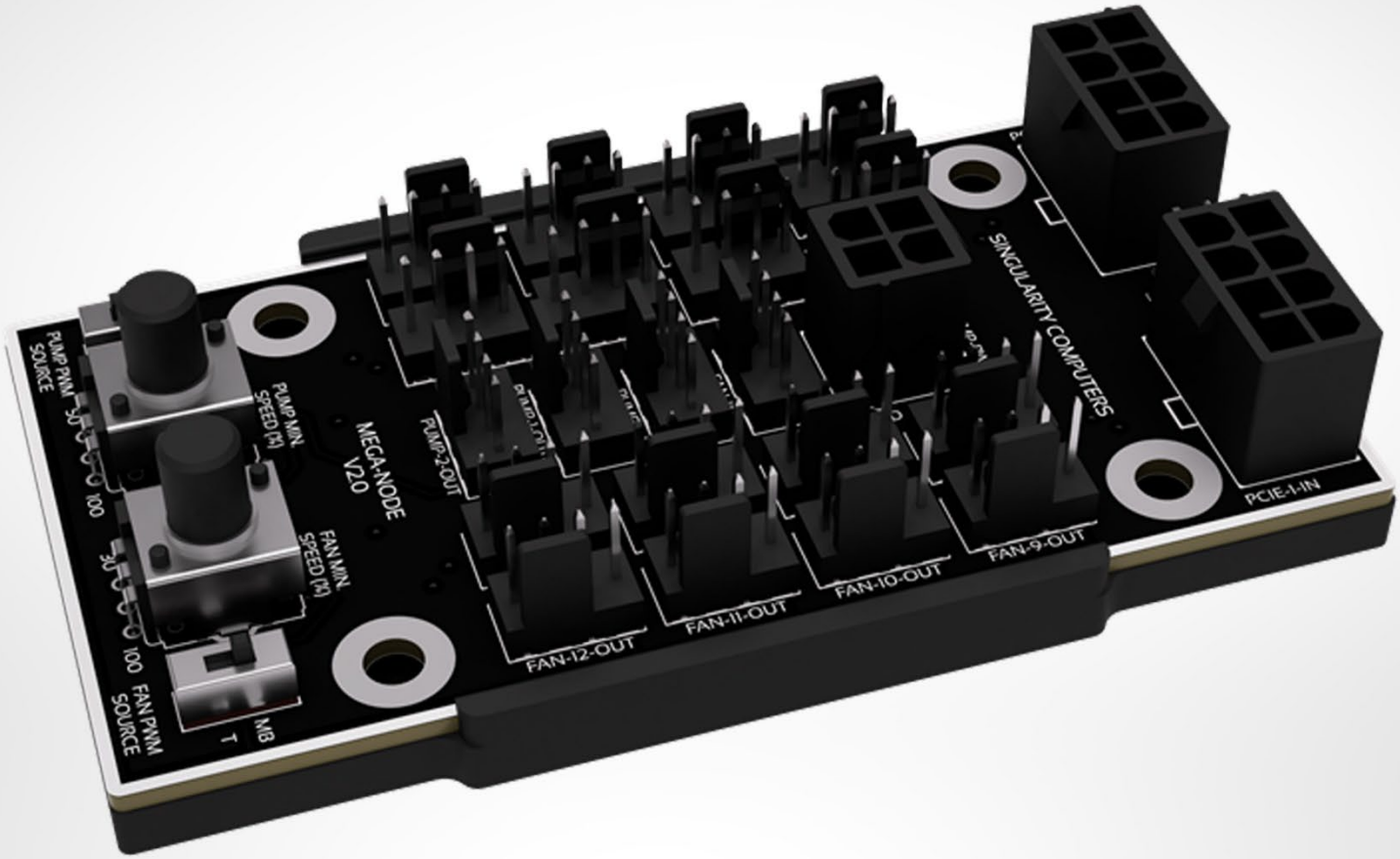
SINGULARITYCOMPUTERS

MEGA-NODE



Manual

Revision 1.2

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Introduction

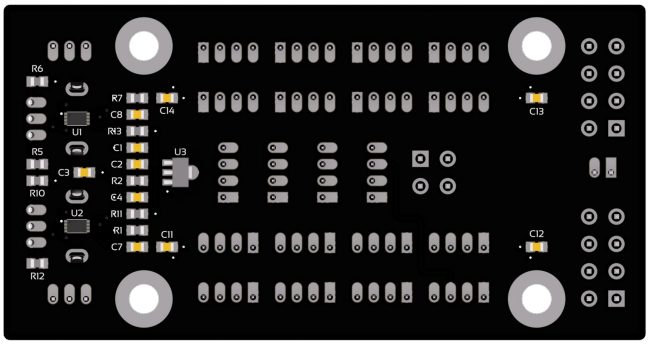
An active powered hub with unique temperature-based RPM control achieved through hardware only for standalone use. No software, firmware or connection to an operating system or BIOS is needed. The Mega-Node Hub has two PWM zones, one for up to x16 fans and another for up to x2 pumps, both controlled by the same temperature sensor input. For the fans the RPM range is 30-100% and for pumps 50-100% and the minimum RPM can be adjusted within this range via the potentiometers. Both PWM zones can be switched between the onboard temperature-based RPM control and the usual motherboard RPM control via switches, and there are input cables for the fans and x2 pumps so that the RPM can be controlled and/or read via the motherboard or another controller. It has an adaptor cable which plugs in via a 4pin ATX connector which has x2 SATA and x2 Molex for powering D5 pumps. There are two 8pin PCIE input connections for up to 300W of total power, only one needs to be connected for function depending on the amount of components connected.

Features

- Active-powered PWM hub with 4-layer PCB
- High-quality components with black PCB and connectors
- Supports PWM control for fans and pumps
- Two independent temperature-based PWM control circuits
- Controls fan and pump speeds based on coolant temperature without a motherboard
- Adjustable PWM temperature response via onboard potentiometers
- Switchable motherboard or local temperature-based PWM control
- Dedicated 4-pin ATX power connector supports up to 2x pumps
- Dedicated single RPM output prevent RPM conflicts.

Specifications

Mega-Node	• 2x 8pin PCIe power inputs for 150W+150W maximum power. • 2x PWM input headers to connect a motherboard for PWM signal and RPM reading • 16x PWM output headers for up to 16x fans • 2x PWM output headers for up to 2x pumps • Temperature sensor header for a 10K NTC 3950K type thermistor • 3A maximum current per PWM header • 4A maximum current per pin for ATX 4pin power • Switchable PWM source between motherboard and local temperature control
Footprint	56mm x 99mm w/ bottom plastic case | 52mm x 99mm w/o bottom plastic case
Mounting Holes	38.9mm x 60.3mm rectangle for M4 fasteners and standoffs
FAN Min. Speed	30%
PUMP Min. Speed	50%



Installation Guide

Installing the Mega-Node is as simple as it gets: peel the double-sided tape on the bottom of the plastic case and stick it to a flat surface, or remove the plastic case and install M4 standoffs to it and secure it to a surface with 4 mounting holes. This is user- and case-dependent.

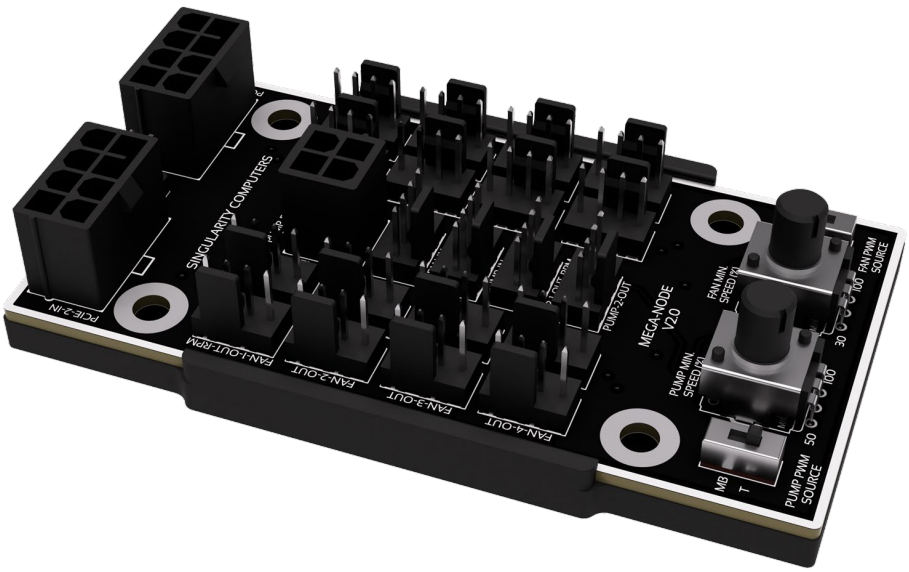
Plug in at least 1x PCIe 8pin power cable from Your power supply, then the fans and an optional temperature sensor. Plug in the included 4pin ATX pump power cable and plug the pump(s) MOLEX or SATA power cables into it, then connect the 4pin PWM cable of the pump(s) to the Mega-Node.

Switch the switches to “T” for a temperature-based PWM control and turn the potentiometers to the minimum setting for default operation, or switch the switches to “MB” and connect the Mega-Node to a motherboard with a PWM linking cable to act as a powered PWM hub controlled by the motherboard BIOS.

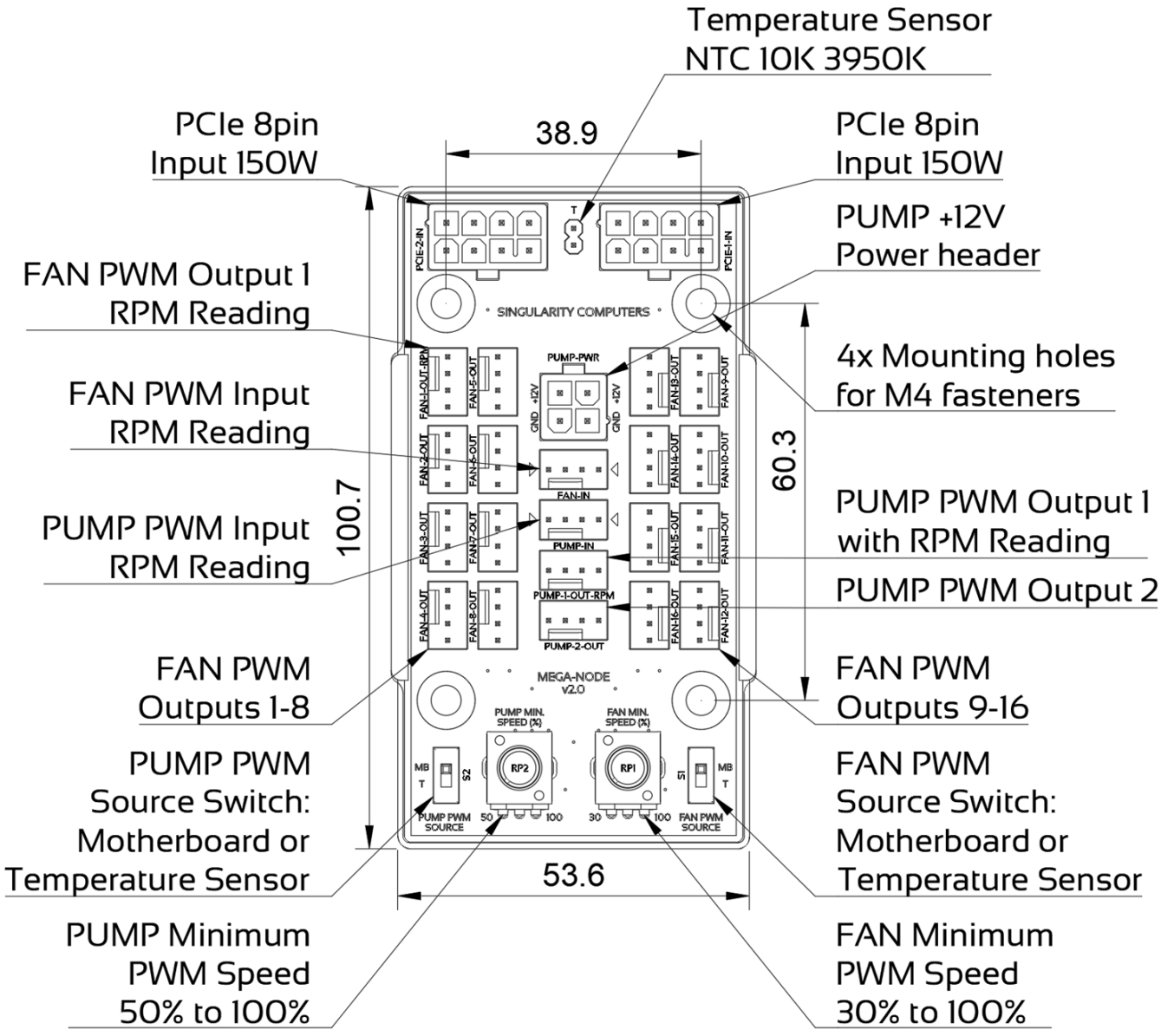
Operation

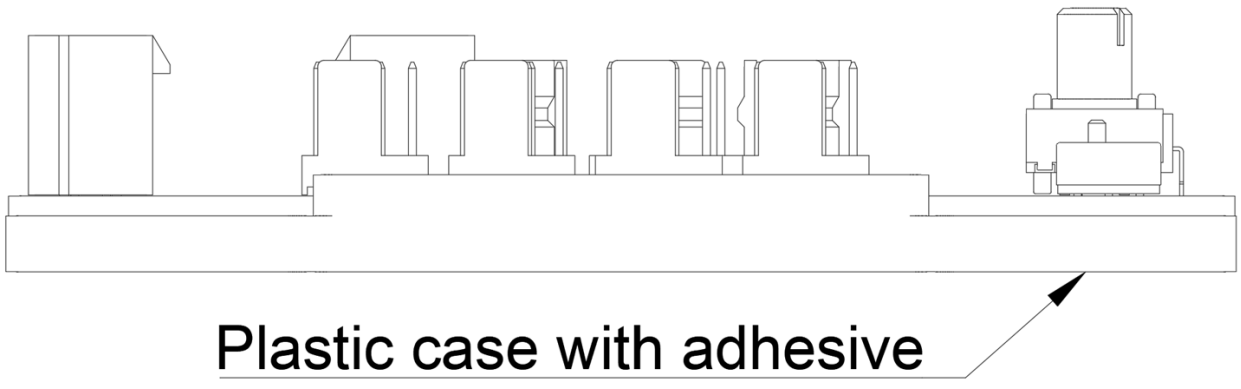
The Mega-Node will execute the below behaviour in “T” mode:

- Maintain the set minimum PWM speed % below 25˚C coolant temperature.
- Linearly increase PWM speed from the set minimum to 100% between 25˚C and 45˚C coolant temperature.
- PWM remains at 100% above 45˚C coolant temperature.
- Increasing the minimum PWM speed % with the potentiometers will result in lower temps but higher PWM speed and noise. Default operation (potentiometers turned to the minimum) is recommended for most setups as this is the optimal compromise between coolant temperature and fan/pump noise.
- The Mega-Node will always reach 100% PWM speed at 45˚C coolant temperature regardless of the potentiometer setting.
- With no temperature sensor connected the PWM % is fixed by the potentiometers and won't change.



Layout


Temperature Sensor
NTC 10K 3950K
PCIe 8pin
Input 150W
38.9
PCIe 8pin
Input 150W
PUMP +12V
Power header
FAN PWM Output 1
RPM Reading
4x Mounting holes
for M4 fasteners
FAN PWM Input
RPM Reading
60.3
100.7
PUMP PWM Input
RPM Reading
PUMP PWM Output 1
with RPM Reading
PUMP PWM Output 2
FAN PWM
Outputs 1-8
FAN PWM
Outputs 9-16
PUMP PWM
Source Switch:
Motherboard or
Temperature Sensor
FAN PWM
Source Switch:
Motherboard or
Temperature Sensor
53.6
PUMP Minimum
PWM Speed
50% to 100%
FAN Minimum
PWM Speed
30% to 100%
SINGULARITY COMPUTERS
PUMP-PWR
FAN-IN
PUMP-IN
PUMP-1-OUT-RPM
PUMP-2-OUT
MEGA-NODE
v2.0
PUMP MIN. SPEED (%)
FAN MIN. SPEED (%)
RP2
RP1
PUMP PWM SOURCE
FAN PWM SOURCE


Plastic case with adhesive