BIGTREETECH Manta M4P

BIGTREETECH Manta M4P Motherboard Instruction Manual

Model: Manta M4P

1. PRODUCT OVERVIEW

The BIGTREETECH Manta M4P is a 32-bit control board designed for 3D printers, offering high performance and compatibility with various systems, including Klipper firmware. It is specifically engineered to integrate with the Raspberry Pi CM4 or BIGTREETECH CB1 compute modules, making it suitable for advanced 3D printer setups like Voron V0 and Ender 3. This motherboard provides robust control over stepper motors, heaters, and other peripherals, ensuring precise and reliable 3D printing operations.
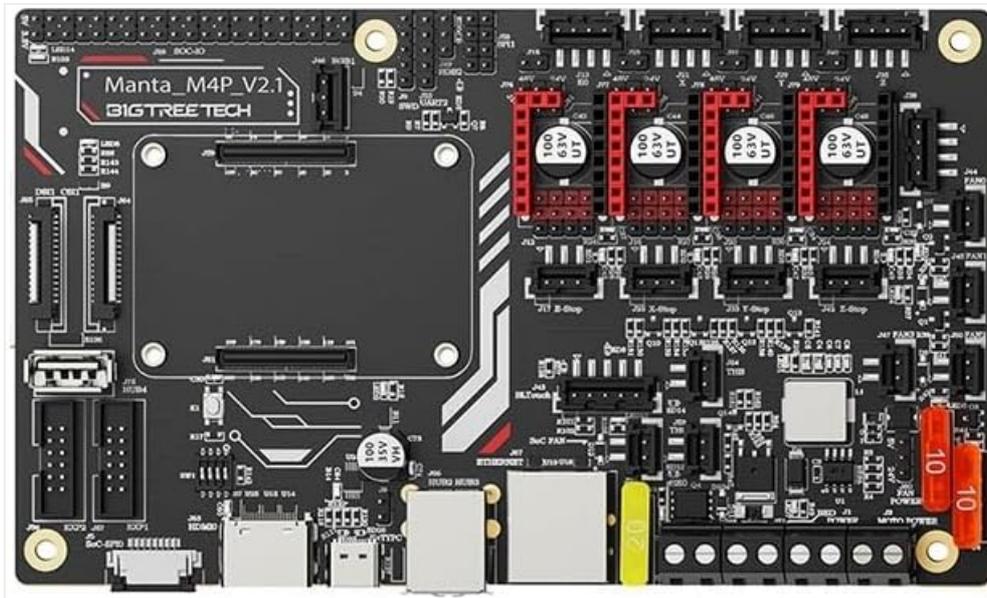

Figure 1: Top view of the BIGTREETECH Manta M4P Motherboard.

2. SETUP AND INSTALLATION

2.1 Unpacking and Inspection

Carefully unpack all components. Verify that the package contains the Manta M4P motherboard, the CB1 compute module (if purchased together), and any included accessories. Inspect all components for any visible damage before proceeding with installation.
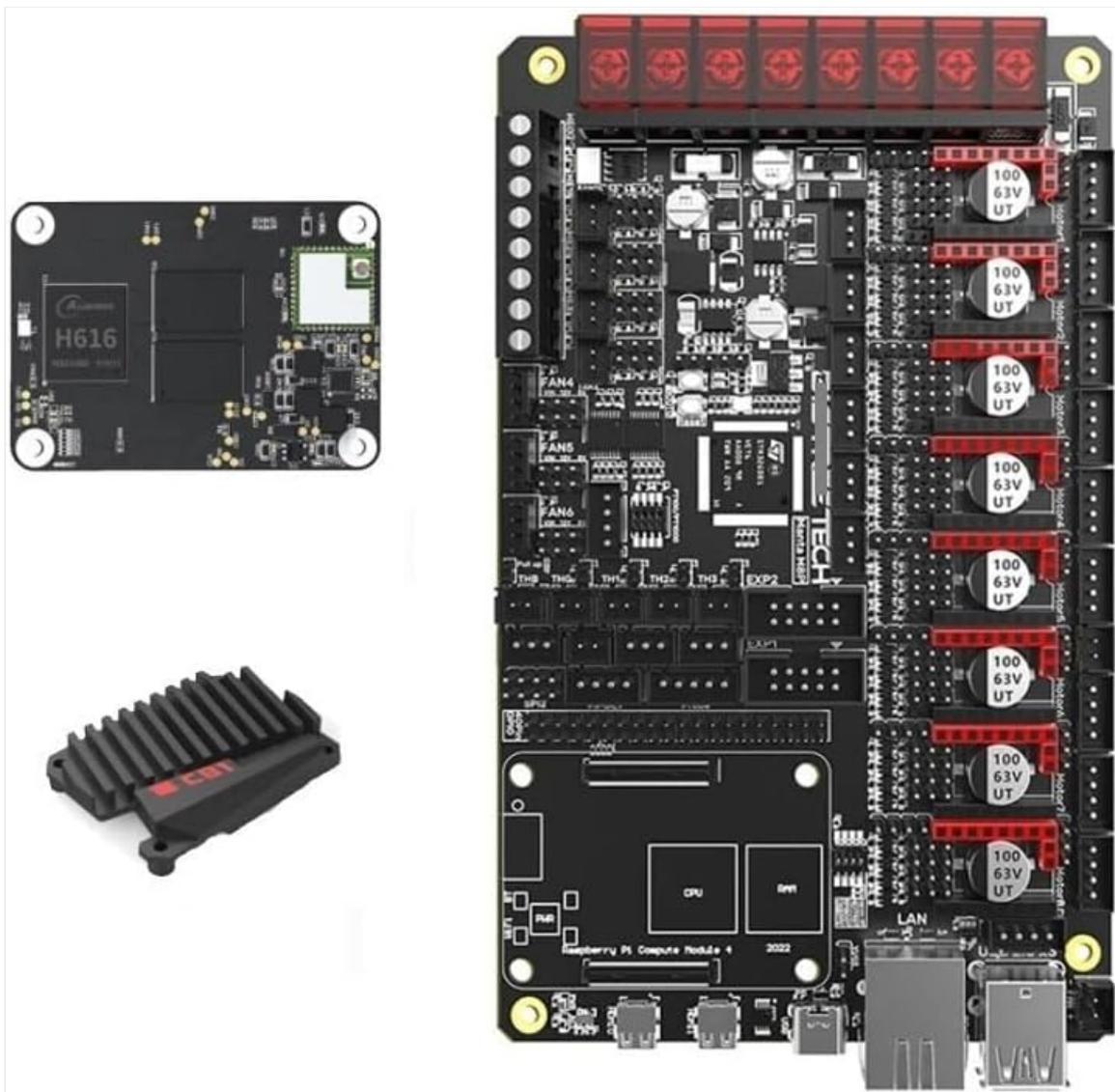
Figure 2: BIGTREETECH Manta M4P Motherboard shown with CB1 module and heatsink.

2.2 CB1 Module Installation

The CB1 compute module serves as the brain for your Klipper setup.

1. Align the CB1 module with the dedicated socket on the Manta M4P motherboard. Ensure the pins are correctly oriented.

2. Gently press the CB1 module into the socket until it is securely seated. Avoid excessive force.

3. If a heatsink is provided for the CB1, attach it according to its specific instructions to ensure proper thermal management.

Figure 3: The BIGTREETECH CB1 Compute Module.

2.3 Stepper Motor Driver Installation

Install your chosen stepper motor drivers (e.g., TMC2209) into the designated sockets on the Manta M4P. Pay close attention to the orientation of each driver, ensuring the enable pin (EN) aligns correctly. Refer to the driver's datasheet for specific orientation details.
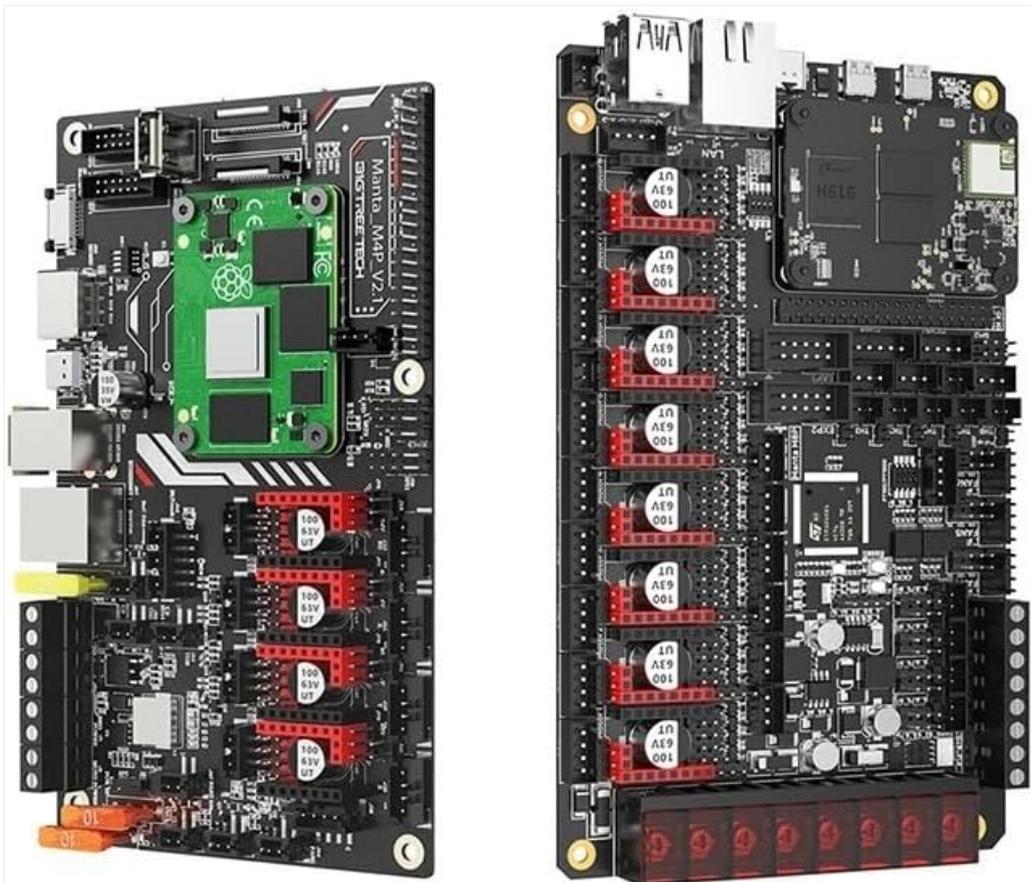

Figure 4: Side view of the Manta M4P with CB1 and stepper motor drivers installed.

2.4 Wiring Connections

Connect all necessary components to the Manta M4P motherboard. Always ensure the power supply is disconnected before making any wiring changes.

- **Power Supply:** Connect your 24V (or appropriate voltage) power supply to the main power input terminals. Observe correct polarity.
- **Stepper Motors:** Connect each stepper motor to its corresponding driver socket.
- **Heaters:** Connect the hotend heater and heated bed to their respective terminals.
- **Thermistors/Sensors:** Connect thermistors for hotend and heated bed temperature sensing.
- **Endstops:** Connect X, Y, and Z axis endstops.
- **Fans:** Connect cooling fans for the hotend, part cooling, and board cooling.
- **Peripherals:** Connect any additional peripherals such as a display, filament sensor, or auto-leveling probe.

Refer to the detailed pinout diagram available on the BIGTREETECH official website or documentation for precise connection points.
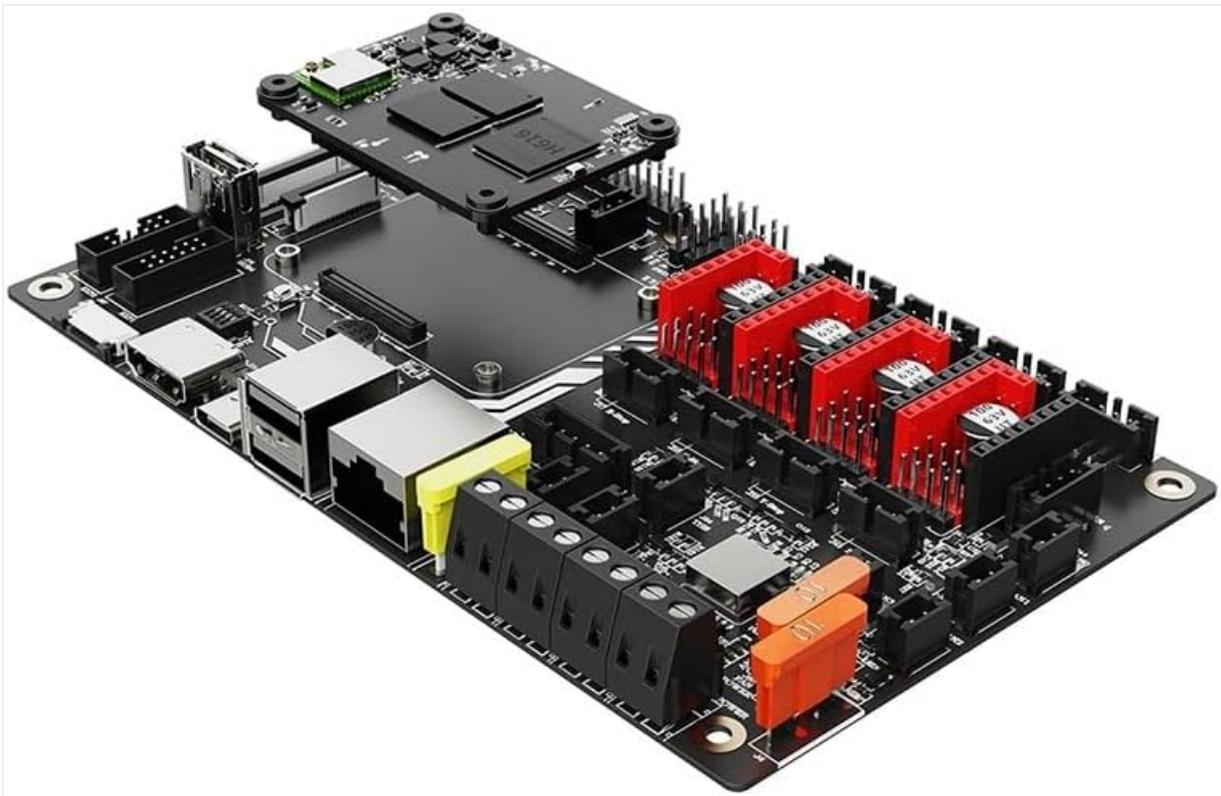

Figure 5: Angled view of the Manta M4P, showing various connection ports.

2.5 Firmware Flashing (Klipper)

The Manta M4P is designed for Klipper firmware. The general process involves:

1. Prepare the Klipper firmware for the Manta M4P using the Klipper configuration tool.
2. Transfer the compiled firmware file to an SD card.
3. Insert the SD card into the Manta M4P's SD card slot.
4. Power on the board. The firmware should flash automatically.
5. Once flashed, remove the SD card.

Detailed instructions for Klipper installation and configuration can be found on the official Klipper documentation website and BIGTREETECH's GitHub repository.

3. OPERATING INSTRUCTIONS

3.1 Power On and Initial Boot

After completing all wiring and firmware flashing, connect the power supply to the Manta M4P. The board should power on, and the CB1 module will boot its operating system.

3.2 Accessing Klipper Interface

Once the CB1 has booted, you can access the Klipper web interface (e.g., Mainsail or Fluidd) via a web browser on a computer connected to the same network. Enter the IP address of your CB1 module to access the interface.

3.3 Basic Printing Operations

From the Klipper web interface, you can:

- Upload G-code files for printing.
- Start, pause, or cancel print jobs.
- Monitor printer status, temperatures, and progress.
- Control individual printer components (motors, heaters, fans) for testing or calibration.

4. MAINTENANCE

4.1 Cleaning

Periodically inspect the motherboard for dust accumulation. Use compressed air or a soft brush to gently remove dust from the board and heatsinks. Ensure the board is powered off and disconnected from the power supply before cleaning.

4.2 Firmware Updates

Regularly check for updates to Klipper firmware and the CB1 operating system. Keeping your software up-to-date ensures access to the latest features, bug fixes, and performance improvements. Follow the official documentation for update procedures.

4.3 Component Checks

Occasionally check all wiring connections to ensure they are secure. Inspect stepper motor drivers and heatsinks for proper seating and thermal contact.

5. TROUBLESHOOTING

5.1 Board Not Powering On

- Verify the power supply is connected correctly and providing the correct voltage.
- Check all power connections for loose wires or incorrect polarity.
- Ensure the power supply is switched on.

5.2 Stepper Motors Not Moving

- Confirm stepper motor drivers are correctly installed and oriented.
- Check motor wiring for correct pinout and secure connections.
- Verify Klipper configuration for motor definitions and current settings.

- Ensure the motor power (VMOT) is supplied to the board.

5.3 Communication Issues with Klipper

- Ensure the CB1 module is properly seated and powered.
- Check network connectivity between your computer and the CB1 module.
- Verify the Klipper firmware on the Manta M4P is correctly flashed and configured.
- Consult Klipper logs for error messages.

6. SPECIFICATIONS

Feature	Detail
Model Name	Manta M4P
ASIN	B0DS67VHCR
Package Dimensions	1.18 x 0.79 x 0.39 inches
Item Weight	1.76 ounces
Manufacturer	SAGUCFS (BIGTREETECH)
Assembly Required	No (for the board itself, but components need assembly)
Number of Pieces	1 (motherboard)

Note: Specifications are subject to change without prior notice. For the most up-to-date information, please refer to the official BIGTREETECH product page.

7. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official BIGTREETECH website or contact their customer service directly. Keep your purchase receipt as proof of purchase.
Online resources such as community forums and documentation on GitHub can also provide valuable assistance for Klipper and BIGTREETECH products.