Dominion® LX CIM Guide Version 2

This document provides a guide for Computer Interface Module (CIM) usage for the Dominion LX. Version 2 provides information on the new digital CIMs, supporting DVI, HDMI and DisplayPort.

■ Dominion LX CIM Usage

The Dominion LX is a family of economical KVM-over-IP switches with single power, single LAN and virtual media. LX is targeted towards small and midsize businesses with less than 75 servers under management.

The Dominion LX can use the following CIMs:

- The economical MCUTP cable CIMs: **MCUTPxx-PS2**, **MCUTPxx-USB**, **and MCUTPxx-SUSB**. These are available in several lengths, i.e. xx equals 06, 20, 40, and 60, representing lengths of 2 feet, 6.5 feet, 13 feet and 20 feet respectively.
- The standard Dominion CIMs: **DCIM-PS2**, **DCIM-USBG2** and **DCIM-SUN**
- The Dominion II digital video CIMs: **D2CIM-DVUSB-DVI, D2CIM-DVUSB-HDMI, D2CIM-DVUSB-DP**
- The Dominion II virtual media CIMs: **D2CIM-VUSB** and **D2CIM-DVUSB**
- The **P2CIM-SER** serial CIM can be used to connect the Dominion LX to a serially managed device.

The Dominion LX does not support Raritan Paragon CIMs other than the P2CIM-SER.

	Dominion LX	Overview
MCUTP CIM Cables 	• MCUTPxx-USB • MCUTPxx-PS2 • MCUTPxx-SUSB	• Cable CIMs • Fixed Length Cables
Basic Dominion CIMs 	• DCIM-PS2 • DCIM-USBG2 • DCIM-SUN	• Standard CIMs
Single Virtual Media CIM 	• D2CIM-VUSB	• OS Virtual Media • Absolute Mouse
Dual Virtual Media CIM 	• D2CIM-DVUSB • D2CIM-DVUSB-DVI • D2CIM-DVUSB-HDMI • D2CIM-DVUSB-DP	• BIOS Virtual Media • Absolute Mouse • Digital Video formats • LX Tiering
Serial CIMs 	• P2CIM-SER • P2CIM-SER-EU	• Connect Dominion LX to serial devices.

■ Dominion LX Recommended USB CIM Usage

The recommended CIM depends on the features desired, the type of server, and the server or PC's video type:

- **MCUTP Integrated CIM/Cables:**
  - Basic CIM features – no stored CIM name or serial number
  - USB, PS/2 & SUN Servers
  - Fixed length cables
- **DCIM-USBG2:**
  - Use flexible, economical CAT5 cabling
  - Basic CIM features
  - USB, SUN & Unix Servers
- **D2CIM-DVUSB:**
  - Advanced features: virtual media, absolute mouse synchronization
  - USB servers. **BIOS use of Virtual Media**
  - Required for LX to LX tiering (cascading).
  - Can be used for generic hot-key based tiering
  - Firmware update
- **D2CIM-DVUSB-DVI, D2CIM-DVUSB-HDMI, D2CIM-DVUSB-DP:**
  - Same features as D2CIM-DVUSB
  - Support for servers/PC's with **DVI, HDMI and DisplayPort** video outputs
- **D2CIM-VUSB:**
  - Advanced features: virtual media, absolute mouse synchronization
  - USB servers. **OS use of Virtual Media**
  - Can be used for generic hot-key based tiering
  - Firmware update

■ Dominion LX MCUTP Cable CIM Usage

For Dominion LX customers who want a basic, low cost, VGA CIM and don't plan to use virtual media or absolute mouse synchronization, **MCUTP cable CIMs** provide an economical alternative to the Dominion CIMs. The cable CIM is an integrated CIM and Cat5 cable available in several different lengths. The available MCUTP cable CIMs are:

MCUTP06-PS2	Integrated UTP cables for PS2 ports, 2 feet
MCUTP20-PS2	Integrated UTP cables for PS2 ports, 6.5 feet
MCUTP40-PS2	Integrated UTP cables for PS2 ports, 13 feet
MCUTP60-PS2	Integrated UTP cables for PS2 ports, 20 feet
MCUTP06-USB	Integrated UTP cables for USB ports, 2 feet
MCUTP20-USB	Integrated UTP cables for USB ports, 6.5 feet
MCUTP40-USB	Integrated UTP cables for USB ports, 13 feet
MCUTP60-USB	Integrated UTP cables for USB ports, 20 feet
MCUTP06-SUSB	Integrated UTP cables for Sun USB ports, 2 feet
MCUTP20-SUSB	Integrated UTP cables for Sun USB ports, 6.5 feet
MCUTP40-SUSB	Integrated UTP cables for Sun USB ports, 13 feet
MCUTP60-SUSB	Integrated UTP cables for Sun USB ports, 20 feet

The MCUTP CIMs do not have an internal memory, therefore there is no storage of the CIM serial number or the CIM name. If you move the MCUTP CIM to another Dominion LX, then you must re-name it.

The other Dominion products cannot use the MCUTP cable CIMs; only the Dominion LX.

■ DCIM-USBG2 Standard USB CIM

The **DCIM-USBG2** is a low cost CIM, but lacks the virtual media, absolute mouse, and tiering features of the virtual media CIMs.

The **DCIM-USBG2** supports both USB and SUN USB. A small switch on the unit determines USB or SUN USB. For Windows targets, the "P" setting should be used. For Sun targets, the "S" setting should be used. For other OS', start with the "P" position. If the keyboard and/or mouse do not operate correctly, switch to the "S" position.

Important Note: You must power cycle the CIM if you change the switch setting while the CIM is connected to the target server.

Steps to power cycle the CIM:

1. Remove the USB connector from the target server. The video connector can remain in place.
2. Wait 5 seconds.
3. Reconnect the USB connector.

You can configure the CIM using a setup menu for various operating modes, such as keyboard and mouse types and keyboard language. **See the appendix at the end of this document for more information.**

■ Virtual Media and Absolute Mouse Synchronization

A Dominion virtual media CIM is required for the virtual media and Absolute Mouse Synchronization features.

There are two VGA based virtual media CIMs:

- The **D2CIM-DVUSB** has dual USB connectors and should be purchased by customers who wish to utilize virtual media **at the OS and BIOS levels.**
- The **D2CIM-VUSB** has a single USB connector and is for customers who will use virtual media **at the OS level**.

There are three virtual media CIMs supporting digital video formats:

- **D2CIM-DVUSB-DVI** – enhanced, dual USB, virtual media CIM for **DVI-D** digital video
- **D2CIM-DVUSB-HDMI** – enhanced, dual USB, virtual media CIM for **HDMI** digital video
- **D2CIM-DVUSB-DP** – enhanced, dual USB, virtual media CIM for **DisplayPort** digital video

All support virtual media sessions to target servers supporting the USB 2.0 interface. These CIMs also support Absolute Mouse Synchronization as well as remote firmware update.

■ Dual Virtual Media USB CIMs (VGA, DVI, HDMI and DisplayPort)

The **D2CIM-DVUSB** has dual USB connectors and should be purchased by customers who wish to utilize virtual media **at the BIOS level,** have servers with digital video outputs and/or want to set up tiered configurations.

Advanced KVM features such as virtual media rely on the power of the USB protocol. But some BIOS do not support the USB specification well enough for these advanced features

The Dual Virtual Media USB CIMs have two USB plugs, one for keyboard/mouse and one for virtual media. This enables many additional server BIOS to access virtual media drives.

- The **black connector** on the DVUSB CIM is used for keyboard and mouse.
- The **gray connector** is used for virtual media. Keep both plugs of the CIM connected to the device at all times.

The device may not operate properly if both plugs are not connected to the target server.

Virtual Media CIM Bulk Pricing

- Packages of 32 and 64 **D2CIM-DVUSB** CIMs provide a discount for buying in volume. Consult your authorized reseller for more information.
- Packages of 64 **D2CIM-DVUSB-xxx** CIMs provide a discount for buying in volume. Consult your authorized reseller for more information.
- Packages of 32 and 64 **D2CIM-VUSB** CIMs provide a discount for buying in volume. Consult your authorized reseller for more information.

Not all servers support Absolute Mouse Synchronization

A USB server port is required, and the OS must support this technology. Microsoft Windows and Mac servers support this, but not UNIX, SUN and Linux.

■ Digital CIMs (D2CIM-DVUSB-DVI, D2CIM-DVUSB-HDMI, D2CIM-DVUSB-DP)

Customers with servers, PC's or MAC's using the DVI-D, HDMI, or DisplayPort digital video formats should use one of the new digital CIMs. These CIMs will support the LX standard video resolutions of up to 1920x1080, including widescreen formats.

DDC/E-EDID is supported by the digital CIMs with the "preferred timing mode" set by the LX administrator. This is the preferred/native/default video resolution, called the "Display Native Resolution" on the LX GUI. The default is 1280x1024@60hz, but this can be changed by the user on the Port Configuration Page for each port. This communicated to the server to tell it what video resolution to use, however not every server/OS/video card will use it. See the release notes and documentation for more information.

In order to use these CIMs, the LX must run Release 2.5.5 (or higher).

Only Single Link DVI and HDMI are supported. For HDMI, HDCP (high bandwidth digital copy protection) is not supported. Digital audio is supported over USB as in previous releases, not embedded in the HDMI or DisplayPort signals.

DVI Compatibility Mode for HDMI CIMs

Servers may output video using limited range RGB in accordance with HDMI standards. The result is that the video may be too dark or light. We have seen this with Dell Optiplex servers at 1920x1080. Also for Apple's Mac Mini using the HDMI port.

A 'DVI Compatibility Mode' check box is available on the GUI for each port. This mode will provide the DVI E-EDID to the target upon request. The server will output a DVI compatible video signal. This improves the video quality for some servers.

■ Connect to Serial Devices with P2CIM-SER

The **P2CIM-SER** (and P2CIM-SER-EU for European market) can be used to connect a serial device (networking device, headless server) to a Dominion LX.

The **P2CIM-SER** converts serial device input to a standard KVM signal for use with Dominion LX. The CIM is powered via USB from the serial device or the PWR-SER-4 four port power adapter.

digital signal to an analog signal.

■ Tiering (Cascading) Feature for Dominion LX

Dominion LX to LX tiering (also known as cascading) is supported. A "Tiered" switch can be connected via the **D2CIM-DVUSB** to the "Base" switch. The D2CIM-DVUSB is the only CIM certified for this purpose

For the generic hot-key based tiering, the D2CIM-DVUSB or D2CIM-VUSB CIMs can be used.

Frequently Asked Questions:

1. **What is the most inexpensive CIM I can use with the Dominion LX?**
   The economical **MCUTP cable-CIMs**, available for USB, PS/2 and Sun are. These are fixed length CIM cables.
2. **I would like to use virtual media. What CIM do I need?**
   You need a virtual media CIM: the **D2CIM-DVUSB**, **D2CIM-DVUSB-xxx** or **D2CIM-VUSB**.
3. **Which virtual media CIM should I purchase?**
   If you plan to use virtual media at the **BIOS level or if you plan to use LX tiering**, then you should purchase the Dual USB CIM – **D2CIM-DVUSB**. This CIM will support virtual media in a wider set of BIOS as well. If you only plan to use virtual media at the **OS level**, then you can use the **D2CIM-VUSB**.

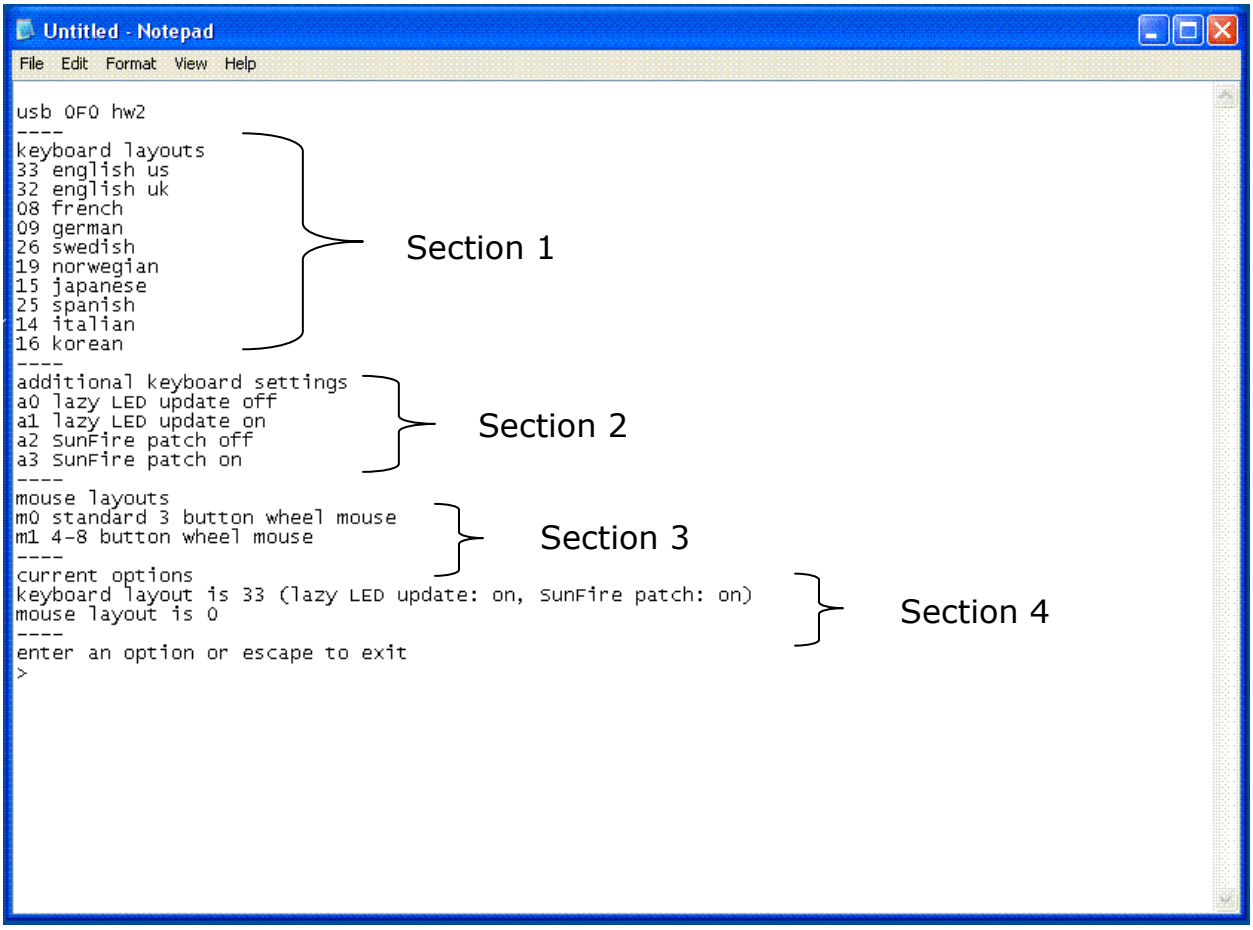
   If you require **DVI, HDMI, or DisplayPort**, then you need a digital video CIM - **D2CIM-DVUSB-DVI**, **D2CIM-DVUSB-HDMI** or **D2CIM-DVUSB-DP**.
4. **The customer wants absolute mouse synchronization, but not virtual media. How to handle this?**
   You can purchase the **D2CIM-VUSB**, but disable the virtual media permissions via the LX's management user interface.
5. **The D2CIM-VUSB is too expensive. Is there an alternative?**
   You can purchase the **D2CIM-VUSB** (or D2CIM-DVUSB) in the 32 or 64 piece packages for a reduced price. Or you can purchase the DCIM-USBG2 or the MCUTP CIMs, which doesn't have virtual media and absolute mouse synchronization for a lower price.
6. **Does the DCIM-USBG2 or MCUTP CIM Cables support virtual media and absolute mouse synch?**
   → **No**, the D2CIM-DVUSB or D2CIM-VUSB is required for these features.
7. **What about Mac target servers? What CIM should be used?**
   For a Mac target server, we recommend the D2CIM-VUSB or D2CIM-DVUSB and absolute mouse synchronization. The "MAC OS X (10.4.9 and later)" USB profile should be used when in the OS and the "BIOS Mac" USB profile when in the Mac BIOS.
8. **I have a few serial devices that I want to connect to a LX. Can I?**
   Yes, the P2CIM-SER can be used to connect serial devices to the LX.
9. **What CIM should I use if a server or PC has DVI, HDMI or DisplayPort video?**
   You need a digital video CIM - **D2CIM-DVUSB-DVI**, **D2CIM-DVUSB-HDMI** or **D2CIM-DVUSB-DP**.
10. **Which CIMs can be used for tiering?**

    The D2CIM-DVUSB (Dual Virtual Media CIM) should be used to connect a "tiered" LX switch to the "Base" tier.
11. **Which CIMs can be used for the generic hot-key based tiering?**

    The D2CIM-DVUSB or D2CIM-VUSB should be used to connect a generic KVM switch to the LX "Base" tier.

The DCIM-USBG2 Setup Menu

This setup menu allows you to configure the CIM for various settings, such as keyboard and mouse types and keyboard language. To access the menu, press the Left-CTL and Num Lock keys simultaneously when a text editor window (in text input mode) has the focus on the target server. All settings are saved in non-volatile memory so the CIM will "remember" these settings. The setup menu as shown in Microsoft Windows Notepad is as follows:



The first line identifies the CIM FW and HW versions. The FW version is in hexadecimal.

Section 1 defines the user keyboard language setting. If you are using a German keyboard, for example, you will enter 09 at the menu prompt (>).

Section 2 defines additional keyboard settings:

- **Lazy LED Update.** When off, the CIM sends all LED status messages from the target server to the switch. When on, the CIM sends only status messages that are different from the message sent previously. Some target servers send the same status continually, possibly overloading the switch. This option prevents the overload.
- **Sun Fire Patch.** A new option introduced in firmware 0EF handles the non-standard USB operation of some Sun Fire target servers. If these servers do not receive a keyboard packet periodically, they assume the keyboard and mouse are disconnected and do not respond to further input. When the switch is in the 'S' position, and the feature is enabled (default), the CIM sends an empty keyboard packet every 500 milliseconds. The feature can be disabled via the CIM setup menu. It is safe to leave this feature on, even when not required as the only side effect will be unnecessary data sent to the target server.

Section 3 defines the mouse type. Standard 3-button wheel mice (m0) and up to 8-button mice and trackballs (m1) are supported currently. The proper driver for the mouse must be installed on the target server.

Section 4 displays the current settings.

This setup menu information also applies to the Paragon II P2CIM-AUSB.