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MakerHawk TC816B

Digital Temperature Controller Thermostat Timer

INSTRUCTION MANUAL - MAKERHAWK TC816

1. Introduction

This manual provides detailed instructions for the operation and maintenance of your MakerHawk TC816 Digital Temperature Controller Thermostat Timer. This versatile device is designed for precise temperature and timing control across various applications, including reptile enclosures, incubators, terrariums, freezers, refrigerators, home brewing, and more. Please read this manual thoroughly before use to ensure safe and optimal performance.



Figure 1: MakerHawk TC816 Digital Temperature Controller with sensor probe.

2. Safety Information

To ensure safe operation and prevent damage, observe the following safety guidelines:

- **Power Source:** Ensure the device is connected to a 120V AC power supply. The maximum load is 15A/1800W. Do not exceed these limits.
- **Secure Connection:** The plug features highly conductive copper plates for efficient power transfer and rust resistance. Ensure it is fully inserted into a compatible outlet.
- **Child Safety:** The safety socket is designed to prevent accidental insertion by children. Keep the device out of reach of young children.
- **Material Safety:** The device casing is made from PC flame-retardant material, offering high-temperature flame resistance.
- **Environmental Conditions:** Avoid exposing the device to extreme temperatures, humidity, or direct water contact.
- **Probe Placement:** Ensure the temperature sensor probe is correctly placed in the environment you wish to monitor and control.

More Safety

Protect Your Security



Figure 2: Illustration of safety features including high conductivity copper plate, safety protection door, and strong flame retardant material.

3. Product Overview

The MakerHawk TC816 features a clear LCD display and intuitive button controls for easy operation. Key components include:

- **LCD Display:** Shows measured temperature, set temperatures, and timer settings.
- **Control Buttons:** MODE, SET, UP, DOWN for navigation and setting adjustments.
- **Sensor Probe:** 1.7m NTC temperature sensor for accurate readings.
- **US Plug:** Standard 3-prong plug for power input.
- **Controlled Outlet:** For connecting heating or cooling devices.
- **Reset Button:** Small button for factory reset (requires a tool).

Product Introduction

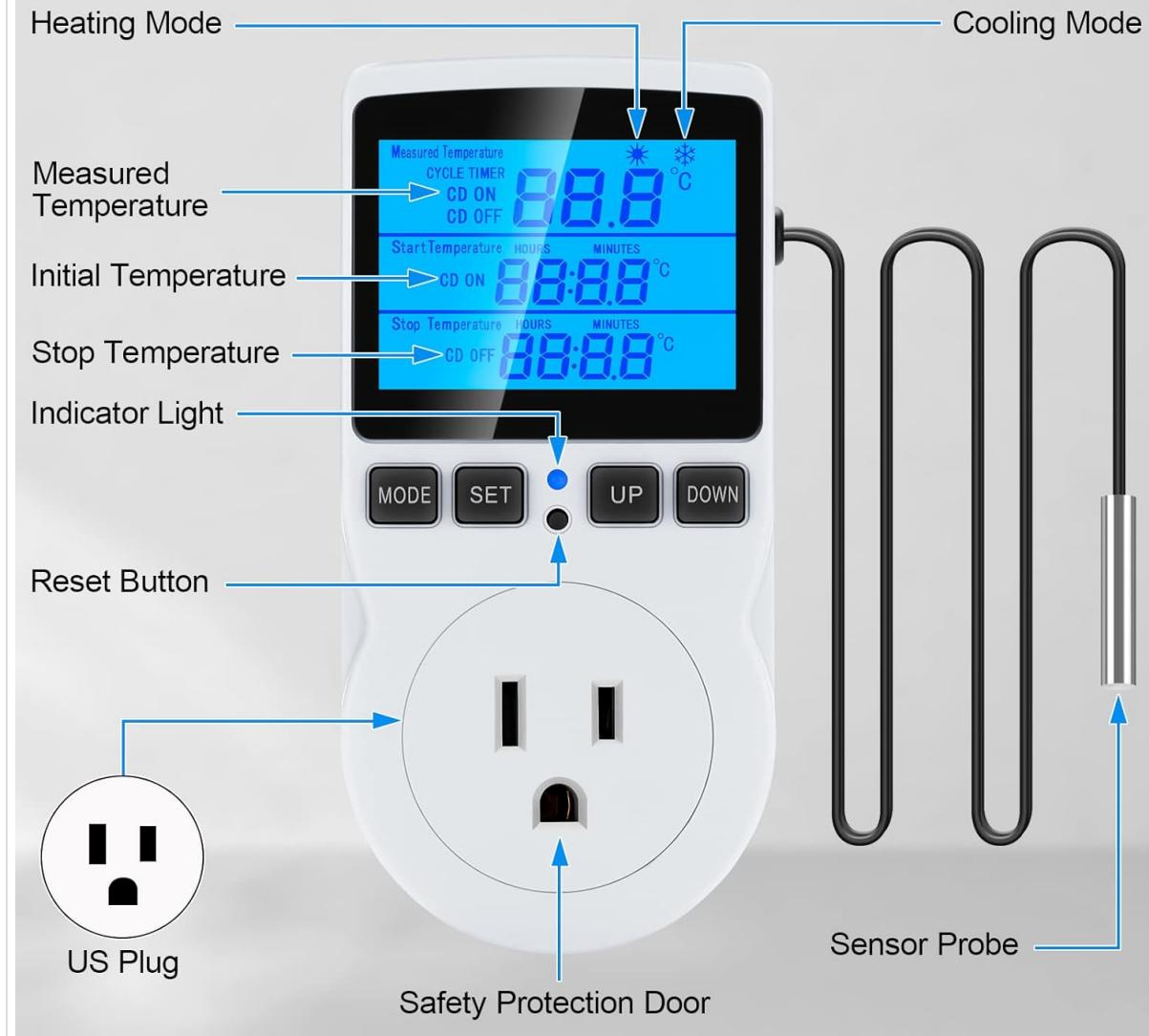


Figure 3: Detailed product diagram highlighting the display, buttons, sensor probe, and power outlet.



Figure 4: Overview of key features including heating/refrigeration, timing, temperature calibration, memory, reset, backup memory, lock screen, backlit LCD, and high accuracy.

4. Setup

Follow these steps to set up your temperature controller:

- 1. Unpack:** Carefully remove the temperature controller and sensor probe from its packaging.
- 2. Connect Probe:** Ensure the sensor probe is securely connected to the designated port on the controller.
- 3. Placement:** Position the sensor probe in the area where you need to monitor and control the temperature (e.g., inside a terrarium, refrigerator, or greenhouse).
- 4. Power On:** Plug the temperature controller into a standard 120V AC wall outlet. The display will illuminate.
- 5. Connect Device:** Plug your heating or cooling device (e.g., heater, fan, refrigerator) into the controlled outlet on the front of the thermostat.

Your browser does not support the video tag.

Video 1: An overview of the MakerHawk TC816 Digital Temperature Controller, demonstrating its physical features and basic setup. This video shows the device from various angles, highlighting the display, buttons, and the length of the sensor cable (1.7m).

5. Operating Instructions

5.1. Switching Temperature Units (Celsius/Fahrenheit)

To switch between Celsius (°C) and Fahrenheit (°F):

- Press and hold the "SET" button for approximately 2 seconds. The display will change the temperature unit.

5.2. Temperature Control Mode

This mode allows you to set a desired temperature range for heating or cooling.

1. Press the "SET" button once to enter temperature control mode.
2. Use the "UP" and "DOWN" buttons to adjust the "Start Temperature" (ON).
3. Press "SET" again to move to the "Stop Temperature" (OFF).
4. Use the "UP" and "DOWN" buttons to adjust the "Stop Temperature".
5. Press "SET" once more to confirm and exit the setting.

Heating Operation: If "Start Temperature" is **less than** "Stop Temperature", the device will operate in heating mode. The connected device will turn on when the temperature drops below the Start Temperature and turn off when it reaches the Stop Temperature.

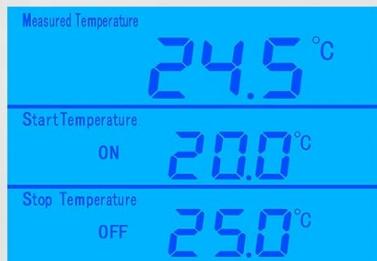
Cooling Operation: If "Start Temperature" is **greater than** "Stop Temperature", the device will operate in cooling mode. The connected device will turn on when the temperature rises above the Start Temperature and turn off when it drops to the Stop Temperature.

Temperature Control Range: -40°C to 120°C (-72°F to 176°F).

5.3. Timing Functions (F01, F02, F03, F04)

The controller offers four distinct timing modes. Press the "MODE" button to cycle through these functions (F01, F02, F03, F04).

Timing Function



Temperature Control Mode



F01 Cycle Timer Mode

Start time (ON) / Stop time (OFF)
Cycle timing



F02 Countdown On Mode

Now Ti.s OFF, Delayed (Start time) ON



F03 Countdown Off Mode

Now Ti.s ON, Delayed (Stop time) OFF, Countdown completion, Turn off the output and exit the run



F04 Countdown On And
Countdown Off Mode

Now Ti.s ON, Delayed (Stop time) OFF, Countdown completion, Turn off the output and exit the run

Figure 5: Visual representation of the four timing modes (F01, F02, F03, F04) and temperature control mode.

- **F01 Cycle Timer Mode:** Sets a repeating ON/OFF cycle.
 - Press "MODE" until F01 is displayed.
 - Press "SET" to adjust ON time (hours and minutes).
 - Press "SET" again to adjust OFF time (hours and minutes).
 - Press "SET" to confirm.
- **F02 Countdown On Mode:** The device remains OFF for a set countdown period, then turns ON.
 - Press "MODE" until F02 is displayed.
 - Press "SET" to adjust the countdown ON time (hours and minutes).
 - Press "SET" to confirm.
- **F03 Countdown Off Mode:** The device remains ON for a set countdown period, then turns OFF.
 - Press "MODE" until F03 is displayed.
 - Press "SET" to adjust the countdown OFF time (hours and minutes).
 - Press "SET" to confirm.
- **F04 Countdown On and Countdown Off Mode:** The device turns ON for a set period, then OFF for

another set period.

- Press "MODE" until F04 is displayed.
- Press "SET" to adjust the countdown ON time (hours and minutes).
- Press "SET" again to adjust the countdown OFF time (hours and minutes).
- Press "SET" to confirm.

Setting Range for Timing Modes: 0 to 99 hours and 59 minutes.

5.4. Temperature Calibration

If you need to fine-tune the temperature reading for accuracy:

- Plug in the device. Within 2 seconds of powering on, press and hold the "MODE" button for 2 seconds until "CALIBRATE" appears on the screen.
- Use the "UP" and "DOWN" buttons to adjust the temperature offset. The calibration range is -9.9°C to 9.9°C.
- Press and hold the "MODE" button for 2 seconds to save the calibration offset and exit. If you do not save, changes will not be applied.



Figure 6: Visual guide for temperature calibration by long-pressing the MODE button.

5.5. Lock Screen Protection

To prevent accidental changes to settings:

- Press and hold the "MODE" and "SET" buttons simultaneously for 5 seconds to lock the thermostat.
- Repeat the process (press and hold "MODE" and "SET" simultaneously for 5 seconds) to unlock the device.

5.6. Backlight Timer Setting

To adjust the backlight duration:

- Press and hold the "UP" and "DOWN" buttons simultaneously for 5 seconds.
- Use "UP" and "DOWN" to select the desired backlight duration:
 - bL-0: 10 minutes
 - bL-1: 1 Hour
 - bL-2: 4 Hours
 - bL-3: 8 Hours
 - bL-4: Always On
- Press "MODE" to save the setting.

6. Maintenance

Regular maintenance ensures the longevity and accuracy of your temperature controller:

- **Cleaning:** Wipe the device with a soft, dry cloth. Do not use abrasive cleaners or immerse the device in water.
- **Sensor Care:** Keep the temperature sensor probe clean and free from debris. Avoid bending or damaging the probe cable.
- **Storage:** When not in use, store the device in a cool, dry place away from direct sunlight and extreme temperatures.
- **Data Storage:** The device has a data storage function that saves all set parameters even after power is off.

7. Troubleshooting

If you encounter issues with your MakerHawk TC816, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Display is blank or not turning on.	No power, loose connection.	Ensure the device is securely plugged into a live 120V outlet. Check the outlet with another device.
Temperature reading is inaccurate.	Sensor probe dirty or misplaced, calibration needed.	Clean the sensor probe. Ensure the probe is correctly positioned. Perform a temperature calibration (see Section 5.4).
Device not switching ON/OFF as expected.	Incorrect temperature settings, timing mode active, locked screen.	Verify your "Start Temperature" and "Stop Temperature" settings. Ensure you are in the correct operating mode (temperature control or timing). Check if the screen is locked (see Section 5.5).

Problem	Possible Cause	Solution
Cannot change settings.	Screen is locked.	Unlock the screen by pressing and holding "MODE" and "SET" simultaneously for 5 seconds.
Need to reset to factory settings.	Software glitch, incorrect settings.	Use the included reset tool (or a thin pin) to press the reset button located in the small hole on the device. This will restore all parameters to default.

8. Specifications

Feature	Detail
Model Number	TC816B
Brand	MakerHawk
Voltage	110V - 120V AC, 50/60Hz
Maximum Load	15A / 1800W
Temperature Control Range	-40°C to 120°C (-72°F to 176°F)
Temperature Control Accuracy	±1%
Timing Accuracy	Max 10 minutes
Sensor Type	NTC Temperature Sensor
Sensor Cable Length	1.7 meters (66.93 inches)
Display Type	LCD with Backlight
Product Dimensions	4.72 x 2.95 x 2.36 inches
Item Weight	6.7 ounces

Product Size



Figure 7: Detailed product dimensions in centimeters and inches.

9. Warranty and Support

MakerHawk products are designed for reliability and performance. For warranty information or technical support, please contact MakerHawk customer service through their official website or the platform where you purchased the product. Please have your model number (TC816B) and purchase details ready when contacting support.

What You Get



Figure 8: What is included in the package: the temperature controller, sensor probe, user guide, and packaging box.