

Mounting and Cable Routing Procedures for Dell™ Digital KVM's (1082DS, 2162DS, 4322DS)

A Dell™ Technical White Paper

Dell™ | Datacenter Infrastructure Engineering

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August 2010



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Introduction

This white paper covers recommended mounting and cable routing procedures for Dell™ Digital KVMs (1082DS, 2162DS, 4322DS) in the following rack enclosures:

- PowerEdge™ 4210
- PowerEdge 2410
- PowerEdge 4820
- PowerEdge 4220
- PowerEdge 2420

The adjustment range for the rails provided with the digital KVMs for third party racks is shown in Table 1. Rail Adjustability Range represents the allowable distance between the outside-facing surfaces of the front and rear mounting posts of the rack

Table 1: Rail Adjustment Range

	Min (mm)	Max (mm)
Square Hole	470	770
Round Hole	456	763
Threaded Hole	462	794

For guidelines on how to route cables within the rack, refer to the Dell *Best Practices Guide for Rack Enclosure* white paper.

Section 1: 0U Mounting Locations

This section details the locations in the Dell PowerEdge rack enclosures where the KVMs can be installed, as shipped by Dell™.

Please note the maximum ambient inlet temperature for the digital KVMs is 50 degrees C. In the event that your rack temperature exceeds this value at the air inlet of the KVM, mount the digital KVM in front of the rack (Section 2.1). The air inlet for the KVM is located on the non-port side, and the air exhaust is located on the port side.

Follow the instructions contained in the *Rack Installation Guide* to install the KVM into the 0U bracket. All illustrations in the following sections were created using a KVM 4322DS, however all the information is applicable to the 1082DS and 2162DS.

1.1 Supported Locations in the PowerEdge™ 4210 and 2410

The PowerEdge 4210 and 2410 racks support mounting the KVM to the vertical and horizontal members of the rack. The PowerEdge 4210 supports mounting four digital KVMs on the vertical members, two on the left side, top and bottom, and two on the right side, top and bottom. The PowerEdge 4210 also supports mounting two Digital KVMs on the horizontal members, one on the left side and one on the right side. The PowerEdge 2410 supports mounting two digital KVMs on the vertical members, one on the left side and one on the right side. The PowerEdge 2410 also supports mounting two Digital KVMs on the horizontal members, one on the left side and one on the right side.

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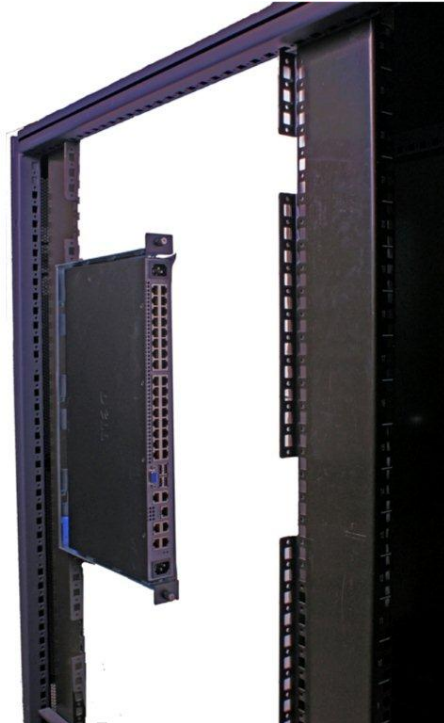
Please note that installation of the KVM where the ports face the ground is an unsupported orientation, and can cause damage to the KVM.

See Figures 1 and 2 for the supported locations to mount the Digital KVM in the aforementioned racks.

Figure 1: KVM Mounted on Vertical Member



PowerEdge 4210 Vertical Top



PowerEdge 2410 Vertical

Figure 2: KVM Mounted on Horizontal Member



PowerEdge 4210 Horizontal



PowerEdge 2410 Horizontal

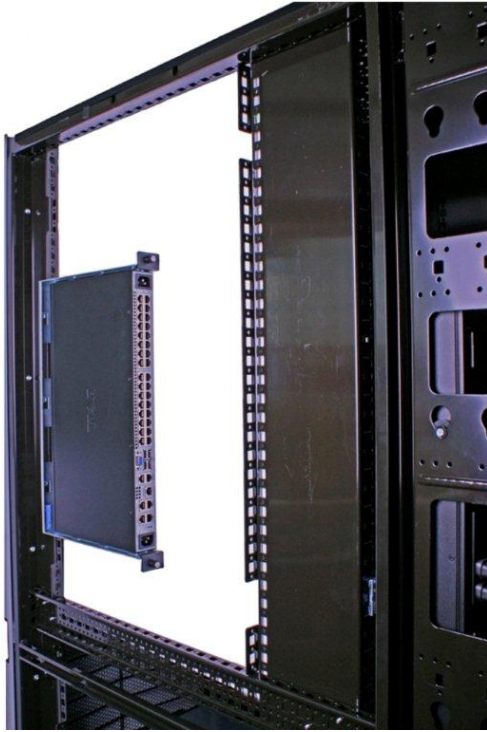
1.2 Supported Locations in the PowerEdge 4820, 4220, and 2420

The PowerEdge 4820, 4220, and 2420 support mounting the KVM to the vertical members of the rack. The PowerEdge 4820 and 4220 support mounting four digital KVMs on the vertical members, two on the left side, top and bottom, and two on the right side, top and bottom. The PowerEdge 2420 supports mounting two digital KVMs on the vertical members, one on the left side and one on the right side. The PowerEdge 4820, 4220, and 2420 do not support mounting the KVM to the horizontal members of the rack. The 0U mounting space on the PowerEdge 4820, 4220, and 2420 offers restricted access to the ports on the back of the KVM unless the side panels can be removed.

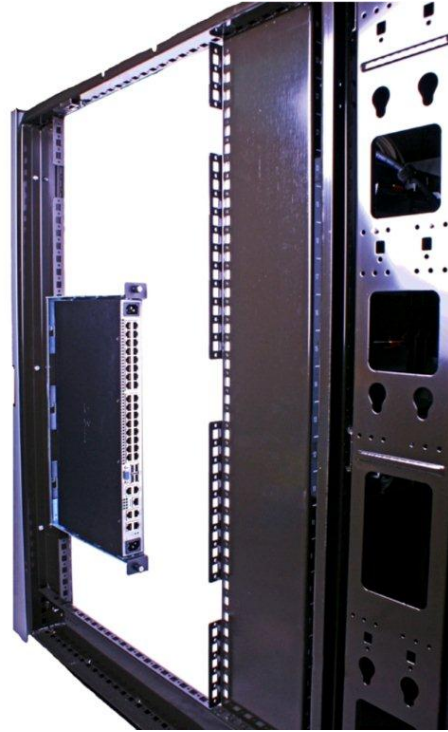
Please note that installation of the KVM where the ports face the ground is an unsupported orientation, and can cause damage to the KVM.

See Figure 3 for the supported location to mount the Digital KVM in the aforementioned racks.

Figure 3: KVM Mounted on Vertical Member



PowerEdge 4220 Vertical Top



PowerEdge 2420 Vertical

Section 2: 1U Mounting Locations

1U mounting is supported in all Dell racks. The rail kit provided with the KVMs installs without tools into four post square and unthreaded round hole racks. Tools will be needed for mounting in four post threaded hole or two post racks.

2.1 Mounting the KVM in the Front of the Rack

Follow the instructions contained in the *Rack Installation Guide* to install the KVM into the 1U Front-rack space. This mounting orientation allows for the air intake of the KVM to be at the front of the rack. This will allow fresh air to be used for cooling purposes.

2.2 Mounting the KVM in the Back of the Rack

Follow the instructions contained in the *Rack Installation Guide* to install the KVM into the 1U Rear-rack space. In this configuration a 1U blanking panel is included in the kit, which when installed prevents air recirculation within the rack. Installation of the KVM in the rear of the rack may be hindered if vertical mount PDUs are installed prior to the KVM in the back of the rack.

Please note the maximum ambient inlet temperature for the digital KVMs is 50 degrees C. In the event that your rack temperature exceeds this value at the air inlet of the KVM, mount the digital KVM in front of the rack (Section 2.1). The air inlet for the KVM is located on the non-port side, and the air exhaust is located on the port side.

Section 3: Cabling a KVM

This section details best practices on cabling the digital KVM in different mounting orientations.

3.1 Four Post Front of Rack Cabling

Follow the instructions contained in the *Rack Installation Guide* to install the KVM into the front of the rack. Once installed, use these instructions to install the cables. All illustrations in the following sections were created using the Dell KVM 4322DS.

3.1.1 Connecting the Cables to the KVM

Connect all applicable cables to the rear of the system and verify that all connections are secure. See Figure 4. It is easier to cable the KVM without having other devices directly above or below.

Figure 4: Four Post Rack: System and Cables Installed



3.1.2 Routing the Power Cables and Data Cables

- 1.) After you have installed cables, route the power cables to one side, using hook and loop straps or tie downs to hold the cables (user supplied). See Figure 5.
- 2.) Route the data cables to the other side using hook and loop straps or tie downs to hold the cables. See Figure 5.

Figure 5: Four Post Rack: Routing Power and Data Cables



3.2 Two Post Flush Mount Cabling

Follow the instructions contained in the *Rack Installation Guide* to install the KVM flush mount into the two post rack. Once installed, use these instructions to install the cables. All illustrations in the following sections were created using the Dell KVM 4322DS.

3.2.1 Connecting the Cables to the KVM

Connect all applicable cables to the rear of the system and verify that all connections are secure. See Figure 7. Note that the back adjustable portion of the rail has been removed to allow access to the tie down holes used to retain the cables. See Figure 6 (front and back view of the removable portion of the rail).

Figure 6: Removable portion of rail



Figure 7: Two Post Rack: System and Cables Installed



3.2.2 Routing the Power Cables and Data Cables

- 1.) After you have installed cables, route the power cables to one side, using hook and loop straps or tie downs to hold the cables (user supplied). See Figure 8.
- 2.) Route the data cables to the other side using hook and loop straps or tie downs to hold the cables (user supplied). See Figure 8.
- 3.) Cables can be bound with optional user supplied cable ties as shown in Figure 9.

Figure 8: Two Post Rack: Routing Power and Data Cables



Figure 9: Two Post Rack: Routing Power and Data Cables (Optional Tie)



Section 4: KVM Resolution Information

4.1 Dell KVM Resolution by Model

Table 2 below shows the resolutions supported by Dell KVM model. The local port is the video port on the back of the KVM that plugs into a monitor. The digitizer is the video sent over IP.

Acronyms:

- Virtual Media (VM)
- Common Access Card (CAC)

Table 2: Dell KVM Resolution by Model

Model	Local Port		Digitizer		VM Support	CAC Support
	Max 4:3	Max 16:10	Max 4:3	Max 16:10		
180AS	1600x1200	N/A	N/A	N/A	N	N
2160AS	1600x1200	N/A	N/A	N/A	N	N
2161DS-2	1600x1200	N/A	1024x768 ⁺	N/A	Y	N
4161DS	1600x1200	N/A	1024x768 ⁺	N/A	Y	N
2321DS	1600x1200	N/A	1024x768 ⁺	N/A	Y	N
1082DS	1600x1200	1680x1080	1600x1200	1680x1050	Y	Y
2162DS	1600x1200	1680x1080	1600x1200	1680x1050	Y	Y
4322DS	1600x1200	1680x1080	1600x1200	1680x1050	Y	Y

⁺ The digitizer is capable up to 1024x768 un-scaled (although it can accept up to 1280x1024, which will be scaled down to 1024x768)

4.2 Server Interface Pod Matrix

Tables 3 & 4 below show information about Dell Server Interface Pods (SIPs). If the table shows the EDID resolution is hardcoded, the maximum resolution the SIP reports to the OS cannot be changed from 1024x768 for the Local Port.

Acronyms:

- Extended Display Identification Data (EDID)
- Display Data Channel (DDC)

Table 3: Server Interface Pod Matrix 4:3 Resolutions

SIPS	EDID Resolution Hard Coded	4:3 Resolutions Capable				USB Speed		CAC Support
		1024x768	1280x1024	1280x1024	1600x1200	FS	HS	
PS/2 SIP	1024x768	Y	Y ⁺	Y ⁺	Y ⁺	N/A	N/A	N
USB 1.1 SIP	1024x768	Y	Y ⁺	Y ⁺	Y ⁺	N/A	N/A	N
USB 2.0 SIP	1024x768	Y	Y ⁺	Y ⁺	Y ⁺	-	Y	N
USB 2.0 + CAC SIP	User Selectable	Y	Y	Y	Y	Y	-	Y

⁺ Requires the user to enable showing unsupported resolutions via the target computer's video adapter settings (effectively ignoring the DDC/EDID).

Table 4: Server Interface Pod Matrix 16:10 Resolutions

SIPS	EDID Resolution Hard Coded	16:10 Resolutions Capable					USB Speed		CAC Support
		800x500	1024x640	1280x800	1440x900	1680x1050	FS	HS	
USB 2.0 + CAC SIP	User Selectable	Y	Y	Y	Y	Y	Y	-	Y