Adder X100 Extender Set
User Guide
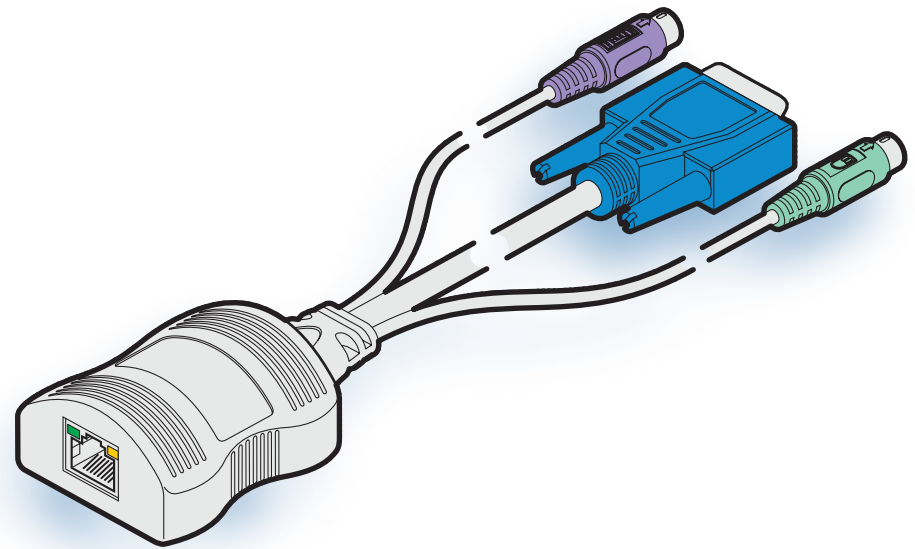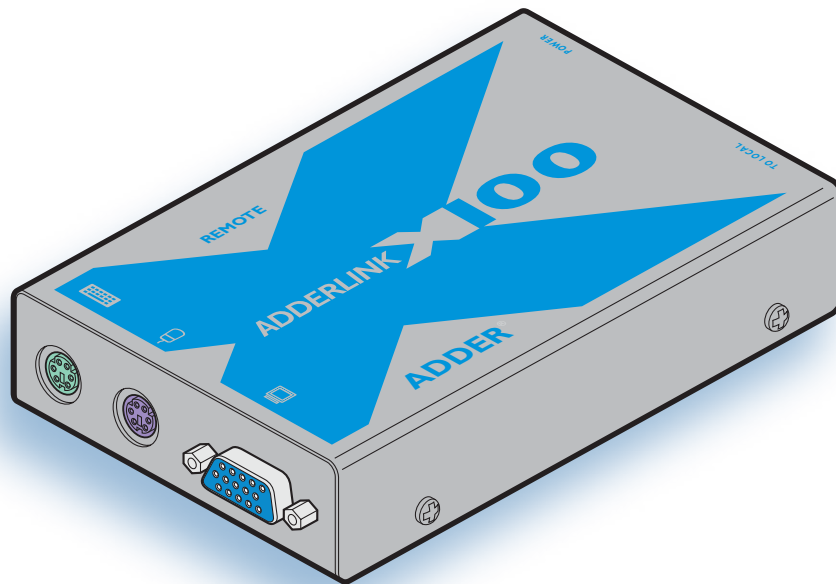
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ADDER®

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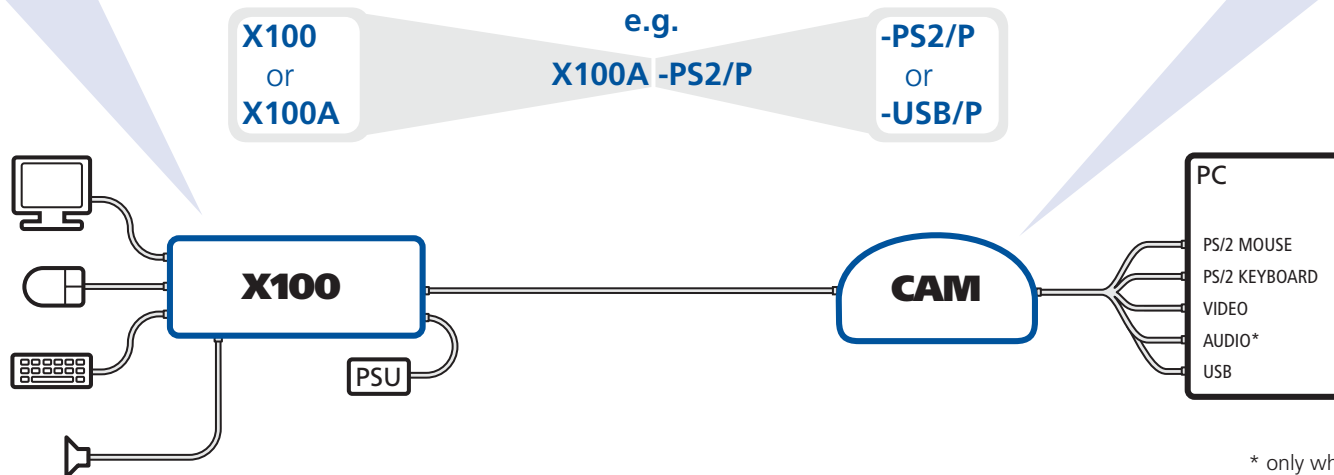
Welcome

Introduction

Thank you for choosing the Adder X100 extender set. These compact modules allow you to place the controlling keyboard, video monitor and mouse more than 100 metres from a computer system. The range topping X100A module also allows you to extend your audio accessories away from your computer.

Two types of remote X100 modules are available and two types of local CAMs can be chosen. These local and remote modules can be used in varying combinations to suit your requirements. The long distance link between the modules is made via Category 5, 5e or 6 twisted pair cabling.

Special circuitry within the remote module allows you to make adjustments to the sharpness and brightness settings to suit your own preferences.

	X100	X100A
PS/2 keyboard connection	✓	✓
PS/2 mouse connection	✓	✓
Video connection	✓	✓
Audio connection		✓
Brightness control	✓	✓
Sharpness control	✓	✓

	-PS2/P	-USB/P
PS/2 keyboard connection	✓	
PS/2 mouse connection	✓	
Video connection	✓	✓
Audio connection*	✓	✓
USB connection		✓

X100
or
X100A

e.g.
X100A -PS2/P

-PS2/P
or
-USB/P

X100

PSU

CAM

PC

PS/2 MOUSE
PS/2 KEYBOARD
VIDEO
AUDIO*
USB

* only when supplied with X100A

Supplied items
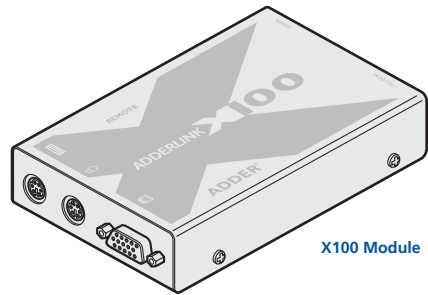
X100 Module
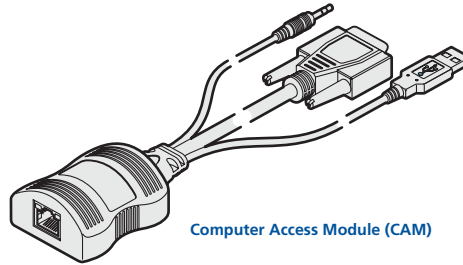
Computer Access Module (CAM)

Note: CAMs with connections suitable for Sun Computers are available under special order.

Package variants

X100-PS2/P	Standard X100 with PS/2-style CAM
X100-USB/P	Standard X100 with USB CAM
X100A-PS2/P	Audio-equipped X100 with PS/2-style CAM
X100A-USB/P	Audio-equipped X100 with USB CAM
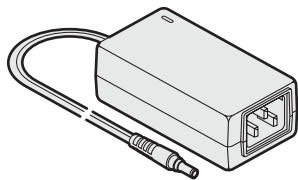
Power adapter and country-specific power lead
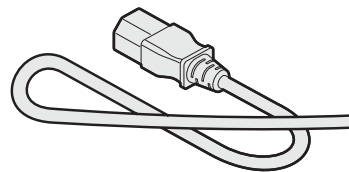
Four self-adhesive rubber feet

CD-ROM

Installation & Operation

Connections

Installation of the X100 modules is straightforward and minimal configuration requirements in most cases. The moulded CAM (*Computer Access Module*) connects directly to 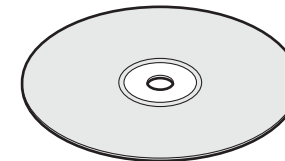the system, while the remote X100 module is at the other end of the twisted pair cable and attaches to the keyboard, mouse, etc.

- Connections at the CAM (local) unit
- Connections at the X100 (remote) module

Cable length advice

The X100 modules support twisted-pair structured cabling within categories 5, 5e and 6. Of these three cable types, category 5 generally provides the best transmission of video signals because its four pairs of conductors are the most evenly twisted.

Category 5e and 6 cables use conductor pairs that are unevenly twisted in order to combat interference effects encountered within higher frequency networks. While these uneven twists work well for Ethernet signals, they can impose problems for the video signals transceived by the X100 modules. The X100 modules send the red, green and blue video signals on separate twisted pairs within the cable. If any of the colour signals are made to travel slightly further or shorter distances than the others, the result is seen as mis-aligned colours on screen. This is called *skew* and becomes more noticeable as cable runs become longer and screen resolutions/refresh rates increase.

As an approximate guide, you should expect the following maximum cable lengths (achievable at resolutions up to 1600 x 1200 @ 60Hz):

Category 5	Category 5e or 6
100m [1]	50 to 100m [1]

[1] *length limited by skew in the cable.*

Connections at the CAM (local) unit

1 Where possible ensure that power is disconnected from the system to be connected.

   (Note: If it is not possible to switch off devices prior to connection, then a 'Hot plug' procedure is available – see the Hot plugging and mouse restoration section for more details).

2 Locate the required CAM and attach its video, keyboard and mouse (PS/2-style or USB) and optional audio connectors to the relevant sockets on the computer system.

A range of different connector combinations are made available by the various CAM formats

USB keyboard/mouse

PS/2-style mouse

PS/2-style keyboard

Audio

Video
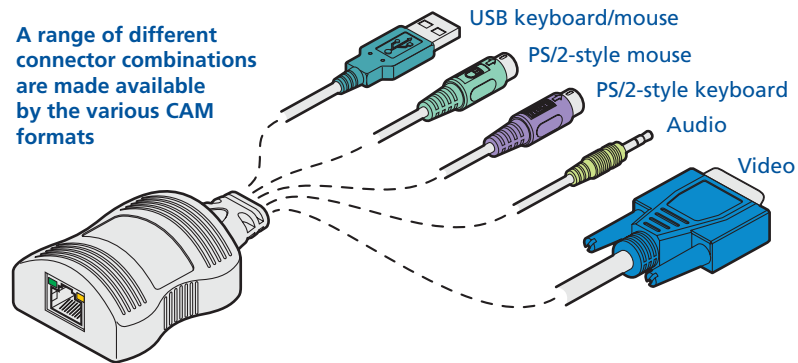
3 Lay a suitable length of category 5, 5e or 6 cabling between the computer system and the remote peripherals - see Cable length advice.

4 Attach the connector of the cable run to the socket of the CAM. The other end of the cable run will attach to the remote X100 module.

Green indicator - power present
Yellow indicator - signal activity

Computer Access Module

Category 5, 5e or 6 cable to X100 module

Note: CAMs derive power from the computer system via either the PS/2-style keyboard connector or USB connector.
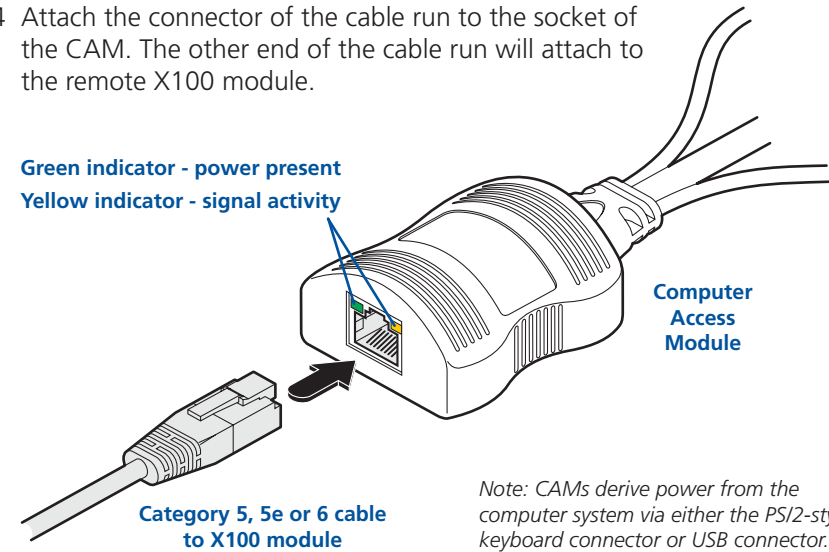
ADDER

Connections at the X100 (remote) module

1 Place the X100 module adjacent to the remote user location.

2 Attach the video monitor, keyboard, mouse (and, optionally for X100A users, speaker) connectors to the sockets of the Adder X100 module.

From mouse

From keyboard

From video monitor

Adder X100 module

3 Attach the connector of the cable run leading from the CAM to the **TO LOCAL** socket of the X100.

Category 5, 5e or 6 cable leading to the CAM module
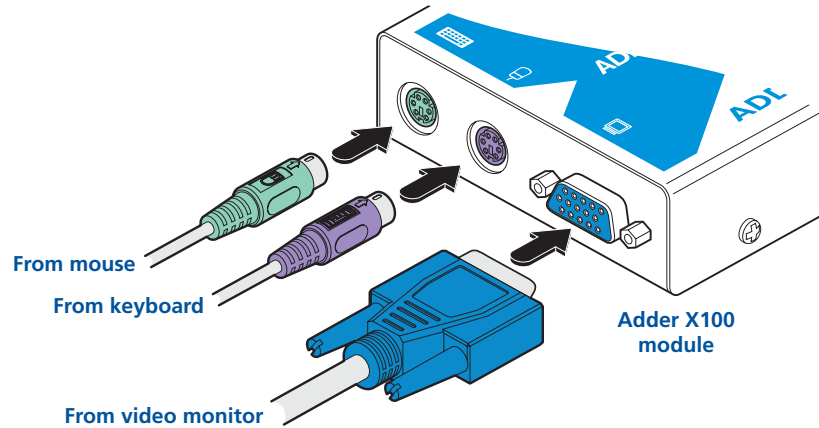
From speakers (X100A models only)

From power adapter

Adder X100 module
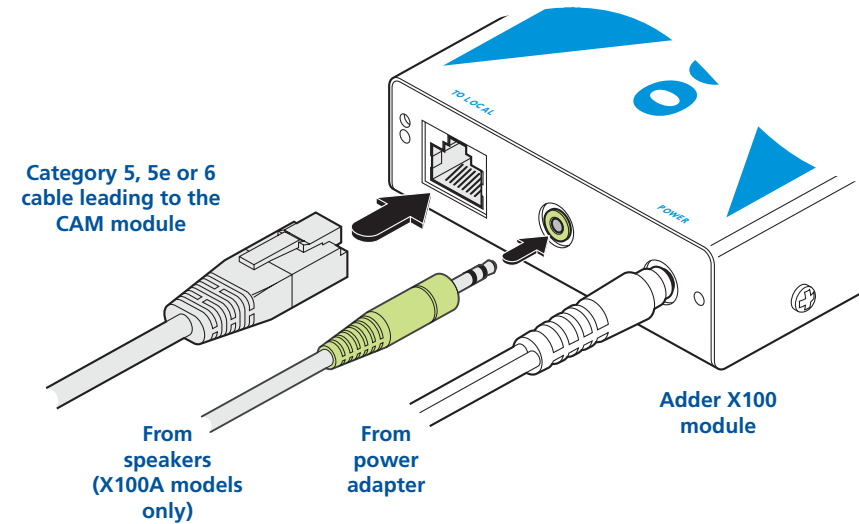
4 (X100A models only) Insert the speaker connector to the light green coloured socket situated between the link connector and the power in socket.

5 Insert the output connector of the power supply into the socket at the front edge of the X100 module labelled POWER.

6 Insert the IEC connector of the supplied power lead into the corresponding socket of the power supply. Connect the other end of the power lead to a nearby mains socket.

7 Where necessary, use the in-built video compensation feature to eliminate any effects caused by the cable run. See <u>Video compensation</u> for details.

X100 module switches
Certain aspects of operation can be affected by the switches on the X100 module.

Determines configuration of hotkeys in conjunction with switch 3

Reserved for future use

**OFF: Normal operation
ON: Flash upgrade**

Determines configuration of hotkeys in conjunction with switch 2
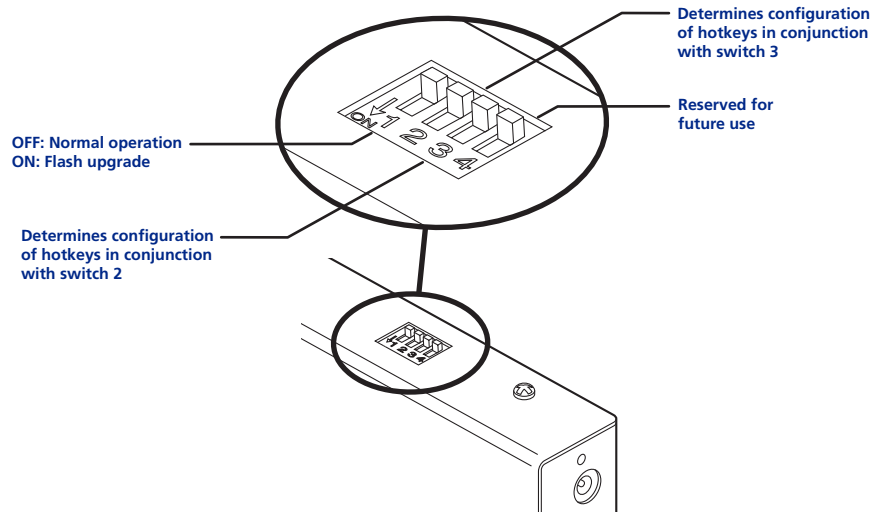
Note: When shipped, all switches are set in the OFF positions and this will produce normal operation.

Switch 1
OFF: Normal operation.

ON: (Before power is applied) Places the X100 module into flash upgrade mode so that the internal software can be changed. Please see the Flash upgrade section in the 'Special configuration' chapter.

Switches 2 and 3
Switches 2 and 3 determine which two keyboard keys (when pressed in unison) are to be designated as 'hotkeys'. Hotkeys signal to the X100 module that the next key to be pressed is a special configuration command for the module and is not to be passed to the computer system.

2 OFF
3 OFF   Hotkeys = CTRL and SHIFT

2 OFF
3 ON   Hotkeys = ALT and SHIFT

2 ON
3 OFF   Hotkeys = CTRL and ALT

2 ON
3 ON   Hotkeys disabled

Switch 4
This switch is reserved for future use.

Operation

General use

In use, the X100 modules should be transparent - the system and its peripherals should operate exactly as normal, the only difference being that they are now up to 100 metres or more apart.

In some installations, you may see some 'shadows' to the right of high contrast screen characters. This can be caused by an incorrectly selected sharpness setting and it may be necessary to make adjustments to correct this. Please see Video compensation - sharpness and brightness in the 'Special configuration' section.

Locking and unlocking the system

In situations where the computer system (and its local CAM) can be locked away the X100 modules offer a viable security system to deter unauthorised use. Once a password has been set, a simple key sequence allows the system to be quickly and securely detached from its peripherals. Only the correct password will reconnect the remote and local modules.

To lock the system

1 First set a password. For further details, please refer to the Password setting section in the 'Special configuration' chapter.

2 Simultaneously press the currently configured hotkeys (by default, Ctrl and Shift) along with L.

The screen will go blank and the three keyboard indicators will begin alternately flashing between the 'Num Lock' and 'Scroll Lock', and 'Caps Lock'. This sequence indicates that a password is required.
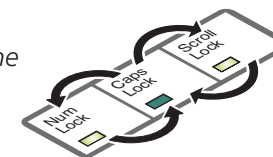
To unlock the system

1 Enter the correct password and press ↵.

Note: Passwords are NOT case sensitive.

Note: If an invalid password has been entered and the keyboard indicators are not flashing as described above, press ↵ to clear the incorrect attempt.

2 If the correct password is entered, the screen will be restored and normal operation can continue.

To enable the video

Simultaneously press the currently configured hotkeys (by default, Ctrl and Shift) long with 1. This command will be required to restore the video if Ctrl and Shift along with L is used when no password has been set.

To disable the video

Simultaneously, press the currently configured hotkeys (by default, Ctrl and Shift) along with 0.

Special configuration

Configuration

You can alter the way that the X100 modules operate to suit your requirements. This is done using the Configuration mode and you can affect the following settings:

- Password setting – allows you to lock the remote module to prevent unauthorised system access.
- Mouse restoration and settings – allows you to restore mouse operation and also to change the mouse type.
- Video compensation - *sharpness & brightness* – allows you to manually adjust the video image to ensure that it is crisp and bright.
- Miscellaneous settings – report firmware version and restore settings.

What are hotkeys?

Hotkeys are two normal keyboard keys that, when pressed simultaneously with a third key, signal to the X100 modules that you are sending a message specifically to them and not to the computer. The hotkeys are ordinarily [Ctrl] and [Shift], while a third keypress determines what you want the modules to do.

If the standard [Ctrl] and [Shift] hotkeys are also needed for computer tasks, you can change them for another combination using switches 2 and 3 on the X100 remote module:

2 OFF	
3 OFF	Hotkeys = [Ctrl] and [Shift] (default setting)
2 OFF	
3 ON	Hotkeys = [Alt] and [Shift]
2 ON	
3 OFF	Hotkeys = [Ctrl] and [Alt]
2 ON	
3 ON	Hotkeys disabled

Entering, using and exiting configuration mode

To enter and use configuration mode:

1 Simultaneously press the currently configured hotkeys (by default, [Ctrl] and [Shift]) along with [↵].

   The three keyboard indicators ('Num Lock', 'Caps Lock' and 'Scroll Lock') will now begin to flash in sequence to show that you are in configuration mode.

2 Press the first letter of the required configuration option, for instance [F].

   All three keyboard indicators will illuminate continuously.

3 Press the number of the required configuration option, for instance [8].

   The 'Scroll Lock' indicator will extinguish, leaving the 'Num Lock' and 'Caps Lock' indicators lit.

4 Press [↵] to confirm your option.

   The three keyboard indicators ('Num Lock', 'Caps Lock' and 'Scroll Lock') will now begin to flash in sequence again.
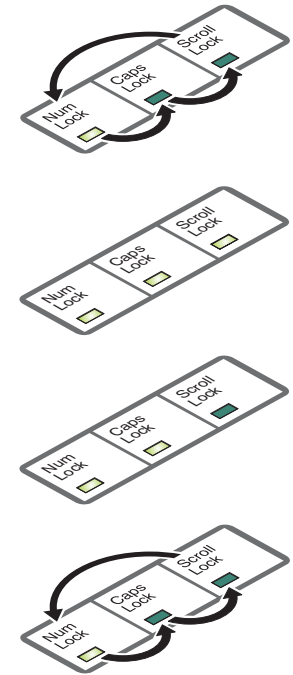
To exit from configuration mode:

1 Within configuration mode, the three keyboard indicators should be flashing in sequence to show that the module is ready to receive a new command.

2 Press [↵].

   The three indicators will return to their normal states.

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Password setting

Password protection allows you restrict access to the system only to authorised personnel. A password first needs to be set and then, using the keyboard attached to the remote X100 module, a simple key sequence allows the system to be quickly and securely detached from its peripherals.

To set a password

1 Simultaneously, press the hotkeys (by default, `Ctrl` and `Shift`) along with ↵ to enter configuration mode.

2 Press `P` followed by ↵.

3 Now enter your new password, within the following constraints:

   • Passwords are NOT case sensitive,

   • Passwords may be any length from one character to a maximum of forty characters,

   • The following keys may NOT be used: `Ctrl`, `Alt`, `Shift`, or ↵

4 When you have entered the password, press ↵ to signal its completion.

5 Press ↵ once more to exit configuration mode.

For full details about how to lock and unlock the system using your password, please see the Locking and unlocking the system section in the 'Installation and operation' chapter.

Hot plugging and mouse restoration

It is strongly recommended that you switch off the computer system before attempting to connect it via the X100 modules. However, if this is not possible then you need to 'hot plug' the X100 modules while power is still applied to the system. There is not normally a danger of damage to the system, however, when mouse communications are interrupted, often they fail to reinitialise when reconnected. X100 modules provide a feature to reinstate mouse communications once the necessary connections have been made.

There are two main types of data formats used by current PC mice, these are the older 'PS/2' format and the more recent 'IntelliMouse®' format introduced by Microsoft. These use slightly different data arrangements and it is important to know which type was being used before you hot-plugged the X100 modules. The previous setting depends both on the type of mouse and the type of driver as various combinations of PS/2 and Intellimouse are possible. Using the incorrect restore function may produce unpredictable results and require the system to be rebooted.

Which restore setting do I use?

The general rule is that unless both the mouse *and* the driver are *both* Intellimouse compatible then you need to restore the mouse as 'PS/2'.

Recognising an Intellimouse-style mouse
The Intellimouse format was introduced to support, among other features, the scroll wheel function. If your mouse has a scroll wheel, then it is likely to support the Intellimouse format. If you have a Microsoft mouse, then it will usually state that it is an Intellimouse on its underside label.

Recognising an Intellimouse driver
Before hot plugging your X100 modules (or afterwards using only keyboard control), access the Windows Control Panel and select either the *Mouse* option (on Windows NT, 2000 and XP) or the *System* option (on Windows 95, 98, ME). Look for the name of the driver, which will usually include the words *PS/2* or *Intellimouse*.

To restore mouse operation when hot plugging:
1 Carefully connect the X100 modules to the system and its keyboard, mouse, monitor and speakers.
2 Simultaneously, press the hotkeys (by default, [Ctrl] and [Shift]) along with [↵] to enter configuration mode.
3 Enter the appropriate restore function code:
   - *PS/2* – press [M] [6] [↵]
   - *IntelliMouse* – press [M] [7] [↵].
4 To exit configuration mode, press [↵].
5 Move the mouse a short distance and check for appropriate on-screen cursor movement. If the mouse cursor darts erratically around the screen, then cease moving the mouse. This is an indication that the chosen restore function is incorrect. Try again using the other restore function.

   Note: The restore functions predict the likely mouse resolution settings but may not restore the exact speed or sensitivity settings that were originally set.

Microsoft and Logitech -specific mouse settings

In certain installations some Logitech mouse drivers may lose the action of the mouse buttons when used with the standard 'Microsoft compatible' signalling protocol used between the modules. To solve this problem, select the 'Logitech compatible' mouse signalling protocol.

To change mouse signalling protocols
1 Simultaneously, press the hotkeys (by default, [Ctrl] and [Shift]) along with [↵] to enter configuration mode.
2 Enter the appropriate protocol code:
   - *Microsoft compatible* – press [M] [3] [↵]
   - *Logitech compatible* – press [M] [4] [↵]
3 To exit configuration mode, press [↵].

Video compensation (sharpness and brightness)

Using the in-built X100 controls you can adjust the picture sharpness and brightness to improve the remote picture quality.

Video compensation is best carried out when viewing high contrast images with vertical edges, such as black lines on a white background. When doing so, if you notice that the screen image is 'fuzzy' or 'dark' then the image controls may not be able to solve this condition.

To display a suitable high contrast image

The best way to clearly view the effect of sharpness and brightness adjustments is to display a high contrast image, with vertical edges, on the screen.

High contrast
black character
on white
background

Black or bright
white shadow
on the right
indicates
the need for
sharpness
adjustment

- Open a word processor, type the capital letter 'H', or 'M' and increase the point size to 72 or higher. For best results, the background should be white and the character should be black.
- A BLACK shadow on the right of the character indicates UNDER compensation.
- A WHITE shadow on the right of the character indicates OVER compensation.
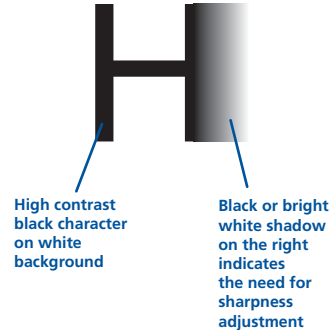
Note: The Word processor method is accurate and quick. However, for the very finest video compensation, use the latest Adder "skew" test pattern program which shows both the skew pattern and a section of mixed size Hs (black on white and white on black).

To apply remote user video compensation

1 On the keyboard that is connected to the X100 remote module, simultaneously, press the hotkeys (by default, `Ctrl` and `Shift`) along with `↵` to enter configuration mode.

    The three keyboard indicators ('Num Lock', 'Caps Lock' and 'Scroll Lock') will now begin to flash in sequence. The speed of the sequence indicates the level of the sharpness adjustment currently applied: the slower the rate, the lower the level of sharpness being applied.
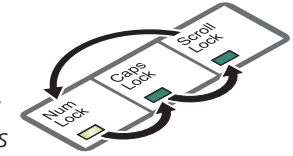
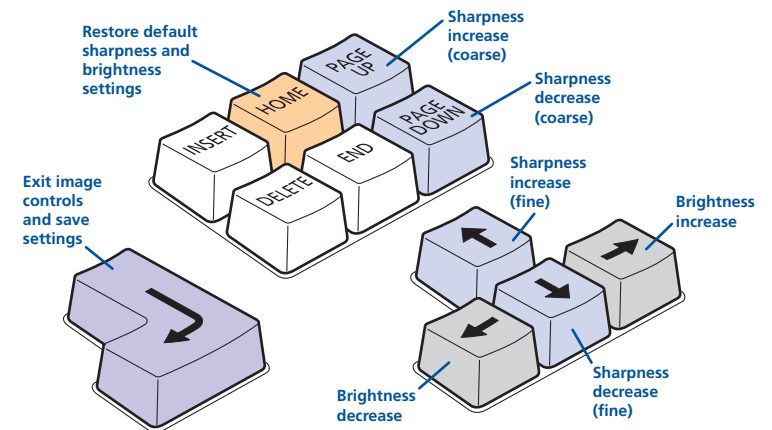2 While viewing the displayed screen image, use the following keys to adjust the controls:

    Sharpness: `↑` `↓` for fine adjustment, `Page Up` `Page Down` for coarse adjustment.

    There are 255 sharpness levels (one coarse step jumps 10 levels).

    To autoset sharpness: Press `F` `2` `↵` to make the module calculate and apply an automatic compensation level - you can use this as a starting point for your fine tuning.

    Note: If the monitor goes blank and switches off (due to oversetting the sharpness adjustment) press the Home key to restore.

    Brightness: `←` `→` for adjustment. There are 255 brightness levels.

    Restore default
    sharpness and
    brightness
    settings

    Sharpness
    increase
    (coarse)

    Sharpness
    decrease
    (coarse)

    Sharpness
    increase
    (fine)

    Brightness
    increase

    Exit image
    controls
    and save
    settings

    Brightness
    decrease

    Sharpness
    decrease
    (fine)

3 When no shadows are visible and the displayed images have crisp edges, press `↵` to exit configuration mode and permanently save all settings.

    The new compensation settings will be stored, even when power is removed or if a complete reset is initiated. These settings should not require further changes unless the cabling arrangements are altered.

Miscellaneous settings

The following are configuration settings within the modules that are not covered in other sections of this guide. These can be achieved once within configuration mode by pressing the indicated keys:

Report X100-series firmware version - F 1 ↵
Before initiating this command, ensure that the system is running an application that can display typed keys as screen characters - e.g. a word processor or Windows Notepad. The current firmware version will be written to the application in the form of the letter 'V' followed by three numbers - for example V201 means version 2.01.

Reset all configuration options to default states - F 8 ↵
Returns all user configurable options to the settings that are installed at manufacture. The password will be cleared, however, any current image control settings or skew adjustments will not be reset.

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Performing flash upgrades

The Adder X100 modules and CAMs are fully reconfigurable via flash upgrades using the KVM Firmware Uploader utility.

During the upgrade you will be required to connect the X100 module directly to a computer system using a special cable. The upgrade utility will update the firmware of the X100 and also temporarily transform it so that it can update the CAM unit. Once completed, the X100 will return to its normal operation.

The KVM Firmware Uploader utility is available from the Adder Technology website (www.adder.com) and allows you to check the current revision of the X100 firmware. Full instructions are provided with the download file.

Further information

Getting assistance

- Adder Technology website – *www.adder.com*
  Check the Support section of our website for the latest solutions and driver files.

- Email – *support@adder.com*

- Fax   in the UK: **01954 780081**
            in the US: **+1 888 275 1117**

- Phone   in the UK: **01954 780044**
            in the US: **+1 888 932 3337**

Warranty

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

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

Safety information

- For use in dry, oil free indoor environments only.
- Do not use to link between buildings.
- Ensure that all twisted pair interconnect cables are installed in compliance with all applicable wiring regulations.
- Do not connect CATx link interfaces (RJ45 style connectors) 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 socket outlet close to the X100 module 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 X100 module, 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 modules yourself.
- The X100 module and power supply can get warm in operation – do not situate them in an enclosed space without any ventilation.
- The X100 module does not provide ground isolation and should not be used for any applications that require ground isolation or galvanic isolation.

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Radio Frequency Energy

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

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

European EMC directive 89/336/EEC

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

FCC Compliance Statement (United States)

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

Canadian Department of Communications RFI statement

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

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

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Documentation by: CORPORATE TEXT & DESIGN   www.ctxd.com