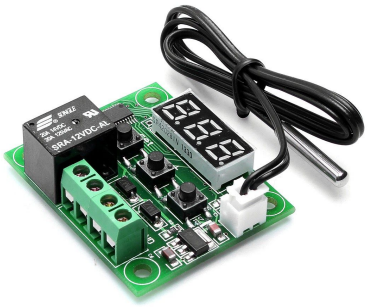
W1209 12V -50° to 110°C Digital Thermostat Temperature Controller Module

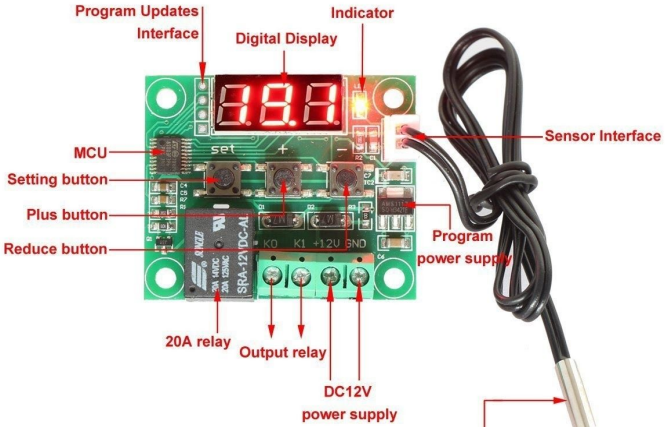


The W1209 is a low cost yet highly functional thermostat controller. This module intelligently controls power to most types of electrical device based on the temperature sensed by the included high accuracy NTC remote temperature sensor.

The cooler, heater or fan is connected to a power supply through the relay contacts K0 and K1, and the temperature on/off setpoints are programmed into the W1209 using the onboard Set, Increase and Decrease buttons and display. The relay contacts are then open and closed, acting as a power switch for the cooler/heater, based on the temperature measured by the NTC temperature sensor (included with the module) and the setpoints programmed into the W1209 controller. 3 switches are used to configure the parameters including on & off trigger temperatures. The on-board relay can switch up to a maximum of 125V AC or 14V DC at 20A. The temperature is displayed in degrees Centigrade via its 3 digit display and the current relay state by an on board LED.

Note that the power supply must be connected to the K0 / K1 relay contacts, the relay is not connected to the 12V support power. If your device operates on 12V, the same power supply can be used for both, otherwise a separate power supply should be used to power your device as shown in the interconnect drawing below.

Examples: 1) Set P0 to C for cooling, P1 (hysteresis) to 2 degrees, and setpoint to 30C, with a fan wired to the fan's power supply with one of the connections (either hot or ground) connected through the K0/K1 relay contacts. When the temperature measured by the sensor rises to 30C [(1)], the fan will turn on to cool. When the temperature drops below 28C (30C setpoint - 2C hysteresis [(1)]), the fan will turn off.
2) Set P0 to H for heating, P1 to 1 degree, and setpoint to 15C, with a heating element wired to its power supply through the K0/K1 relay contacts. When the temperature drops to 15C, the heater will turn on. When the temperature rises above 16C (15C setpoint + 1C hysteresis), the heater will turn off.



Specifications:

- Temperature Control Range: -50° ~ 110°C
- Resolution at -9.9°to 99.9°: 0.1°C; 1°C over 99.9°
- Measurement Accuracy: 0.1°C; Control Accuracy: 0.1°C
- Refresh Rate: 0.5 Seconds
- Input Support Power (DC): 6V - 12V
  The maximum input support voltage should not exceed 12V. In applications such as an automobile or RV where the battery voltage can exceed 12V, a regulator circuit such as a 1N5349 zener diode and series resistor should be used to limit the voltage to 12V
- Measuring Input: NTC (10K 0.5%)
- Waterproof Sensor: 0.5M cable
- Output: 1 Channel Relay Output, 20A max current

Power Consumption:

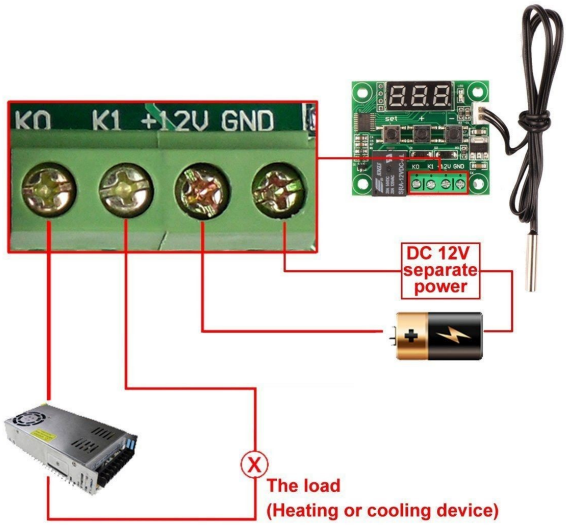
- Static Current: ~35mA; Maximum Current: ~65mA

Environmental Requirements:

- Temperature: -10° ~ 60°C; Humidity: 20-85%

Dimensions:

- 48mm x 40mm x 14mm (LxWxH)



Displaying the current temperature:
The thermostat will display the current temperature in degrees C by default.
When in any other mode, making no input for approximately 5 seconds will cause the thermostat to return to this default display.

Setting the trigger temperature:
To set the trigger temperature press the button marked 'SET'. The display will flash. You can now set a trigger temperature in 0.1°C increments using the '+' and '-' buttons. If no buttons are pressed for approximately 2 seconds the trigger temperature will be stored and the display will return back to the current temperature.

SETTING THE PARAMETERS:
To set any parameter first press the 'SET' button for at least 5 seconds. The display should now display 'P0'. This represents parameter P0. Pressing the '+' or '-' buttons will cycle through the various parameters (P0 to P6). Pressing the 'SET' button while any of the parameters are displayed will allow you to change the value for that parameter using the '+' and '-' buttons (see below). When finished setting a parameter press the set button to exit that option. If no buttons are pressed for approximately 5 seconds the thermostat will exit the parameter options and will return back to the default temperature display.

Setting the cooling or heating parameter P0:
The parameter P0 has two settings, C and H. When set to C (default) the relay will energize when the temperature setpoint is reached. Use this setting if connecting to an air-conditioning system. When set to H the relay will de-energize when the temperature is reached. Use this setting if controlling a heating device.

Setting the hysteresis parameter P1:
This sets how much change in temperature must occur before the relay will change state. For example, if you set the hysteresis value at 1C and the desired temperature on the thermostat at 20°C, the relay will be deactivated at 21°C (20°C+1°C) [(1)]. The relay is activated again when the temperature drops to 20°C. Setting this hysteresis to a higher value helps stop the thermostat from continually triggering when the temperature drifts around the trip temperature.

Setting the upper limit of the thermostat parameter P2:
This parameter limits the maximum trigger temperature that can be set, less than 110 degrees. It can be used as a safety to stop an excessively high trigger temperature from accidentally being set by the user.

Setting the lower limit of the thermostat parameter P3:
This parameter limits the minimum trigger temperature that can be set, more than -50 degrees. It can be used as a safety to stop an excessively low trigger temperature from accidentally being set by the user.

Setting temperature offset correction (calibration) parameter P4:
Should you find there is a difference between the displayed temperature and the actual temperature (for instance if the temperature probe is on a long run of cable) you can make minor corrections to the temperature reading with this parameter. Calibration allows you to adjust the temperature in 0.1° increments.

Setting the trigger delay parameter P5:
This parameter allows for delaying switching of the relay when the trigger temperature has been reached. The parameter can be set in one minute increments up to a maximum of 10 minutes. If you set 1 minute, the relay is activated until one minute after reaching the set temperature.

Setting the high temperature alarm parameters P6 and P7:
Setting the alarm to ON through parameter P6, and setting a temperature value for this parameter via P7, will cause the relay to switch off when the the temperature reaches this setting. The display will also show '---' to indicate an alarm condition. The relay will not re-energize until the temperature falls below this value. The default setting for P6 is OFF. (NOTE : Some models set the temperature alarm value through P6, and do not have a P7 parameter.)

[(1)] NOTE REGARDING HYSTERESIS SETTING: Depending upon the firmware version of your module, the hysteresis is either subtracted from, or added to, the temperature setpoint. For example, when P0 = "C", hysteresis (P1) is set to "2" and the setpoint is 28, either the relay will activate at 28 and deactivate or 26 (setpoint - hysteresis), or it will activate at 30 (setpoint + hysteresis), and deactivate at 28. A quick test will confirm which firmware version your module has.

To reset, press and hold both + and – buttons simultaneously. After 5 seconds it will reset to factory defaults.