SINGULARITYCOMPUTERS

PLASMA
CPU WATER-BLOCK
MANUAL

V0.1

Introduction

We have created a CPU water-block which is compatible with both Intel Socket 1700 and AMD Socket AM5. It can be used as a normal CPU water-block or as a direct die water-block. We wanted to create a CPU water-block which can do everything and comes at a reasonable price. The water-block is compact with a simple design making installation easy. The included stand offs are the correct length so that when the fasteners bottom out the correct tension is achieved. The water-block is non directional so either port can be used as inlet or outlet. The water-block has an integrated PCB which has both UV and ARGB LEDs and a switch to select between them.

Specifications & Included Items

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Included Items	Plasma CPU Water-block.
Electronics Integration	PCB with integrated ARGB and UV LEDs and a selector switch.
Materials & Manufacturing Process	Nickel Plated CNC Machined Copper. CNC Machined Clear Cast Acrylic.
Gasket (Main & Spare)	Clear silicone.
Fasteners	Stainless Steel.
G ¼" Threads	x2.

Plasma CPU Water-Block

The Plasma Water-Block was originally designed for delidded processors as a direct-die block but the compatibility was soon extended to include stock processors as well. Additionally, the block is compatible with both the Intel LGA 1700 and the AMD AM5 socket. This way a single Plasma Water-Block is all You need regardless of Your platform or processor cooling setup.

The Plasma Water-Block does not need retention brackets or custom backplates. Each platform or setup has its own set of 4 standoffs to mount the water-block on. With this design choice if you later change your platform or decide to delid Your processor then You won't need to buy another water-block or request additional parts for Your new setup.

On the block there is built-in RGB and UV lighting with a toggle switch to choose between them. The UV LEDs' intention is to make the liquid flowing through the block and channels glow if there is a UV reactive additive in the liquid, giving the block a unique lighting effect. Hence the name: Plasma.

The Plasma Water-Block consists of the following parts:
- UV/ARGB PCB cover
- ARGB cable
- 10mm machined acrylic top
- Translucent silicone gasket
- Nickel plated copper cold-plate
- Silicone foam ring-pad (for Intel LGA 1700 direct-die only)
- Standoffs (type is platform and setup dependent)
- Nylon washers (for Intel LGA 1700 only)
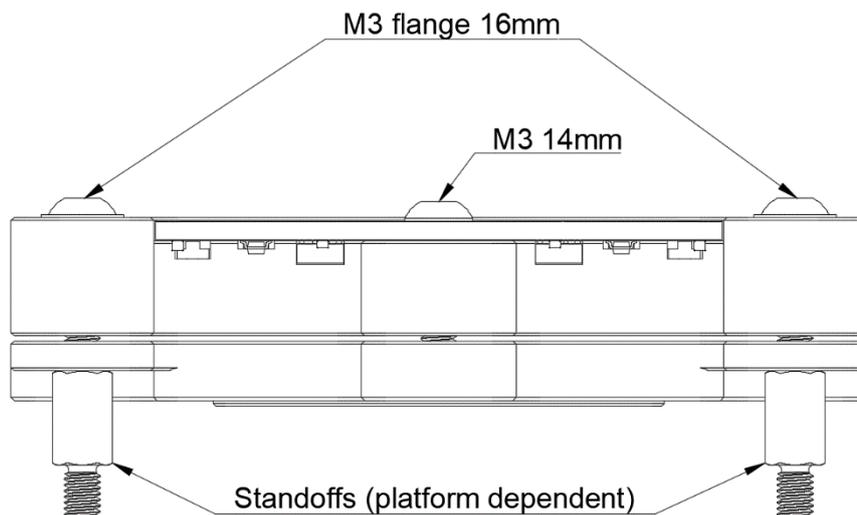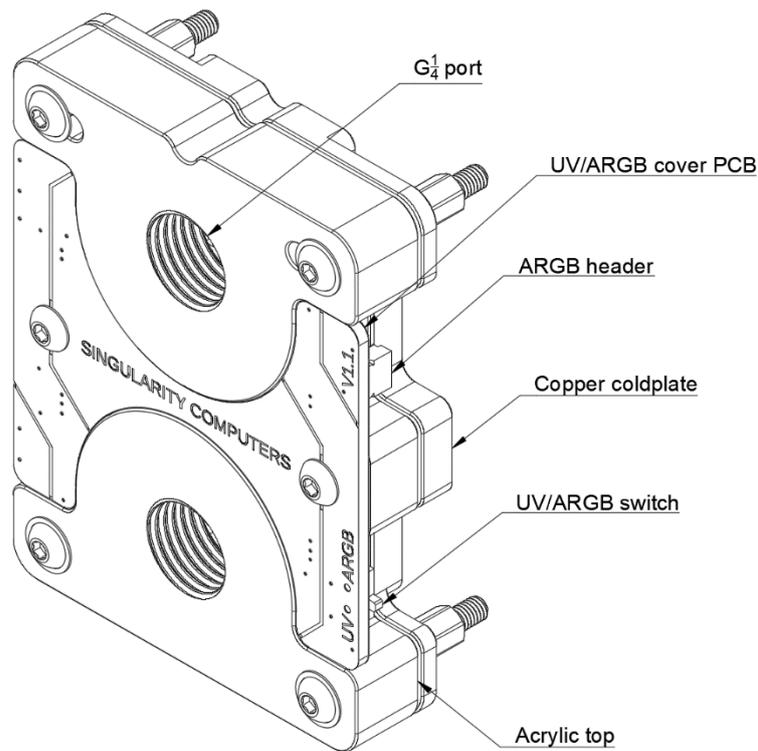
Preparation on Intel LGA 1700 sockets:

1. Open up the lever and the socket cover.
2. Remove the top retention mechanism by unscrewing the top 2 torx fasteners
3. Install the appropriate standoffs into the threaded holes that had the torx fasteners:
   "*Intel LGA 1700 stock standoffs*" with "*Intel LGA 1700 nylon washers*"

   - OR -

   "*Intel LGA 1700 direct-die standoffs*" with "*Intel LGA 1700 nylon washers*"
   - The nylon washers are used to protect the surface of the motherboard and to achieve the target height of the standoffs. The nylon washers are underlined necessary for Intel LGA 1700.
   - It is advisable to put super-glue or LOCTITE® thread-locker on the threads of the standoffs to stop them from getting loose later during the installation of the block.
4. Repeat steps 2 & 3 with the bottom part of the retention mechanism.
   It is important to only remove only one retention mechanism at a time, not both, to prevent the Intel LGA 1700 backplate from falling off.

Preparation on AMD AM5 sockets:

1. Remove the 4 torx fasteners and the AM5 retention mechanism (leave the top and bottom plastic parts above and below the socket in place as they prevent the AM5 backplate from falling off during installation).
2. Install the appropriate standoffs into the threaded holes that had the torx fasteners:
   "*AMD AM5 stock standoffs*"

   - OR -

   "*AMD AM5 direct-die standoffs*"
   - Do not use the nylon washers for AMD AM5 platforms.
   - It is advisable to put super-glue or LOCTITE® thread-locker on the threads of the standoffs to stop them from getting loose later during the installation of the block.

Installation of the Plasma Water-Block:

1. Install the processor into the socket and apply thermal paste or other thermal interface material on it.

> ⚠ **Extra necessary step for delidded Intel LGA 1700 processors for direct-die operation.**
> Peel the silicone foam ring-pad and place it on the nickel-plated copper cold-plate. This silicone has an adhesive layer on one side to attach it to the surface.

Silicone foam ring-pad for Intel LGA 1700 direct-die
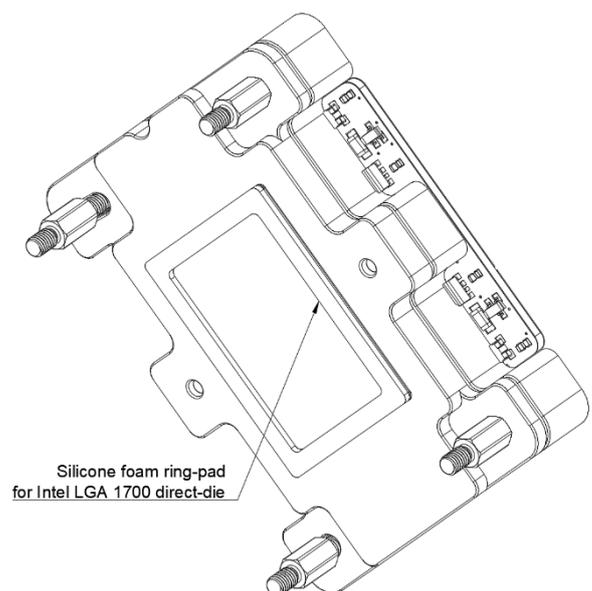
2. Attach the RGB cable to the Plasma Water-Block's UV/ARGB cover PCB.

3. Place the block on top of the processor and align it so the mounting holes are above the standoffs on the motherboard. Place and hold a finger on the top of the block to prevent movement during the installation process. There is a rounded notch on the acrylic top and the copper cold-plate which marks the top or North side of the block.

4. Using the "Mounting fasteners" put in all 4 fasteners and start screwing them in. Turn the screw until You start feeling a little resistance then move onto the next screw. At this stage we only want to keep the water-block in place and engage the 4 screws equally.

5. Start tightening the screws in increments - do not tighten one corner or side fully or too much but make one full turn on a fastener and then move onto the next one in a cross-pattern to spread the pressure and lower the block down evenly. Keep repeating this method until the screws bottom out. The Plasma Water-Block does not rely on fastener tension, a torque screwdriver is not needed. When the fasteners bottom out in the standoffs then the target mounting pressure and height is achieved. The standoffs are custom engineered to provide ideal mounting pressure for each platform and cooling solution.

> ⚠ **WARNING** ⚠
>
> When removing the water-block, first fully remove the 4 mounting fasteners from the 4 corner holes while holding the water-block in place then lift the water-block up vertically. The CPU will be attached to the cold plate and the block will pull it out of the socket. This is normal behavior but caution is to be taken. Do not tilt the water-block while the CPU is attached to it, but lift it out of the socket and away from the motherboard while holding it horizontally to avoid the CPU dropping back into the socket or onto the motherboard. Only then gently rotate the CPU back and forth to loosen the grip of the thermal interface material and it should separate from the cold plate.

Liquid cooling information:

- The Plasma Water block does not use a jet-plate design, therefore which port is used as an inlet or outlet is up to the user to choose.

- For Intel processors the flow direction does not matter as the hot-spots on the CPU die are generally centred. For AMD processors with a chiplet design on the other hand, the majority of the heat comes from the chiplets which are located on the lower bottom half area, which means the water entering through the bottom port directly hits the copper area above these chiplets, cooling them first and with more coverage than if the top port was used. Our internal testing showed a 1°C difference between using the bottom versus the top port as entry.

- The Plasma Water-Block uses regular G1/4 BSPP threads for fittings.
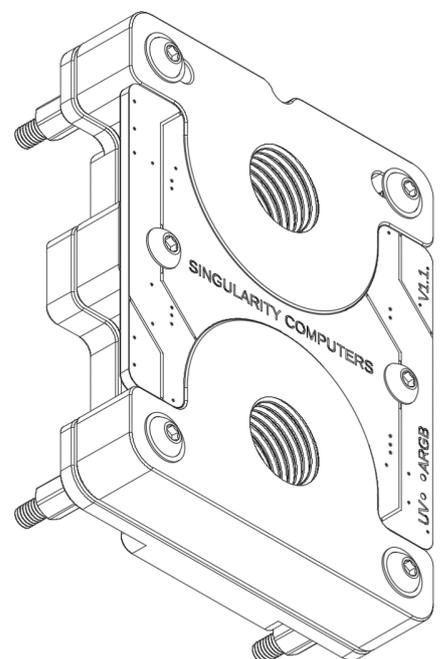
Electrical information:

- The included RGB cable plugs into a digital/addressable 5V header on the motherboard or RGB controller or hub (1. +5V (arrow) 2. ARGB signal 3. GND).
- The toggle switch sets which type of LEDs are operational, choose between RGB and UV.

Standoff information for technical enquiries and replacements:

Intel LGA 1700 stock standoffs	14.5mm
Intel LGA 1700 direct die standoffs	11.5mm
AMD AM5 stock standoffs	15.5mm
AMD AM5 direct die standoffs	12.0mm