WRAITH 2.0
VOLTA

POWERBOARD MANUAL

Revision 1.00

SINGULARITYCOMPUTERS

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IMPORTANT: Wraith 2.0 Volta Warranty

Wraith 2.0 Volta has a limited 2-year warranty.

Welcome to Singularity Computers and your new Wraith 2.0 Volta! We look forward to seeing what you create.

1: The Integrated Liquid Cooling System is pressure tested at the factory, so there is no need to adjust the fasteners on the manifold. Take care not to over tighten any fasteners on the acrylic. As soon as you feel any significant feedback or tension go no more than 1/4th of a turn past it. On the metal parts you can tighten normally. We are not responsible for damage caused by over-tightening the fasteners.

2: Any thread stripping, cross threading or thread damage of any kind will not be covered under our warranty. All threads are pre-tested. We use stainless steel fasteners which are extremely tough.

3: All acrylic is carefully checked for scratches, marks or particles as the manifold is assembled. We are not responsible for mistreatment of the acrylic. Only clean with a microfiber cloth and use nothing except distilled or deionized water for cleaning, or Novus Plastic Cleaner. Damage caused by cleaning agents (particularly alcohols or solvents) is not covered under warranty.

4: Acrylic Surface Guarantee: Marks on acrylic which cannot be wiped away with a microfiber cloth will only be covered under warranty under the following conditions: That they did not occur after the item was shipped from the Singularity Computers Factory or Retailer. If there are more than 10 marks which are beyond 5mm in length and visible when facing perpendicular to the surface. Evidence of this must be photographed in detail and photographs must be taken perpendicular to the surface. Marks must be easily visible in photographs; subtle marks will not be covered.

5: For the latest coolant recommendations please visit http://bit.ly/sc-important-info. We are not responsible for staining of the acrylic, but it has never been an issue with our products. Most staining will be easy to remove by flushing out the loop with distilled water for 24hrs or using Mayhems Blitz. If you are concerned about staining then we suggest Mayhems Non-Stain Dyes.

6: Any damage which occurs after the item leaves the Singularity Computers Factory or our Retailers is not covered under warranty. We are not responsible for shipping damage or mishandling.

Introducing Wraith 2.0 Volta

The Singularity Computers PowerBoard is essentially a distribution plate for cables. In Wraith 2.0 Volta is fully integrated replacing the entire rear wall of the case. Behind it are two acrylic covers, one clear with laser etching and another satin black cover. The PowerBoard integrates the 24pin and 8pin EPS, PWM & ARGB Hubs, direct connect SATA 2.5" and 3.5". It also has integrated ARGB LEDs around the perimeter and under the motherboard, a touch activated power button, power and reset buttons and an on/off switch for the ARGB LEDs. The PowerBoard reduces cable clutter meaning there is more space for liquid cooling components and loop building. Volta fits a high-end water-cooled cooled system with 2x 240mm radiators, the largest GPUs, any size SFX-L PSU and pump and reservoir. There are two PSU locations depending on the configuration you prefer; the rear PSU location allows larger pump/reservoir combos to be used and the front PSU position allows more 3.5" drives to be installed.

Features

The PowerBoard is a PCB which integrates the 24pin and EPS, PWM and ARGB Hubs, direct connect SATA 2.5" and 3.5", Power and Reset Buttons, ARGB LEDs with an on off switch and a touch activated Power Button. The PowerBoard distributes core component cables and integrates other features and functions. It is a new method for cables allowing standardization of cable lengths and making cable management no longer necessary. Wraith 2.0 Volta comes included with a standard set of black sleeved linking cables including 24pin x1 and 8pin EPS x2, the PCIE cables need to be directly connected from the PSU to the GPU.

The functionality integrated on the Powerboard means that these components don't have to be installed separately. For example, the PWM and ARGB hubs, lighting and the direct connect SATA 2.5" and 3.5". The need for cable management is almost completely removed by the PowerBoard. A large portion of the case cost is due to the integration. These are components you do not have to purchase for your build. The Powerboard is a full solution for cables and ARGB and PWM hubs. With the integration we did not just develop a case, we also developed all the integrated components. This meant that we could focus more on optimization than would normally be possible.

Despite its small size Wraith 2.0 Volta can fit a high-end liquid cooled build including a full-sized GPU and SFX-L PSU. It can fit x2 240mm radiators 30mm thick with a single set of fans. There is enough space for a pump and reservoir combo such as the Protium 3.0 ARGB 150 D5 Reservoir Combo. The PowerBoard reduces cable bulk allowing more space for liquid cooling components. There is a PSU mounting location toward the front of the case on the bottom panel and at the back of the case on the rear panel. The main benefit of the front PSU location is you can fit an extra 3.5" HDD, and the benefit of the rear one is that you can fit larger pump/reservoir combos. It depends on your build layout and how you want it to look.

Design & Engineering

We have been building high end water-cooled systems for over 15 years. Our approach to product development begins with a need for our own builds and so the origin is always function. From there we start to build ideas around this function and the aesthetics and everything else follows. The original ideas for our products came from years of building highly customized, high end water-cooled systems and trying to reduce the exceptionally long build times and complexity. Our approach to development is hands on, we are using and testing our own products every day.

Manufacturing & Quality

Almost all components of Wraith 2.0 Volta are CNC machined from a solid block of material. There is no hidden or back side, and this also goes for the components being installed. Due to this we selected the most high-end materials manufacturing process. The Distribution Plate is machined on a CNC router built from thick sheets of cast acrylic. It is hand assembled with silicone gaskets and stainless-steel fasteners, and pressure tested. The metal components are machined with extreme precision from solid blocks of 6061 aluminum on a CNC mill then sand blasted and anodized.

Specifications & Included Items

Connections	24pin x1. EPS x2. PWM x4. ARGB x 7. SATA 2.5" x4. SATA 3.5" x2 (removes x2 2.5" when used). Touch activated Power Button. Power & Reset Buttons. LED on/off switch.
Cables	PowerBoard Linking Cables: 24pin x1. 8pin EPS x1. 18AWG Black Headshrinkless Sleeve. PWM Female to Female 50cm Black Sleeved x1. ARGB Female to Female 50cm Black Sleeved x1.
Motherboard Form Factor	Mini-ITX, Mini-DTX.
Case Dimensions	407mm x 407mm x 170mm (Including legs).
Package Dimensions	450mm x 500mm x 120mm
Case Weight	4 kg
Case Packaged Weight	5 kg
Expansion Slots	3x
Storage	2.5" x5 (x2 are 2.5" or 3.5"). 3.5" x3 (2 are 2.5" or 3.5").
PSU Compatibility	SFX, SFX-L (maximum length available).
Radiator Top / Front	240mm x 30mm
Maximum GPU Length	300mm
Maximum GPU Thickness	3 slots
Maximum GPU Width	Maximum width available.
Maximum CPU Cooler Height	130mm
Front Panel I/O	Vandal Switch 16mm
Vertical GPU Mount	1x Singularity Computers PCIe 4.0 Bracket & Riser Cable
Materials	6061 Anodized Aluminum, Cast Acrylic, Stainless Steel
Manufacturing Process	CNC Router, CNC Mill, CNC Lathe

Panels Layout
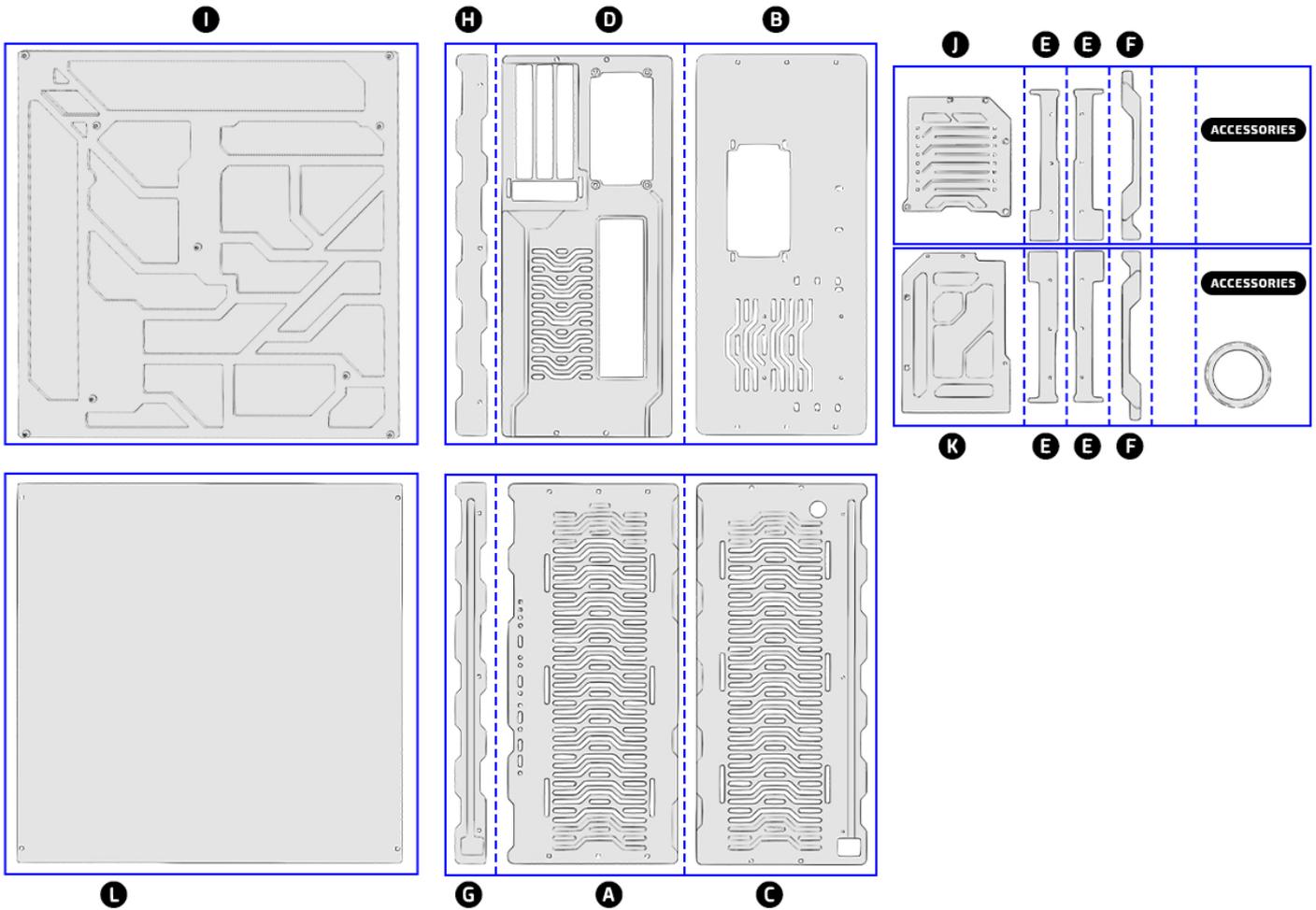
Assembly Tolerances & Alignment

Wraith 2.0 Volta uses CNC machining and very thick materials. This means it is manufactured with extreme precision and there is no flex or play in any of the materials. Due to this we have built in tolerances to most mounting holes to allow for the looser tolerances on the components being installed. If a component does not align then loosen the related fasteners and you will be able to align it. All of the outer panels have a tolerance built in so that they can be used for alignment also.

Tools Required

- M4 Allen Key
- M3 Allen Key
- 6-32 Hex Key
- Fill & Drain Tubes

Note: Tools listed are not included, unless otherwise specified.

## Step 1 - Attach Corner Pieces to Top Panel

Parts Involved	• **A** Top Panel x1 • **E** Corner Pieces x2	• M4 x 10mm Button Head Fasteners x6

Attach the corner pieces to the top panel using x6 M4 10mm Button Head Fasteners.
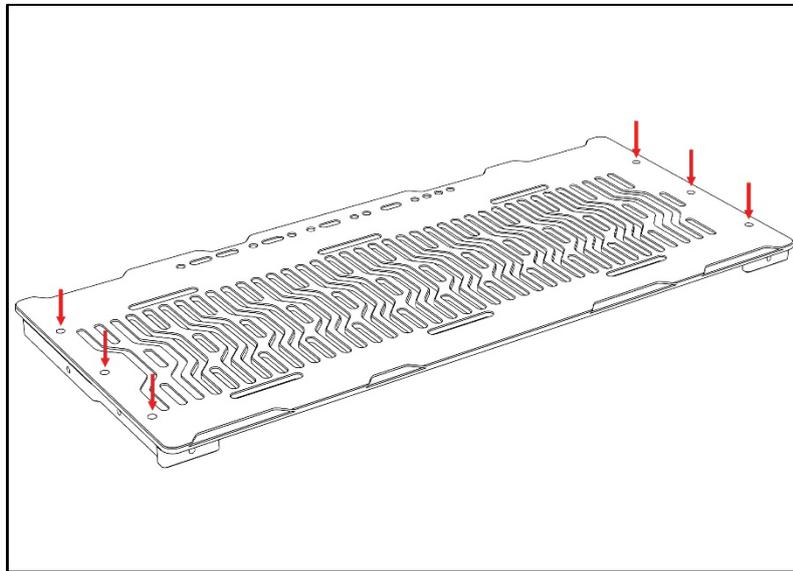


Step 2 - Attach Corner Pieces and Feet to Bottom Panel

| Parts Involved	• **B** Bottom Panel x1 • **E** Corner Pieces x2 • **F** Feet x2	• Vertical GPU Mount • M4 x 10mm Fasteners x6 • M4 x 6mm Fasteners x2

Attach the Corner Pieces to the Bottom Panel using x6 M4 10mm Fasteners in the marked holes below.
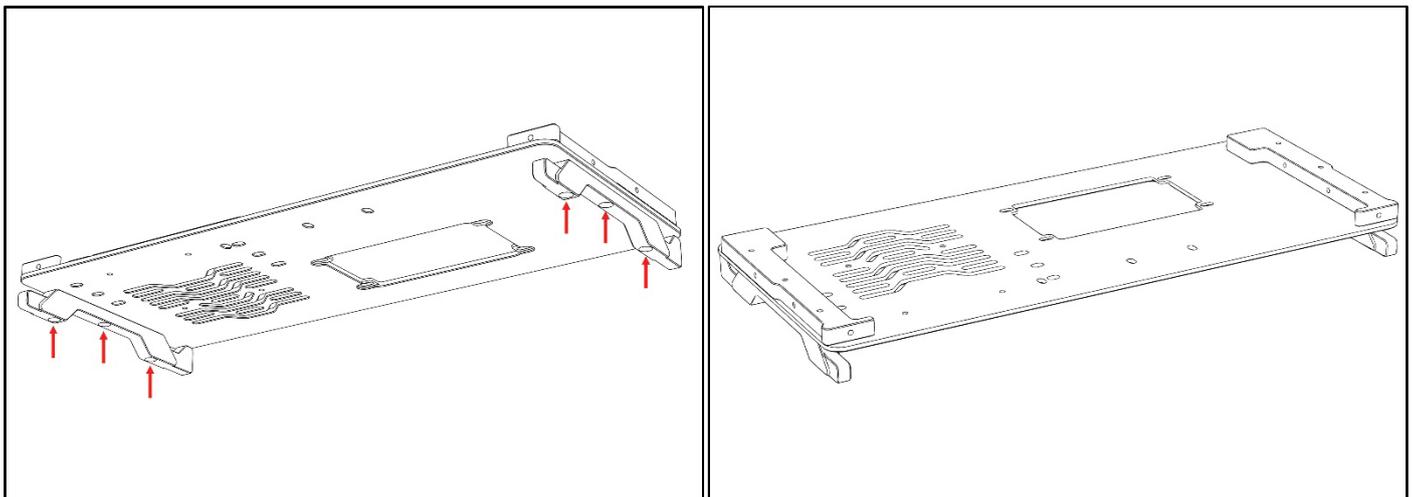
Attach Vertical GPU Mount to bottom panel in the position marked in the diagram below using x2 M4 6mm fasteners.
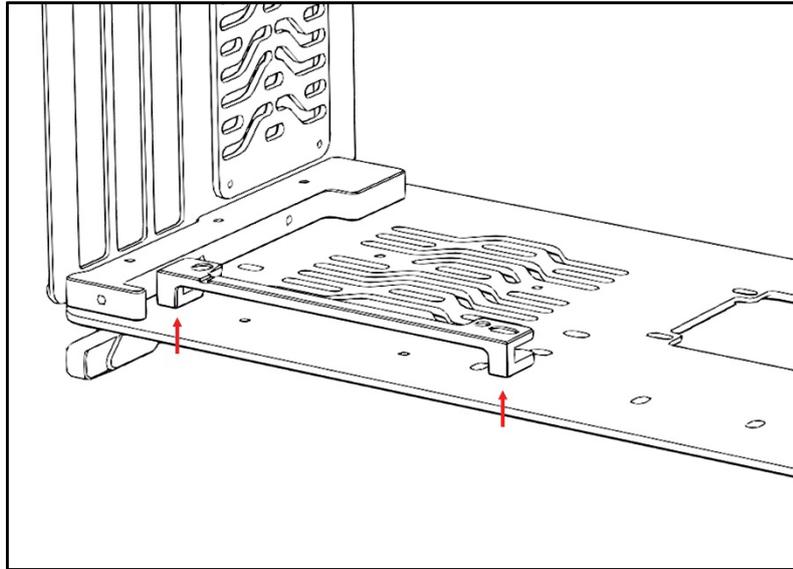
## Step 3 - Attach LED Diffusor and LED Shroud to Front Panel

Parts Involved	• **C** Front Panel x1	• 30cm LED Strip x1
	• **G** LED Diffusor x1	• Power Button x1
	• **H** LED Shroud x1	• M4 x 10mm Fasteners x3

Remove the adhesive backing from the LED strip and attach it to the LED strip position highlighted in the diagram below. Route the cable through the cable routing hole at the bottom of the front panel. Attach the LED Diffusor and LED Shroud at the same time using x3 M4 10mm Fasteners. Do not over tighten fasteners on acrylic.

Install the Power Button into hole as shown in the diagram. Use the included O-ring on the inside of the panel and tighten the retention ring onto it.
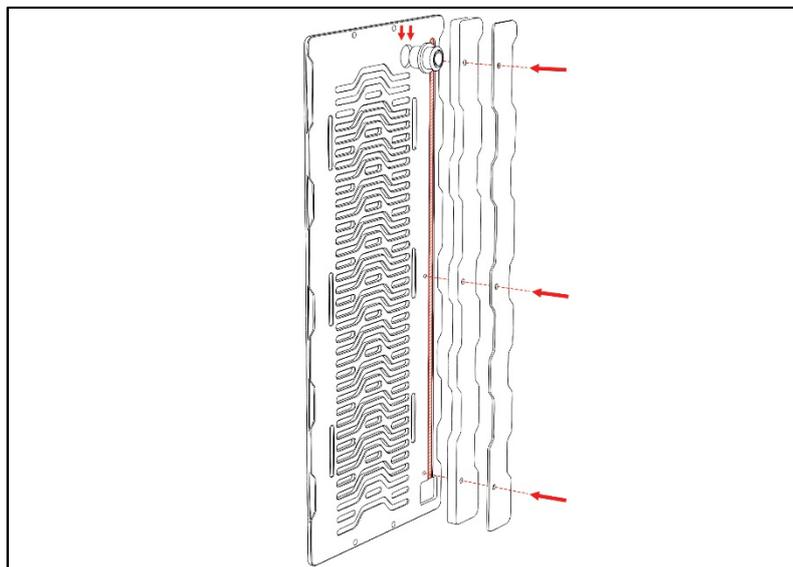
Step 4 - Attach Rear I/O Block to Rear Panel

Parts Involved	• Rear I/O Block x1	• M4 x 10mm Fasteners x2
	• Ⓓ Rear Panel x1	• 6-32 x 0.25" x3

Attach the Rear I/O Block to the Rear Panel using x2 M4 10mm Fasteners. The Rear I/O Block is adjustable so that you can fit your GPU into position. Use x3 6-32 x 0.25" Fasteners to attach your GPU to the Rear I/O Block during building the system.
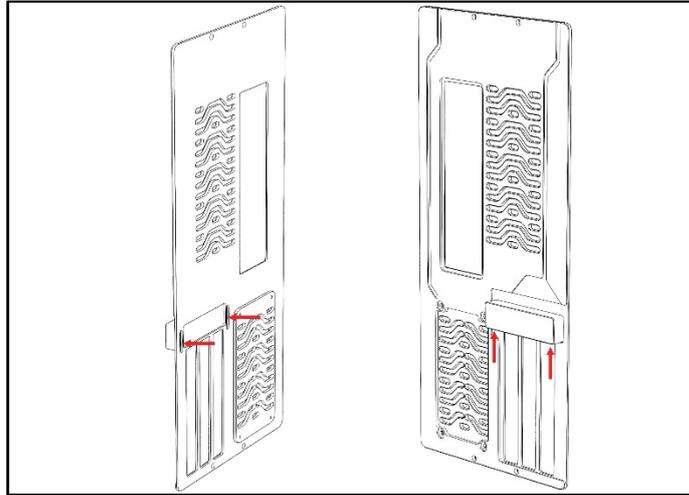
Step 5 - Assemble Wraith 2.0 Volta Outer Panels

Parts Involved	• Front Panel Assembly x1	• Rear Panel Assembly x1
	• Top Panel Assembly x1	• M4 x 10mm Fasteners x8
	• Bottom Panel Assembly x1	

Attach Front, Rear, Bottom and Top Panel assemblies to each other via the Corner pieces (which should already be installed) using x8 M4 10mm Fasteners.
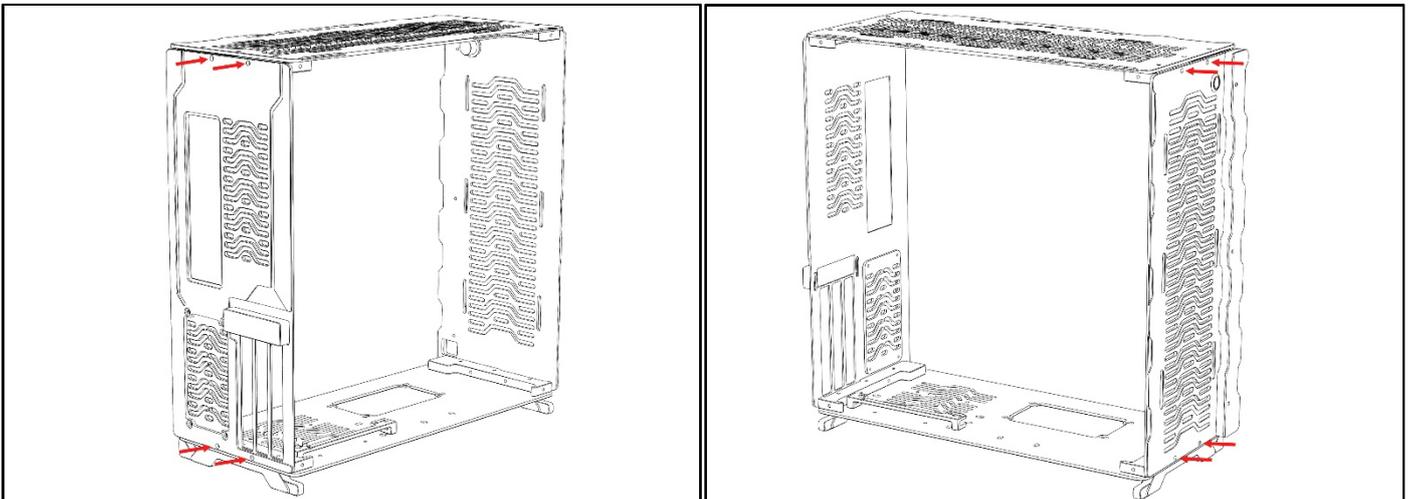
## Step 6 - Install Wraith 2.0 Volta Manifold

Parts Involved	• Wraith 2.0 Volta Metal Parts Assembly x1 • M4 x 22mm Fasteners x8
	• (I) Wraith 2.0 Volta Manifold x1

Put the Wraith 2.0 Volta Metal Parts Assembly onto its side so that it is horizontal with the Corner Pieces facing so that the side with the two holes is facing upwards. Install the Wraith 2.0 Volta Manifold into the Wraith 2.0 Volta Metal Parts Assembly. If the Manifold does not fit then loosen off some of the fasteners holding the outer panels onto the Corner Pieces. Use x8 22mm M4 Fasteners to attach the Wraith 2.0 Volta Manifold to the Corner Pieces. Do not over tighten fasteners on acrylic.
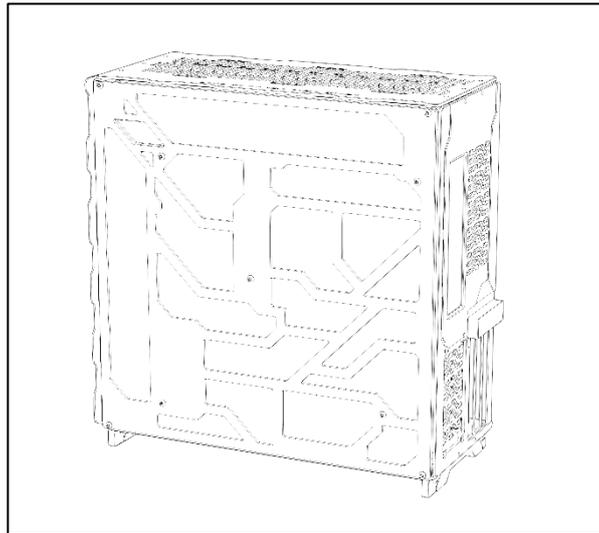
Step 7 - Drive Installation

On the bottom panel of Wraith there is a 2.5" and 3.5" drive mount.

A 2.5" drive can be flat mounted in the position marked in the diagram and a 3.5" drive can be side mounted in the position marked in the diagram below. Only single slot GPUs can be installed in the rear most slot when a 3.5" drive is installed because the drive sits in front of the GPU.
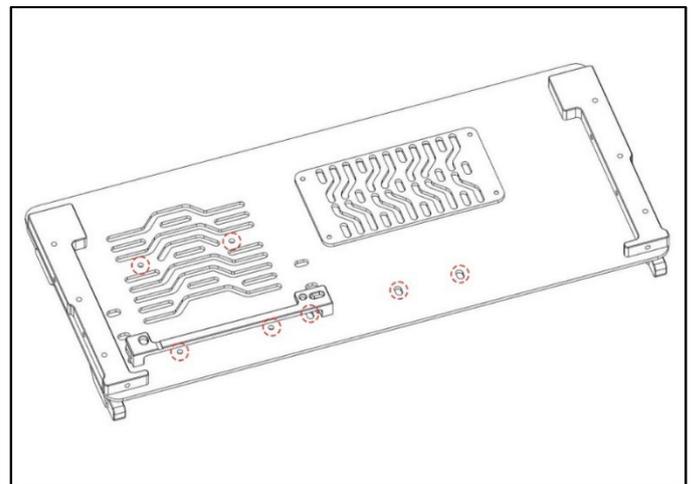
Step 8 - Side Panel Window Installation

Parts Involved	• (L) Side Panel Window x1 • M4 x 10mm Button Head Fasteners x4

Attach the Side Panel Window to the Corner Pieces using the x4 M4 12mm Fasteners.

Step 9 – Install PSU

Parts Involved	• PSU Cover	• 6-32 x 0.25" Fasteners x4
	• Wraith 2.0 Volta 90° Power Cable	• M4 x 6mm Fasteners x4

There are two PSU mounting locations on Wraith 2.0 Volta for different variants of the case. The PSU needs to be mounted onto the rear panel using 6-32 x 4 and the PSU Cover needs to be mounted on the bottom panel PSU mounting location using M4 x 6mm x 4.

Mount the PSU onto the bottom panel PSU Mounting location using x4 6-32 x 0.25" fasteners. Alternatively, you can use the fasteners included with your PSU. Any SFX or SFX-L PSU will fit. You will need to use the included power cable which has a 90° connector to fit under the case.
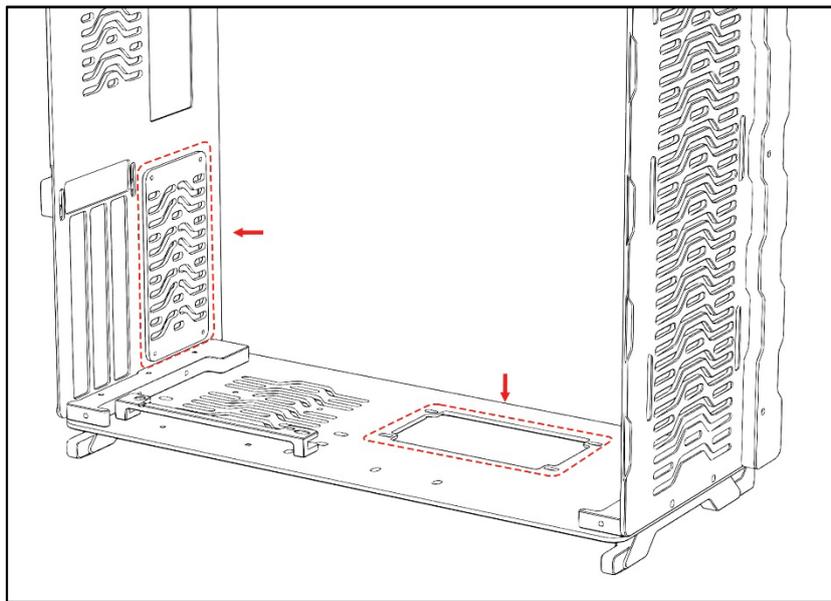
For more information about Singularity Computers and our products, please visit/scan the following links:

OFFICIAL SITE	PRODUCTS	SUPPORT	WRAITH FAQ
http://bit.ly/sc-official-site	http://bit.ly/sc-products	http://bit.ly/sc-contact-us	http://bit.ly/wraith-faq

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Wraith 2.0 Volta PowerBoard

ARGB OUTPUT X3
PWM OUTPUT X2

FRONT BUTTON HEADER

EPS 8P OUTPUT

ARGB INPUT

EPS 8P OUTPUT

PWM INPUT

ARGB ON/OFF SWITCH

POWER BUTTON

RESET BUTTON

POWER, RESET,
LED HEADER

MB 24P OUTPUT

TOUCH SWITCH

2.5" DRIVE X2

2.5" or 3.5" DRIVE

SATA INPUT x4
ARGB OUTPUT

2.5" or 3.5" DRIVE

EPS 8P INPUT

MB 24P INPUT

POWERBOARD

ARGB OUTPUT

PWM OUTPUT X2
ARGB OUTPUT X3
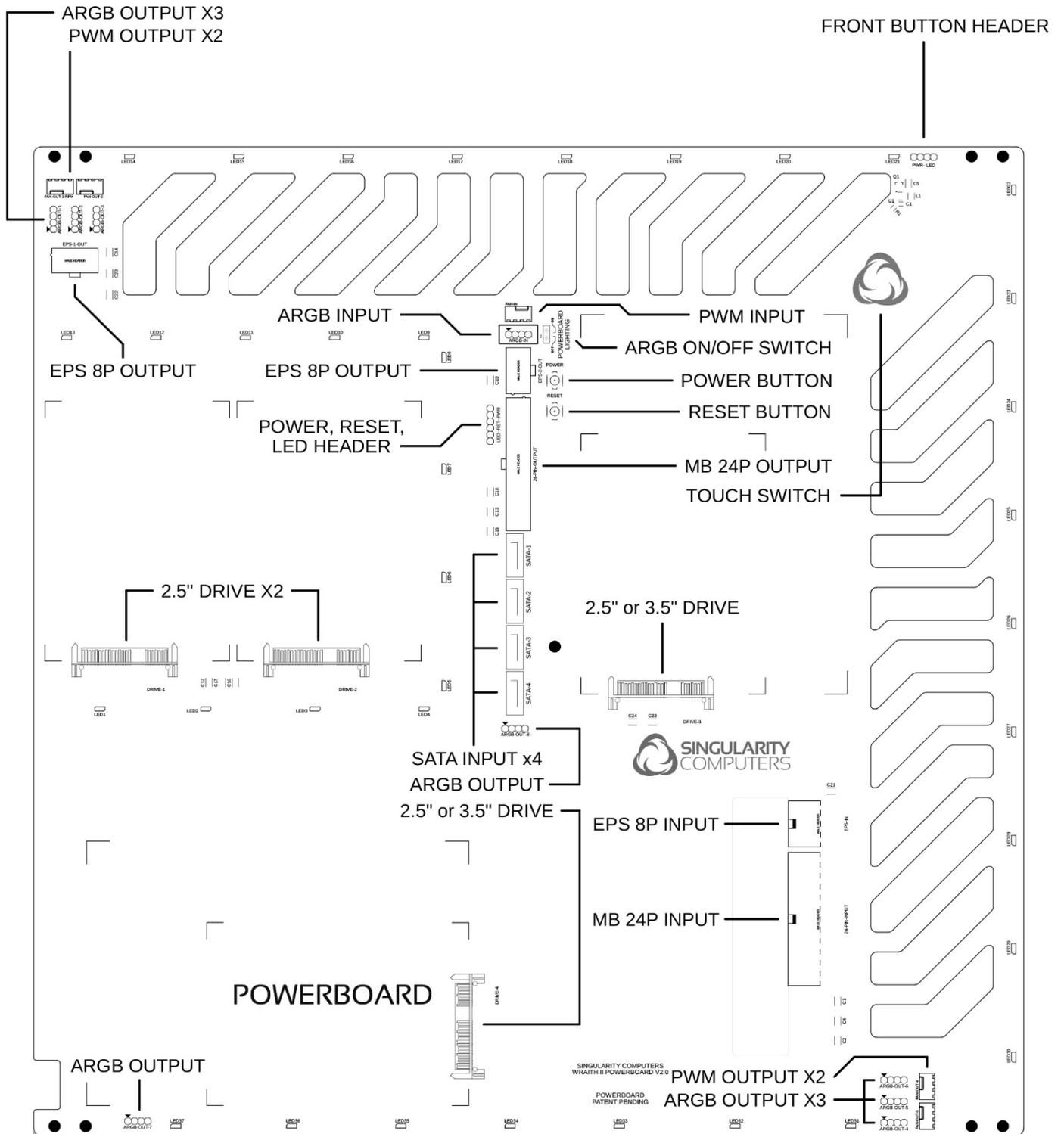
⚠ *All PowerBoards need PowerBoard Linking Cables.*

PowerBoard PSU Cables

The stock cables that come with every power supply can be used, plug in as many cables as input connectors are available.

Singularity Computers offers custom sleeved and shorter PSU cable kits that are a better fit than stock cables.

PowerBoard Linking Cables

Wraith 2.0 Volta comes with a standard kit of PowerBoard Linking Cables which includes 24pin MB x1 and 8pin EPS x1. The pinout of these Linking cables is mirrored and the lengths are custom to achieve an arch. The connectors are also female on both sides (refers to the pin and not to the connector housing). PWM and ARGB linking cables are also included to connect from Your motherboard or controller to the PowerBoard PWM and ARGB inputs. Use our Cable setup guide if making custom Linking Cables.

Power Connectors

The input and output connectors are not wired directly together but they are shared, so if EPS-1-IN is plugged in then any of the EPS outputs can be used, it is not limited to EPS-1-OUT.

ARGB Connectors

The PowerBoard has built-in ARGB lighting and acts as an ARGB hub. An ARGB source, like a motherboard ARGB header, must be connected to the ARGB-IN header on the PowerBoard. The input header is marked with a white rectangle around it for easier identification. The PowerBoard uses this ARGB signal to light up the built-in LEDs and splits this signal to all ARGB outputs. What signal goes into the input will be displayed on the built-in LEDs and all LED strips attached to the ARGB outputs, in parallel. The PowerBoard does not show up as an individual component in ARGB controlling software, but it can be controlled by controlling the motherboard ARGB header, which will show up in software. The PowerBoard LEDs and headers are powered by the power supply 24pin connection, so they will only light up when the system is turned on, but not when the system is turned off or in stand-by mode. The ARGB headers are conveniently located where they are expected to be used, next to radiator mounts, GPU, and CPU waterblocks and close to Elite kits. Do not plug a 4pin/12V RGB device into the PowerBoard, only 3pin/5V ARGB/DRGB (addressable/digital RGB) devices are compatible.

ARGB On/Off Switch

This switch connects/disconnects the ARGB control signal from the built-in LEDs on the PowerBoard. When turned ON, the LEDs will immediately light up. When turned OFF, the LEDs will not light up from the next time the system is turned ON from a cold boot but will display the last colour they were displaying before the switch was turned OFF. After turning the switch OFF, turn off the system, wait 5 seconds and turn the system ON again. This switch does not control ARGB headers, only the built-in LEDs on the PowerBoard.

UV On/Off Switch

This switch turns the built-in UV LEDs on the PowerBoard ON/OFF. It is a live switch, and the UV lighting should immediately turn ON or OFF based on the position of the switch. There is no need to reboot the system.

PWM/Fan Connectors

The PowerBoard acts as a powered PWM/Fan hub. A PWM source, like a motherboard CPU Fan header, must be connected to the FAN-IN header on the PowerBoard. The PowerBoard shares this PWM signal to all PWM outputs. What signal goes into the input will be the same control signal sent to every fan connected to the PowerBoard. The PowerBoard does not show up as an individual component in fan controlling software, but it can be controlled by controlling the motherboard CPU Fan header, which will show up in software. The PowerBoard PWM headers are powered by the power supply, so there is less strain on the motherboard. Only FAN-1-OUT-RPM monitors the speed of a connected fan which is reported back to the motherboard. If no fan is connected to this header, the motherboard will see zero RPM even if all other headers have fans connected to them, so populate FAN-1-OUT-RPM first with a fan that You would like to monitor the RPM of. The PWM headers are conveniently located where they are expected to be used, close to radiator mounts.

Power, Reset, LED Header

Connect the motherboard front panel headers to this header to enable functionality of the touch button on the back side of the PowerBoard, the POWER and RESET buttons on the front side and the header for the front panel button on the case. Refer to the motherboard's manual for the pinout of its front panel header:

Connect PWR_BTN (motherboard) with POWER SW cable to PWR (PowerBoard) Polarity matters, although it varies by motherboard maker. If it is wired the wrong way then the system will automatically turn ON and then OFF, repeatedly. It is the same behaviour from holding the power button indefinitely. If this is the case, turn the power supply main switch to OFF and reverse the connector polarity of the POWER SW cable either on the motherboard or on the PowerBoard side.

Connect RESET (motherboard) with RESET SW cable to RST (PowerBoard). +/- Polarity does not matter.

Connect POWER_LED (motherboard) with POWER LED+/- cable to LED (PowerBoard) +/- Polarity does not matter.

FRONT BUTTON HEADER: connect the main power button from the front panel here:

POWER SW cable to PWR (PowerBoard), polarity does not matter.

POWER LED+/- to LED (PowerBoard), polarity does not matter.

Powering on the system

There are up to 4 ways to turn the system on. The first is the main power button that's installed onto the front of the case. Second is the built-in buttons on the PowerBoard. Third is the touch button on the back side, top left corner area of the PowerBoard inside the acrylic cut out, touch the Singularity Computers logo to turn the system on. Fourth is the power button built into the motherboard, it depends on the model whether it has it or not.

SATA Connectors

Connect the SATA inputs into the SATA outputs on the motherboard and install 2.5" and/or 3.5" drives into the PowerBoard. There is no need to connect a SATA power cable to the 2.5" drive, it is powered directly from the PowerBoard.

SATA drive support:

- Drive 1: 2.5"
- Drive 2: 2.5"
- Drive 3: 2.5" or 3.5"
- Drive 4: 2.5" or 3.5"

Mount Drives

To mount drives the rear covers will need to be removed by undoing the fasteners marked in the diagram below.