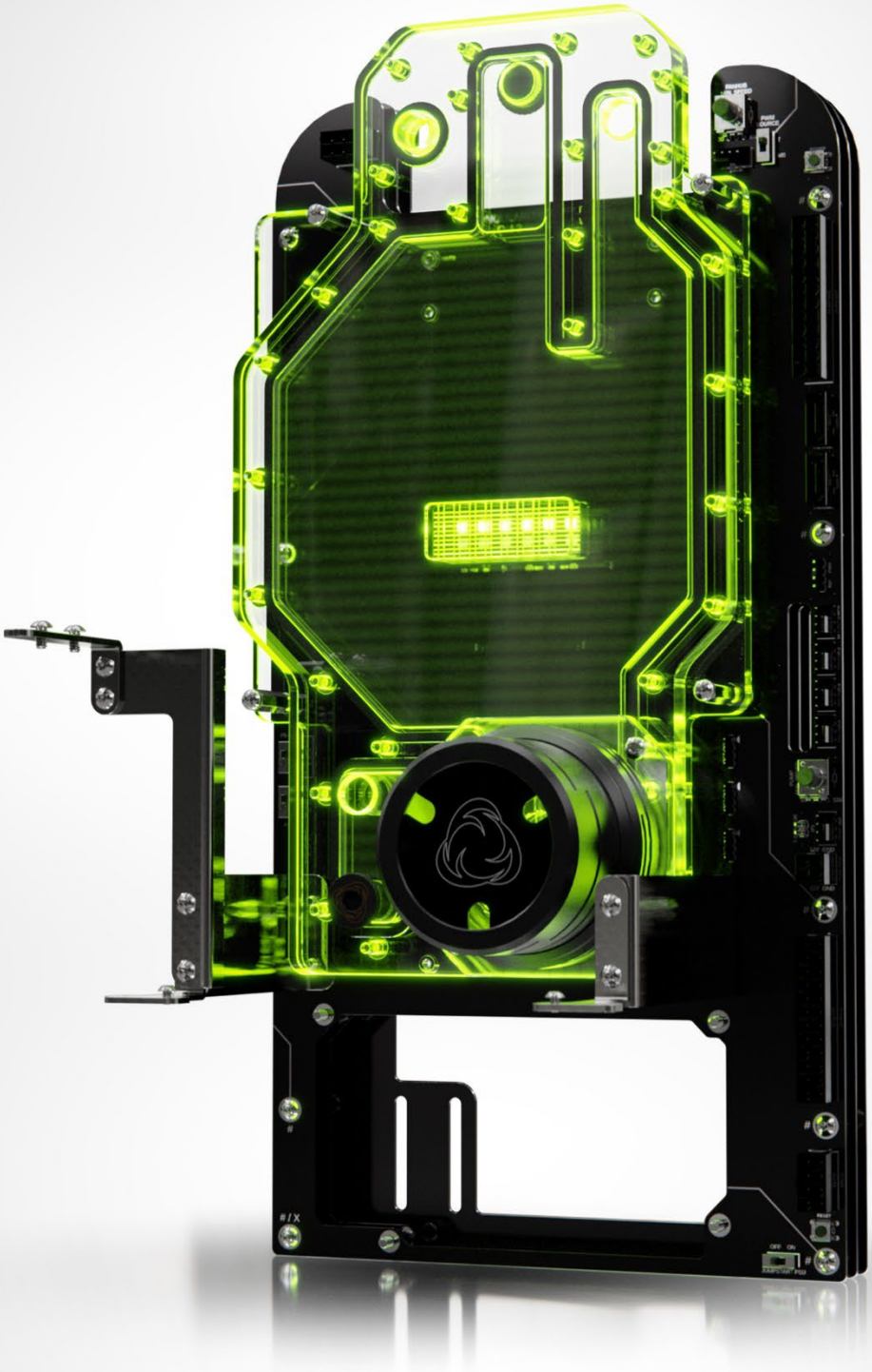
SINGULARITYCOMPUTERS

PHANTOM 2 ITX



Asembly Manual

Revision 1.0

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Introduction

The Phantom 2 ITX Case turns the Singularity Computers PowerBoard into the case itself. Phantom 2 does not aim to be the smallest Mini-ITX case, but to achieve maximum component density with unrestricted airflow and support for high-end watercooling. Phantom 2 disappears amongst the components mounted to it, it is completely about component selection and will show off the skill of the builder. It fits ITX motherboards, 4 slot graphics cards, ATX power supplies and 2x 2.5" drives. Water-cooling is possible with the included Phantom 2 Universal Radiator Mount which fits 120mm, 140mm, 240mm, 280mm, 360mm, 420mm, 480mm and 560mm radiators. There is no limitation on radiator thickness and push/pull fans also fit. All components are mounted directly onto the PowerBoard which acts as a rack as well as a power distribution plate. It has the MB 24pin, EPS 8pin, pump power, a temperature controlled PWM hub for the fans and the D5 pump integrated along with Power and Reset buttons and a JUMPSTART PSU switch. There are integrated direct connect SATA power connections to avoid the use of SATA power cables. It has built-in ARGB and UV lighting. There is no rear access needed to the case for cable management, all cables can be connected from the front. Black sleeved cables are included with the case and custom colored sleeved linking cables can be purchased separately.

Features

- **PowerBoard Integration**
  The Phantom 2 PowerBoard is a PCB integrating 24pin, EPS, SATA, Power, and Reset Buttons with PWM control, ARGB and UV lighting. Essentially, the PowerBoard is a distribution plate for cables while integrating other features and functions as well. It is a new method for cables allowing standardisation of cable lengths and making traditional cable management no longer necessary. Phantom 2 comes included with a standard set of black sleeved linking cables including 24pin x1 and 8pin EPS x1 meaning that these cables don't have to be purchased separately.

- **Reduced build time due to integration**
  Cables do not need to be purchased separately and no cable management is needed for the core component cables.

- **High End Components**
  It is designed to fit the largest high-end GPUs. It can fit the largest PSUs although it is recommended to pick a short and light PSU to make transporting the system easier, same applies to the GPU. For the water-cooling system it can fit any 120mm or 140mm class radiator size with unlimited thickness and push/pull fans.

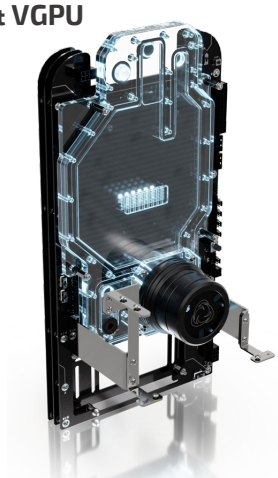
- **Radiator Adjustment**
  The additional Phantom 2 Universal Radiator Mount is adjustable to help with port alignment and to turn the radiator into a support leg.

- **Storage**
  The Phantom 2 PowerBoard has 2x 2.5" SATA Drive positions.

Phantom 2 ITX Case Specifications

Case Components	PowerBoard PCB parts: x4 total. Stainless steel fasteners and stand offs.
Electronics Integration	24pin x1, 8pin EPS x1. Power and Reset Buttons. 2.5" SATA 3.0 6Gb/s Direct Mount. PWM FAN and PUMP headers. Potentiometers for PWM control. ARGB and UV lights.
Cables	PowerBoard Linking Cables and PowerBoard PSU Cables available here. Custom Cables available here.
Motherboard Form Factor	Mini-ITX.
Expansion Slots	x4.
Case Form Factor	SFF.
Package Dimensions	395mm(L) x 430mm(W) x 40mm(H) Case is flat packed and requires assembly.
Package Weight	2 kg.
Case Dimensions	185mm(L) x 215mm(W) x 386mm(H)
Case Weight	1.5 kg.
Storage	2x 2.5".
Radiators	120mm, 140mm, 240mm, 280mm, 360mm, 420mm, 480mm, 560mm. There is no limitation on radiator thickness and push/pull fans can be used.
Max. GPU Length &Height	Unlimited.
Max. GPU Thickness	Unlimited in vertical GPU mode, 80mm in horizontal GPU mode.
Max. CPU Cooler Height	Unlimited in horizontal GPU mode, 77mm in vertical GPU mode.
Max. PSU Length	Unlimited (short PSUs are preferable for the aesthetics so that they don't protrude too far.
Front Panel I/O	Power and Reset buttons.
Vertical GPU Mount	Yes, purchasable as an add-on with an optional D5 distribution plate.
Materials	PCB with stainless steel fasteners, stand offs and GPU mounting hardware.
Manufacturing Process	PCB and metal folding.
Assembly	Flat packed and needs to be assembled by the customer.
Accessories	M3 Hex Keys x1.

Parts List

	Item		Quantity
Phantom 2 ITX Case 	Phantom 2 PowerBoard		1
	Phantom 2 Reinforcement Left		1
	Phantom 2 Reinforcement Right		1
	Phantom 2 Universal Radiator Mount		1
	HGPU (Phantom 2 Horizontal GPU Mount)		1
	SATA 2.5" L-brackets		2
	#6-32 10mm SO-F	F	14
	#6-32 10mm SO-M	M	16
	#6-32 117mm SO-M	X	2
	#6-32 0.25" SCR x37	#	37
	8pin EPS 10cm Linking Cable		1
	24pin MB 10cm Linking Cable		1
	PWM Linking Cable		1
	ARGB Linking Cable		1
	PowerBoard Switch Power Cable		1
	PowerBoard Switch Reset Cable		1
	SATA 10cm Data Cable		2
	Power Cable		1
	M3 8mm SCR		6
	M3 / #6-32 Hex-key		1
Phantom 2 Vertical GPU Mount 	VGPU1		2
	VGPU2		2
	VGPU3		1
	VGPU4		1
	PCIe Gen4 Riser		1
	#6-32 0.25" SCR		12
	M3 4mm SCR		2
Phantom 2 D5 Reservoir Distribution Plate & VGPU 	VGPU1		2
	VGPU2		2
	VGPU3		1
	VGPU4		1
	PCIe Gen4 Riser		1
	#6-32 0.25" SCR		12
	#6-32 20mm+10mm SO-M		4
	M3 4mm SCR		2
	D5 Distribution Plate		1
	4pin ATX pump power cable		1

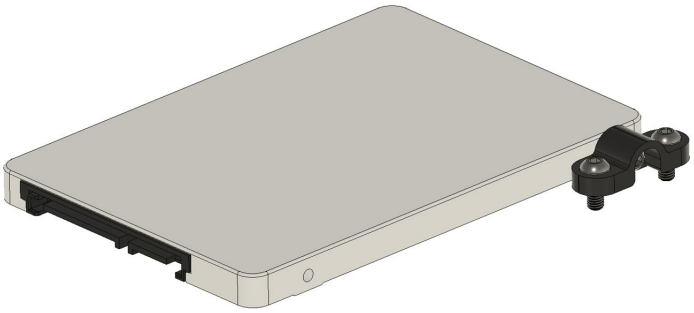
Note: **SCR** – SCRew **SO-F** - StandOff Female **SO-M** - StandOff Male

Assembly Manual

Step 1: Mounting the Drives (optional)

Required Parts	•	x2	2.5" drives	•	x6	M3 8mm SCR	
	•	x2	SATA 2.5" L-Brackets				

Mount the 2.5" drives to the main PowerBoard before doing any other assembly as access to these drives will be restricted by other parts.



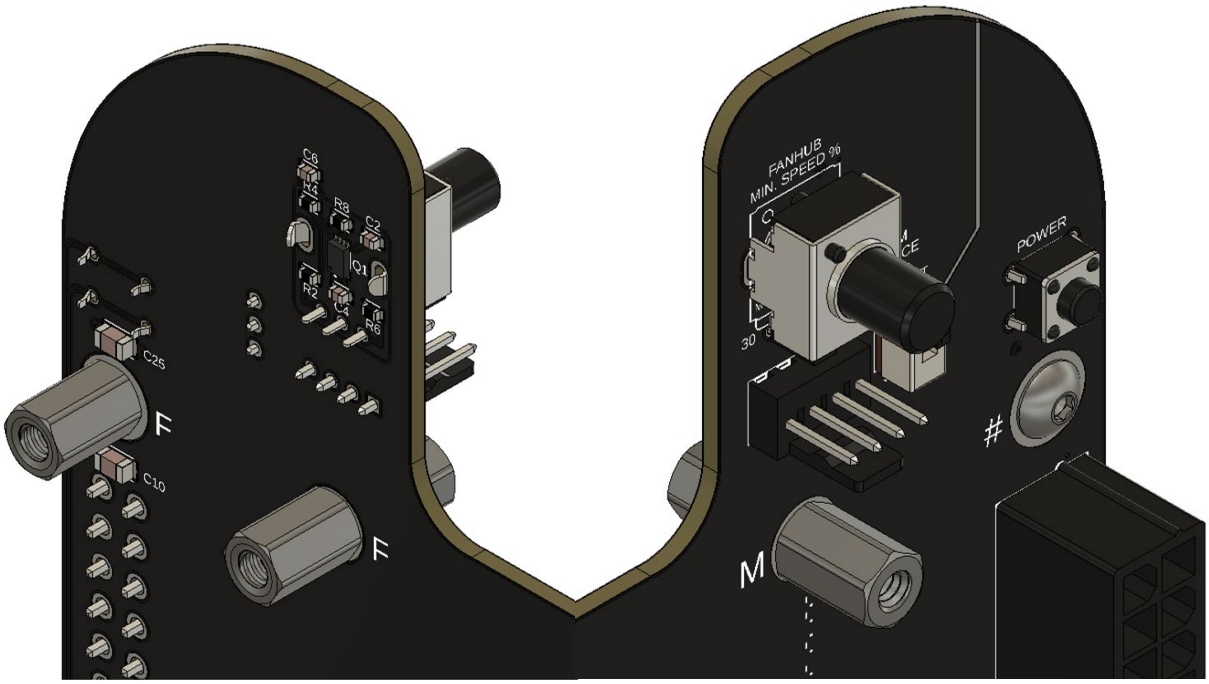
Use an M3 8mm SCR fastener to mount a SATA 2.5" L-bracket to a drive then install the drive to the SATA receptacle on the PowerBoard and secure it with 2x M3 8mm SCR to the PowerBoard.

Step 2: Preparing the Main PowerBoard

Required Parts	•	x10	#	#6-32 0.25" SCR	•	x4	M	#6-32 10mm SO-M
	•	x14	F	#6-32 10mm SO-F				

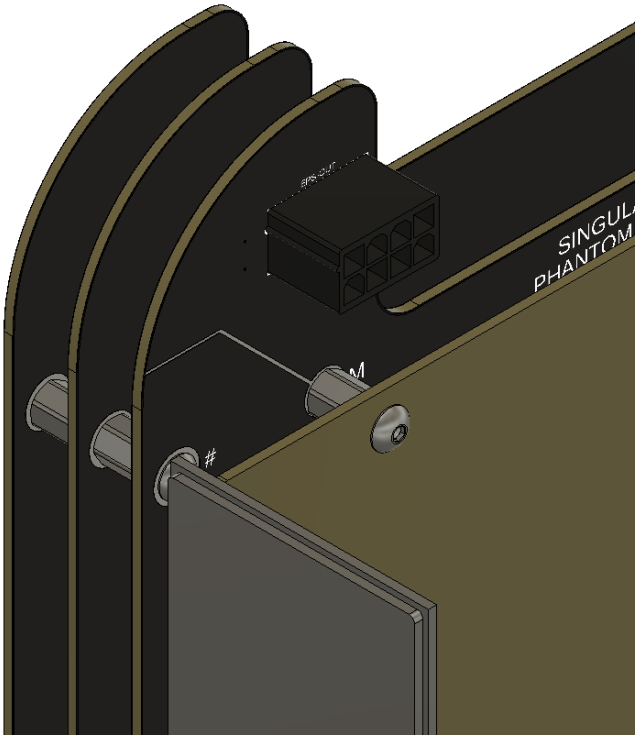
Part A: Grab x10 #6-32 10mm SO-F female standoffs and install them to the holes marked "F" on the back side of the PowerBoard and secure them from the front side with x10 of #6-32 0.25" SCR fasteners for holes marked with "#".

Part B: The remaining x4 of the #6-32 10mm SO-F female standoffs will have a #6-32 10mm SO-M male standoff on the opposing side instead of fasteners, these form the 4 mounting points for the ITX motherboard at the mounting holes marked with "M" on the front side of the main PowerBoard.

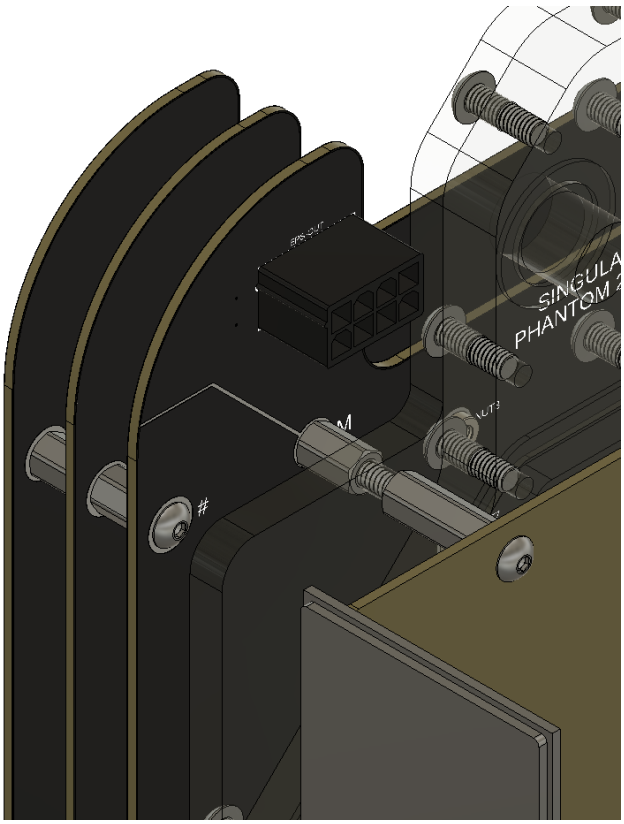


Step 3: Installing the Motherboard and D5 distribution plate

Required Parts	• x4 #6-32 0.25" SCR • ITX motherboard	• D5 Distribution Plate (Option B) • x4 #6-32 20mm+10mm SO-M (Option B)



Option A without the distribution plate: Install the ITX motherboard onto the #6-32 10mm SO-M standoffs on the front side of the main PowerBoard and secure it with x4 #6-32 0.25" SCR fasteners.

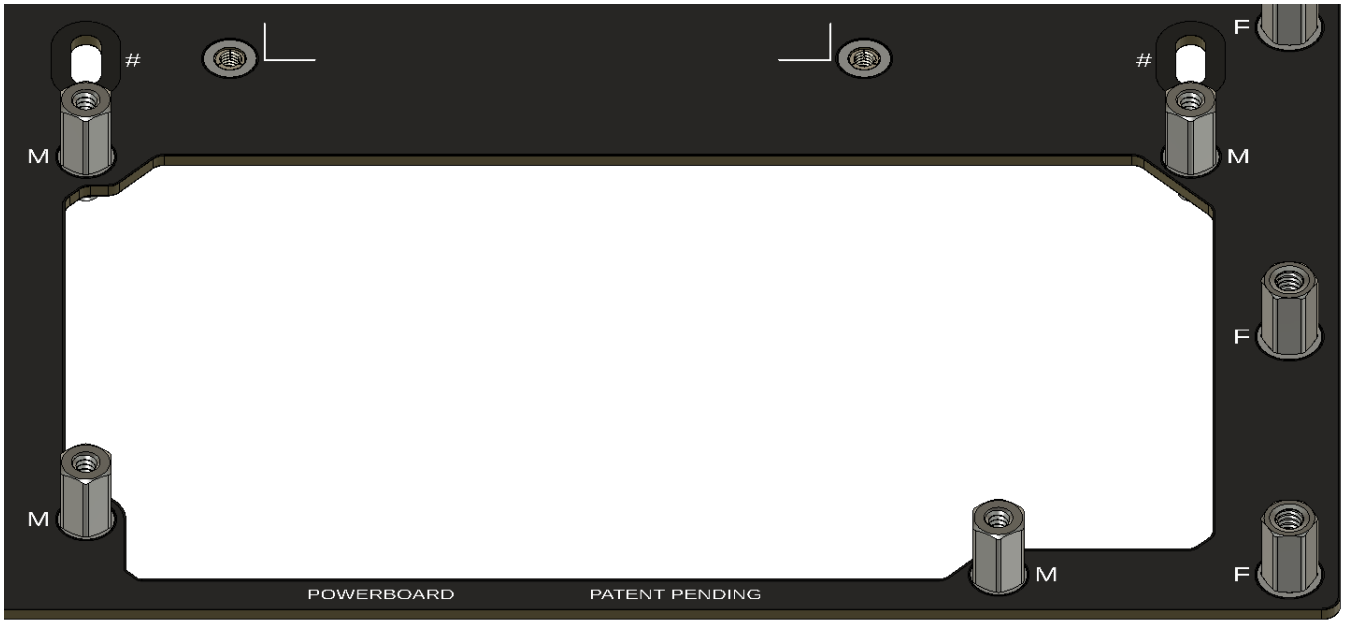


Option B with the distribution plate: Install the D5 distribution plate onto the #6-32 10mm SO-M standoffs on the front side of the main PowerBoard and secure it with x4 #6-32 20mm+10mm SO-M x4 male standoffs. Install the ITX motherboard onto the #6-32 20mm+10mm SO-M male standoffs and secure it with x4 #6-32 0.25" SCR fasteners. Install the D5 pump with an o-ring and the metal cover to the distribution plate.

Step 4: Installing the Power Supply

Required Parts	• x4 M #6-32 10mm SO-M • ATX Power Supply	• Power Cable	

Grab an ATX power supply and 4x of the #6-32 10mm SO-M male standoffs and secure the power supply onto the main PowerBoard at the mounting holes marked with "M" on the lower back side around the power supply cutout. These standoffs will need to be finger tight as the case gains most of its structural integrity from these mounts. Plug in the included Power Cable to the power supply now as the Universal Radiator Mount will block access to it later. *Some power supplies have paint build-up inside the threads that make driving in the standoffs difficult. This can be cleaned by using the mounting screws included with the power supply and a screwdriver. Drive all 4 mounting screws in and then out to remove the paint.*



Step 5: PCIe Mounting Bracket

The installation of a PCIe mounting bracket is optional but needed for dedicated graphics cards. For systems with only integrated graphics, this step can be skipped, go to Step 5.
The D5 Distribution Plate is only compatible with the Vertical GPU Mount.

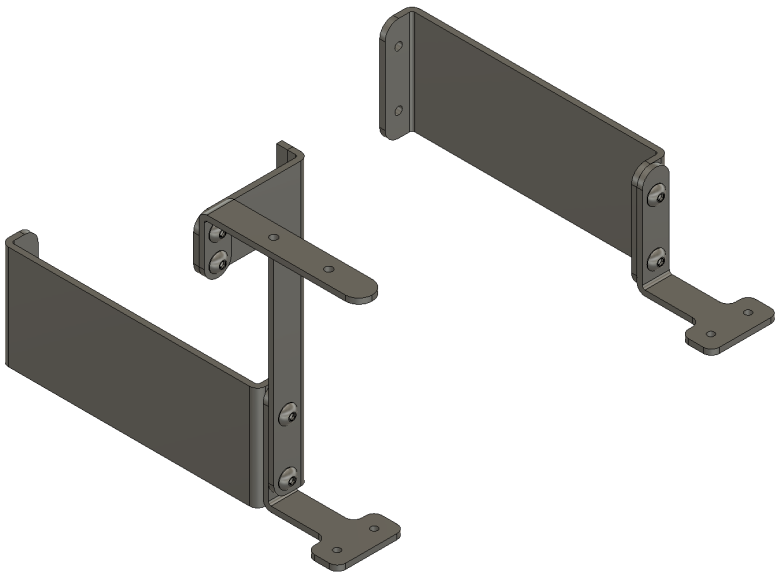
Required Parts	• x2	X #6-32 117mm SO-M (Horizontal)	• x1	VGPU3 (Vertical)	
	• x10	#6-32 0.25" SCR (Vertical)	• x1	VGPU4 (Vertical)	
	• x1	HPGU (Horizontal)	• x1	PCIe Gen4 Riser (Vertical)	
	• x2	VGPU1 (Vertical)	• x2	M3 4mm SCR (Vertical)	
	• x2	VGPU2 (Vertical)			

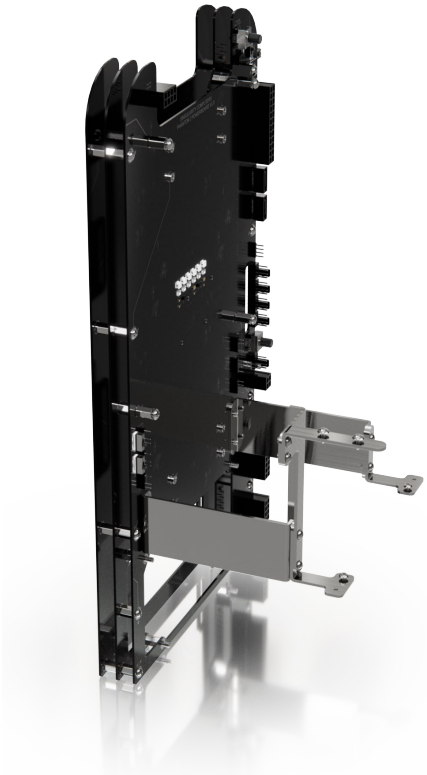
Horizontal:

Remove the x2 #6-32 0.25" SCR fasteners from the mounting holes marked "X / #" and replace them with x2 #6-32 117mm SO-M male standoffs, then put the Phantom 2 Horizontal GPU mount on top and secure it with the x2 #6-32 0.25" SCR fasteners that we removed previously to the #6-32 117mm SO-M male standoffs.

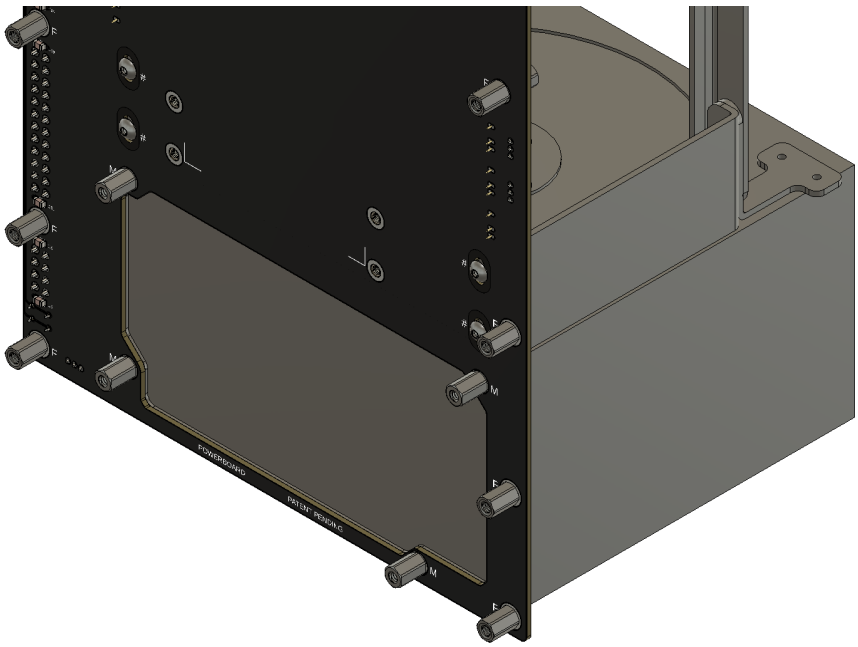
Vertical:

Part A - Assemble the Vertical GPU Mount using x6 #6-32 0.25" SCR fasteners to this stage:



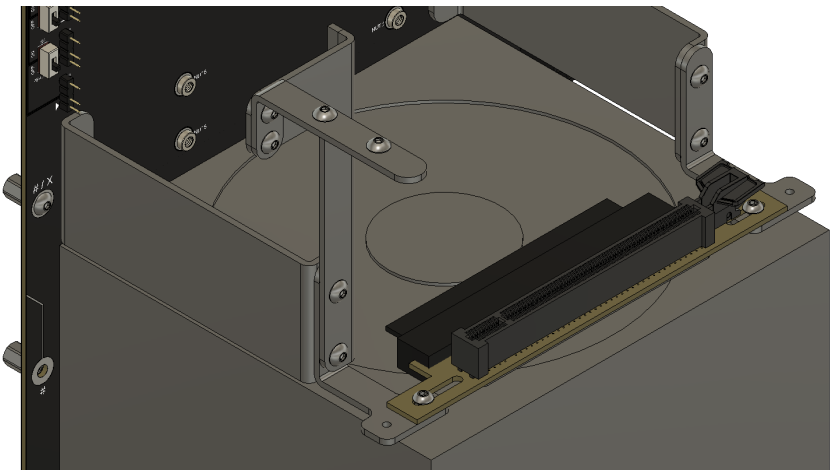


Part B - Install the mount to the main PowerBoard and secure it using x4 #6-32 0.25" SCR fasteners, but do not tighten them for now as the height of the mount will need to be set:

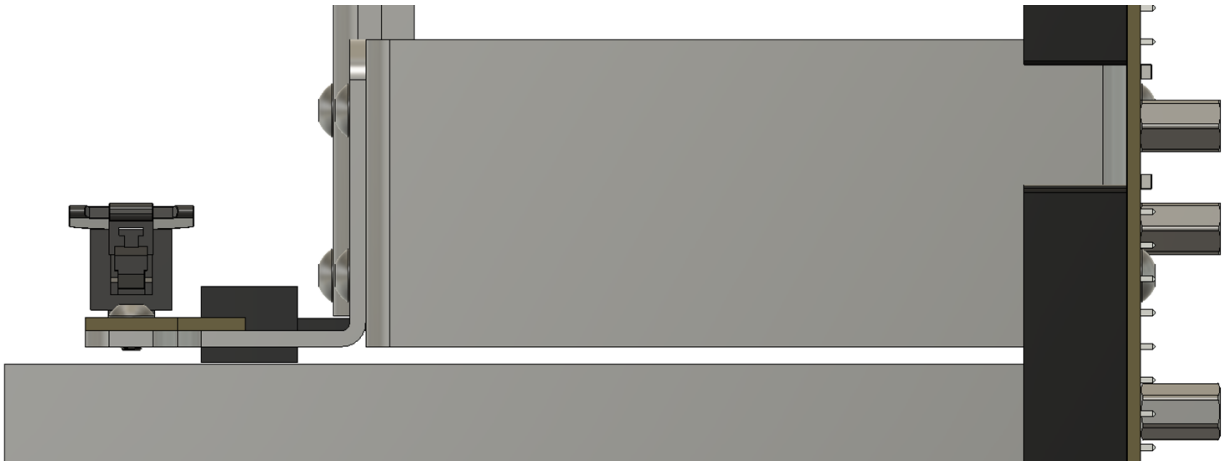


Part C - Install the PCIe Gen4 Riser cable PCB to the mount using x2 M3 4mm SCR fasteners and center the riser for optimal position:

The riser cable should be folded under the D5 pump cover to hide the excess then plugged into the motherboard.



Part D - Adjust the height of the Vertical GPU Mount assembly until the PCIe Riser cable rests on the top of the power supply then tighten the #6-32 0.25" SCR fasteners on the back of the PowerBoard that we left loose for this purpose previously:



Step 6: Phantom 2 Reinforcements

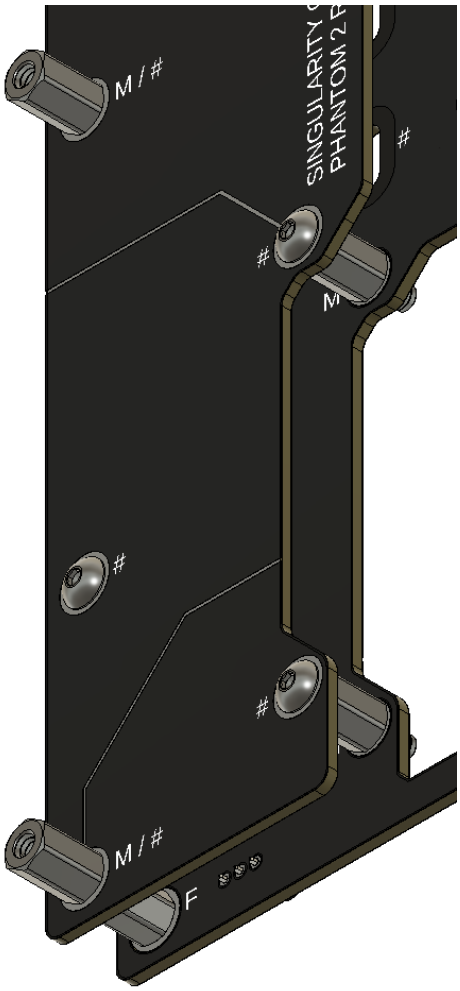
Required Parts	• x18/x10	#	#6-32 0.25" SCR	• x1	Phantom 2 Reinforcement Left
	• x0/x8	M	#6-32 10mm SO-M	• x1	Phantom 2 Reinforcement Right

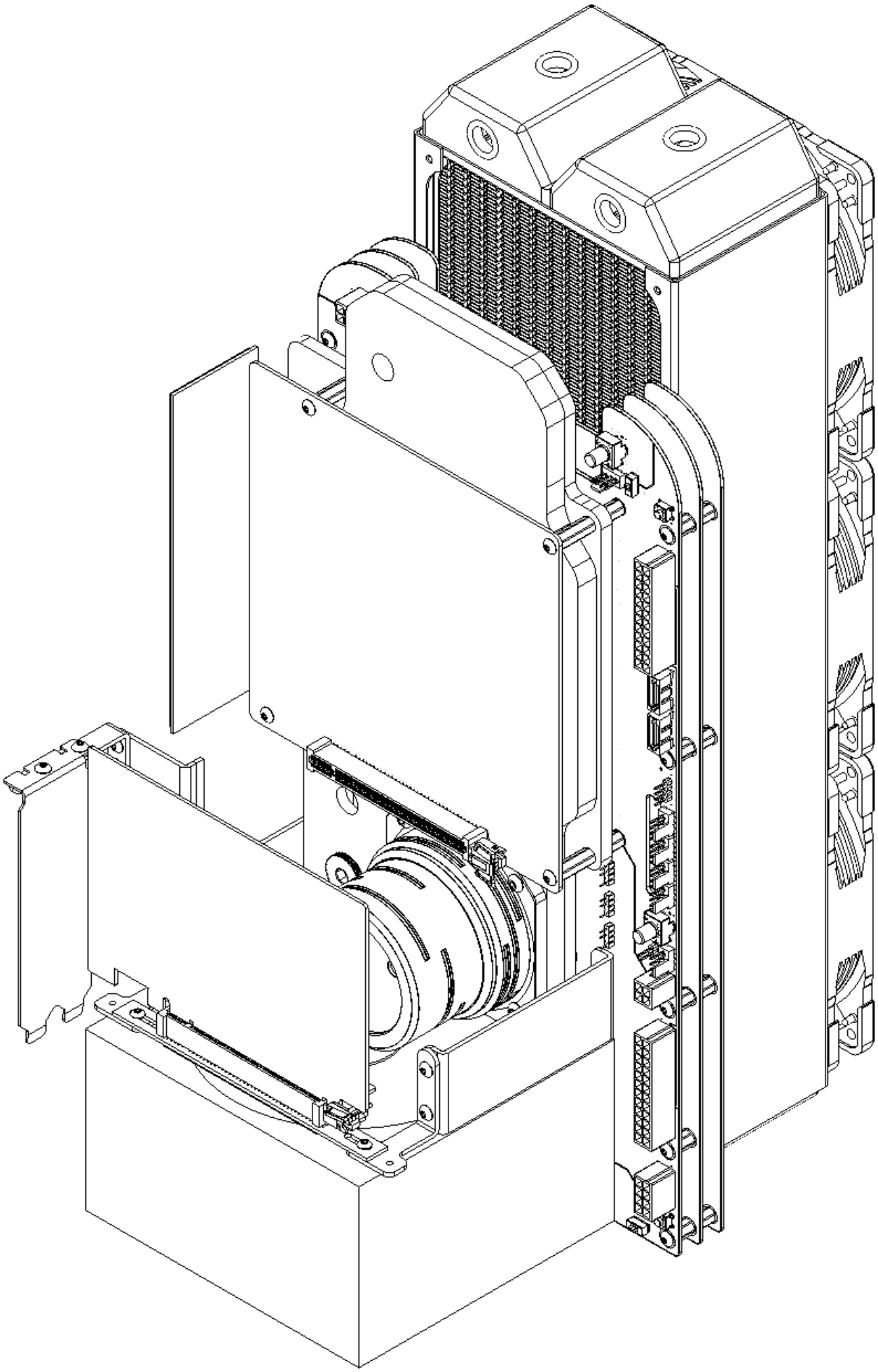
Route the Power Cable between the standoffs and under the Phantom 2 Reinforcement pieces before installing them.

Without a Phantom 2 Universal Radiator Mount:
Grab the Phantom 2 Reinforcement pieces and mount them to their designated locations and secure them with a total of x18 #6-32 0.25" SCR fasteners for the holes marked with "#" or "M/#".

With a Phantom 2 Universal Radiator Mount:
Grab the Phantom 2 Reinforcement pieces and mount them to their designated locations and secure them with a total of x10 #6-32 0.25" SCR fasteners for the holes marked with "#" and x8 #6-32 10mm SO-M for the holes marked with "M/#".

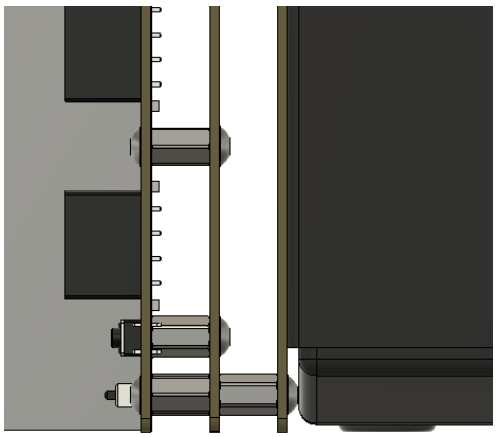
These cover pieces increase the structural integrity of the case so the fasteners and standoffs will need to be finger tight.





Step 7: Phantom 2 Universal Radiator Mount (optional)

Required Parts	• 120mm / 140mm Class Radiator • x8 #6-32 0.25" SCR



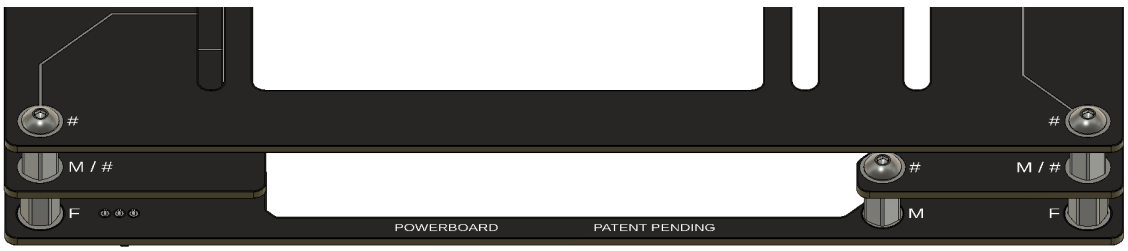
The installation of this part is optional for the case but needed for attaching radiators.

A 140mm Radiator Mount will be available soon as an add-on which is optimized for 140mm, 280mm, 420mm and 560mm radiators with more adjustability for better port alignment

For the Phantom 2 Universal Radiator Mount any 120mm or 140mm class radiator can be mounted: 120mm, 140mm, 240mm, 280mm, 360mm, 420mm, 480mm, 560mm. There is no limitation for radiator width.

Part A - Install the radiator onto the Phantom 2 Universal Radiator Mount, securing it with its included mounting hardware to the side where the white text and circuit lines are (facing away from the PowerBoard). The height of the radiator position can be adjusted vertically so lift it up or lower it down until the bottom of the radiator touches the floor and it will act as a support leg for the case. Tighten the mounting hardware to secure the radiator into position.

Part B - Now secure the assembly to the Phantom 2 Reinforcement pieces with x8 #6-32 0.25" SCR fasteners to the mounting holes marked with "#" symbol on the Phantom 2 Universal Radiator Mount.

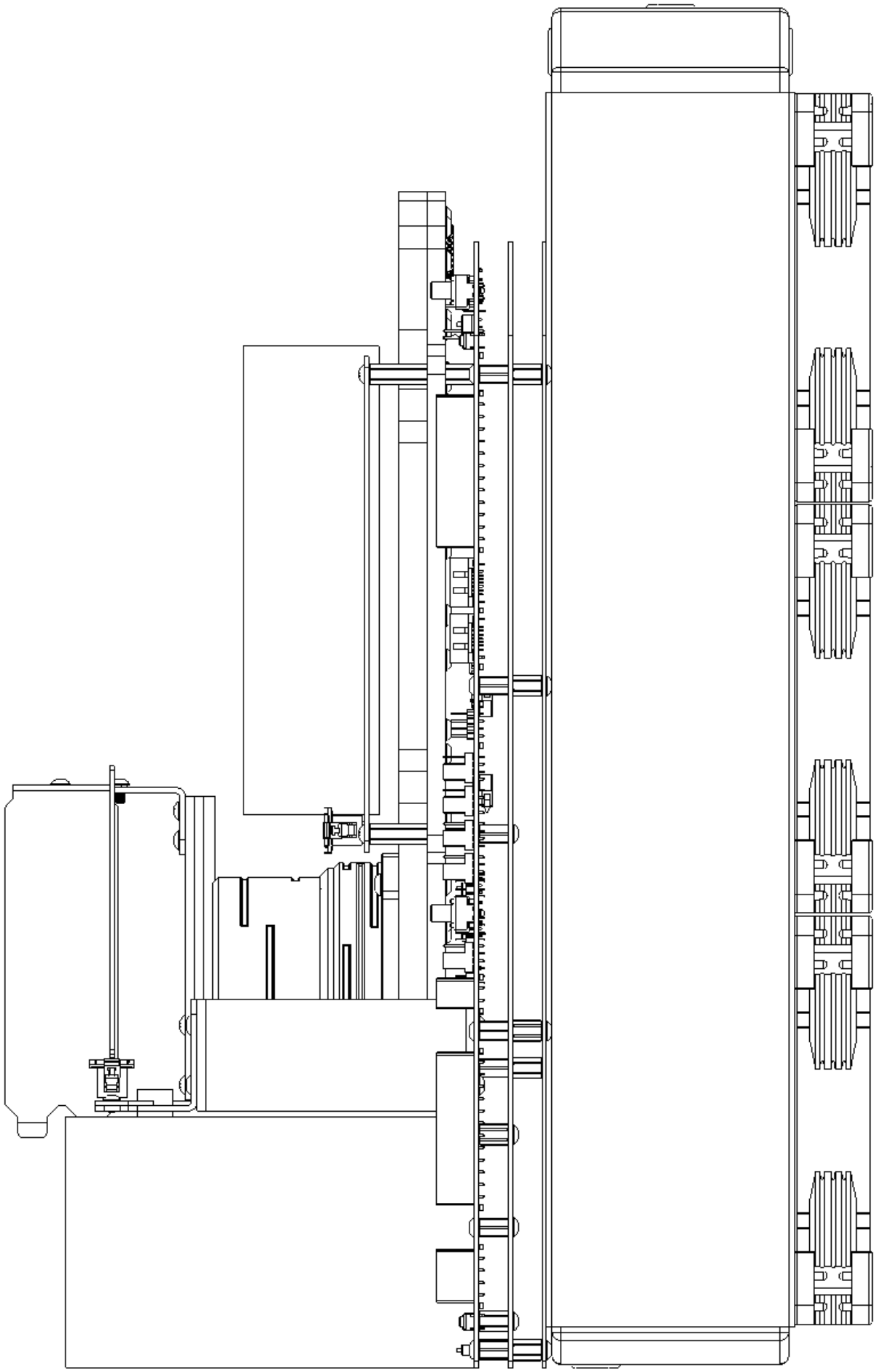


Step 8: Cable Installation

Required Parts	• 8pin EPS 10cm Linking Cable • 24pin MB 10cm Linking Cable • "POWER SW" Wire • "RESET SW" Wire	• x2 SATA 10cm Data Cable x2 • PWM Linking Cable • ARGB Linking Cable • Temperature sensor (purchased separately)

Install the included 8pin EPS and 24pin MB Linking Cables to the motherboard's appropriate connectors. Orientation does not matter. If 2.5" drives are installed, connect the motherboard to the PowerBoard with SATA 10cm DATA Cables. SATA-1 is connected to DRIVE-1, SATA-2 is to DRIVE-2. Plug in the included "POWER SW" and "RESET SW" wires to the motherboard front panel header and to the PowerBoard's "RST-PWR" header to enable the POWER and RESET button functionality. Connect the FAN-IN header to one of the motherboard's PWM headers with the PWM Linking Cable to allow for PWM control and RPM reading of the fans plugged into the PowerBoard. Connect the ARGB-IN header to an ARGB output header on the motherboard to enable and control the PowerBoard's built-in ARGB lighting and ARGB hub.

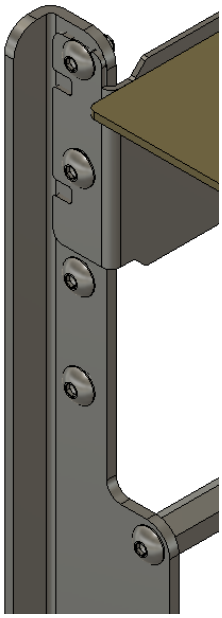
Plug in an optional temperature sensor to the 2pin header labeled "T". This header accepts 10K NTC-type thermistors which are available as a stop fitting from major brands.



Step 9: Graphics Card Installation

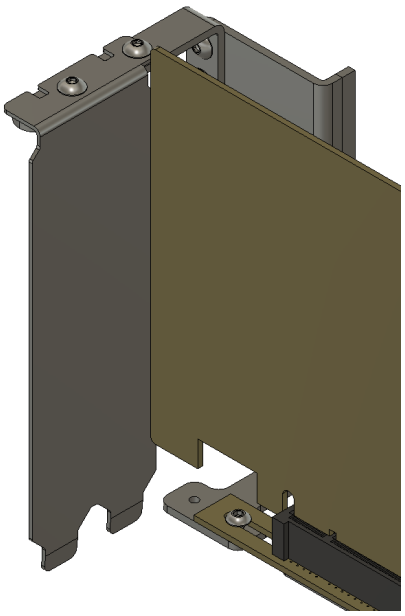
Required Parts	• x2 - x4 #6-32 0.25" SCR • Graphics Card

*Installing a graphics card is optional but **Step #4** is required.*



Horizontal

Undo the latch on the motherboard's PCIe slot then plug in the card and secure it to the Horizontal GPU Mount with up to x4 #6-32 0.25" SCR fasteners depending on how wide is the graphics card.

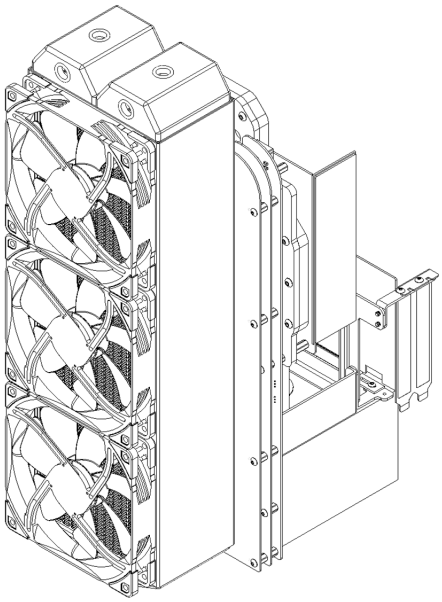


Vertical

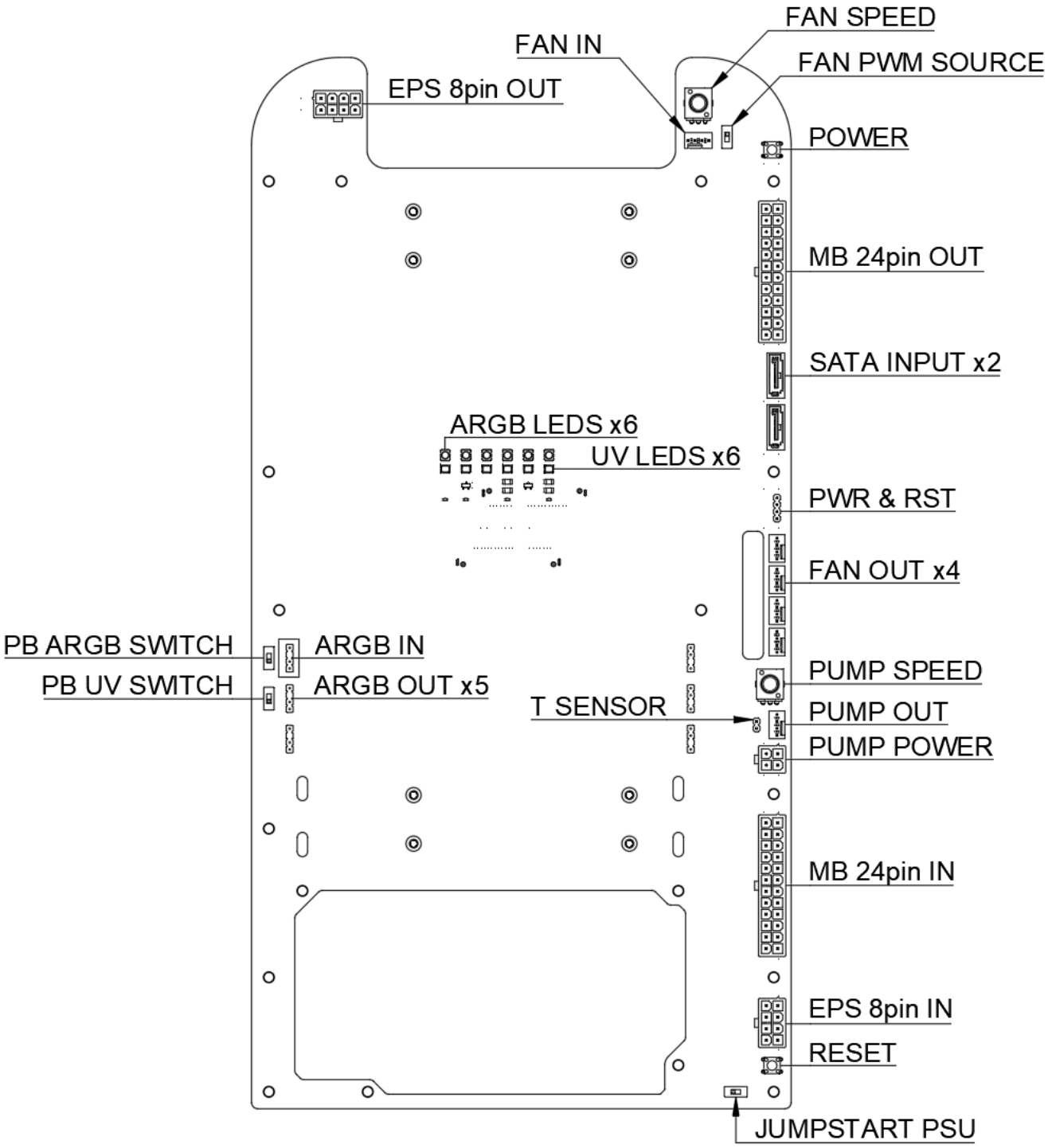
Undo the latch on the PCIe Riser Cable's slot then plug in the card and secure it to the Vertical GPU Mount with x2 #6-32 0.25" SCR fasteners.

Step 10: Power Cables

Plug the power supply's 8pin EPS and 24pin MB into the appropriate input connectors on the main PowerBoard then fold and secure them with cable ties. If using a dedicated graphics card then plug in the power supply's PCIe power cables to the graphics card. Singularity Computers can provide custom length sleeved cables for most power supplies.



Phantom 2 PowerBoard Overview



⚠ ***All PowerBoards need PowerBoard Linking Cables.***

D5 Reservoir Distribution Plate Overview