANUALLY CONFIGURE AGILITY UNITS VIA THEIR WEB PAGES

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

The default addresses (if using port 1) are: **Transmitter:** https://169.254.1.33
Receiver: https://169.254.1.32

The default addresses (if using port 2) are: **Transmitter:** https://169.254.1.43
Receiver: https://169.254.1.42

The opening page should be displayed:



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

START OF LIFE: IPATH OR POINT TO POINT CONFIGURATION

To streamline initial configuration processes, all Agility ACR1002DP 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 Agility ACR1002DP unit boots, its SoL procedure will guide it to automatically determine which of two modes it should adopt:

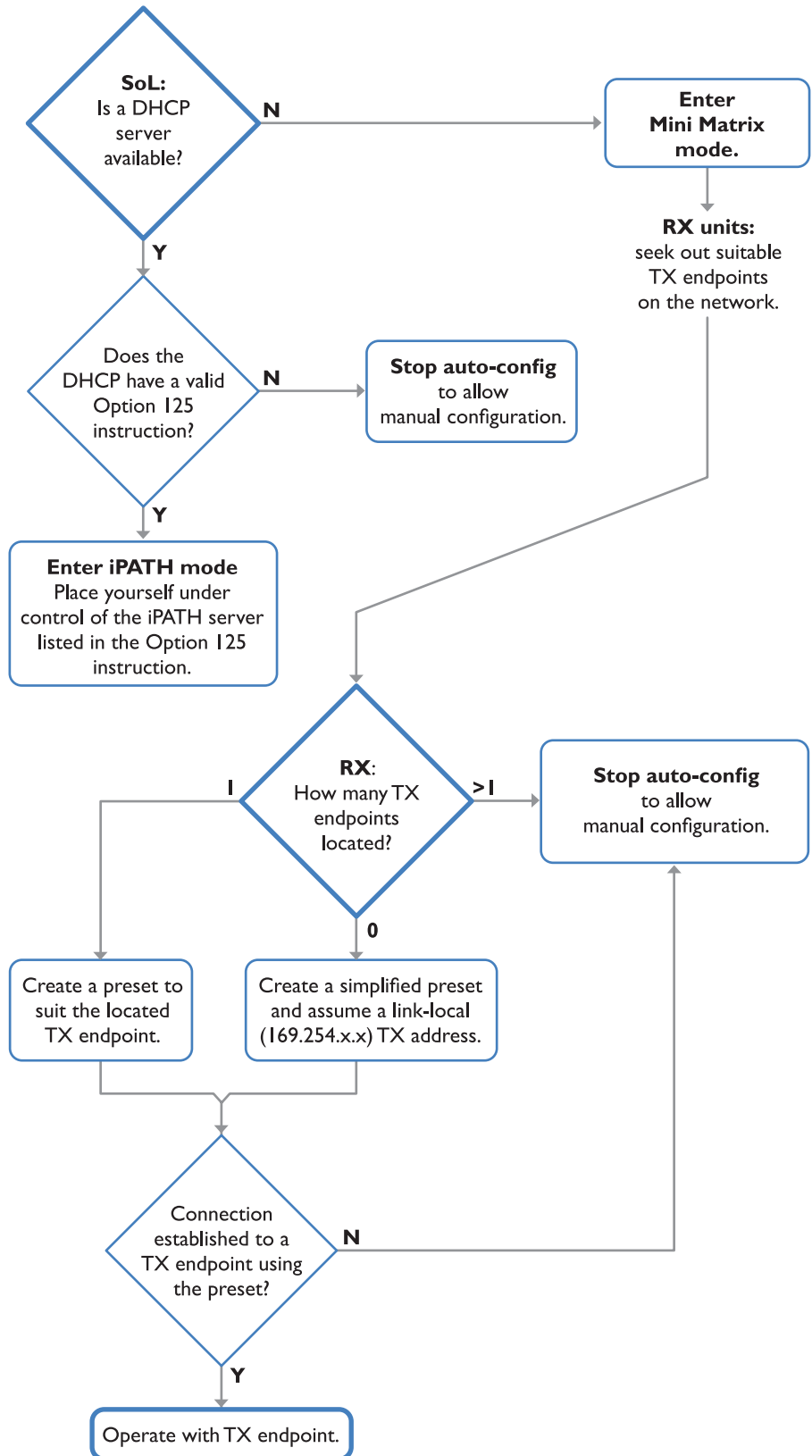
- **iPATH mode** - place itself into the control of a specific iPATH server on the network, whereupon the Agility unit will be assigned suitable configuration details to fit within the network of similar units.
- **Mini Matrix (P2P) mode** - place itself into Mini Matrix (Point to Point) mode to allow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

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

Note: If an iPATH server is present on the network then the modules don't have to be within SoL procedure for it to be placed under iPATH control.

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

Note: When the modules enter Mini Matrix mode, you can cancel auto-SoL at any point by pressing Ctrl-Alt-C.



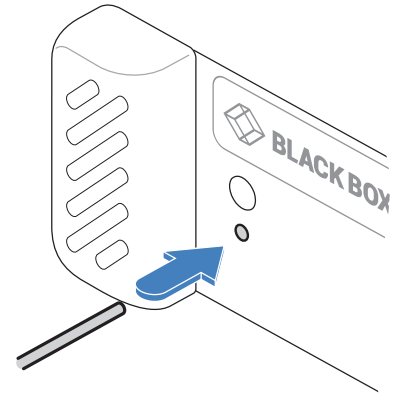
PERFORMING A MANUAL FACTORY RESET

A factory reset returns Agility unit to its default configuration.

TO PERFORM A MANUAL FACTORY RESET

- 1 Power on the Agility 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 time (less than ten seconds) and then back to **blue** while Agility 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.

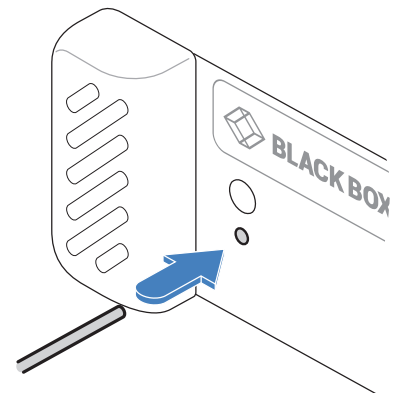


PLACING THE DEVICE INTO RECOVERY MODE

Recovery mode may allow an Agility 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 Agility 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 time (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.*

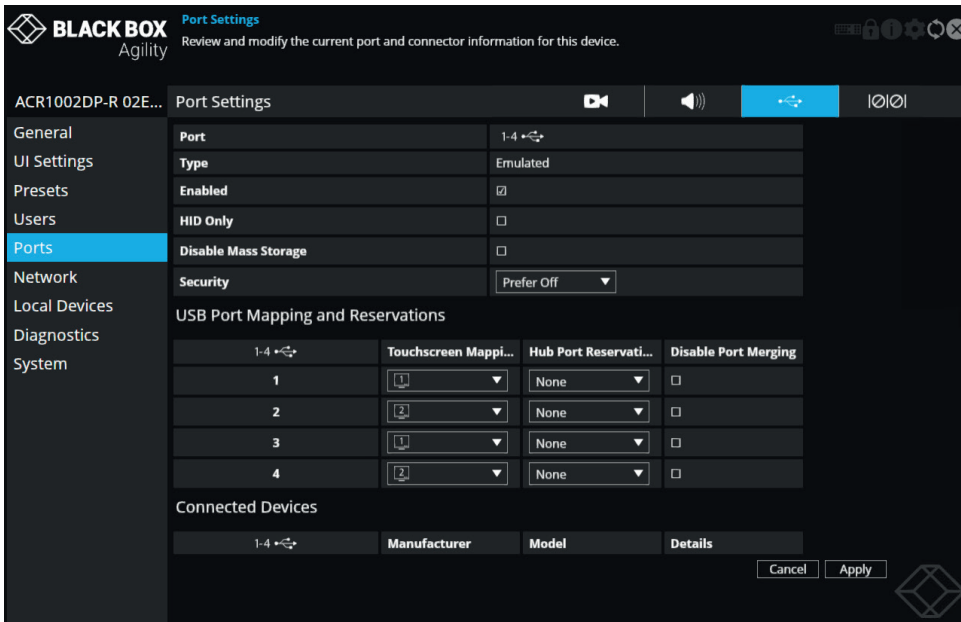


CONFIGURING DUAL TOUCHSCREENS

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

TO ATTRIBUTE DUAL TOUCHSCREENS

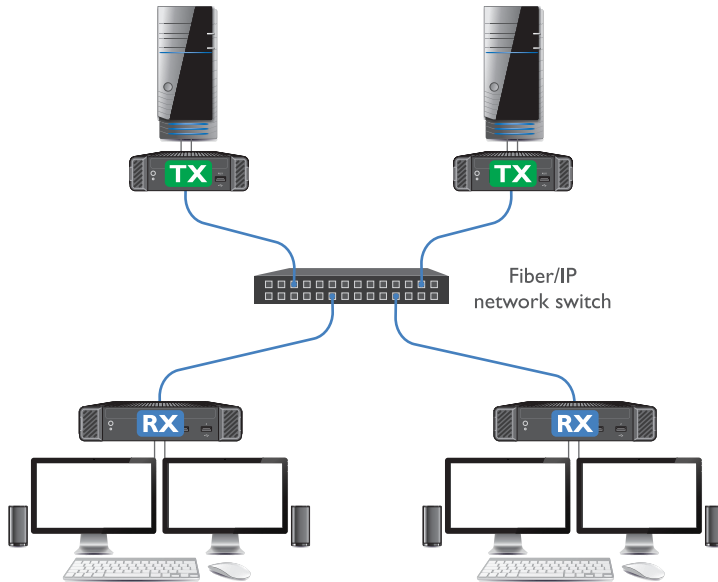
- 1 Access the Configuration pages on the receiver - see page 30.
- 2 Click the Ports entry from the list of pages on the left side.
- 3 Click the USB page icon:  to display the following:



- 4 In the USB Port Mapping and Reservations section, match the primary touchscreen to the port number (1-4) 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 Agility units are most often organised and managed by a central iPATH server, it is possible to create small networks of Agility units, most often in matrix arrangements, i.e., multiple transmitters and receivers which can freely cross-connect.



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

TO CREATE AN UNMANAGED MATRIX

1 Connect Agility transmitters and receivers (with their various hosts and peripherals) to a suitable switch, as described in the Installation section - see page 10.

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

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

2 Access the Configuration pages - see page 30.

3 Click the Transmitters option from the list on the left side. This page will list all of the available transmitters which are not under iPATH control. See page 41.

4 Click the Presets option from the list on the left side. Use this page to add each transmitter to the list of presets for the receiver that you are editing. See page 35.


TO USE THE MATRIX

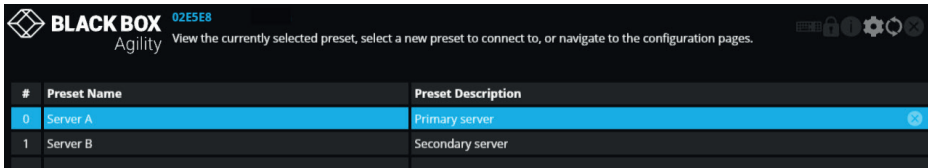
- On each receiver, use the OSD to access the required transmitters in the usual manner. See page 30.

CREATING AND EDITING PRESETS




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

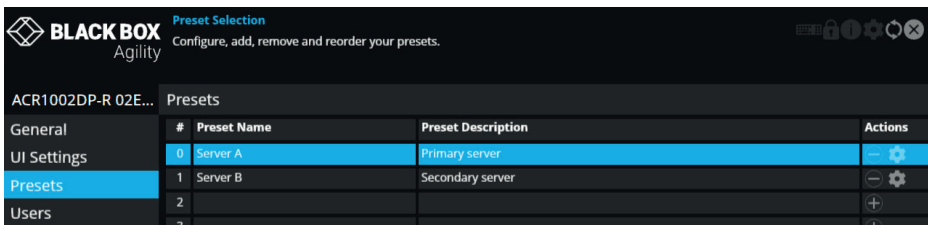
TO ACCESS THE PRESET CONFIGURATION PAGE

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




Note: The number on the left corresponds to the hotkey sequence that will connect to that channel, e.g., press Ctrl-Alt-4 to connect to the 4th preset.


- 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:

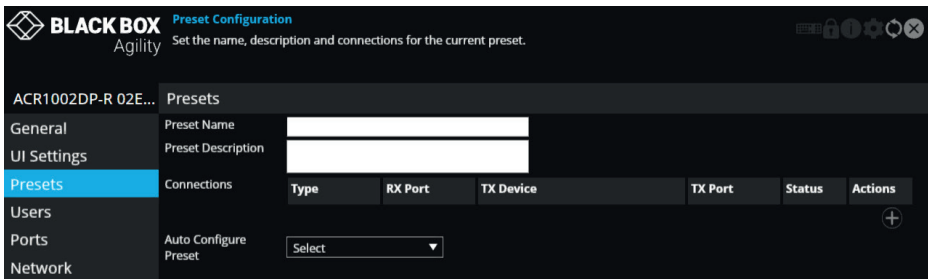


TO REMOVE A PRESET

- 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 of a vacant preset entry to display the configuration page:



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

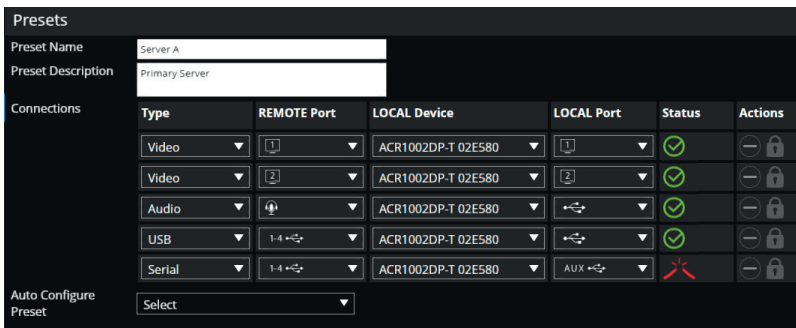
continued

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 Agility transmitter that you wish to connect with. All of the required 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 module is shown in the TX Device column. Click and change this entry, if required.
 - 3 In the Type column, click the Select option 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 on the previous page.
- 2 Click and drag a preset to the required position within the list.

For more information about the options and status indications, see page 35.

CHAPTER 5: OPERATION

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

INDICATORS

The front and rear panels of each Agility unit feature an indicator capable of producing numerous color and flash patterns to provide a useful guide to operation. The dual indicators provide the same color and flash patterns.

INDICATOR COLOR AND FLASH PATTERNS

The front and rear panel indicators use 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 Agility unit).
Red	Booting before processor loaded or failed.
Red rapid flash	A critical error has been detected that is preventing the device from being used (a malfunction message will also be displayed within the OSD.)
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

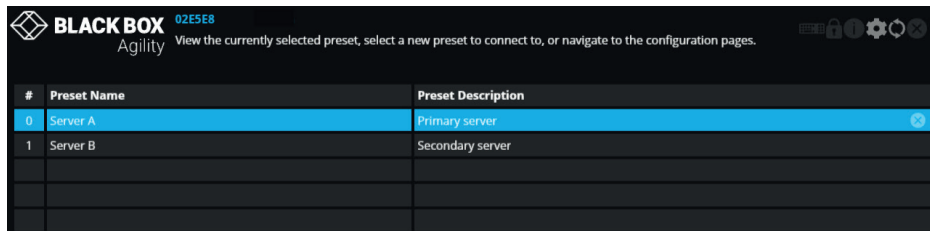
The OSD provides a quick and easy way to access Agility transmitters as well as configuration details.


TO ACCESS THE OSD

1 On the console of your Agility receiver, either:


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

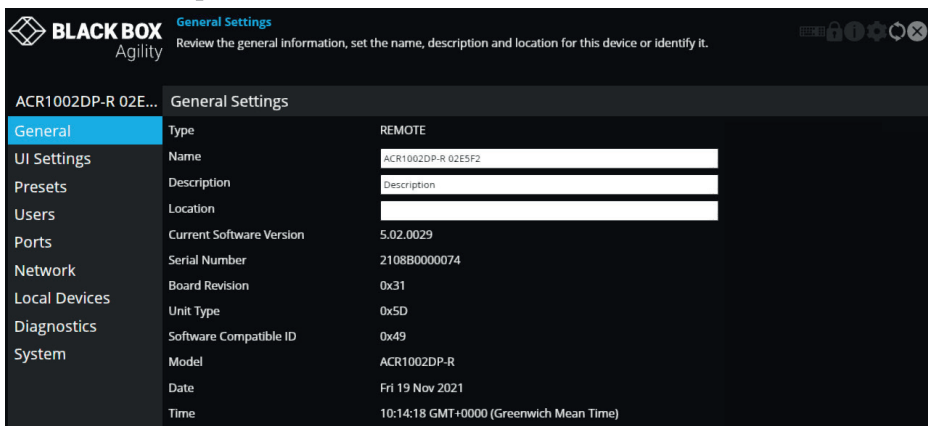
2 The Preset Selection page will be displayed:



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

3 On the preset page, either

- Click/tap a preset entry to connect with the required transmitter,
- 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 EXIT THE OSD

1 Either press the Esc key or tap the  icon in the top right corner.

CHAPTER 6: FURTHER INFORMATION

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

- Getting assistance - see right
- [Appendix A](#) - Configuration pages
- [Appendix B](#) - Tips for success when networking Agility units
- [Appendix C](#) - Troubleshooting
- [Appendix D](#) - Glossary
- [Appendix E](#) - Fiber/copper modules and cables
- [Appendix F](#) - Using the optional Agility rack shelves
- [Appendix G](#) - Open source licenses




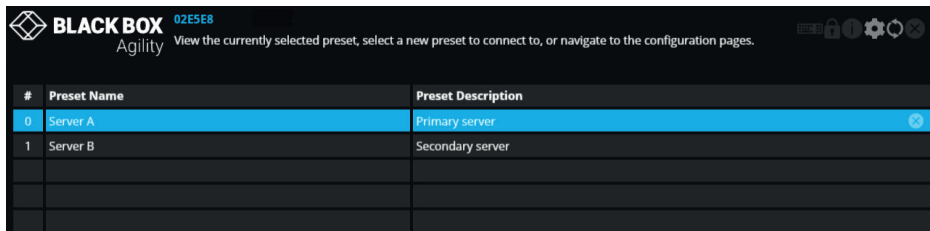
APPENDIX A - CONFIGURATION PAGES


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

- [Receiver - General Information](#)
- [Receiver - UI Settings](#)
- [Receiver - Presets](#)
- [Receiver - Users](#)
- [Receiver - Ports](#)
- [Receiver - Network](#)
- [Receiver - Local Devices](#)
- [Receiver - Diagnostics and Statistics](#)
- [Receiver - System](#)
- [Transmitter - General Information](#)
- [Transmitter - UI Settings](#)
- [Transmitter - Users](#)
- [Transmitter - Ports](#)
- [Transmitter - Network](#)
- [Transmitter - Diagnostics and Statistics](#)
- [Transmitter - System](#)


TO ACCESS THE OSD

- 1 On the console of your Agility receiver, 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 transmitter,
 - 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 30.
- 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.


TO EXIT THE OSD


- 1 Either press the Esc key or tap the  icon in the top right corner.

RECEIVER - GENERAL INFORMATION

To get here

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

1 On the console keyboard attached to the receiver, 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

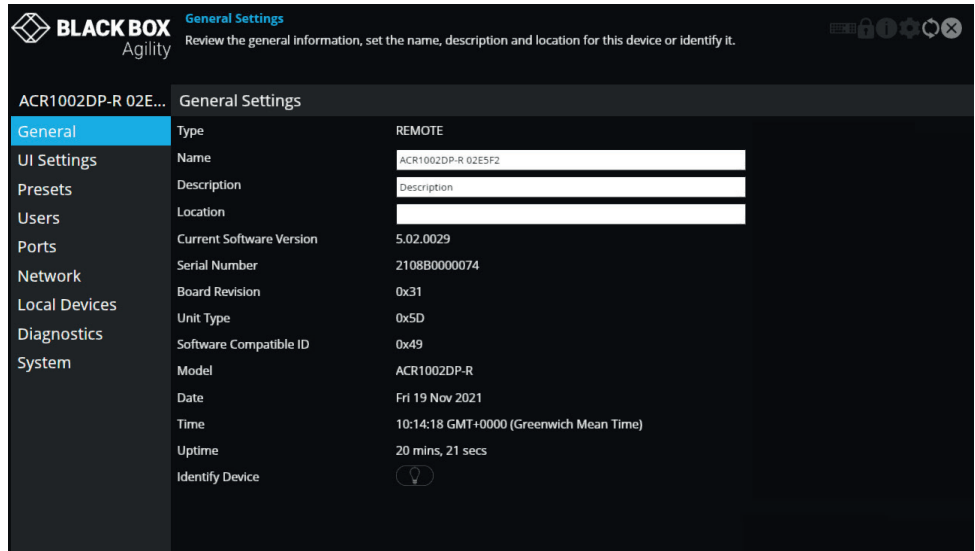
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

4 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 iPATH server control.

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

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

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.

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).

RECEIVER - UI SETTINGS

To get here

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

1 On the console keyboard attached to the receiver, 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 **UI Settings** link.

OR

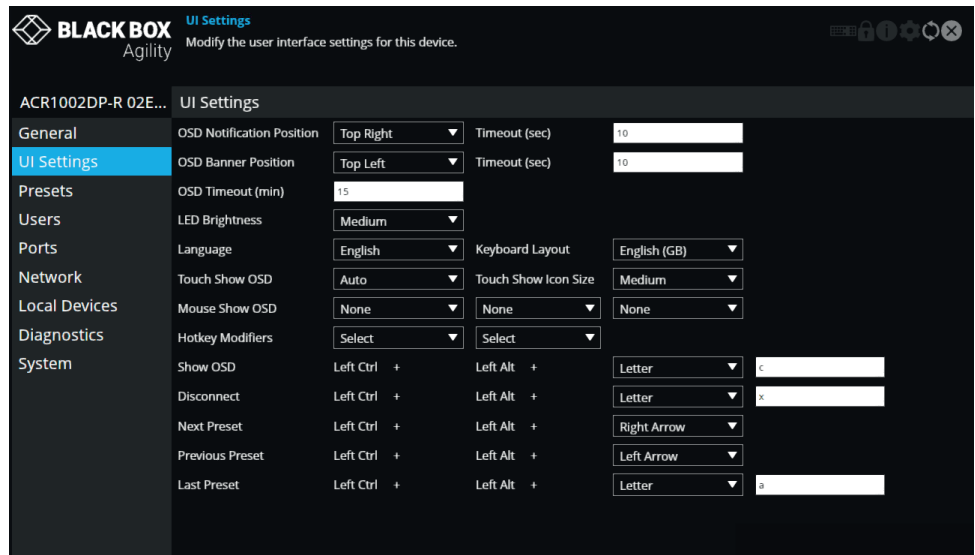
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

4 If necessary, 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 persistence of the OSD if no interaction has taken place.

LED brightness - Determines the brightness of the front and rear panel LED indicators.

The following entries are also displayed when the unit is not under iPATH 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 iPATH server control.


* These entries are all visible but are not configurable under iPATH control.

RECEIVER - PRESETS

To get here

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

1 On the console keyboard attached to the receiver, 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.

OR

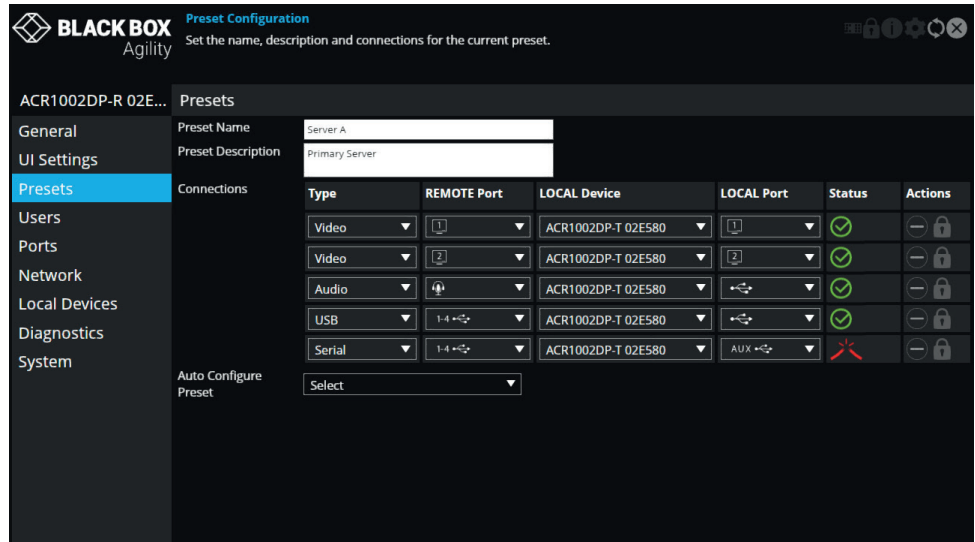
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.


4 If necessary, click the **Presets** link.





Preset Information

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

Each row details one type of connection which has been made. It lists the output port on the receiver and the source port from the transmitter 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 transmitter.


Audio


Agility units support audio connections from the host PC via the USB connection (which is converted at the transmitter). The only option given will be , which represents the combined analog audio port on the front panel.


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 output device available on the port for this connection (e.g., 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).

RECEIVER - USERS

To get here

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

1 On the console keyboard attached to the receiver, 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 **Users** link.

OR

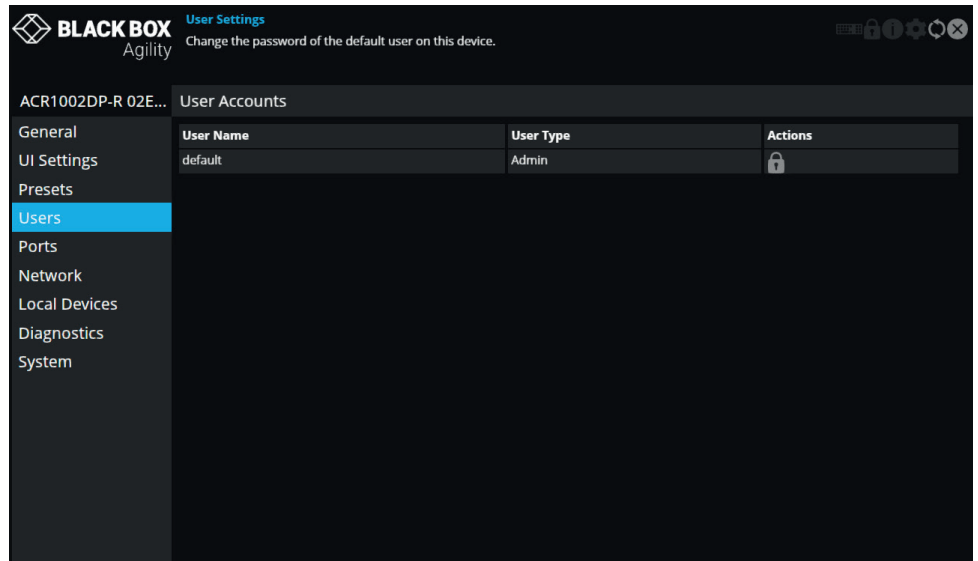
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

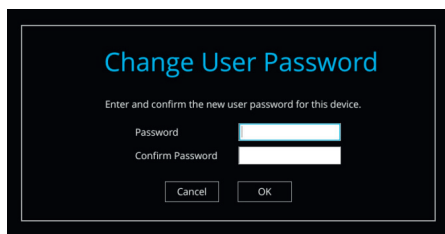
4 If necessary, click the **Users** link.



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.

RECEIVER - PORTS

To get here

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

1 On the console keyboard attached to the receiver, 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 **Ports** link.

OR

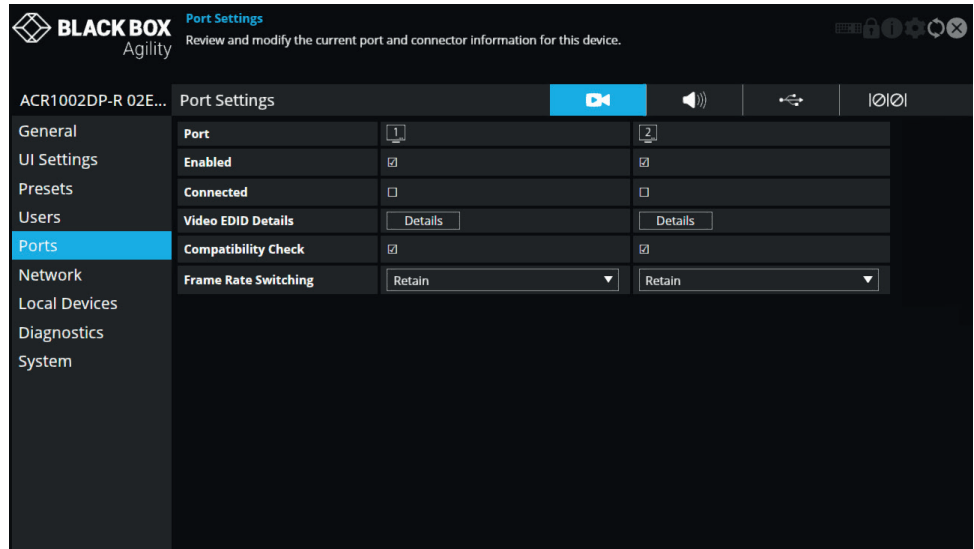
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

4 If necessary, click the **Ports** link.



Video Ports

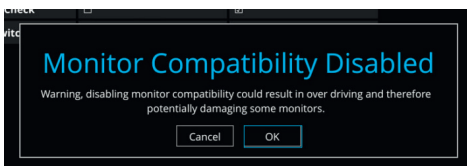
This page provides basic information about the two video ports located on the receiver.

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, colourimetry 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, bpc, 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:



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 iPATH 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 receiver.

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 - DisplayPort audio functionality will be added in future firmware updates.

Compatibility Check - DisplayPort audio functionality will be added in future firmware updates.



USB Ports

This page provides basic information about the USB ports numbered 1 to 4 inclusive, located on the receiver.

Type - Identifies the type of USB ports. All are listed as Emulated.

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

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

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 receiver.

Port - Indicates that an optional USB-to-serial converter may be connected to ports 1 - 4 of the receiver (a similar device needs to also be connected to the AUX port on the transmitter).


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




RECEIVER - NETWORK

To get here

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

1 On the console keyboard attached to the receiver, 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 **Network** link.

OR

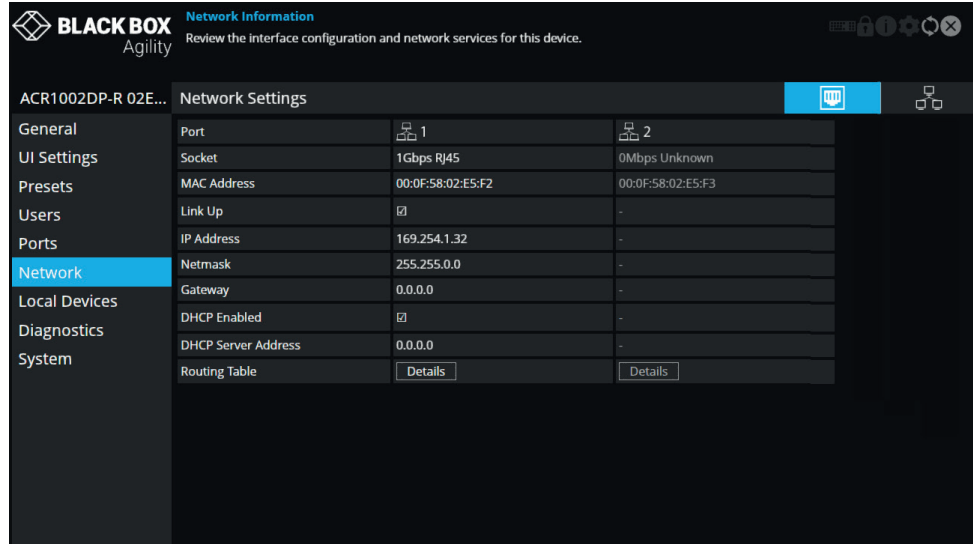
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

4 If necessary, click the **Network** link.



General	Port	1	2
UI Settings	Socket	1Gbps RJ45	0Mbps Unknown
Presets	MAC Address	00:0F:58:02:E5:F2	00:0F:58:02:E5:F3
Users	Link Up	<input checked="" type="checkbox"/>	-
Ports	IP Address	169.254.1.32	-
Network	Netmask	255.255.0.0	-
Local Devices	Gateway	0.0.0.0	-
Diagnostics	DHCP Enabled	<input checked="" type="checkbox"/>	-
System	DHCP Server Address	0.0.0.0	-
	Routing Table	Details	Details



Port Settings

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

Socket - Details each operational network socket and what connection speeds they have established. Socket 2 is determined by the SFP modules plugged into it.

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 - The IP address of this network interface. This is not configurable, the device can function in a network zero-config state which does not require the setting of a static IP address.

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

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.



Destination	Gateway	Netmask
169.254.0.0	0.0.0.0	255.255.0.0



Network Information

Default Domain - Reserved for future use.

Independent Networks - When ticked, the Agility 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 Agility receivers link with Agility transmitters due to their use of auto discovery. However, when an Agility receiver links with other dual port Agility transmitters, 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.

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

Dynamic iPATH Servers - Lists iPATH server addresses obtained via DHCP.


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




RECEIVER - LOCAL DEVICES

To get here

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

1 On the console keyboard attached to the receiver, 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 **Local Devices** link.

OR

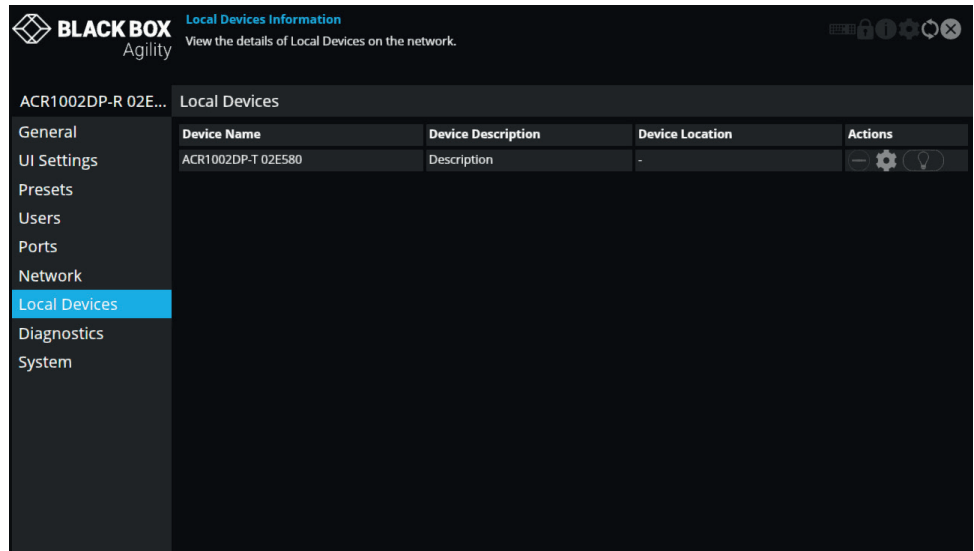
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.



4 If necessary, click the **Local Devices** link.



Local Devices

This page lists the available transmitters on the network which aren't under iPATH control - *Note: Older Agility units are generally not discoverable using this process, however, if the Start of Life process was able to connect point-to-point to an ACR1002DP 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 transmitter. When clicked, you will be directed to the General page for the chosen transmitter.
- Click  to flash the front panel indicators on the transmitter to assist with identification.
- Click the X button in the top right corner to return to return to the receiver pages.

RECEIVER - DIAGNOSTICS AND STATISTICS

To get here

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

1 On the console keyboard attached to the receiver, 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 **Diagnostics** link.

OR

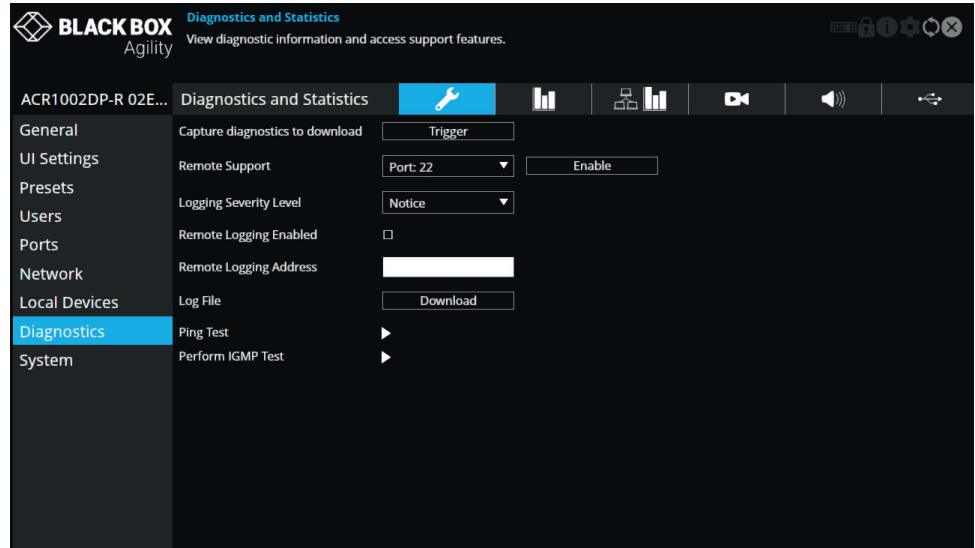
1 Connect a computer to the same network as the receiver.

2 Run a web browser and enter the IP address of the receiver:

https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

4 If necessary, click the **Diagnostics** link.



Log Settings

This page provides numerous key diagnostic log settings.

Capture diagnostics to download - 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 1-4. *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 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; Agility 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.

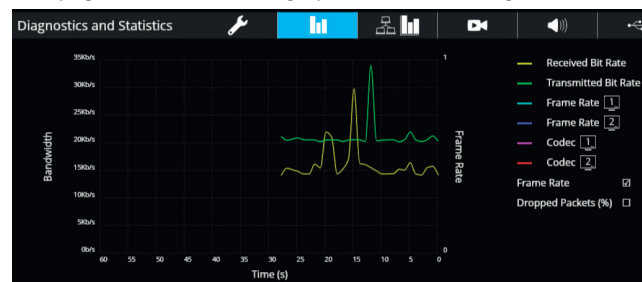
Ping Test - Allows you to conduct a ping test to any selected address or device.

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

Not yet implemented.


RECEIVER - SYSTEM

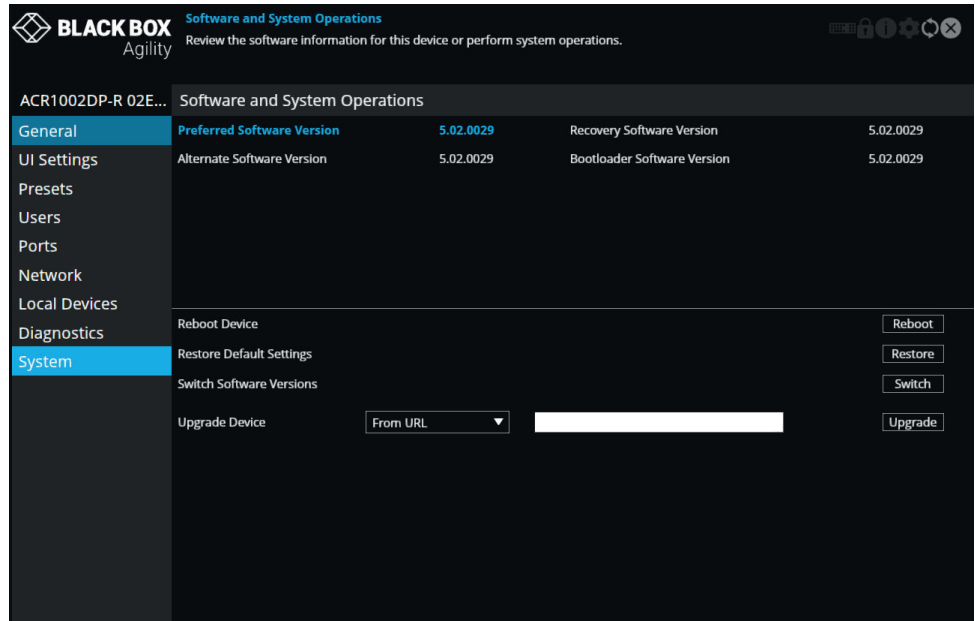
To get here

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

- 1 On the console keyboard attached to the receiver, 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 **System** link.

OR

- 1 Connect a computer to the same network as the receiver.
- 2 Run a web browser and enter the IP address of the receiver:
https://169.254.1.32 (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.42** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 If necessary, click the **System** link.



ACR1002DP-R 02E... Software and System Operations

General	Preferred Software Version	5.02.0029	Recovery Software Version	5.02.0029
UI Settings	Alternate Software Version	5.02.0029	Bootloader Software Version	5.02.0029

Presets
Users
Ports
Network
Local Devices
Diagnostics
System

Reboot Device

Restore Default Settings

Switch Software Versions

Upgrade Device

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.

TRANSMITTER - GENERAL INFORMATION


To get here

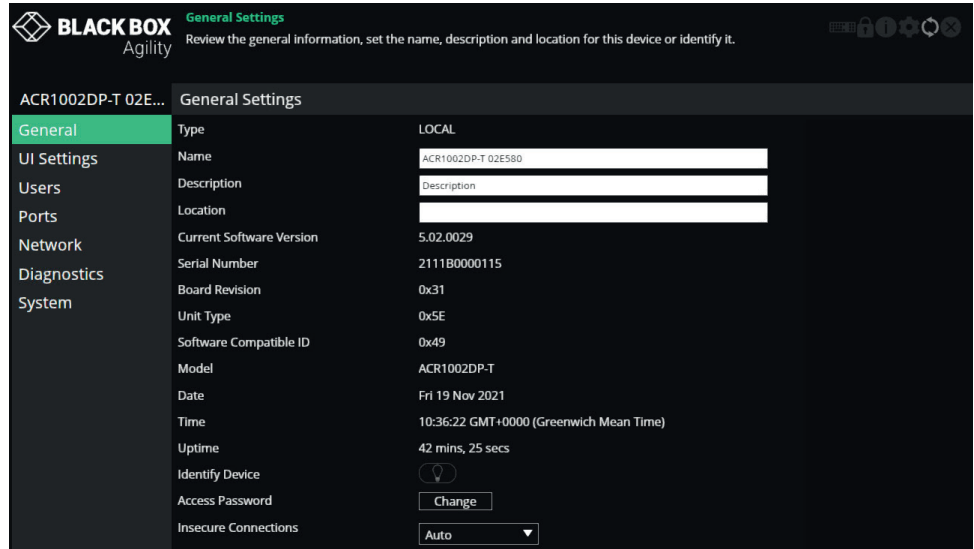
You can access this page in two ways, however, the first method is not available if the module is under iPATH control:

- 1 On the console keyboard attached to the receiver, 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 **Local Devices** 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 transmitter.
- 2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 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 iPATH server control.

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

Location - Allows you to optionally add a description of the device's location. Useful when many Agility units are being used. Not shown when operating under iPATH 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.

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 receiver must provide in order to connect (video, audio, etc.) to the transmitter


Insecure Connections - Controls whether the transmitter will accept insecure connections from receivers. Insecure connections are those from older Agility products where the security credentials are not implemented. Initially, the transmitter 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'.


TRANSMITTER - UI SETTINGS

To get here

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

1 On the console keyboard attached to the receiver, 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 **Local Devices** option and then click the  icon for the required transmitter.

4 If necessary, click the **UI Settings** link.

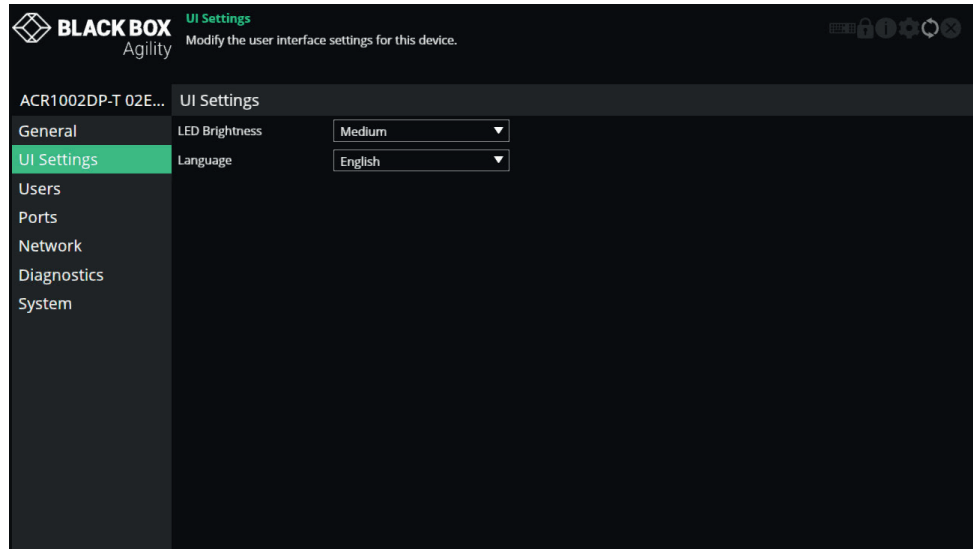
OR

1 Connect a computer to the same network as the transmitter.

2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*

3 Click the  icon in the top right corner.

4 If necessary, click the **UI Settings** link.



UI Settings




LED brightness - Determines the brightness of the front and rear panel LED indicators.

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


TRANSMITTER - USERS

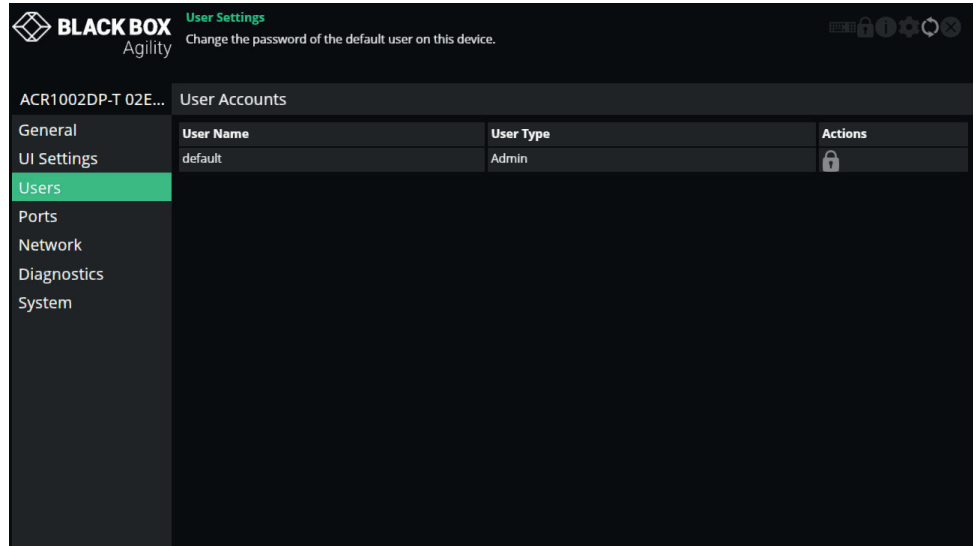
To get here

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

- 1 On the console keyboard attached to the receiver, 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 **Local Devices** option and then click the  icon for the required transmitter.
- 4 If necessary, click the **Users** link.

OR

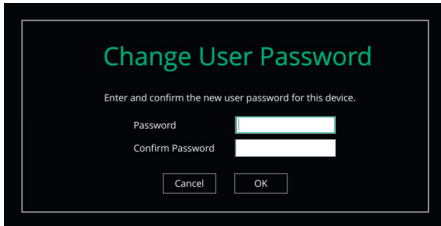
- 1 Connect a computer to the same network as the transmitter.
- 2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 If necessary, 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

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


TRANSMITTER - PORTS

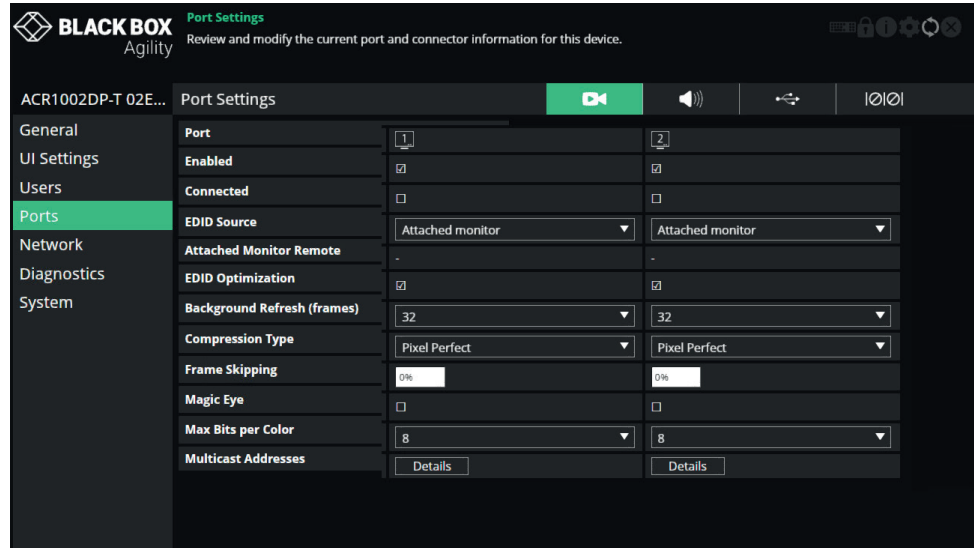
To get here

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

- 1 On the console keyboard attached to the receiver, 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 **Local Devices** option and then click the  icon for the required transmitter.
- 4 If necessary, click the **Ports** link.

OR

- 1 Connect a computer to the same network as the transmitter.
- 2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 If necessary, click the **Ports** link.



Video Ports

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

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. .

Attached Monitor Receiver - If the 'Attached monitor' option has been selected as the 'EDID Source', then this displays the name of the receiver 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 transmitter. 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 Agility units are used with host computers that have dithered video output. It also improves performance if the video source is noisy.

Max Bits per Colour - These settings are fixed at 8bpc for this model.

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.



Audio Ports

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

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

Connected - Confirms whether devices are connected to respective ports.

EDID Source - DisplayPort™ audio functionality will be added in future firmware updates.

EDID Optimization - DisplayPort audio functionality will be added in future firmware updates.

Quality Mode - Analog audio only. This option is currently fixed at 48khz, 16bit.

Multicast Addresses - Not supported on this model.



USB Ports

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

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.*

Present Boot Keyboard - When ticked, the transmitter 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 transmitter 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 receiver requests it.



Serial Port

This page provides basic information about the serial option port located available on the AUX USB port located on the front panel of the transmitter.

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

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).




TRANSMITTER - NETWORK

To get here

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

- 1 On the console keyboard attached to the receiver, 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 **Local Devices** option and then click the  icon for the required transmitter.
- 4 If necessary, click the **Network** link.

OR

- 1 Connect a computer to the same network as the transmitter.
- 2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 If necessary, click the **Network** link.

BLACK BOX Agility Network Information
Review the interface configuration and network services for this device.

ACR1002DP-T 02E... Network Settings

General	Port	1	2
UI Settings	Socket	1Gbps RJ45	0Mbps Unknown
Users	MAC Address	00:0F:58:02:E5:80	00:0F:58:02:E5:81
Ports	Link Up	<input checked="" type="checkbox"/>	-
Network	IP Address	169.254.1.33	-
Diagnostics	Netmask	255.255.0.0	-
System	Gateway	192.168.16.1	-
	DHCP Enabled	<input checked="" type="checkbox"/>	-
	DHCP Server Address	192.168.42.134	-
	Bandwidth Limit	1000 (10-1000) Mbps	-
	Routing Table	Details	Details



Port Settings

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

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 - The IP address of this network interface. This is not configurable, the device can function in a network zero-config state which does not require the setting of a static IP address.

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

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.

Bandwidth Limit - This option can be used to set an upper limit (between 10 and 1000 Mbps aka 1Gbps) 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:

Routing Table
The routes configured for this interface.

Destination	Gateway	Netmask
169.254.0.0	0.0.0.0	255.255.0.0

[OK](#)



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.

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

Dynamic iPATH Servers - Lists iPATH server addresses obtained via DHCP.




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




TRANSMITTER - DIAGNOSTICS AND STATISTICS

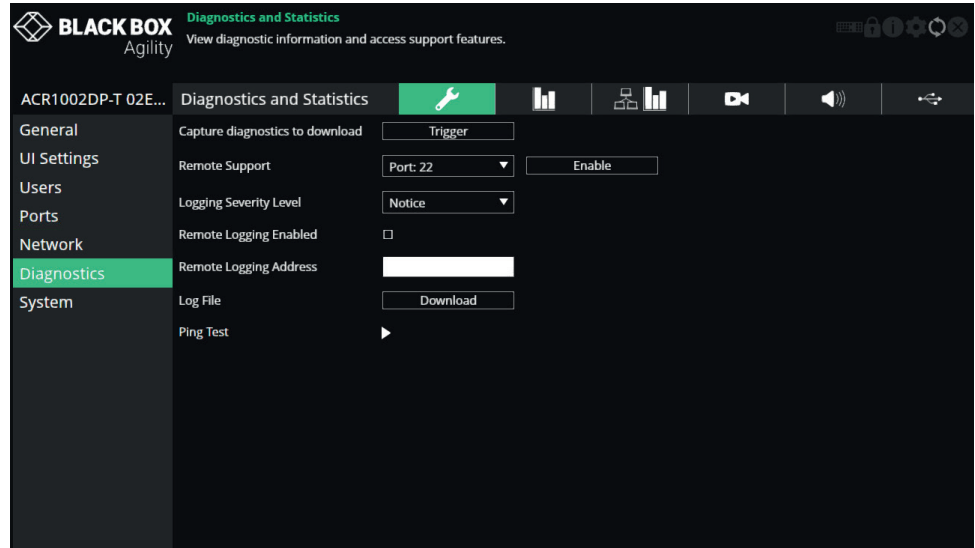
To get here

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

- 1 On the console keyboard attached to the receiver, 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 **Local Devices** option and then click the  icon for the required transmitter.
- 4 If necessary, click the **Diagnostics** link.

OR

- 1 Connect a computer to the same network as the transmitter.
- 2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 If necessary, 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 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; Agility 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.

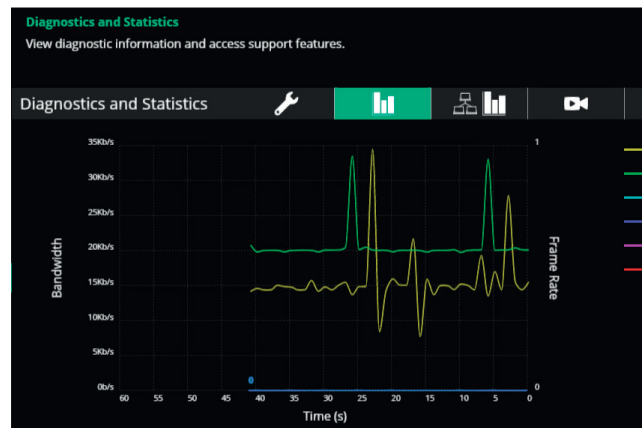
Log File - If viewing this page using a browser: Click to download the log file to the host computer's browser. If viewing this page via the OSD, the log will be shown as a scrollable list.

Ping Test - Provides a quick and easy way to check the link status to a receiver. 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.



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




Not yet implemented.




TRANSMITTER - SYSTEM

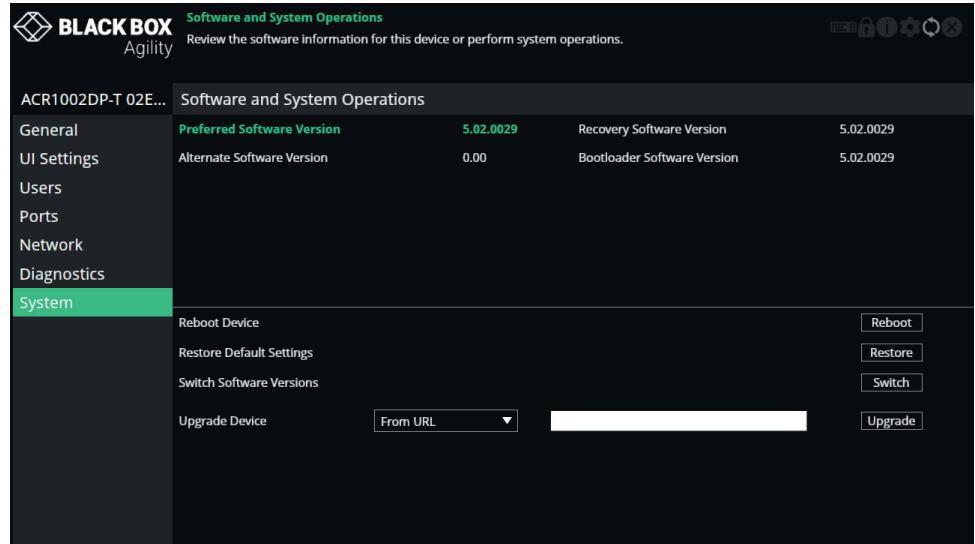
To get here

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

- 1 On the console keyboard attached to the receiver, 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 **Local Devices** option and then click the  icon for the required transmitter.
- 4 If necessary, click the **System** link.

OR

- 1 Connect a computer to the same network as the transmitter.
- 2 Run a web browser and enter the IP address of the transmitter: **https://169.254.1.33** (this is the default address when using port 1). If you are using SFP port 2, then the default address will be **https://169.254.1.43** *Note: These default addresses can be changed.*
- 3 Click the  icon in the top right corner.
- 4 If necessary, click the **System** link.



ACR1002DP-T 02E...	Software and System Operations			
General	Preferred Software Version	5.02.0029	Recovery Software Version	5.02.0029
UI Settings	Alternate Software Version	0.00	Bootloader Software Version	5.02.0029
Users				
Ports				
Network				
Diagnostics				
System				

Reboot Device

Restore Default Settings

Switch Software Versions

Upgrade Device

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 - TIPS FOR SUCCESS WHEN NETWORKING AGILITY UNITS

Agility 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 Agility 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

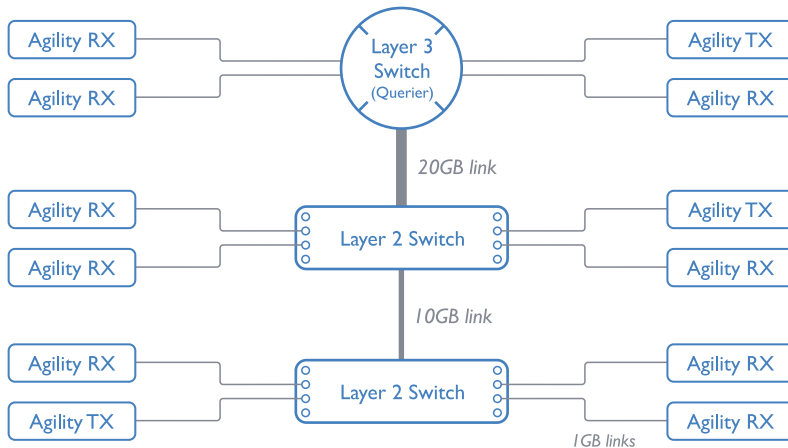
Network layout is vital. The use of [IGMP snooping](#) also introduces certain constraints, so take heed:

- 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 iPATH server is used to administer multiple Agility transceivers, ensure the iPATH server and all Agility 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 transmitters 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.

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 Agility 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 Agility 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 Agility 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 Agility 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 Agility units are fully updated to the latest firmware version (at least v2.1).

APPENDIX C - TROUBLESHOOTING

PROBLEM: THE VIDEO IMAGE OF THE AGILITY 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 Agility 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 Agility units may be outputting Jumbo frames due to the video resolution (2048 horizontal pixels) being used. If Jumbo frames are output by an Agility unit, but the network switches have not been configured to use jumbo frames, the switches will attempt to break the large packets down into standard packets. This process introduces a certain latency and could be a cause for dropped packets.
- One or more Agility units may be using an old firmware version. Firmware versions prior to v2.1 exhibited an issue with the timing of IGMP join and leave commands that caused multicast flooding in certain configurations.

REMEDIES:

- Ensure that [IGMP snooping](#) is enabled on all switches within the subnet.
- Where each Agility 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 Agility 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.
- Ensure that the firmware in every Agility unit is version 2.1 or greater.
- Try adjusting the transmitter settings on each Agility to make the output data stream as efficient as possible. See [Agility transmitter video settings](#) for details.

PROBLEM: THE AUDIO OUTPUT OF THE AGILITY 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: IPATH CANNOT LOCATE WORKING AGILITY UNITS.

There are a few possible causes:

- The Agility units must be reset back to their zero config IP addresses for iPATH discovery. If you have a working network of Agility units without iPATH and then add iPATH to the network, iPATH will not discover the Agility units 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 Agility units are connected. Without portfast enabled, Agility units will all be assigned the same zero config IP address at reboot and iPATH 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 Agility 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 Agility units and the iPATH server are located within the same subnet because iPATH cannot cross subnet boundaries.
- [Manually reset](#) the Agility units to their zero config IP addresses.
- Enable portfast on all switch ports that have Agility units attached to them or try temporarily disabling STP on the switches while iPATH is attempting to locate Agility units.



APPENDIX D - GLOSSARY

INTERNET GROUP MANAGEMENT PROTOCOL

Where an Agility 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.

Black Box Agility 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 Agility 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 Agility units.

Jumbo frames (or Jumbo packets) offer advantages for Agility 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.

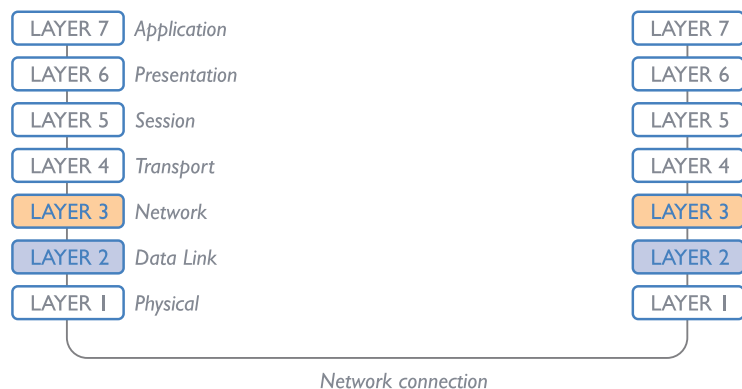
So which one to choose? The *Cut-through* method has the least latency so is usually the best to use with Agility units. However,

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 Agility units? 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 E - FIBER/COPPER MODULES AND CABLES

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

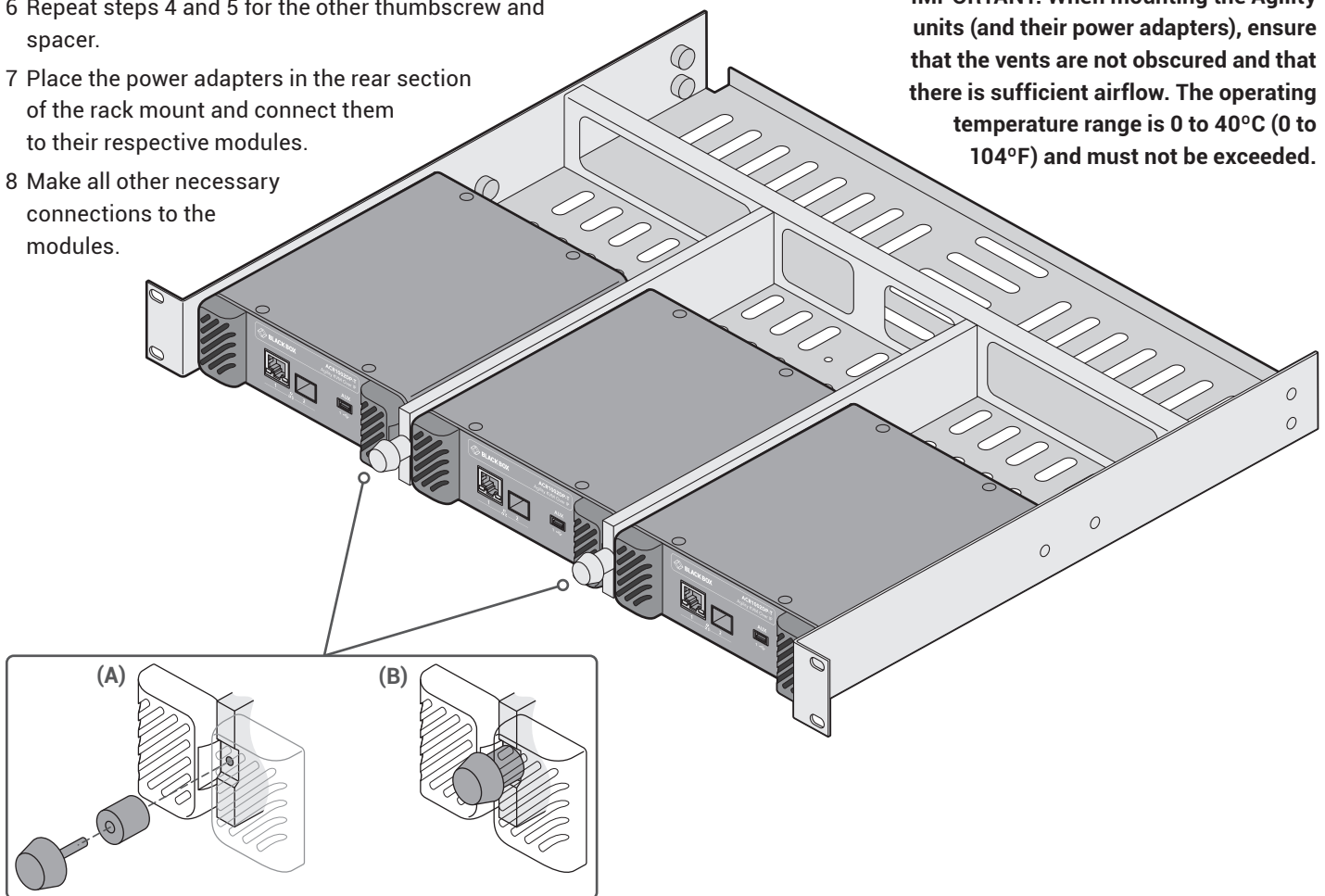
Name	Fiber size	Type	Coding		Distance at 1Gbps
			Normal applications	Suggested print nomenclature	
OM1	(62.5/125)	Multimode (TIA-492AAAA)	Orange	62.5/125	220m
OM2	(50/125)	Multimode (TIA-492AAAB)	Orange	50/125	550m
OM3	(50/125)	Multimode (850 nm Laser-optimized) (TIA-492AAAC)	Aqua	850 LO 50 /125	550m
OM4	(50/125)	Multimode (850 nm Laser-optimized) (TIA-492AAAC)	Aqua	850 LO 50 /125	550m
OS1 and OS2	(9/125)	Single-mode (TIA-492C000 / TIA-492E000)	Yellow	SM/NZDS, SM	20km
CATx	n/a	CAT5e and above	n/a	n/a	100m

APPENDIX F - USING THE OPTIONAL AGILITY RACK SHELVES

ACR-RMK3 RACK MOUNT FOR AGILITY ACR1002DP AND ACR1002FDP TRANSMITTERS

- 1 Install the empty rack mount into your 19" rack frame and fully secure it.
- 2 Place compatible modules into the three bays of the rack mount so that their rear panels butt up against the small pegs located on each of the side walls.
- 3 Locate the supplied thumbscrews and spacers.
- 4 Insert the thumbscrew through the spacer; then insert into the small hole at the end of a divider (A).
- 5 Gently tighten the thumbscrew so that the spacer engages with the inner edges of the modules that are either side of the divider to hold them in place (B).
- 6 Repeat steps 4 and 5 for the other thumbscrew and spacer.
- 7 Place the power adapters in the rear section of the rack mount and connect them to their respective modules.
- 8 Make all other necessary connections to the modules.

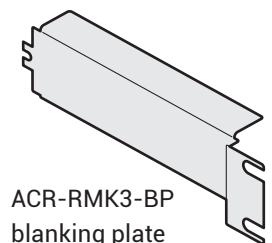
IMPORTANT: When mounting the Agility units (and their power adapters), ensure that the vents are not obscured and that there is sufficient airflow. The operating temperature range is 0 to 40°C (0 to 104°F) and must not be exceeded.



USING A BLANKING PLATE WHEN A SINGLE MODULE IS INSTALLED

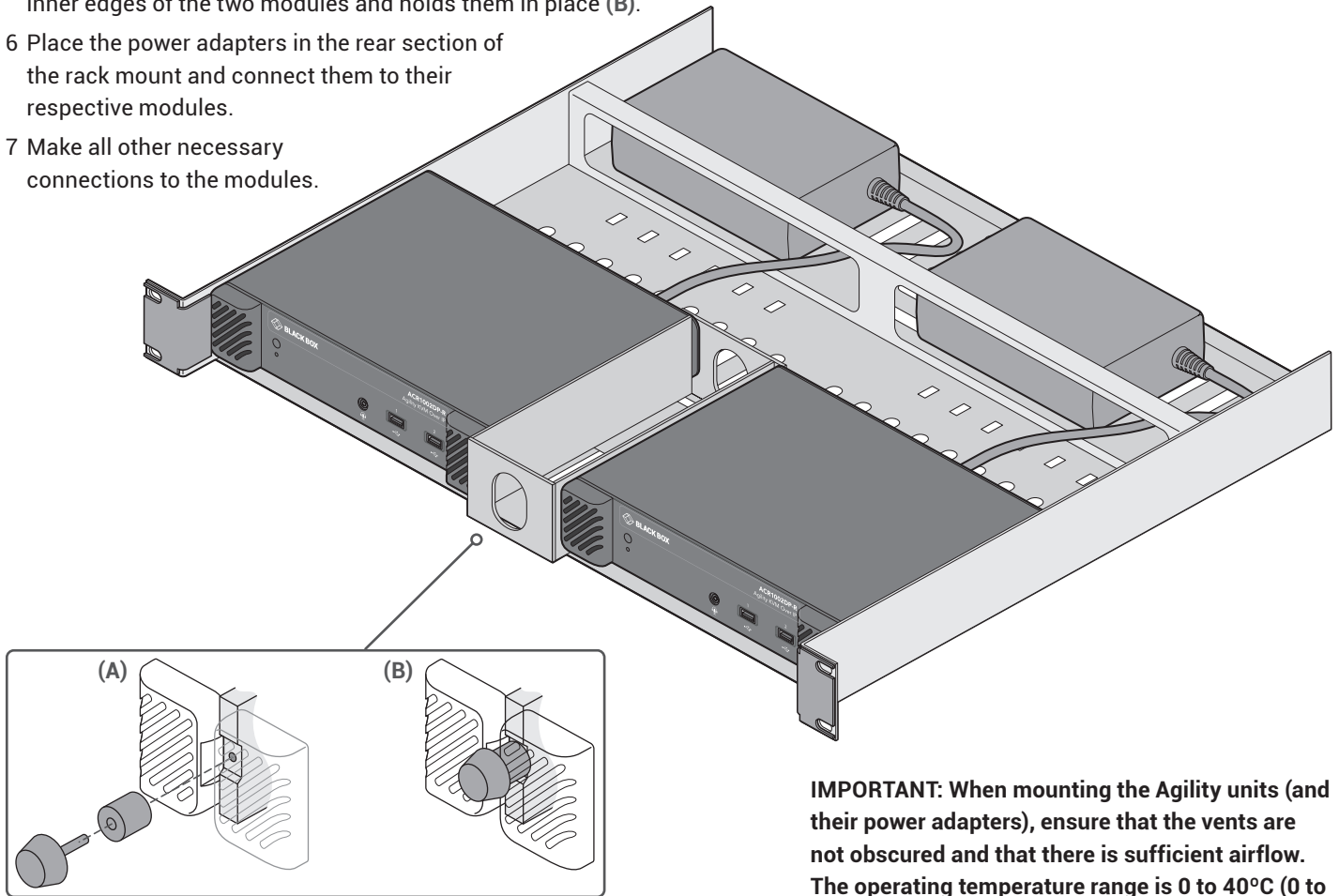
In order to maintain suitable cooling airflow, if only two modules are installed within the rack mount, you are recommended to install an optional blanking plate: ACR-RMK3-BP

Note: The outer edge of the blanking plate needs to overlap the ears of the rack mount itself, so you need to either install the blanking plate before the tray is installed or briefly remove the mounting bolts on the blanked side (while supporting the weight of the tray) to allow the blanking plate to be put in place.



KVXHP-RMK RACK MOUNT FOR AGILITY ACR1002DP AND ACR1002FDP RECEIVERS

- 1 Install the empty rack mount into your 19" rack frame and fully secure it.
- 2 Place a compatible module into each side of the rack mount 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 modules and holds them in place (B).
- 6 Place the power adapters in the rear section of the rack mount and connect them to their respective modules.
- 7 Make all other necessary connections to the modules.



IMPORTANT: When mounting the Agility 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 40°C (0 to 104°F) and must not be exceeded.

ACR-RMK3 and KVXHP-RMK rack mounts:

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.

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- Module: openssl
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3. [3]Bernd Altmeier <altmeier@atsoft.de> hopf Elektronik serial line and PCI-bus devices
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5. [6]Michael Barone <michael.barone@lmco.com> GPSVME fixes
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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, ntpq saveconfig
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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> Unixware1 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@pfcs.com> GNU automake/autoconfigure makeover, various other bits (see the ChangeLog)
53. [57]Kenneth Stone <ken@sdd.hp.com> HP-UX port
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56. [60]Brian Utterback <brian.utterback@oracle.com> General codebase, Solaris issues
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- Module: icu
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- Module: dropbear
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-

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- Modules: libunistring gmp nettle
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- Modules: dhcp libjw

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- For use in dry, oil free indoor environments only.
- Do not use to link between buildings.
- Ensure that the twisted pair interconnect cable is installed in compliance with all applicable wiring regulations.
- Do not connect the CATx link interface (RJ45 style connector) to any other equipment, particularly network or telecommunications equipment.
- Warning – the power adapter contains live parts.
- No user serviceable parts are contained within the power adapter - do not dismantle.
- Plug the power adapter into a grounded socket outlet close to the unit that it is powering.
- Replace the power adapter with a manufacturer approved type only.
- Do not use the power adapter if the power adapter case becomes damaged, cracked or broken or if you suspect that it is not operating properly.
- If you use a power extension cord with the units, make sure the total ampere rating of the devices plugged into the extension cord do not exceed the cord's ampere rating. Also, make sure that the total ampere rating of all the devices plugged into the wall outlet does not exceed the wall outlet's ampere rating.
- Do not attempt to service the units yourself.
- The units and power supplies can get warm in operation – do not situate them in an enclosed space without any ventilation.
- The units do not provide ground isolation and should not be used for any applications that require ground isolation or galvanic isolation.



