armarac™

Installation Guide

MODEL NUMBER: 980-BSVR and 980-WIRE

SERIAL NUMBERS: 980-A-XXXX

VERSION: 1.0

TABLE OF CONTENTS

SECTION A: PREPARATION

1. Tools Required

The following tools will be required to successfully complete the installation and configuration of your 980 Series Armarac:

- Hex Allen Key Set - Metric
- Hex Allen Key Set - Imperial
- Spirit Level
- Ø10mm (or 3/8-inch) drill bit for timber (if mounting to timber framed wall)
- Ø10mm (or 3/8-inch) drill bit for masonry (if mounting to brick or concrete wall)
- Rotary power drill (hammer function if mounting to masonry wall)
- Battery drill with adjustable torque settings
- Phillips No.3 screwdriver bit (suitable for battery drill)
- 13mm (1/2 inch) long socket and socket driver wrench
- 150mm (6 inch) adjustable spanner
- Pencil (for marking out)

2. Recommended Fastening System

Introduction

The Armarac is designed primarily for mounting flat against a clear, unobstructed wall.

! Due to the weight of the Armarac enclosure and wall mount bracket, and that of the possible equipment it may contain, it is essential to ensure that the wall and fasteners are of adequate strength to accept the resultant loading. It is possible that a 980-BSVR Armarac fully loaded with equipment could weight up to 195kg (415lb).

If in any doubt please consult an engineer before proceeding.

NOTE: if the proposed walls' load bearing rating is not adequate then we strongly recommend using the Armarac Support Stand (980-STD). Please consult your reseller or contact Thureon for more information.

Anchoring Systems

The Armarac wall mount bracket is designed to fasten to the wall with two vertical columns of four M8 (5/16in) anchors down each side, spaced vertically @ 270mm (10.5in) and spaced horizontally @ 600mm (24in) centers.

NOTE: Please drill all holes using the wall mount bracket as the template.

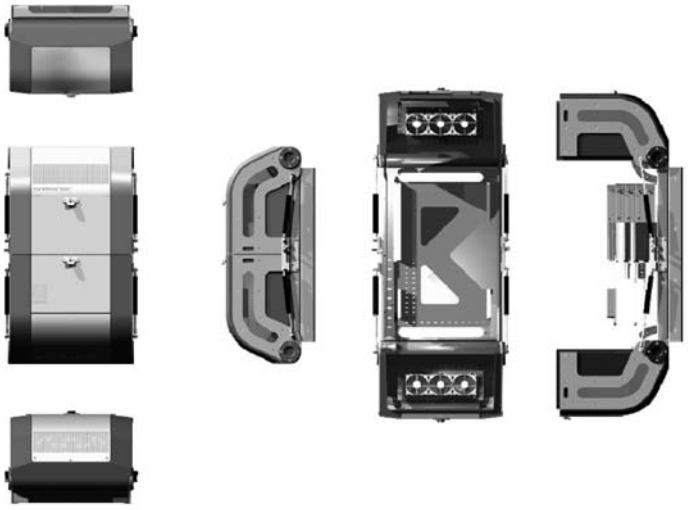
SUBSTRATE	RECOMMENDED SYSTEM	
Wooden Frame; Carpentry	Hilti HSL Heavy Duty Anchor *Or equivalent*	
Masonry; Concrete Block, Concrete Slab Brick	Hilti HSL Expansion Anchor (M8) [note not suitable for brick] *Or equivalent*	
	Hilti HIT-HY Series Chemical Anchor System, and Hilti HAS Threaded Anchor Rod (M8) Or equivalent	
For more information and availability see **www.hilti.com**		

When using the 980-STD Support Stand; eight (8) M8 fasteners are used to secure the wall mount bracket to the Stand. Additionally four (4) M10 (3/8in) anchors should also be used to secure the stand in to the floor. Refer to recommended fastening systems above.

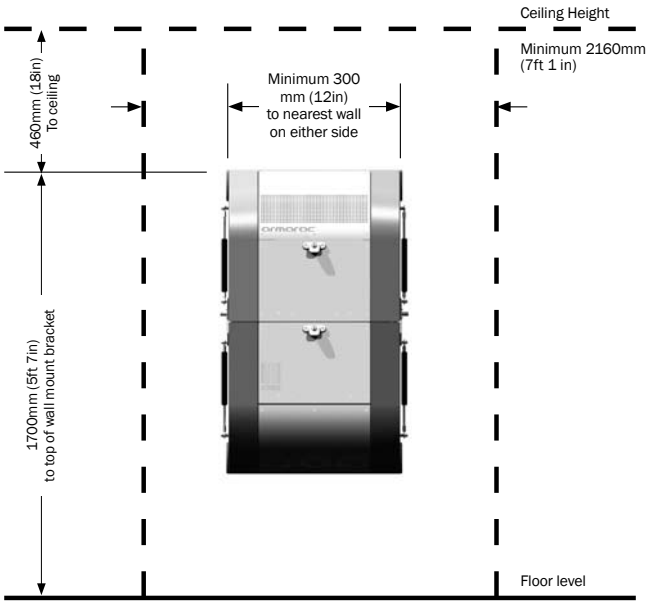
If in any doubt please consult with an engineer as to the best anchoring system to use for your environment.

3. Recommended Spacing and Clearances

For the Armarac to function correctly it is essential to provide enough clearance above, below and to either side of each Armarac. Access to the equipment will be compromised if the following minimum clearances are not maintained.



3.1 One standalone Armarac:

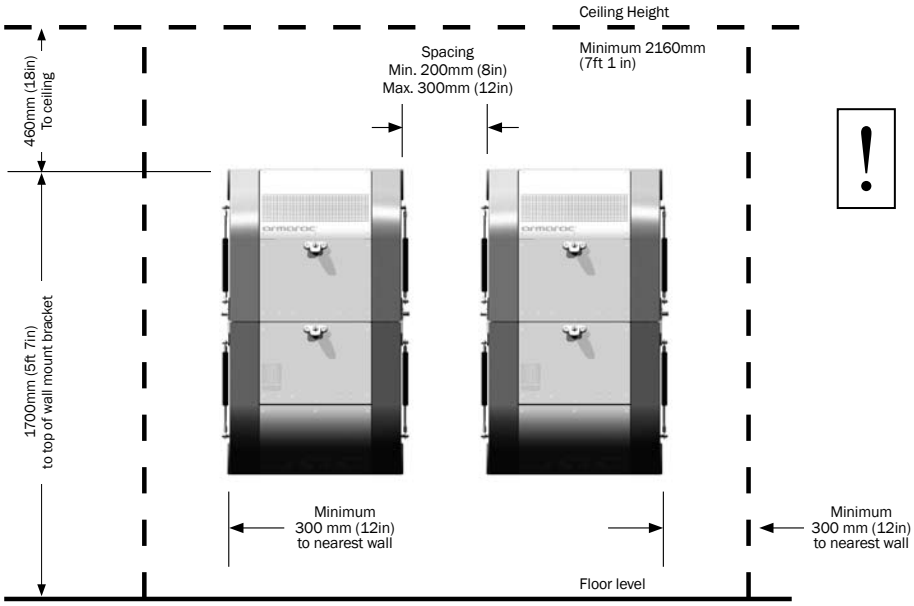


NOTE: Please consider future expansion requirements when positioning your Armarac. If you have the room, then you may consider allowing space for a second enclosure.

3.2 Two Armarac's (utilising teaming Kit)

Two or three Armarac's can be teamed together, sharing the LCD/Keyboard module and connecting the KVM modules in each enclosure.

The Teaming Kit also allows for UPS power and internetworking cabling between enclosures.



When fitted to the Support Stand the Armarac is still ideally suited to being positioned flat against a wall to enhance security of the installation.

3.3 Armarac(s) with Support Stand

Follow the same spacing and clearance requirements as those above.

SECTION B: ENCLOSURE MOUNTING

4. Mounting the Armarac to a load bearing wall (stand not required)

STEP 1 – Separating the wall mount bracket

- De-crate your Armarac.
- Lift out Armarac and place on the floor (minimum 2 people required, recommend 4 people).
- Unlock the Armarac clam shell doors using the key barrel locks located between the gas struts on either side of the Armarac.
- Whilst still laying flat on the floor open the upper and then the lower door.
- Remove the chassis retaining bolts, located either side of the 19-inch patch panel cut-out (x2 M8) with a 5mm (3/16in) hex head Allen key. (These will be required again in Step 10).
- Close the Armarac lower door and then close the upper door.
- Slide the Armarac towards the top of the wall mount bracket to disengage the rear mounting lugs.
- Lift the Armarac up and off the wall mount bracket and place on the ground to one side (minimum 2 people required, recommend 4 people).
- You now have the Armarac and wall mount bracket sitting separately on the floor.

STEP 2 – Identify the Armarac installation location

- Identify the wall to which the Armarac is to be mounted.

  Verify that the wall is load bearing and capable of holding a possible load of 195kg (415lbs). Consult with an engineer if in any doubt.

  If installing on a wooden framed wall; locate the vertical stud centers.

! NOTE the wall mount bracket must be secured directly in to these framing studs.

! **Note that the 980-BSVR and 980-WIRE Models are suitable for 600mm (24 inch) stud center timber framed walls and solid masonry walls – all other mounting substrates are required to use the Armarac Support Stand (980-STD).**

STEP 3 – Mark the position of the Wall Mount Bracket

- Taking in to account minimum and recommended clearances and spacing referred to Section A – 3 above, proceed to mark out the wall.
- Hold the *wall mount bracket* against the wall and mark the top left hole centre (minimum two people required).
- Alternately measure 1640mm (5ft 4½ in) up from floor level and mark the hole center on the centreline of the vertical framing stud or on the brick/block concrete wall.

STEP 4 – Drilling the first holes

Drill the first hole with the appropriate drill bit size to the recommended depth for the chosen fasteners suitable for the type of wall and anchoring system.

Fit the fastener in to the hole through the *wall mount bracket* (start with top left hole).

Note if using a chemical masonry anchor it will need to cure before taking the weight of the wall mount bracket.

Using a spirit level on the top and sides of the *wall mount bracket* to ensure the bracket is square, mark the top right mounting hole center.

Remove the bracket; drill the hole to the recommended size and depth for the anchoring system being used.

STEP 5 – Terminate the power supply

Remove the *power cable shield* from the rear of the *wall mount bracket* using a hex Allen key exposing the rear terminals of the IEC C19 power termination socket.

Complying with local electrical regulations, connect the electrical power circuit to the IEC C19 power socket with adequate cable length for the final position of the *wall mount bracket*. Remember the cable cover will need to be on the cable before final termination to the power socket.

Refit the power cable shield to the *wall mount bracket.*

Refit the wall mount bracket to the wall using both of the top fasteners. (Careful to note curing times if you're using chemical masonry anchors).

STEP 6 – Drill the remaining holes

With the *wall mount bracket* in place, held by the top two bolts, drill the remaining six holes through the wall mount bracket pre drilled holes.

Fit and tighten the remaining six fasteners.

STEP 7 – Confirm bracket is secure

Confirm all eight (8) fasteners have secured the *wall mount bracket* to the wall.

Verify all recommended torque (and if applicable curing times) specified by the anchoring system manufacturers have been met.

STEP 8 – Structure cabling access

Ensure the buildings structured cabling can feed through the 19-inch patch panel mounting slot cut-out on the *wall mount bracket* from the rear.

At this point the structured cabling can be terminated on to your 19-inch patch panel(s).

The patch panel(s) can then be installed on to the *wall mount bracket* from the front using four M6 fasteners for each patch panel.

STEP 9 – Mounting the Armarac

Using a minimum of two (2) people, lift the Armarac up and position it against the *wall mount bracket* aligning the mounting hooks to the matching slots in the *wall mount bracket.*

Once aligned, lower the Armarac so that the mounting hooks are fully engaged.

STEP 10 – Securing the Armarac

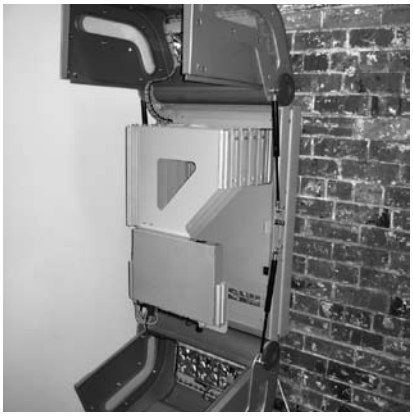
Carefully open the Armarac upper clam shell door and then open the lower door.

Fully open the Vertiblade bracket to gain access to the lower chassis area.

Ensure the two security retention fastener holes are aligned with *wall mount bracket* threaded holes.

Fit and tighten the two M8 hex socket heads screws (removed during Step 1) to secure the Armarac chassis to the *wall mount bracket.*

Close the Vertiblade, close the Armarac lower door then and close the Armarac upper door.



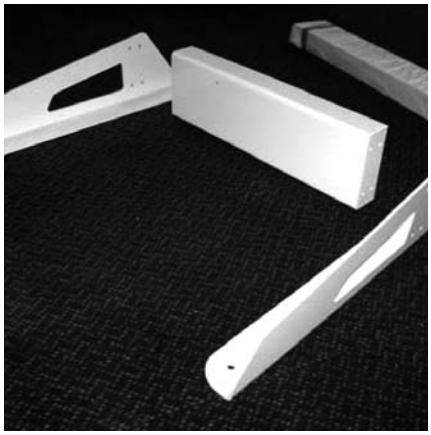
You have now successfully installed your Armarac and are ready to start installing your equipment – **see Section C.**

5. Mounting the Armarac to the Support Stand

Verify that the floor is suitable for anchoring the Armarac and support stand. Select the appropriate anchoring system for the floor substrate type. (Refer Section A) If in any doubt consult an engineer.

STEP 1 – De-crate your Support Stand

Remove the packet of fasteners and carefully lift the two *uprights,* two feet and cross-member out of the packing case and lay on the floor.



STEP 2 – Assemble the Stand

Taking care, position the left-hand and right-hand *feet* and *uprights* in the correct orientation ensure the holes in the *uprights* face inwards and that the cross-member flat surface faces to the front.

Assemble the left-hand foot to the cross member through the left-hand upright using the four M8x120mm bolts, washers and nuts provided. (Note this is easier with two people)

Assemble the right-hand *foot* to the *cross-member* through the right-hand *upright* using the remaining four M8x120mm bolts, washers and nuts.

STEP 3 – Fit the wall mount bracket

Using at least one person to hold the wall mount bracket in place, from the rear fit and tighten the eight M8 x25 bolts through the *wall mount bracket* and in to the support stand uprights.

STEP 4 – Terminate the power supply

Remove the *power cable shield* from the rear of the *wall mount bracket* using a hex Allen key exposing the rear terminals of the IEC C19 power termination socket.

Complying with local electrical regulations, connect the electrical power circuit to the IEC C19 power socket with adequate cable length for the final position of the *wall mount bracket.* Remember the cable cover will need to be on the cable before final termination to the power socket.

Refit the *power cable shield* to the *wall mount bracket.*

STEP 5 – Structure cabling access

Position the *support stand* and *wall mount bracket* in the desired location against the wall. Refer Section A – 3 for spacing requirements.

Ensure the structured cabling can feed through the 19-inch patch panel mounting slot cut-out on the *wall mount bracket* from the rear.

At this point the structured cabling may be terminated on to your 19-inch patch panel(s).

The patch panel(s) can then be installed on to the *wall mount bracket* from the front using four M6 fasteners for each patch panel.

STEP 6 – Starting to Secure the Support Stand

Ensure the support stand and *wall mount bracket* are in the correct position.

Mark and drill the left rear hole through the left foot in to the floor. Size and depth of the hole as specified by your chosen manufacturers anchoring system.

Fit and tighten the first anchor bolt through the left rear foot.

STEP 7 – Secure the Support Stand

With the first anchor secured (adhering to manufacturers recommended curing times if using a chemical masonry anchor fastener system), mark and drill the remaining three anchoring holes through the support stand feet.

Fit and tighten the remaining three anchor bolts.

Note if you are installing against a wall you may also wish to secure the wall mount bracket directly to the wall by fastening through the wall mount bracket mounting holes into the wall substrate - before mounting the Armarac.

STEP 8 – Mounting the Armarac

Using a minimum of two (2) people lift the Armarac up and position it against the *wall mount bracket* taking care to align the mounting hooks to the matching slots in the *wall mount bracket*.

Once aligned, lower the Armarac so that the mounting hooks are fully engaged.

STEP 9 – Securing the Armarac

Carefully open the Armarac upper clam shell door and then open the lower door.

Fully open the Vertiblade bracket to gain access to the lower chassis area.

Ensure the two security retention fastener holes are aligned with *wall mount bracket* threaded holes.

Fit and tighten the two M8 hex socket heads screws (removed during Step 1) to secure the Armarac chassis to the *wall mount bracket.*

Close the Vertiblade, close the Armarac lower door and then close the Armarac upper door.

You have now successfully installed your Armarac and are ready to start installing your equipment – see Section C.

SECTION C: EQUIPMENT MOUNTING: SERVER ROOM

6. Vertiblade Conversion

Armarac's Vertiblade system allows the user to configure the equipment mounting brackets for either 1 Unit (1U) or 2 Unit (2U) devices. Typically the Armarac will arrive configured for one half-depth 1U device, one full-length 2U device at the rear (such as a UPS) and three 1U full-depth devices.

Converting from Two 1-Unit brackets to One 2-Unit Bracket

Note: the brackets to be converted must be adjacent and of the same depth i.e. both full length Vertiblade panels or both double headed Vertiblade panels.

STEP 1 – Remove the Server Screw Adapters

Using a battery drill with a Philips No.3 bit remove the two countersunk set screws from both left-hand and right-hand *Screw Adapters.*

STEP 2 – Repeat for the adjacent Vertiblade

Using a battery drill remove the two countersunk set screws from both left-hand and right-hand *Screw Adapters.*

STEP 3 – Remove the Vertiblade panel from the front bracket

Open the Vertiblade system so that the foremost of the two brackets to be converted has exposed the fasteners on the back of the panel. Using a hex head Allen key remove the two (2) left-hand countersunk screws and the four (4) right-hand screws. Carefully remove the panel from the Vertiblade hinge extrusion and store for future use. Retain the right-hand Vertiblade extrusion for use in Step 7 below.

STEP 4 – Fit the left-hand 2U Screw Adapter

Firstly ensure that you have the correct 2U *Screw Adapter* thread to match your device. Place the 2U *Screw Adapter* across the top of the two left-hand Vertiblade extrusions. Carefully align the mounting holes in the *Screw Adapter* with the corresponding slots in the Vertiblade extrusion. Using a battery drill and No3 Philips bit, screw in the countersunk set screws to install the *Screw Adapter.*

STEP 5 – Fit the right-hand top 2U Screw Adapter

Place the 2U *Screw Adapter* across the top of the rear right-hand Vertiblade extrusion. Carefully align the mounting holes in the *Screw Adapter* with the corresponding slots in the Vertiblade extrusion. Using a battery drill, and No.3 Philips bit, screw in the countersunk set screws to install the *Screw Adapter.*

Note: Do not attempt to fix this adapter plate the other piece of extrusion yet.

STEP 6 – Fit the right-hand bottom 2U Screw Adapter

Place the 2U Screw Adapter across the bottom of the rear right-hand Vertiblade extrusion. Carefully align the mounting holes in the *Screw Adapter* with the corresponding slots in the Vertiblade extrusion. Using a battery drill, and No.3 Philips bit, screw in the countersunk set screws to install the *Screw Adapter.*

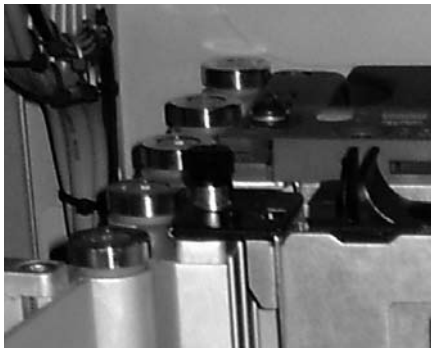
STEP 7 – Fit the second right-hand Vertiblade extrusion

Place the right-hand Vertiblade extrusion removed in step 3 in between the upper and lower 2U *screw adapter.* Carefully align the mounting holes in the adapter plate with the corresponding slots in the Vertiblade extrusion. Using a battery drill, screw in the countersunk set screws to install the *Screw Adapter.*

This Vertiblade bracket is now ready to accept 2U devices.

7. Screw Adapters

Different equipment manufacturers often use different retention screw thread sizes to hold their equipment to the rack kits. The Armarac has a series of corresponding server Screw Adapters to suit each type of thread to ensure that all equipment is securely fastened to its Vertiblade.



STEP 1 – Determine the correct thread requirement

Choose between the M4, 10/32 and M6 Vertiblade 1U (or 2U) *screw adapters* to match your equipment manufacturer's server retention screw thread size.

STEP 2 – Remove the current thread adapters

Using a battery drill and No.3 Philips bit remove the two extrusion mounting screws from the left-hand and right-hand *Screw Adapters.*

STEP 3 – Install the correct thread adapters

Carefully place the new *Screw Adapter* on top of the Vertiblade extrusion, aligning the two outside holes with the two outside extrusion slots below.

Using a battery drill, and Philips bit screw in the two countersunk set screws to install the *Screw Adapter*. Repeat for the other side of the Vertiblade.

8. Installing Your Equipment

It is recommended to start with the equipment at the rear of the Armarac and that the heaviest equipment should be installed at the rear e.g. Uninterruptible Power Supply (UPS).

Please configure your Armarac for the correct Unit sizes (refer Section C – 6 above) e.g. setting up 1U and 2U combinations to match the equipment you intend to install.

Please ensure the correct manufacturer specific retention thread screw adapters have been fitted (refer Section C – 7 above).

STEP 1 – Open the rear Vertiblade

Open the front Vertiblade brackets to gain maximum access to the rear mounting space. Noting that the rear most equipment bay does not hinge.

STEP 2 – Install your first device

Carefully lift the device in to the 19-inch opening. Take care to align the manufacturers' retention screws with the holes in the *Screw Adapters* on both the left-hand and right-hand Vertiblade extrusions.

Note take care to ensure the "top" surface of the equipment faces outward. This will ensure easy access to server mainboards and DVD/CD drives.

STEP 3 – Secure your first device

Install and fasten the manufacturers' retention screws securely in to the Vertiblade Screw Adapters on both sides of the 19-inch bay. Close the Vertiblade bracket in front of the device to ensure correct spacing has been achieved.

STEP 4 – Install remaining devices

Repeat Steps 1 to 3 above for each device to be installed in your Armarac.

9. Cabling Guide

Armarac provides facility to install and correctly manage all of the cabling required for a full 6U of equipment. To avoid excess cable clutter we recommend using cables that are 1.0m to 1.5m in length (3ft, 4ft, 5ft long).

Note due to the nature of the Vertiblade articulated hinging system all cabling is required to run on the left-hand side of the enclosure to ensure each bracket can open properly for full device access.

STEP 1 – Main Power Supply

Connect the wall mount bracket power outlet [IEC-C19] to your UPS inlet or power distribution unit (PDU) using an IEC-C20 plug and flex. **Do not turn your UPS on yet.**

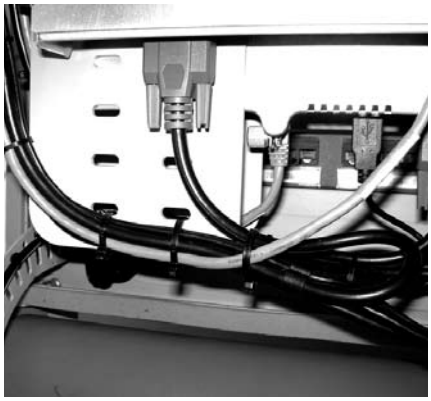
STEP 2 – Management Controller

From your UPS (or PDU) run an IEC-C13 AC power circuit to the Armarac *Management Controller* located in the front lower Vertiblade bracket. Open the front Vertiblade to 90 degrees, to ensure correct cable length and flex, fix the cable across the transverse cable management area of each Vertiblade panel.

STEP 3 – Device Power Distribution

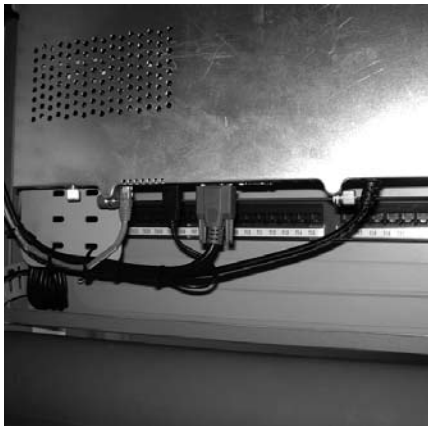
Continue to run AC power cables from your UPS (or PDU) to each device that you have installed in the Vertiblade brackets.
For each device open its Vertiblade bracket up to 90 degrees to ensure the correct length and positioning of the cable. Use the slots at the bottom of each Vertiblade panel to cable-tie the power cables in to position.

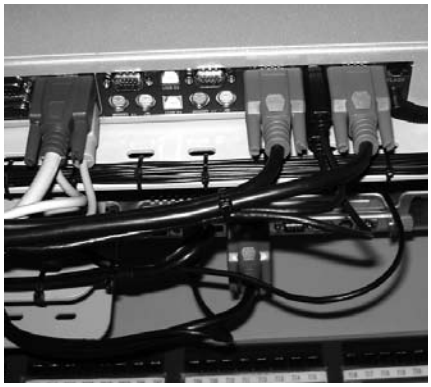
Once all of the cables are run, group them in to looms and cable-tie to the transverse cable management slots across each Vertiblade. Ensure each bracket, one by one, can fully open without pinching or pulling the cables.



STEP 4 – KVM Cables

If you have purchased your Armarac with the optional *KVM/LCD module*; run a video (DB15) and USB cable from each server to the KVM interface of the *Management Controller* located in the front lower Vertiblade bracket. Following the same procedure of opening each Vertiblade bracket up to 90 degrees, and ensuring each cable connects at each end without pulling or pinching when the bracket is opened and closed.

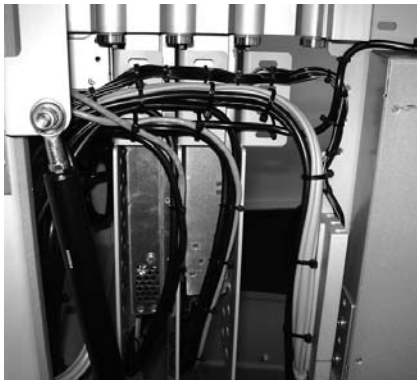
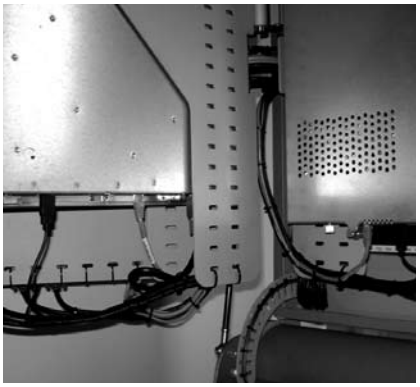
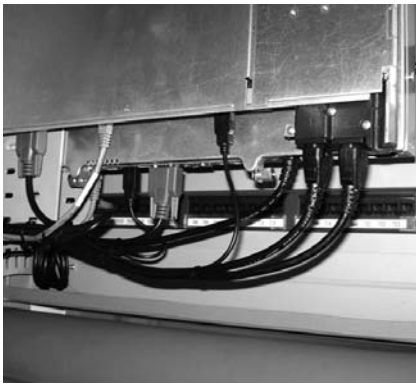




STEP 5 – Networking

Now install the networking cables from each of your devices; either from one device to another, or to the 19-inch patch panel installed on the *wall mount bracket.*

Cable-tie these cables to the power and KVM to create cable looms to each Vertiblade bracket. Ensure the Vertiblade can open to 90 degrees without interference from the cabling.

STEP 6 – Tape/Backup Drive

If you purchased the *tape drive module*, install your device in the standard 5.25-inch half-height device bay and plug in the 12V/5V Molex power connector provided.

Now you can install the SCSI or USB cable from your server, down the Armarac 'cable snake' on the left hand side and in to the drive mount cavity.

Ensure the cable has enough flex by opening each Vertiblade to 90 degrees and checking for pulling or pinching of cables.

Note we recommend the use of unshielded SCSI cables when connecting to the tape drive module.

STEP 7 – Excess Cable

Take care to choose cables that are as close as possible to the correct length.

Ideal power, VGA video, networking and USB cables are 1.0m, 1.2m and 1.5m (3ft, 4ft and 5ft).

However, if there is excess cable to be managed then carefully contain the excess at the rear of the Vertiblade. Do not try to manage excess cable across the Vertiblade brackets.

SECTION D: EQUIPMENT MOUNTING: WIRING CLOSET

10. Installing Your Equipment

The Armarac Wiring Closet (980-WIRE) model is designed to provide housing for up to 144 ports networking equipment.

Space is provided for;

- one 1U or 2U/19-inch rackmount uninterruptible power supply, and
- six 24-port 1U/19-inch Cat-5 or Cat-6 patch panels, and
- three 48-port 1U/19-inch rackmount LAN switches.

STEP 1 – Install UPS

Install the uninterruptible power supply in the rear most Vertiblade bracket (refer Section C -6 above if the bracket requires changing from 2U to 1U).

STEP 2 – Install LAN Switches

Install the first 48-port switch in the top of the front Vertiblade bracket. The second 48-port switch in the top of the second Vertiblade bracket and the third switch in the lower bay of the second bracket.

Note these switches must not exceed a depth of 350mm (14in) or two will not fit on the second Vertiblade bracket.

Secure the switches by use the manufacturer recommended screw fastener. Ensure that the Vertiblade extrusions have the corresponding screw thread adapter installed (refer Section C – 7 above).

STEP 3 – Install the Patch Panels

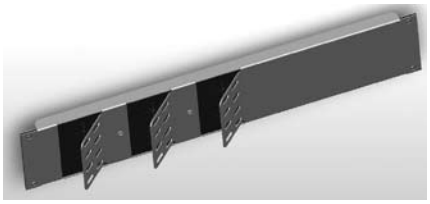
Install the six 24-port 1U patch panels vertically in the zigzag Vertiblade bracket.

The RJ45 ports should be to the front and number port number 1 to the bottom.

Use four M6 bolts to secure each patch panel.

11. Cabling Guide

STEP 1 – Structured Cabling



Installed in the 2U slot in the Armarac wall mount bracket is a cable gland bracket. This bracket has six (6) openings for bundles of 24 Cat-5 or Cat-6 cables from the buildings structured cabling field outlets.

Install the looms of 24 cores through each opening in the gland plate. Note the plate automatically directs these cables to the left.

Feed the cables around on to the tray at the rear of the zigzag bracket.

Ensure the cable tails are long enough to fully open the Vertiblade zigzag to access the UPS in the rear mounting bay.

Terminate each loom on the appropriate patch panel in accordance with the cabling standard being adopted (Cat-5 or Cat-6).

Check that the Vertiblade brackets can open and close without causing strain on the structured cabling or interfering with the hinging mechanism.

STEP 2 – Power Distribution

Refer Section C - 9 (above) for power reticulation from the UPS (or PDU) to each of the LAN switches and the Armarac *Management Controller* device located in the front Vertiblade lower mounting bay.

STEP 3 – First 24 Patch Leads

Open the Vertiblade to 90 degrees to access the zigzag bracket with the six patch panels.

Using 1.0m (3ft) approved patch leads, connect from Port 1 on the front LAN switch to Port 1 on the left most patch panel.

Repeat for all 24 ports. Carefully loom the 24 cores together adhering to cabling standards.

STEP 4 – Second 24 Patch Leads

Repeat the process in Step 3 for the second 24 ports on the first/front 48-port LAN switch.

Starting at Port 25 on the LAN switch, using a 1.0m (3ft) approved patch lead connect to Port 1 on the second 24-port patch panel on the left-hand side of the zigzag bracket.

Repeat for all 24 ports. Carefully loom the 24 cores together adhering to cabling standards.

STEP 5 – Second 48-port Switch

Repeat Steps 3 and 4 above for the second 48-port switch installed in the top slot of the second Vertiblade bracket.

Connect switch ports 1 to 24 to the fifth 24-port patch panel installed in the Vertiblade zigzag bracket.

Connect switch ports 25 to 48 to the sixth (right-hand side) 24-port patch panel installed in the Vertiblade zigzag bracket.

STEP 6 – Third 48-port Switch

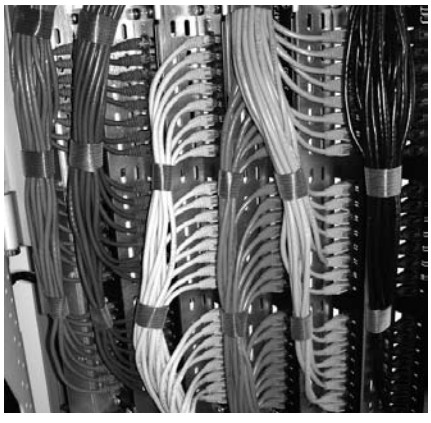
The third 48-port switch is installed in the second Vertiblade bracket lower mounting bay.

Open the Vertiblade to 90 degrees to access the zigzag bracket with the six patch panels.

Using 1.0m (3ft) approved patch leads, connect from Port 1 on the LAN switch to Port 1 on the third patch panel in from the left-hand side.

Repeat for all 24 ports. Carefully loom the 24 cores together adhering to cabling standards.

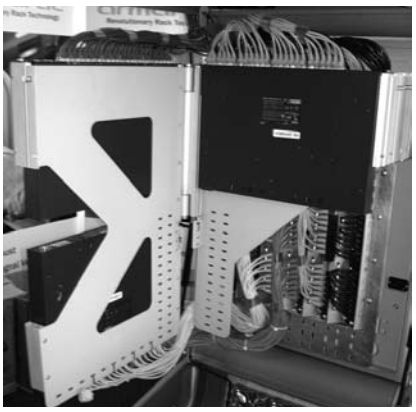
STEP 7 – Third 48-port Switch – Second 24 ports



Using 1.0m (3ft) approved patch leads, connect from Port 25 on the LAN switch to Port 1 on the fourth patch panel in from the left-hand side. Repeat for all 24 ports. Carefully loom the 24 cores together adhering to cabling standards.

STEP 8 – Check for Interference

Ensure that each Vertiblade bracket can fully open without cables pinching or pulling on any device or patch panel. Ensure that the Armarac clam-shell doors can close without causing interference with any cables or the *ventilation fans.*



SECTION E: KVM MODULE

The KVM module allows you to control up to a maximum of 256 computers with one keyboard, monitor and mouse. They support PS/2 input devices (keyboard and mouse) as well as VGA, SVGA, XGA and XGA-2 video.
They support both PS/2 and USB output. This enables cross-platform control over PCs and USB-based computers including USB Sun workstations and Mac computers.

Feature Overview

- **Hot Keys:**
  Hot key functionally allows you to select a desired port using designated key commands. By using a simple hot key sequence on your keyboard, selecting one computer from as many as 256 computers is instantaneous.

- **AutoScan:**
  The AutoScan feature allows you to set your KVM Switch to scan and monitor the activities of all operating computers connected to the switch – one by one. The time interval allotted for each computer can be defined or adjusted through the On-Screen Display (OSD) menu.

- **On-Screen Display (OSD):**
  The OSD feature simplifies server management by allowing you to assign individual names to each connected server throughout the system. It provides a visual means of switching between computers and setting the time interval for the AutoScan function.

12. Equipment Requirements:

Cables:
To connect to the KVM Switch each PS/2 computer requires one VGA cable, one PS/2 keyboard cable, and one PS/2 mouse cable. Keyboard and mouse cables must have PS/2 male-to-PS/2 male connectors. Each USB computer requires one VGA cable and one **USB** A-to-B cable.

Video resolution support of up to 1024x768@85Hz requires use of a 75Ohm coaxial VGA cable to preserve signal integrity. VGA cables must have HDDB15 female-to-HDDB15 male connectors.

KVM Switches are for use on CPUs using:

Platforms:

- Windows 95/98/2000/Me/NT/XP
- DOS
- Turbo Linux and all Linux distributions
- Novell NetWare 4.x/5.x
- Mac (with USB support)
- Sun (with USB support)

Specifications:

Part No:	F1DA104T
Power:	12-Volt DC, 1-Amp power adapter with center-pin positive polarity
Daisy-Chain:	Maximum of 16 KVM Switches
Connections Supported:	4
Keyboard Emulation:	PS/2
Mouse Emulation:	PS/2
Max. Resolution:	1024x768
Bandwidth:	400MHz
Keyboard Input:	6-pin miniDIN (PS/2)
Mouse Input:	6-pin miniDIN (PS/2)
VGA Port:	15-pin HDDB type
Operating Temp:	32° to 104° F (0-40° C)
Storage Temp:	-4° to 140° F (20-60° C)
Humidity:	0-80% RH, non-condensing

13. Installation

Connect the Computer:

PS/2 Installation

1. Using an OmniView KVM Cable, plug in the male VGA connector to the VGA port on the computer. Connect the other end (the female connector of the VGA cable to the back of the KVM Switch labelled “VGA 01”.

   NOTE at least one computer MUST be cabled in to the VGA 01 port for the KVM to function properly.

2. Connect the PS/2 keyboard and PS/2 mouse connectors of the cable to the keyboard and mouse ports on the computer. Connect the other ends of the cables to the keyboard and mouse ports located directly underneath VGA 01 on the KVM Switch.

3. Repeat steps 1 and 2 for each additional PS/2 computer you wish to connect.

USB Installation:

Boot the computer you wish to connect via USB as you would normally with the keyboard, monitor, and mouse connected directly to the computer. After the operating system finishes loading, connect the KVM Switch to the USB computer using the USB A-to-B cable that is part of your USB KVM Cable. Your computer should recognize your KVM Switch and automatically install the HID USB driver if necessary. Once your computer finishes installing the USB driver, you can power down your computer to connect it to the KVM.

1. Using a USB KVM Cable, plug the male VGA connector into the VGA port on the computer. Connect the other end (the female connector) of the VGA cable to the back of the KVM Switch for the appropriate port you wish to connect to (for example “VGA 02”).

2. Connect the USB cable's "A-type" connector to an available USB port on your USB computer. Connect the other end of the USB cable (with the "B-type connector) to the corresponding port on the back of the KVM Switch (for example, "USB 02").

NOTE: We recommend you attach the KVM cable directly to a free USB port on your computer.

Repeat steps 1 and 2 above for each additional USB computer you wish to connect.

14. Using Your KVM Switch

Powering up the System:

Once all cables have been connected, power up the computers that are attached to the KVM module. All computers can be powered on simultaneously. The KVM Switch emulates both a mouse and keyboard on each port and allows your computer to boot normally.

The computer connected to port "1" will be displayed on the monitor. Check to see that the keyboard, monitor, and mouse are working normally. Proceed to do this with all occupied ports to verify that all computers are connected and responding correctly. If you encounter an error, check your cable connections for that computer and reboot. If the problem persists, please refer to the Troubleshooting section in this manual.

Using Your KVM Switch:

Now that you have connected your Console and computers to your KVM Switch it is ready for use.

Select connected computers by either the direct-access port selectors, located on the front panel of the KVM, using the On-Screen Display, or by using hot key commands through the Console keyboard. It takes approximately 1-2 seconds for the video signal to refresh after switching computers. Re-synchronization of the mouse and keyboard signals also occurs. This is normal operation and ensures that proper synchronization is established between the Console and the connected computers.

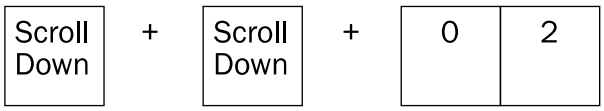
Selecting a Computer Using Keyboard Hot Key Commands:

Switch to the next or previous port with simple keyboard key sequences using the "Scroll Lock" key and either the up or down arrow keys. To send commands to the KVM, the "Scroll Lock" key must be pressed twice within two seconds. The KVM will beep, confirming that it is in hot key mode. Next, press the up or down arrow keys and the KVM Switch will switch to either the prior port or the next port.

Switch to next active port – Down arrow

Switch to previous active port – Up arrow

With a single-switch configuration (no daisy-chained switches), you can switch directly to any port by entering the two-digit number of the port you wish to access. For example, if you press “Scroll Lock”, “Scroll Lock”, “02” the KVM Switch will switch to the computer on port 2 located on BANK 00. (requires Armarac Teaming Kit)



Switch to BANK 00, Port 2 – (02)

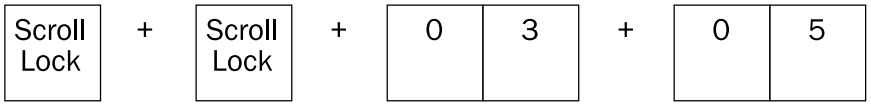
NOTE: You will have approximately five seconds to complete each hot key sequence.

With Teaming Kit switch configuration, you can switch between BANKs by pressing “Scroll Lock”, “Scroll Lock”, “Page Up”, to switch to the previous BANK. Press “Scroll Lock”, “Scroll Lock”, “Page Down”, to switch to the next BANK.

Switch to previous BANK – Page Up

Switch to next BANK – Page Down

With a daisy-chain switch configuration, you can switch directly to any port on any BANK by pressing “Scroll Lock”, “Scroll Lock”, BANK Address”, “Port Number”. For example, if you press “Scroll Lock”, “Scroll Lock”, “03”, “05”, the computer on BANK 03, Port 5 will become active



AutoScan Mode:

Pressing the AutoScan button on t he KVM Switch will activate the AutoScan function. In AutoScan mode, the KVM Switch remains on one port for a pre-set number of seconds, before switching to the next computer. This time interval can be adjusted via the On-Screen Display menu.

NOTE: There is no mouse or keyboard control in AutoScan mode. This is necessary to prevent data and synchronization errors. If the user is using the mouse or keyboard when the KVM Switch is switching between ports, data flow may become interrupted and could result in erratic mouse movement and/or wrong-character input when using the keyboard.

Press any button on the front panel or any key on the keyboard to disable AutoScan.

Keyboard Hot Key Commands

Conveniently command the KVM Switch to switch ports through simple keyboard key sequences. To send commands to the KVM, the "Scroll Lock" key must be pressed twice within two seconds. You will hear a beep for confirmation. Below is a complete list of hot key commands:

NOTE: You will have approximately five seconds to complete each hot key sequence.

SL	SL	Up Arrow	Switch to PREVIOUS ACTIVE port
SL	SL	Down Arrow	Switch to NEXT ACTIVE port
SL	SL	Page Up	Switch to PREVIOUS BANK (By default, selects first active port on the BANK)
SL	SL	Page Down	Switch to NEXT BANK (By default, selects first active port on the BANK)
SL	SL	Y	Directly switch to PORT Y on BANK 00 (Single-Switch Configuration) Y=01 to 16
SL	SL	X Y	Directly switch to PORT Y on BANK X (Daisy-Chain Configuration) (X+00 to 15) (y=01 TO 04)
SL	SL	Delete	Reset On-Screen Display menu
SL	SL	S	Disable sound in Auto-Scan mode
SL	SL	Space Bar	Activate On-Screen Display
SL	SL	A	Enable Auto-Scan mode (Refer to AutoScan button)

On Screen Display Menu Control:

To access the On-Screen Display (DSD) menu, press "Scroll Lock", "Scroll Lock", and the space bar. Immediately, the OSD overlay screen will appear. The superimposed menu screen is generated by the KVM, and does not affect your computer or software function in any way.

The main OSD menu is shown below. It displays the current selected BANK. If you have only one KVM, it will display "BANK 00".

- A "*" symbol indicates that the computer is powered.
- (↑↓): SELECT: Navigate to different computers in the same BANK.
- (PGUP/DN): BANK: Select previous BANK by pressing the "Page Up" key and next BANK by pressing the "Page Down" key.
- (Insert): RENAME: Name each computer (up to 15 characters).
- (ENTER): SAVE: Save the content input.
- (TAB): SETUP: Open "Setup" menu.
- (ESC): EXIT: Exit the On-Screen Display.

AutoScan Time:

Specifies the amount of time the KVM Switch remains on a port before switching to the next port while in AutoScan mode. You may select different time intervals – 7, 15, 30 or 60 seconds. Use the OSD to set the AutoScan time interval.

OSD Display Time:

Specifies the amount of time the OSD menu is displayed. Also specifies the amount of time the "Port Identification" tag displays on-screen after making a port selection. You may choose 7, 15, 30 or 60 seconds.

- For both settings, you may use the arrow keys to navigate. After you have selected the desired time intervals, push "enter" key to save the entry.
- Press the "ESC" key to go back to the original OSD menu screen.
- Press the "ESC" key again to exit the On-Screen Display completely.
- Once you have selected a computer on the menu, press "Enter" to switch to that port.

NOTE: If there are Slave units connected and the AutoScan time and OSD display time settings are set on the Master unit, the settings will also apply to all slave units when the Armarac Teaming Kit is installed.

15. KVM Module FAQs

Q: What operating systems does the KVM Switch support?

A: The KVM Switch will support any operating system that runs on a PS/2 and USB platform. It will also work with non-USB Sun and Mac operating systems using the appropriate adapters (Belkin PS/2 Sun Adapter (F1D082), Belkin PS/2 Mac Adapter (F1D080)). Operating systems include, but are not limited to, DOS, Windows 95/98/2000/Me/NT/XP, Linux, and Mac OS.

Q: How does the KVM Switch allow the user to switch between ports?

A: The KVM Switch supports three methods of port selection. The user can select computers using specially designated keyboard hot keys, through On-Screen Display, or can independently access the desired port by pushing the direct-access port selectors.

Q: Can PS/2 and USB Connections be used simultaneously on the same port?

A: No. You must use one or the other for each CPU's dedicated port on the KVM.

Q: Do I have to install any software to use the KVM Module?

A: No. The KVM Switch does not require any drivers or software to be installed in your computers. Simply connect all your computers to the PC ports on the KVM, then attach one keyboard, monitor and mouse to the Console port and it is ready for use.

Q: Can I use the KVM Switch to switch video signals only?

A: Yes, you may use the KVM Switch to switch between video signals only without having to connect the keyboard and mouse. The keyboard and mouse should be connected directly to the computer that the video signal is taken from to ensure that your computer functions properly.

Q: Can I use the KVM Switch on my Sun computer that supports USB?

A: Yes, the KVM Switch works with all Linux kernels configured for USB support.

16. Troubleshooting

GENERAL

My computer does not boot when connected to the KVM Switch but works fine when I connect the keyboard, video, and mouse directly to the computer.

- Make sure that the keyboard and mouse cables are connected tightly between the KVM Switch and the computer.
- Check that the keyboard and mouse cables are not crossed.

VIDEO

I am getting ghosting, shadowing, or fuzzy images on my monitor.

- Check that all video cables are inserted properly
- Check that the monitor you are using supports the resolution and refresh-time setting on your computer.
- Check that the graphics card you are using supports the resolution and refresh-rate setting on your computer.
- Connect the monitor directly into the computer you are having trouble with to see if the problem still appears.

I am getting a black screen on my monitor.

- Check that all video cables are inserted properly.
- If you are not using a power adaptor, check that the keyboard cable is connected and inserted properly between the computer and KVM Switch for the appropriate port.
- If you are using the KVM Switch only for video switching and have no keyboard and mouse connection between the KVM Switch and PC, you will need to purchase the optional 9V DC, 600mA power adaptor (F1D065-PWR for your appropriate country).
- Connect your monitor directly to the computer to verify that your monitor is functioning properly.
- Make sure that at least one computer is installed on the KVM VGA 01 port.

I am getting an AV indicator on my monitor.

- Check that all video cables are inserted properly.
- Cycle the power on the LCD and KVM switch by resetting the Armarac Control Module by turning the power off then back on again.
- Remove the LCD cover plate for the inside of the upper Armarac door and press the “PC/AV” button on the LCD control panel to cycle through the input modes until “PC” appears on the screen.

KEYBOARD

The computer does not detect a keyboard and I get a keyboard error reported at boot up

- Check that the keyboard cable between the KVM Switch and the computer is completely connected. Tighten any loose connections.
- Try using a different keyboard.
- Try connecting the computer to a different port.
- If you are using the keyboard software that was included with your keyboard, uninstall it and then reinstall the standard Microsoft keyboard driver.

MOUSE

The mouse is lost when I switch to a different port.

- Check that the mouse you are using is connected properly to the Console of the KVM.
- If you are using a mouse driver that was included with your mouse, uninstall it and install the standard Microsoft mouse driver.
- Disconnect and reconnect the mouse cable attached to the channel with which you are experiencing problems to re-synchronize the mouse connection.
- Make sure the mouse works when directly plugged into the computer.
- If the computer is coming out of standby mode, allow up to one minute to regain mouse function.
- De-activate power-management schemes on the PC with which you are experiencing problems.
- Try a different mouse.

The mouse is not detected at boot-up

- Check the cables and make sure that they are inserted correctly.

The computer boots up, but the mouse does not work

- Make sure the mouse is plugged in properly.
- Make sure the mouse works when directly, plugged into the computer. Rebooting may be necessary when trying this.
- Try a different mouse

When I switch from one port to another, mouse movement is completely erratic.

- Make sure you do not have more than one mouse driver installed. Make sure that the driver is either for a standard PS/2 mouse or a Microsoft computer-compatible PS/2 mouse.
- Make sure you do not have any mouse drivers loaded in your CONFIG SYS or AUTOEXEC.BAT files.
- Avoid moving the mouse or pressing the mouse button when switching ports on the KVM.
- You can reset the mouse and resume proper mouse movement simply by unplugging the mouse from the front of the KVM Switch for about 2-3 seconds and then plugging it in again.

USB

I am connecting my computer to the USB KVM Switch via USB and my keyboard and mouse do not work

- Prior to connecting the USB KVM, make sure that the HID USB driver is installed on each computer. (To install the HID USB driver, connect a USB mouse and USB keyboard to the computer. A Windows operating system should automatically install the drivers.)

Some of the keys on my keyboard are not functioning properly when I use a Mac computer.

- Because you are using a PC keyboard on a Mac system, a few of the option keys on your PC keyboard may be reversed. All major keys will function as labelled.

SECTION F: MAINTENANCE

17. Replacing Fans

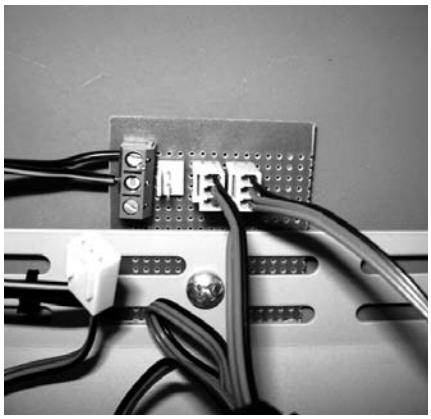
From time to time the ventilation fans inside the Armarac enclosure may reach the end of their life-cycle and need to be replaced.

This replacement can be carried out without interrupting the power or equipment operation. The Armarac can continue to provide power to the remaining fans as these fans are powered by 12Volts DC.

STEP 1 – Identify the fan which has failed

Unlock and open the upper and lower clamshell doors.

Take note of which fans are not spinning. Or that are spinning more slowly than the rest.



STEP 2 – Remove the faulty fan

Disconnect the fan's power feed from the *fan power distribution* block.

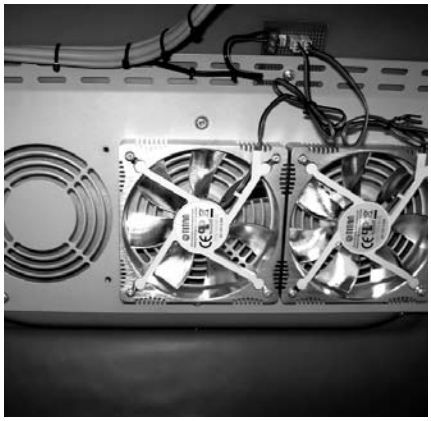
Using a hex Allen key unscrew the four set screws from each corner of the fan body. Keep the fasteners that you remove.

STEP 3 – Fit the replacement fan

Position the new fan so that the four mounting holes align with the holes in the *fan mount tray.*

Using a hex Allen key screw the four set screws in to each corner of the fan body.

Reconnect the fan's power feed to the *fan power distribution* block.



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