*M*icro *A*utonomations LLC

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Mercedes Fan Controller

V2.1

Description

This module controls C-Class fans from Mercedes. It has three different methods to control the fan. It will vary the fan speed automatically to attempt to maintain the temperature set by the user. It will implement a staged output, where the fan will ramp up in 4 predefined speeds determinate on the engine temperature. Lastly, it may be controlled by a relay to turn the fan on or off. As a safety feature, if the controller does not detect a temperature sensor, it will turn the fan on; or, if the sensor wire gets grounded, it will turn the fan on.

Onboard status LED

There is a green LED on the controller board to act as a status light. The light will blink depending on its current status, as shown in the table below.

Status LED	Cause
1 flash every 2 seconds	Controller is powered on, waiting for signal to turn the fan on. Normal operation.
Constant flashing	Error detected. Either no sensor installed, or the sensor input is grounded. Fan will run at full speed, and dash gauge will peg Hot (if installed)
2 flashes	Fan is turned on due to the AC input being active
Steady on	Fan is on due to temperature. Normal operation.

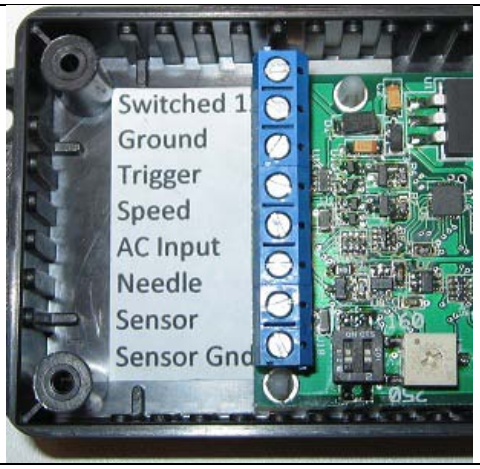
Max Specs

Max input voltage: 18v

Max voltage on AC input pin: 18v

Max voltage on any other pin: 5v

Pinout

There are eight (8) connections on the blue screw terminal strip: Switched 12v Input Ground Trigger Output Speed Output AC input Dash Temp Gauge output (needle) Temperature Sensor + Temperature Sensor – (GND)	

Signal Description

Switched 12v Input

Main power input to the controller. This must be from a switched source so the controller is off when the vehicle is off.

Ground

Main ground for the controller. This must have a good connection to ground.

Trigger Output

This is the On/Off signal to the Mercedes Fan. Do not apply any external voltage or ground to this pin. This signal is required for the fan to operate.

Speed Output

This is the variable duty cycle speed signal to the Mercedes Fan. Do not apply any external voltage or ground to this pin. Do not accidently reverse these two signals. This signal is required for the fan to operate, even if you are not using the variable speed function.

AC Input

This input indicates the AC system is operating, and that the fan should be turned on. This pin may be either grounded, or tied to +12v by the AC system. This may also be controlled by a switch to manually turn the fan on. There is a 5 second delay after this signal is active before the fan turns on, or turns off. When activated, the fan will turn on to 50%. If the temperature requires it, the speed will automatically increase above 50%.
This input is optional, and may be left unused.

Dash Temp Gauge Output

This is the output to the Mopar dash gauge. This will emulate the temperature sensor and move the needle corresponding to the current temperature. This only works with a temperature sensor installed,

and if there is a constant voltage regulator installed in the dash cluster. This will not work with the stock dash voltage regulator.
This function is intended for use in those applications where there are not enough plugs in the manifold to install another temperature sensor. In that case, the stock Mopar sensor can be replaced with the small diameter Autometer sensor. The Fan Controller will operate off this new sensor, and then drive the dash temperature gauge.
This output is optional, and may be left unused

Temperature Sensor +
With a two prong temperature sensor, it does not matter which terminal goes here. With a one terminal temperature sensor, or installation using a switch/relay, this is the pin to use.

Temperature sensor – (temp sensor GND)
This pin is internally connected to ground. When using a two terminal temperature sensor, connect one terminal to this pin. Leave this pin empty when using a single terminal temperature sensor, or when using a switch/relay.

Wire Installation

We recommend using 18awg wire to install the controller. Nothing larger is necessary, and may not fit in the screw terminals. Carefully insert the stripped wire into the corresponding screw terminal, and then tighten the screw with a small flathead screwdriver. Tighten until snug; too tight could break the terminal and/or damage the circuit board.

A ½”hole will need to be drilled in the enclosure to route wires through. Depending on the mounting orientation will determine which edge is better to use. Drill on the bottom edge to prevent water from entering from the top.

Wiring diagrams

With two terminal Temperature sensor installed, it does not matter which terminal on the sensor goes to which on the controller.

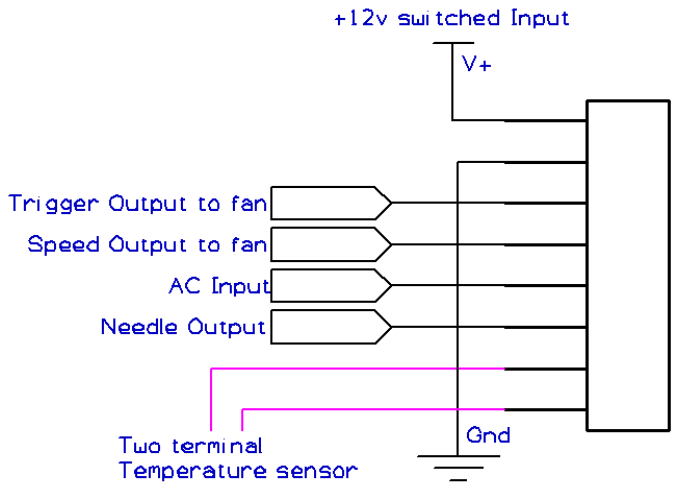


Fig 1: Installation with two terminal temperature sensor

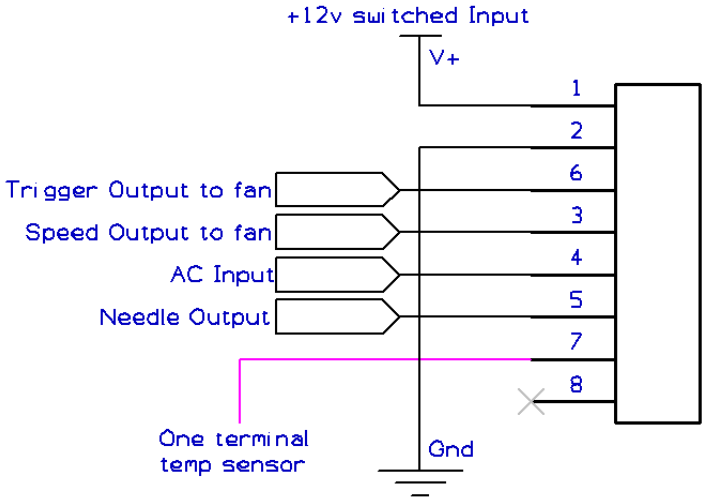


Fig 2: With one terminal temperature sensor installed. Pin 8 is not connected.

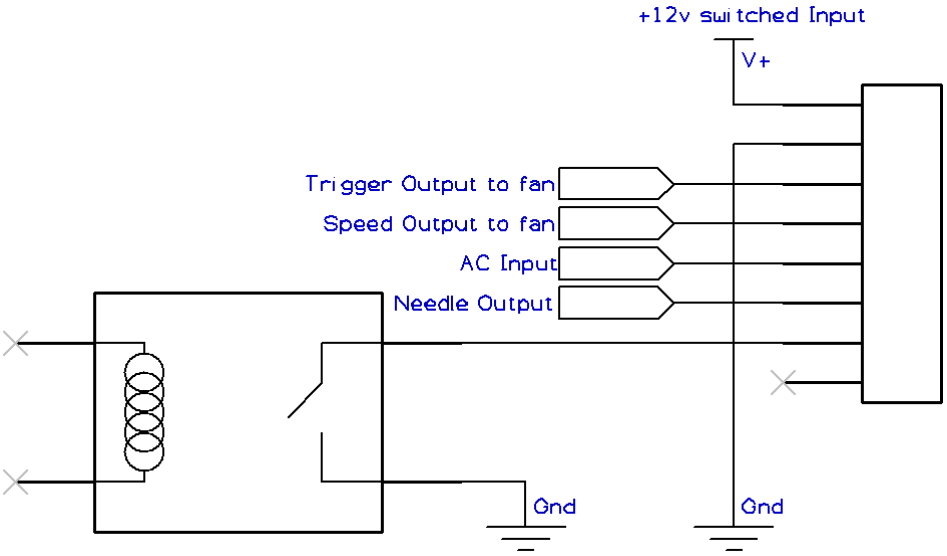


Fig 3: With relay sensor installed

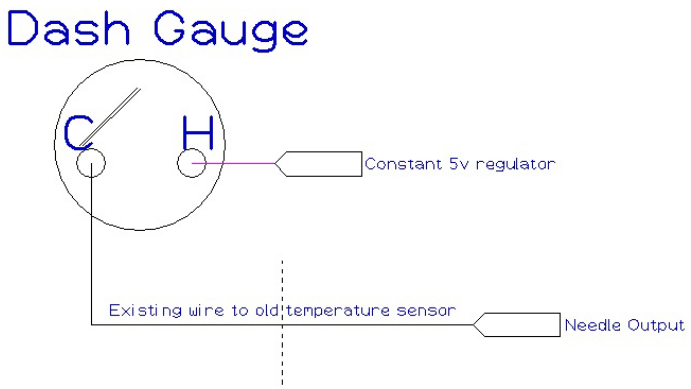
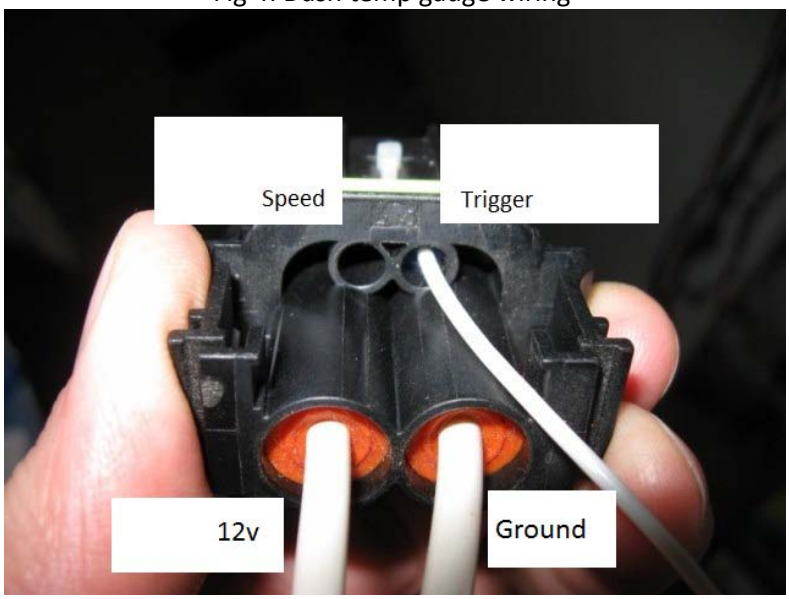


Fig 4: Dash temp gauge wiring



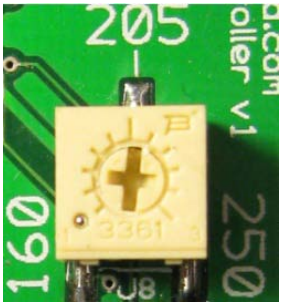
View of the plug going into the fan

Setting the turn on temperature

The turn on temperature is set by turning the tan potentiometer/knob on the controller board with a small flathead screwdriver. The white lettering on the controller board roughly shows the temperatures at different positions.

Due to small differences between all temperature sensors, the best way to set the turn on temperature to match your dash temperature gauge is as follows:

1. Turn knob full clockwise to 250*F.
2. Idle engine to operating temperature where you want the fan to turn on at
3. Slowly turn knob counter-clockwise until the status LED and/or fan turn on. The temperature and knob values are updated once a second, so by turning the knob too fast, you may end up at a lower temperature setting than you desire. This may require some tweaking to adjust the final temperature.



Knob with turn on temperature set to ~207*F

Dip Switch settings

Use a small screwdriver to carefully change the setting of the dip switch.

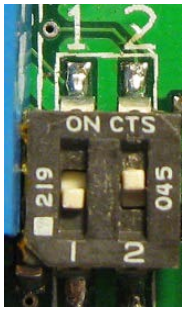
Switch 1:

On = Autometer single terminal sensor (1/8” NPT)
Off = GM two terminal Sensor (3/8” NPT)

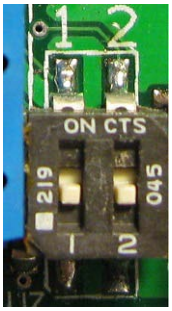
Switch 2 – Indicate whether a temperature sensor is installed, or a relay is installed.

On – Indicates that a relay is installed to command the controller to turn on the fan. The status LED will blink if the Temp sensor + pin is not grounded.
If a temperature sensor is installed, this will activate the Staged Output mode.

Off – Indicates that a temperature sensor is installed. The controller will monitor the temperature, and vary the speed of the fan to maintain the temperature set by the knob.



Switch 2 ‘On’



Switch 2 ‘Off’

Staged Output mode:

In the event that the fan ‘hunts’ too much as it varies the fan speed, the staged output may be enabled. The fan output is set according to the table below. As the engine begins to cool off, the fan will maintain the highest speed reached until it drops below the target temperature, where it will go back to 25%. If the temperature drops far enough, the fan will turn off.

Current temperature	**Fan speed**
> 5* below Set Temperature	Fan off
Set Temp – 5* < Current Temp < Set Temp	25%
Set Temp < Current Temp < Set Temp + 2*	50%
Set Temp + 2* < Current Temp < Set Temp + 5*	75%
Set Temp + 5* < Current Temp	90%

Recommended sensor

Any generic GM type temperature sensor should work with the Mercedes Fan Controller. We have currently tested with a TX3T two terminal temperature sensor. The associated pigtail for this sensor is part number Pico 5615PT. This sensor has a 3/8” NPT thread.

Autometer #2258. This is a single terminal 1/8” NPT sensor. The sensor body MUST have a good connection to ground. You may not be able to use sealant on the threads.

Mounting the controller

We recommend using several self tapping screws to mount the controller, either in the engine bay, or under the dash.

Warranty

This product is guaranteed to be free from workmanship errors for 6 months from date of purchase. Micro Autonomations LLC is limited in liability to the purchase price of the Mercedes Fan Controller.