Hypercube FX System Quick Start Guide

About Hypercube FX and GPU Modules

Package contents

The lists below show the contents of Hypercube FX and GPU Module packages:
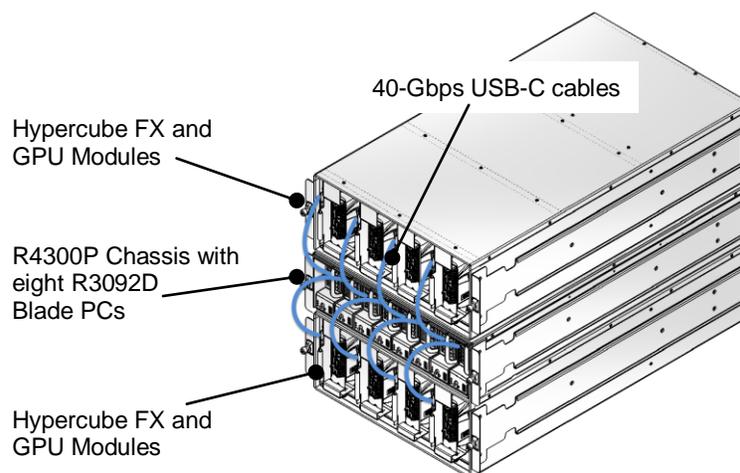
Hypercube FX

- Hypercube FX chassis
- Power supplies (pre-installed—two or three, depending on configuration)
- Fans (pre-installed)
- Power cables (two or three, depending on power supply configuration)

GPU Module

- GPU Module chassis with GPU
- Thunderbolt™ 3 cable for connection to ClearCube R3092D Blade PC

About the Hypercube FX system

The ClearCube® Hypercube FX is a 4U rack-mount chassis containing up to four GPU Modules. Hypercube FX GPU Modules connect to ClearCube R3092D Blade PCs through 40-Gbps USB-C cables, providing R3092D blades with dedicated, one-to-one GPUs. The picture below shows two Hypercube FXs (each containing four GPUs) connected to one R4300P chassis containing eight R3092D Blade PCs.
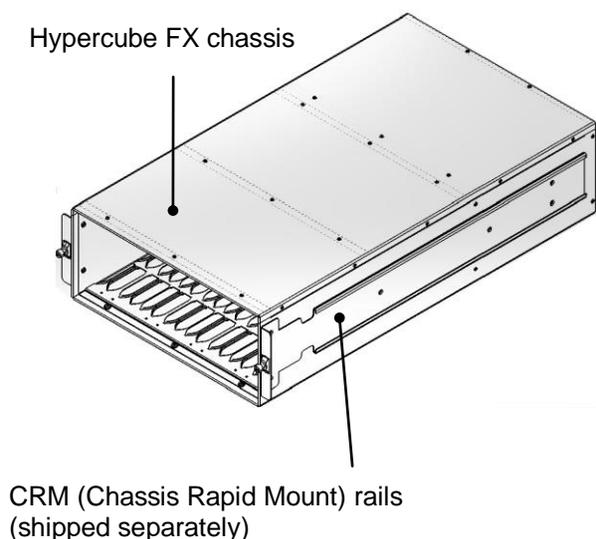

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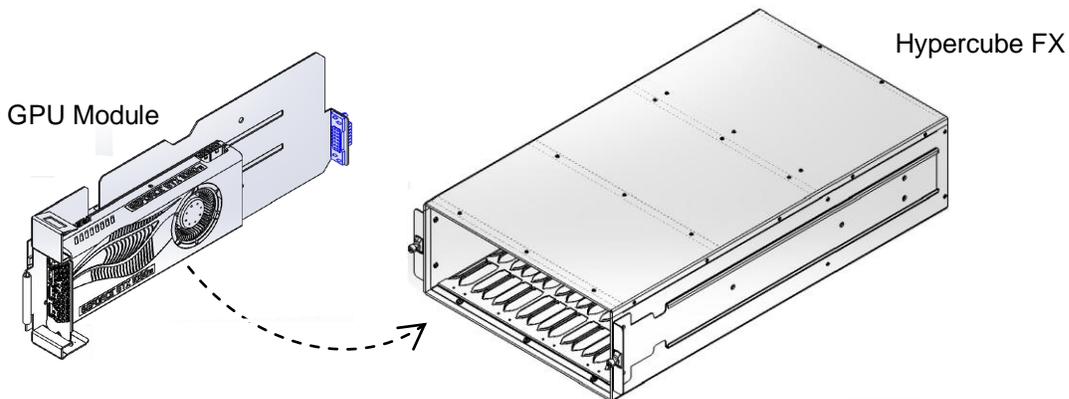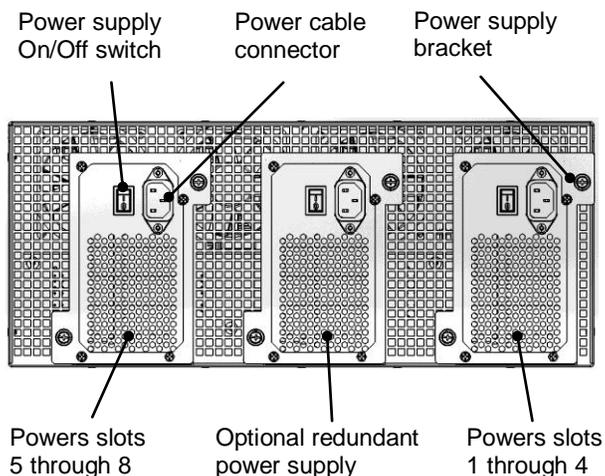**ClearCube Technology, Inc.   1505 Volta Drive, Suite 100   Cedar Park, TX 78641   (512) 652-3500   www.clearcube.com**

Hypercube FX features

The pictures below show the major Hypercube FX features.

Hypercube FX side view

Hypercube FX chassis

CRM (Chassis Rapid Mount) rails (shipped separately)

Hypercube FX rear view

Power supply On/Off switch

Power cable connector

Power supply bracket

Powers slots 5 through 8

Optional redundant power supply

Powers slots 1 through 4

GPU Module

Hypercube FX

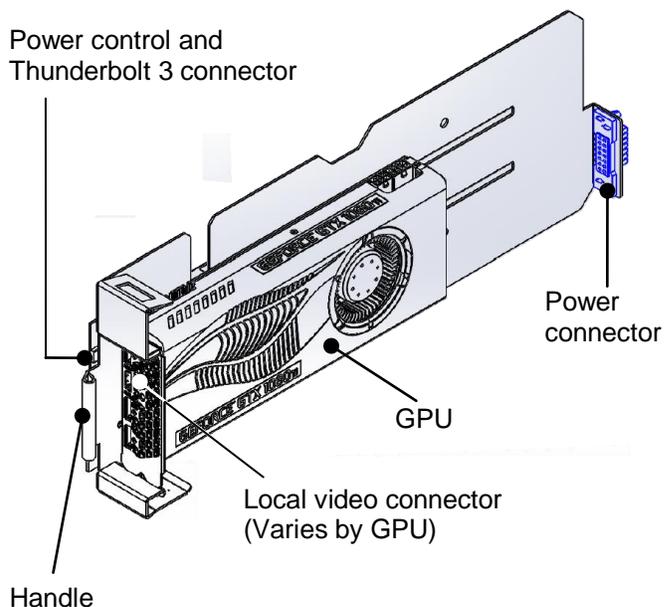*Continued on next page*

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About Hypercube FX and GPU Modules, Continued

GPU Module features   The pictures below show GPU Module features.

GPU Module side view

Power control and
Thunderbolt 3 connector

Power
connector

GPU

Local video connector
(Varies by GPU)

Handle

GPU Module front view

Power control and
Thunderbolt 3
connector

Local video
connector
(Varies by GPU)
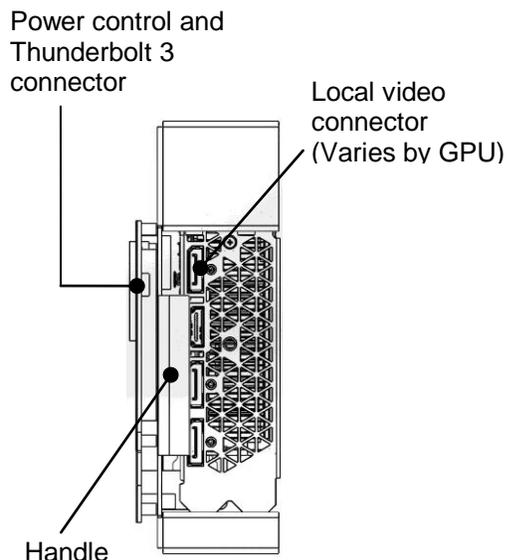
Handle

Before You Begin

Personal and product safety

CAUTION: Prevent ESD (electrostatic discharge) damage to Hypercubes and components by always discharging your body before handing (for example, by touching a grounded, unpainted, metal object). ESD can vary depending on many environmental conditions, including clothing that users wear and how they handle products. ESD damage can potentially cause unsupported product behavior including failure. Always perform ESD prevention steps before using ClearCube products.

Before setup

Be sure to have the following before installing a Hypercube FX system:

- **R4300P Chassis and blades**
  ClearCube R4300P Chassis with R3092D Blade PCs. Connect Hypercube FX to these blades to provide expanded GPU capabilities.

- **4-post server rack**
  A cabinet or rack with adequate space for the Hypercube FX (4U, or rack units) and the R4300P chassis and blades (4U) you are connecting to.

- **Mounting rails**
  ClearCube CRM (Chassis Rapid Mounting) rails. See the ClearCube Support site at www.clearcube.com/support for CRM kit mounting instructions.

- **GPU drivers**
  Appropriate GPU drivers for the GPU Module in your Hypercube FX. GPU drivers are available at www.clearcube.com/support.
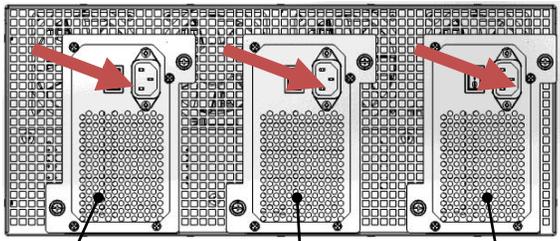
Installing Hypercube FX and Modules

Attaching rails and mounting

The steps below show how to mount a Hypercube FX in a rack.

CAUTION:	Hypercube FXs mounted in a rack using a CRM Kit are designed to *remain stationary* after being secured to a rack using the CRM thumb screws. CRM Kits do not enable Hypercube FXs to serve as shelves or supports.

CAUTION:	Fully extending the Hypercube FX removes it from the rack. Ensure the Hypercube FX is adequately supported before fully extending or removing it. Otherwise, it may fall and can cause damage and injury.

These instructions assume you have ClearCube CRM chassis rails, a four-post server rack, and appropriate power connections for each Hypercube FX power supply.

Step	Action
1	Be sure to leave space around the Hypercube FX (above, below, or both) to mount ClearCube R4300P chassis and R3092D Blade PCs that will connect to the Hypercube FX. After mounting, you will use 40-Gbps USB-C cables to connect GPU Modules in the Hypercube FX to R3092D Blade PCs. See the picture in "About the Hypercube FX system" above for an example of a typical Hypercube FX and R4300P chassis mounting configuration.
2	Attach CRM rails to the Hypercube FX and server rack. See *Chassis Rapid Mounting Kit Quick Start Guide*, available from ClearCube Support, for mounting instructions. From www.clearcube.com/support/, select **R4300 Chassis** from the Backpacks/Cages drop-down menu. From the R4300 page, click **Manuals**, and then click **CRM (Chassis Rapid Mounting) Kit Quick Start Guide**.
3	Connect the AC power cables (included with the Hypercube FX) to the power supply connectors on the rear of the Hypercube FX (your Hypercube FX might have two or three power supplies). The picture below shows the power connectors and the Hypercube FX slots that each power supply powers. Powers slots 5 through 8 Optional redundant power supply Powers slots 1 through 4

See "Hypercube FX power supplies" below for more information about Hypercube FX power controls.
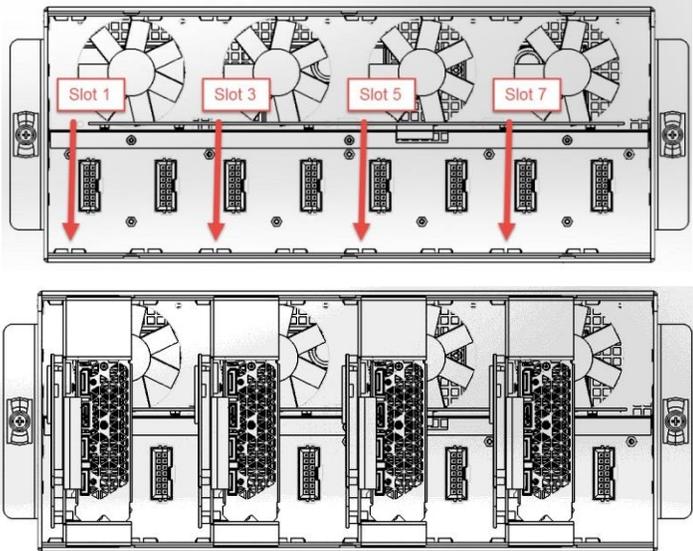
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Inserting GPU Modules

After mounting the Hypercube FX, install GPU Modules as shown below.

NOTE:	Before inserting and using GPU Modules, be sure to see "Powering on" for important instructions and warnings about powering GPU Modules off and on.

Step	Action
1	Hypercube FXs contain eight module slots (starting from left to right from the front of the Hypercube FX), corresponding to guide rails on the top and bottom walls. Be sure to insert GPU Modules in odd-numbered slots only. The picture below shows module slots 1, 3, 5, and 7, and a Hypercube FX with GPU Modules installed in those slots.
2	Orient each GPU Module so the handle is on the left, as shown above.
3	CAUTION: Remove all USB-C cables from the GPU Module *before inserting* into the Hypercube FX. Failure to do so can cause critical hardware failure, data loss, or both. Align modules with the guides on the inside of the chassis, and then slowly insert the module into the chassis until it stops. You might feel a slight resistance as the power connectors align with the internal power socket. CAUTION: Never force modules into a Hypercube FX. Mishandling modules can cause critical hardware failure, data loss, or both.
4	Ensure GPU Modules are fully seated in the Hypercube FX.

Removing GPU Modules

The steps below show how to remove GPU Modules from a Hypercube FX.

Step	Action
1	From the connected Blade PC, close any applications using the GPU. **CAUTION:** Close all applications using the GPU. Failure to do so can cause unsupported operating system behavior, critical hardware failure, and data loss.
2	Remove the 40-Gbps USB-C cable (which powers off the GPU Module) and all other cables. **CAUTION:** Remove external cables before removing the GPU Module. Failure to do so can cause critical hardware failure, data loss, and unsupported operating system behavior on the connected computer.
3	Hold the module by the handle and pull back to remove it. Support the rear of the module as you remove it from the Hypercube FX so it does not fall over or drop during removal.

Power Controls

Hypercube FX power supplies

Hypercube FXs contain two or three power supplies (depending on configuration). Power supplies provide power for GPU Modules and are controlled by power switches on the rear of the Hypercube FX. Each power supply is controlled by its own switch
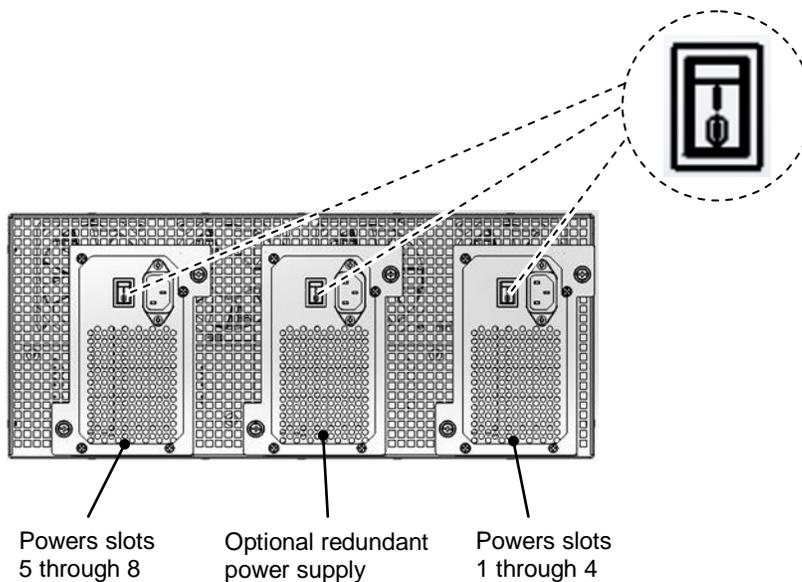
Powers slots 5 through 8   Optional redundant power supply   Powers slots 1 through 4

Hypercube FXs contain eight module slots (starting from left to right from the front of the Hypercube FX):

- The power supply shown on the right (above) powers slots one through four.

- The power supply shown on the left powers slots five through eight.

- The optional power supply in the middle provides redundant/failover power.

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Power Controls, Continued

Powering on GPU Modules

GPU Modules are hot-pluggable and automatically power on when connected to the Thunderbolt port of an R3092D blade that is powered on.
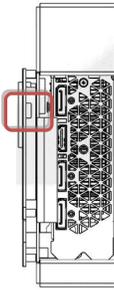
These instructions assume an R4300P Chassis with R3092D blades is installed and powered on in the same rack as the Hypercube FX, and the Hypercube FX power supplies are powered on.

Step	Action
1	Plug the ClearCube 40-Gbps USB-C cable (included with the Hypercube FX) into the R3092D blade to which you're connecting the GPU. Be sure to rotate the USB-C connector so the ClearCube logo on the top of the cable faces the lightning bolt icon on the R3092D blade's USB-C connector.
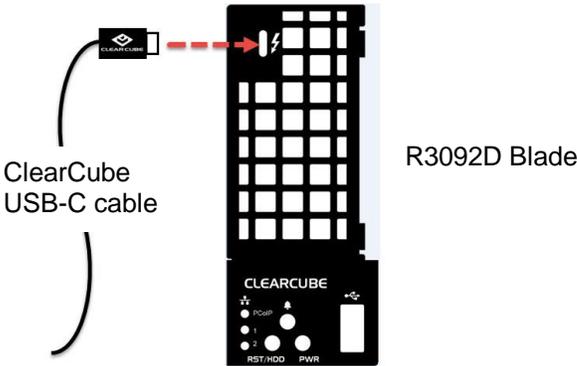
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Power Controls, Continued

Powering on GPU Modules (continued)

Step	Action
2	Insert the other end of the USB-C cable into the GPU Module's Thunderbolt 3 connector on the upper-left side of the USB Module. GPU Module Thunderbolt 3 connector The GPU module powers on.

If the GPU Module does not power on or you are unable to see the GPU from the R3092D blade's operating system, check the following (ClearCube strongly recommends using the 40-Gbps USB-C cable shipped with the GPU Module):

- Make sure the R3092D blade you are connecting to is powered on.

- Check the rear of the Hypercube FX to see if the Hypercube FX power supplies are powered on.

- If you're using the ClearCube-branded USB-C cable, check that the cable is oriented correctly. From the R3092D Blade, be sure the ClearCube logo on the cable faces the lightning bolt logo on the R3092D blade.

- If you're using a 3rd-party Thunderbolt cable, remove the cable from the R3092D blade or the GPU Module, rotate the cable 180 degrees, and reconnect it to the device.

- Check to see if the USB-C cable you're using is a certified Thunderbolt cable. Note that poor-quality cables can fail or cause poor device performance. Contact ClearCube for information about recommended 3rd-party cables.

Powering off GPU modules

To power off GPU Modules, remove the ClearCube 40-Gbps USB-C cable from the GPU Module's Thunderbolt 3 connector.

CAUTION:	Close all applications using the GPU before removing the GPU Module from the Hypercube FX. Failure to do so can cause unsupported operating system behavior, critical hardware failure, and data loss.

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Initial Connection and Setup

**Connecting to a blade and installing GPU drivers**

After installing and connecting the Hypercube FX GPU Modules to R3092D Blade PCs, use a zero client to connect to the R3092D blades. These instructions assume an R4300P Chassis with imaged R3092D Blade PCs, zero clients, and a DHCP server are on the same network.

Step	Action
1	Power on the R3092D to which you are going to connect.
2	Connect one or more monitors to the zero client.
3	Connect a network cable to the connector located on the rear of the zero client (fiber or copper, depending on model), and then connect the other end of the cable to the appropriate network infrastructure device (such as a network switch, fiber transceiver, or router).
4	Connect a USB keyboard and a mouse to the USB ports on the front or rear of the zero client.
5	Connect the AC power adapter to the power cable (included with the zero client).
6	Connect the power adapter to the rear of the client, and then plug the power cable into a power outlet. Ensure that the zero client and the blade's PCoIP® host card are on the same network.
7	Click the **Connect** button on the zero client's display. After a moment, select the **host card** to connect to from the list displayed. After several moments, the R3092D login screen or desktop is displayed.

You can now install GPU drivers on the R3092D blade.

Viewing local video

You can connect a monitor to a video port on the front of the GPU Module for local maintenance or configuration in the data center. Depending on the GPU configuration on GPU Modules, some video ports might not be accessible.

Local video connector (Varies by GPU)
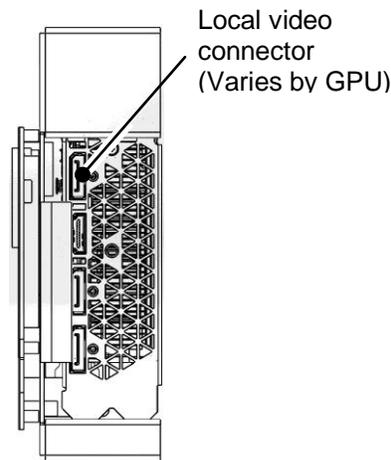
Additional Information and Support

Trouble-shooting

The list below shows common troubleshooting steps:

- Be sure the BIOS is current on the R3092D Blade PC you are connecting to. See www.clearcube.com/support, select **R3092D** from the Compute Devices drop-down menu, and select **BIOS** to find the current BIOS file. Updating tools and instructions are included in the download.

- Be sure all USB-C cables are 40-Gbps USB-C cables, and they are inserted and oriented correctly in the R3092D Blade PC. See "Powering on GPU Modules" above for more information.

- If you are not seeing video:

  o Be sure you have installed the driver for the GPU on the GPU Module. Install the driver on the R3092D Blade PC.

  o If you only see video on one display in a multi-display configuration, note that Windows 10 can disable displays as soon as Windows starts. Log in to Windows 10 from the active display, right-click the desktop, and select **Display settings**. From the Multiple displays menu, select **Extend these displays**. Click **Apply**, and then click **Keep these changes**.

Documentation resources

See the ClearCube support site at www.clearcube.com/support/ for drivers and additional documentation about R3092D Blade PCs and zero clients.

Contacting Support

Web	www.clearcube.com/support/
Email	support@clearcube.com
Toll-free	(866) 652-3400
Direct	(512) 652-3400

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