CUBIX GPU-Xpander 40 User Guide

GPU-Xpander 40 is a portable PCI Express (PCIe) expansion device that enables connection of graphics or other controllers to a host computer. The host must have at least one PCIe x8 or x16 expansion slot available for the host adapter. A PCIe Generation 1 (Gen 1) slot provides 20Gbps connection with the host while a PCIe Gen 2 slot provides 40Gbps connection with the host. With multiple host adapters, a single computer can support multiple GPU-Xpander 40 units. One GPU-Xpander 40 connects to one computer. GPU-Xpander 40 (see the image at the right) provides 2 or 4 PCIe Gen 2 x16 slots for high-end video controllers with high-resolution, multi-monitor support, for high-performance computing (HPC), Compute Unified Device Architecture (CUDA) -enabled controllers or other PCIe adapters.

GPU-Xpander 40 Technical Specifications

Expansion slots	PCI Express x16, x8 electrical
Number of slots	2 or 4 slots
Form factor support	2 double-wide or 4 single-wide, full-length controllers or adapters
Connecting cable	External PCI Express x8, 68-pin cable
Connector duty cycle	250 mating cycles maximum per connector
Length, standard	2.00meters (78.74inches or 6.56feet)
Length, optional	1.00meters (39.37inches or 3.28feet)
Length, optional	3.00meters (118.11inches or 9.84feet)
PCIe x8 host adapter	Install in a PCIe x8 or x16 slot
PCIe Gen 2.*x* slot	Provides up to 40.0Gbps data transfer
PCIe Gen 1.*x* slot	Provides up to 20.0Gbps data transfer
Front panel	4 status LEDs
System reset	On, system reset; off, normal operation
Link OK	On, cable connected; off, cable not connected
Power supply good	On, main power on, voltages in spec; off, power off or voltage out of spec
Power supply on	On, main power on; off, main power off
Rear panel	Power on/off switch and power input receptacle
AC power supply	One single-phase, auto-ranging, 100-240VAC, 11.0-5.5Amps, 50/60Hz; total output power is not to exceed 750Watts
Operating environment	0° to 30° Celsius (32° to 86° Fahrenheit) temperature 5% to 80% non-condensing humidity
Dimensions	11.00" H x 6.12" W x 15.00" D (27.94cm H x 15.56cm W x 38.10cm D)
Weight	17.60lbs (7.98kg)
Warranty / period	Parts & labor return to manufacturer / 1 year
Ext. warranty period	Optional 2, 3 or 4 years

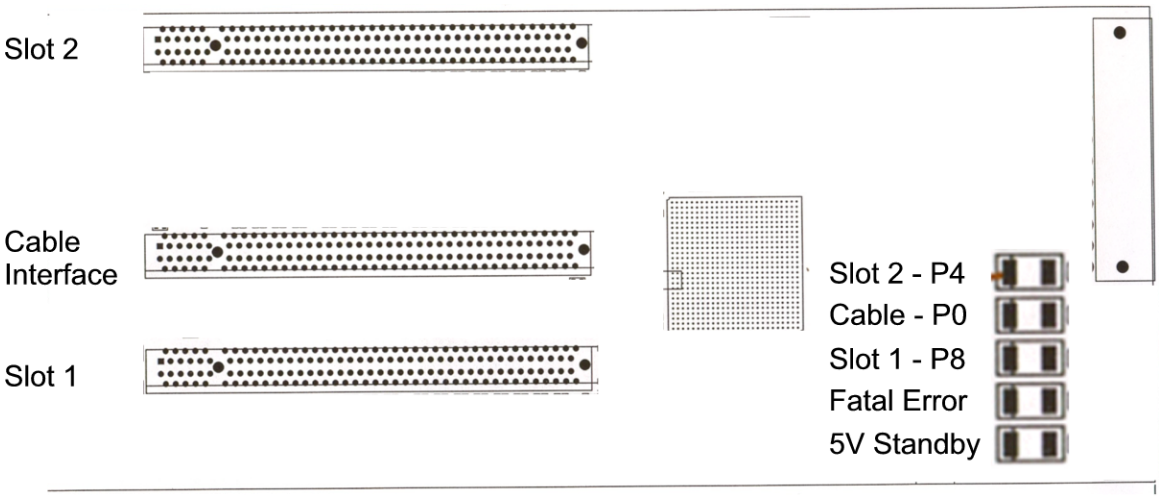
Quick Start

Install a GPU in the host system and install device drivers. Once the drivers are working, move the GPU to GPU-Xpander, install the adapter in the host computer and connect GPU-Xpander to the adapter using the cable provided. The host computer, if it is plug-n-play, will detect the new hardware configuration and install device drivers.

Start-up / Test Procedure

Check your host computer motherboard vendor's Website for device driver and firmware updates, especially those that may affect multiple GPUs. Also, check BIOS configuration for spread spectrum settings for CPU and PCIe. Most vendors set spread spectrum to [Auto]. Change the CPU and PCIe spread settings to [Disable], save the settings and exit BIOS configuration, which restarts the computer. For this procedure, use a Philips #2 screwdriver. Switch off AC power from the host computer and the GPU-Xpander 40 but leave the power cord to each connected. Do not install GPUs until instructed to do so within this procedure.

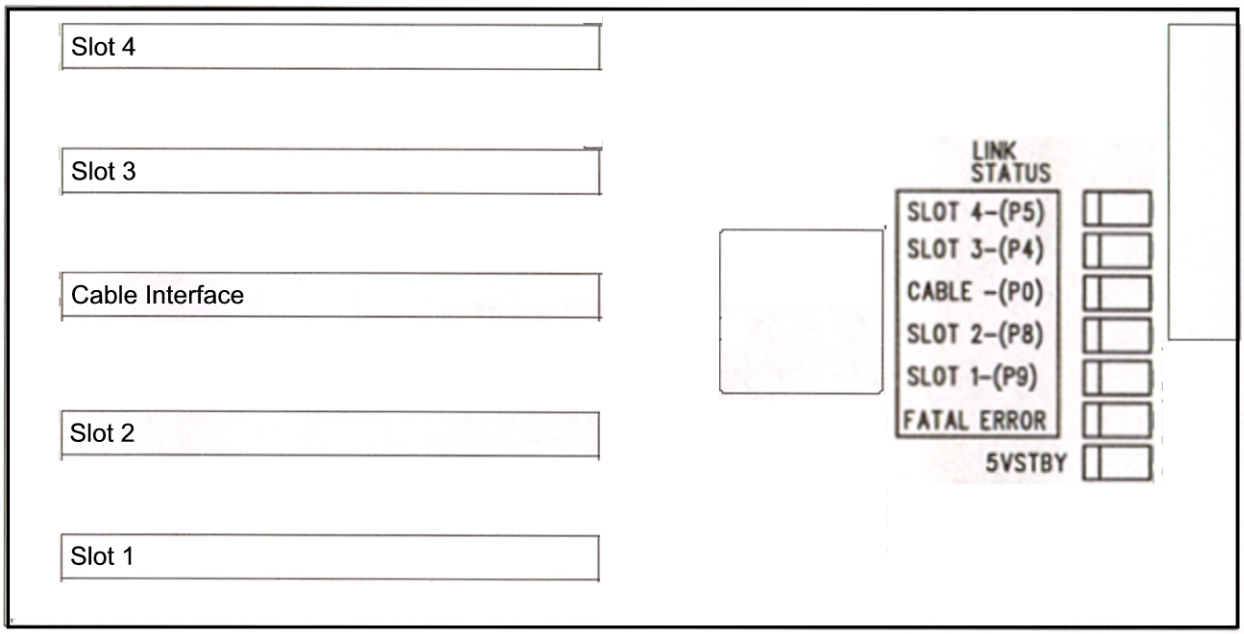
1. Install the Cubix host adapter in a PCIe x8 or x16 slot within the host computer. In an Apple® Mac Pro, install the host adapter in a PCIe x8 slot.
2. Remove the 4 screws in the top cover, remove the cover and set it aside.
3. Connect the external PCIe cable to the host computer port.
4. On GPU-Xpander 40, switch on the AC power switch next to the AC receptacle.
5. Power up the host computer. The GPU-Xpander 40 also powers on.
6. This step applies only to GPU-Xpander with two slots. If you do not have this unit, skip this step. Confirm that exterior Link LED, the Link LED on both adapters and the interior Cable LED (P0) are lit green for each unit. The unit fan should also be spinning. If not, check the following:
   - Host computer BIOS settings for CPU and PCIe spread spectrum are set to [Disable]. If not, disable, save settings and exit BIOS, which restarts the computer.
   - Confirm that the Cubix adapter is firmly seated in a PCIe x16 slot within the host.
   - Confirm that both cable connectors are firmly seated to the adapter connectors.



GPU-Xpander Interior LED Notes

- Wait until 5V Standby LED shuts off before adding / removing GPUs to / from GPU-Xpander.
- If the Fatal Error LED lights amber, reboot the host computer.
- The Cable LED (P0) inside the GPU- Xpander lights steady green when the host adapter is in a PCIe Gen 2 slot. The Cable LED (P0) in GPU- Xpander blinks green when the host adapter is in a PCIe Gen 1 slot.
- Slot LEDs (P4 and P8) are steady green when current drivers are loaded and the GPU has a load. If slot LEDs are flashing, check the vendor's site for a driver update or put a load on the GPU.

7. This step applies only to GPU-Xpander four slots. If you do not have this unit, skip this step. Confirm that exterior Link LED, the Link LED on both adapters and the interior Cable LED (P0) are lit green for each unit. The unit fan should also be spinning. If not, check the following:
   - Host computer BIOS settings for CPU and PCIe spread spectrum are set to [Disable]. If not, disable, save settings and exit BIOS, which restarts the computer.
   - Confirm that the Cubix adapter is firmly seated in a PCIe x16 slot within the host.
   - Confirm that both cable connectors are firmly seated to the adapter connectors.



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- If the Fatal Error LED lights amber, reboot the host computer.
- The Cable LED (P0) inside the GPU- Xpander lights steady green when the host adapter is in a PCIe Gen 2 slot. The Cable LED (P0) in GPU- Xpander blinks green when the host adapter is in a PCIe Gen 1 slot.
- Slot LEDs (P4, P5, P8 and P9) are steady green when current drivers are loaded and the GPU has a load. If slot LEDs are flashing, check the vendor's site for a driver update or put a load on the GPU.

GPU-Xpander is functioning properly once the Cable Link LED (P0) is either flashing or steady green. Proceed to the next step to install adapters.

8. Switch off AC power to the host computer and the GPU-Xpander 40. Leave the power cords and the external PCIe cable to the host computer port connected.
9. Loosen the captured screws holding down the end brackets.
10. Install the graphics or other controller(s) in the GPU-Xpander PCIe slot(s) and connect PCIe auxiliary (aux) power cables (see the image at the right). Each GPU-Xpander provides two

sets of aux power connectors, including two 6-pin connectors and one 2-pin connector. Your GPU may require a combination, such as two 6-pin receptacles, one 6-pin and one 2-pin or all connectors.

11. Replace the hold-down bracket and tighten the retaining screws.

Warning

Before installing or removing cards from the GPU-Xpander 40, switch off AC power and wait for the 5V Standby LED to power off.

12. Connect GPU video port(s), if present, to monitors. This step is important for Linux, because X Windows (X) will crash if you have not connected video ports to monitors. If you cannot connect monitors to installed GPU video ports, edit the Device section of /etc/X11/xorg.conf to define which GPU X should use as the primary display device. For example:

```
Section "Device"
    Identifier     "Device0"
    Driver         "nvidia"
    VendorName     "NVIDIA Corporation"
    BoardName      "GeForce GTX 480"
    BusID          "PCI:8:0:0"
EndSection
```

    To determine BusID for the GPU with the primary display, run scanpci discussed in Step 14.

13. Power up the computer and the GPU-Xpander 40 to confirm that the appropriate slot link LEDs (P4 and P8 in the image above) are lit green, which confirms that you have installed the controller(s) correctly in each slot.
14. Confirm that your operating system (OS) has detected the new controller(s). For instance, check Windows Device Manager. For instance, in a PC running Microsoft® Windows®, check Windows Device Manager. Within Windows, you can also run GPU-Z, a utility available for free download here. In a Mac Pro, check /System/Library/Core Services/Expansion Slot Utility (read more here). In a PC running Linux, run the following:

```
root# > XFree86 –scanpci
```

    Read more about scanpci here.

15. If all the Cable Link and slot LEDs are lit green but your OS does not detect the GPUs, shut down the OS gracefully, power down GPU-Xpander and remove / replace the GPUs. Make sure that you seat each GPU firmly in its slot and that you connect all auxiliary power connectors properly. Switch on GPU-Xpander and boot up the host computer.
16. Install the appropriate graphics or other controller driver(s) using the vendor's procedure. Apple Mac OS X 10.5.x (Leopard) and 10.6.x (Snow Leopard) do not support natively all NVIDIA® GPU products (*e.g.*, GeForce GTX 465 / 470 / 480 Fermi). If you want to use such GPUs with a Mac Pro, download, install and run a supported Linux derivative or Boot Camp 3.x, which is free for download (here). With Boot Camp installed, you can install and run Windows 7 on your Mac Pro and use NVIDIA Windows drivers.
17. Switch off AC power to the host computer and the GPU-Xpander 40. Leave the power cords and the external PCIe cable to the host computer port connected.

18. Replace the GPU-Xpander top cover with the vents near the rear (away from the fan) as shown in the image on page 1 and secure the screws holding the top cover in place. Use all of the screws included in the bag.

Warning

Replace the cover as soon as possible to allow for proper cooling of controllers installed in the unit and secure the cover in place with all of the screws provided. Do not run GPU-Xpander without the cover for more than a few minutes.

Normal Power On/Off Procedure

1. With GPU-Xpander 40 connected to the host computer and running, shut down the host normally.
2. With GPU-Xpander 40 connected to the host computer and powered down, switch on Xpander first and the connected host next; both will boot up.

Shipping Procedure

Before shipping GPU-Xpander 40, remove any installed graphics or other controller(s) using the following procedure:

1. Switch off GPU-Xpander 40 using the on/off switch near the rear power receptacle.
2. Disconnect GPU-Xpander 40 from the host adapter.

Warning

Switch off GPU-Xpander 40 before connecting or disconnecting the adapter in the host.

3. Using a Philips #2 screwdriver, remove the screws securing the top cover.
4. Loosen the captured screws holding down the end brackets and remove the graphics or other controllers.
5. Replace the hold-down bracket and tighten the captured screws.
6. Pack the graphics cards within the boxes in which you received them.
7. Replace the top cover and secure it in place using 4 screws. Put the remaining screws in the plastic bag included.
8. Remove the power cord.
9. Within the original packaging, pack the GPU-Xpander, the extra screws for the top cover, the power cord, the host adapter and the boxed graphics cards. Include a copy of these instructions.