ePIC UMC for Antminers

Complete User Guide

Last updated: May 2026

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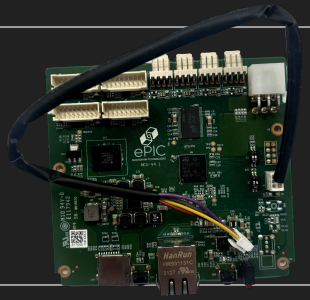
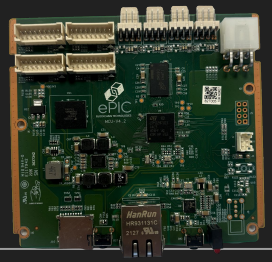
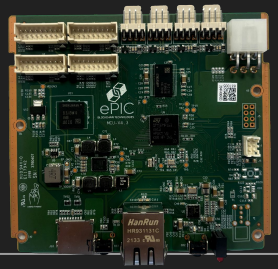
Blockchain Technologies

Control Board Form Factor

UMC V4.x

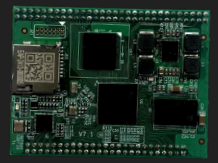
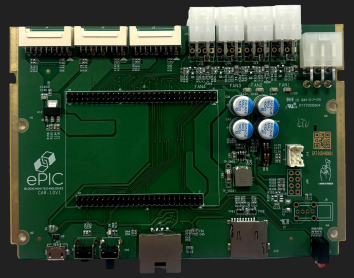
Compatible with Antminer S19 and S21 series

ePIC Blockchain Technologies

	V4.1	V4.2	V4.3	V4.5
Image				
Release Year	2022	2022	2023	2024
Compatible Models	**S19 series** and **S19K Pro** & **S21** with square fan connectors			**S19K Pro & S21**
Note	PSU 4-pin connector is required	PSU 4-pin connector no longer required	J16 enhanced IP report button configured *works on supported 3rd management tools & ePIC Dashboard Modified and enhanced	Square fan female connectors implemented

SOM (System on Module)

UMC V7 Module & Carrier Boards

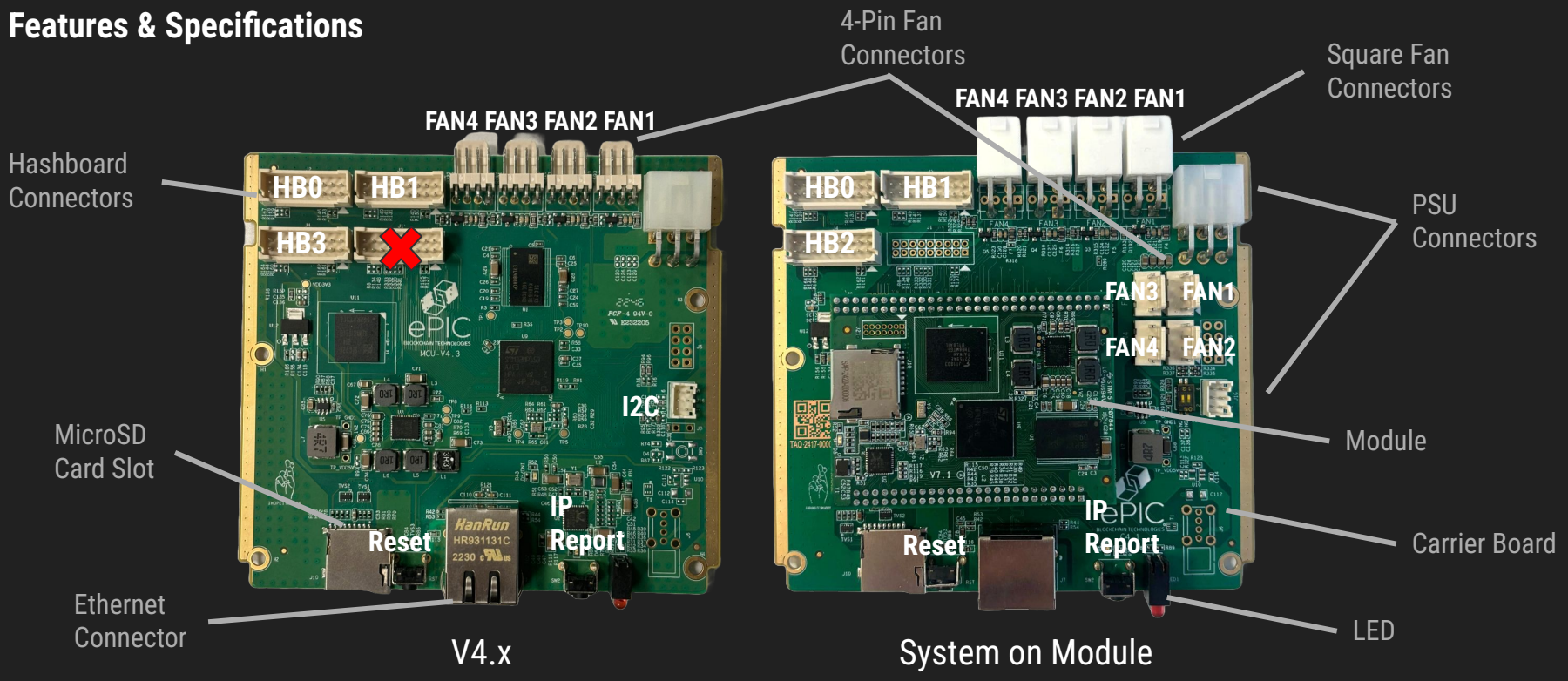
	V7 (Module)	C4	C10
Image			
Release Date	2024	2024	2025
Compatible Models	On **any** carrier boards	**S19 series** **S19K Pro** & **S21**	**S21 Pro, S21 XP, S21 +**
Note	Cannot be used alone		Does not support built-in display

Installing ePIC UMC Control Board

ePIC Control Board for Antminer Overview

Compatible with Antminer S19 and S21 series

Features & Specifications



*The J1 port is DISABLED by default, and the S21 Pro, S21 XP and S21 + models require a different carrier board.

ePIC Control Board for Antminer Overview

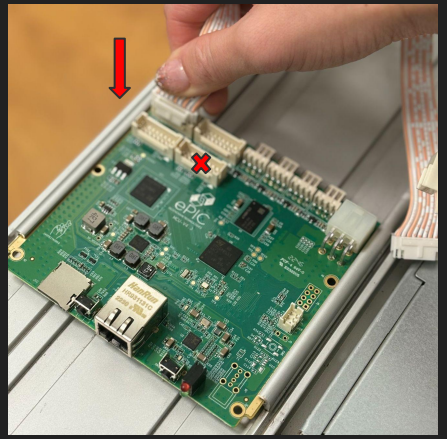
Compatible with Antminer S19 and S21 series

Components

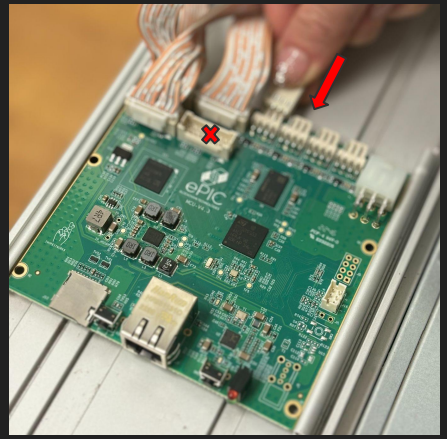
Included	Not Included
ePIC UMC Control Board	MicroSD Card SD card to USB adapter Power Cords Ethernet Cable
Required Tool : Screwdriver 	

Installation Guide

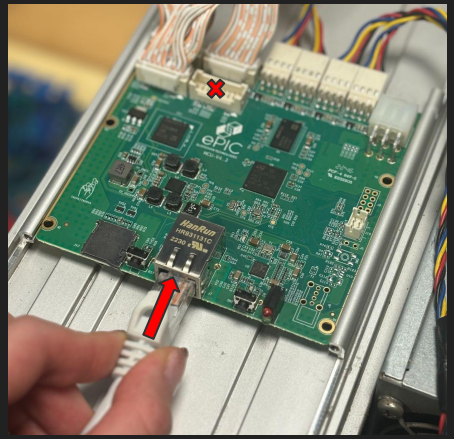
Connect the hashboard, fan, Ethernet and PSU connectors in the direction as shown



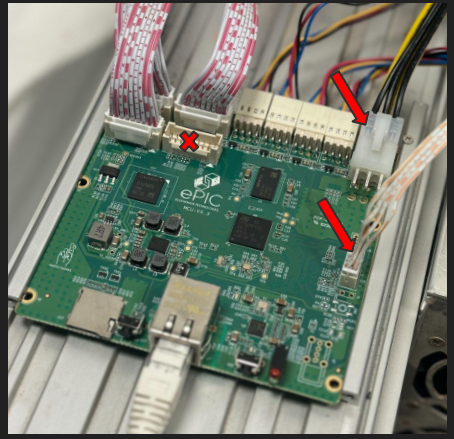
1. Data cable for hashboards



2. Fan connectors



3. Ethernet cable

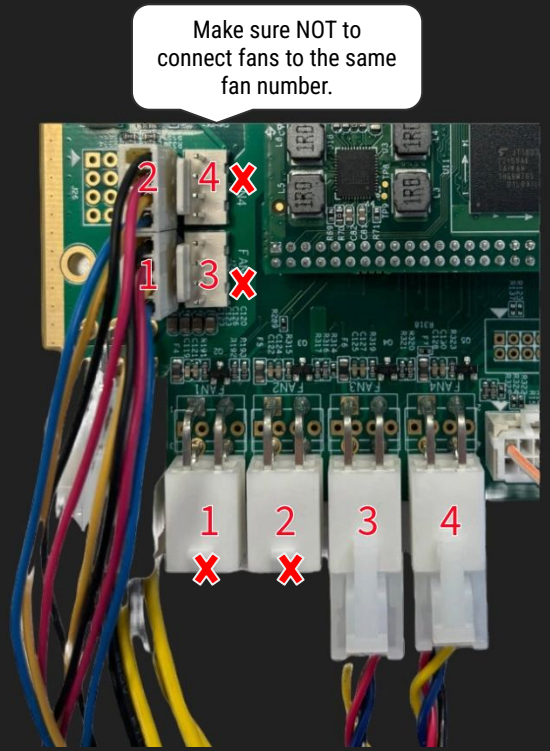


4. PCIe power cable and I2C 4-pin cable

*J1 port is DISABLED by default. S19K Pro may have different fan configuration. Please see the page 10.

How to Connect Two Different Fan Cables for S19K Pro

1. Read the fan numbers labeled on the UMC, as shown
2. Connect the 4-pin fan connectors to **FAN1** and **FAN2**
3. Connect the square fan connectors to **FAN3** and **FAN4**



DO NOT CONNECT TO THE SAME FAN NUMBERS

Example: Connecting both square and the 4-pin fans to FAN1 and FAN2, this will cause the software to detect only two fan.

Pre-Flashing Requirements

1. **Select the correct image**

   Download the appropriate .zip file based on your hardware:

Hardware Model	Required Firmware Image
S19 and S19 Pro (chiptype BM1398 ONLY)	powerplay-antminer-**legacy**-s19
All other miners	powerplay-antminer

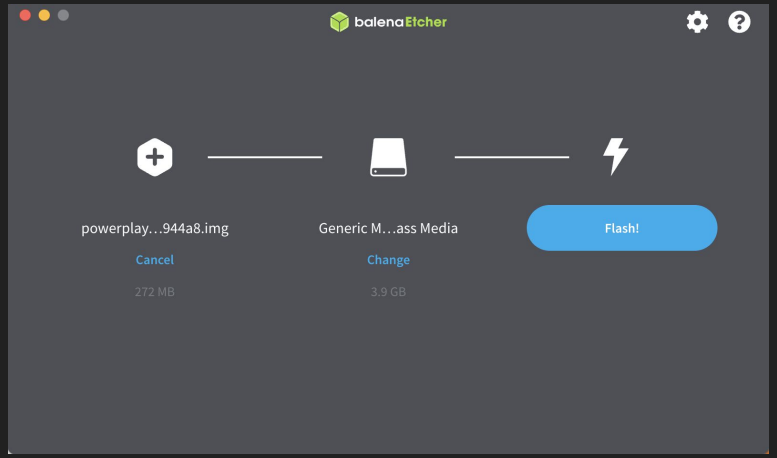
2. **Upgrade path for older versions (v0.56.3 or older)**

   If your miner is currently running v0.56.3 or older, you must choose one of the following methods:

   - **System Update**: update to version v0.100.3 first then update to the latest release
   - **SD recovery**: flash the latest version directly using the SD card instructions below

Flashing the microSD card

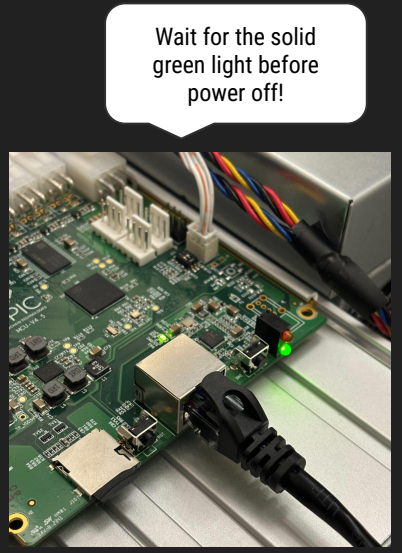
1. Download and install a flashing tool, such as balenaEtcher
2. Visit ePIC Github and download the correct sdrecovery .zip file for your miner based on the guide above
3. Plug your microSD card into your PC
4. Open your flashing application
5. Select the downloaded file and target device
6. Click **Flash!** and wait for the process to finish
7. Once complete, safely eject the microSD card from your PC



balenaEthcher

Flashing the Miner

1. I**nsert the flashed microSD card** into the powered-off miner, then **power it on**
2. The LED will **blink green** for about 30 to 60 seconds
3. Wait for the LED to turn **solid green**, then **power off the miner**
4. **Remove the microSD card** and power the miner back on
5. The LED will **blink green** for another 30 to 60 seconds to boot up, then **alternate red and green** to calibrate
6. Once the LED turns **solid green**, the calibration is complete and the miner will start mining



Step 3

*You can use any available microSD slot on either the module or the carrier board

Using the ePIC Dashboard

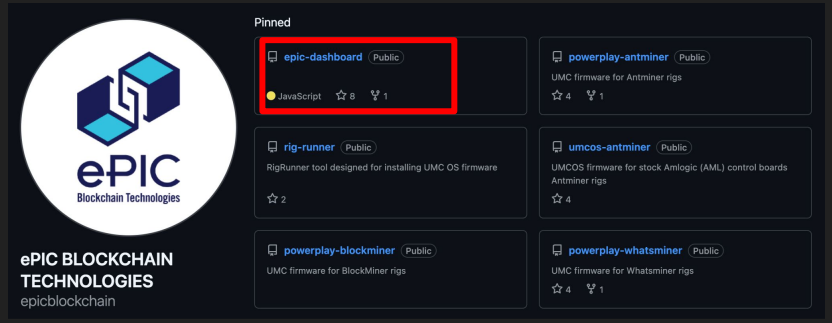
A powerful solution for managing miner fleet

Downloading the ePIC Dashboard

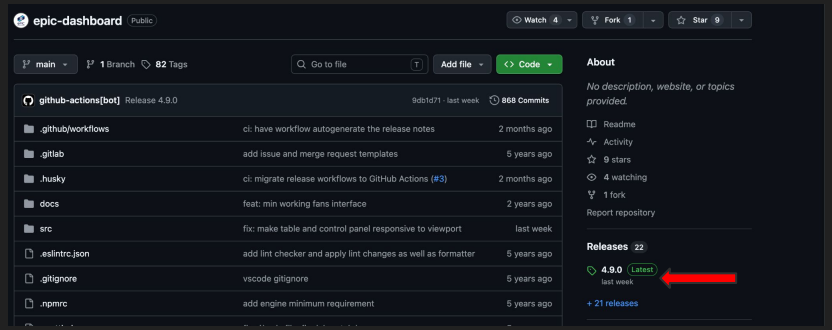
Install fleet management tool to scan for miner IP addresses and manage mining operation from a single interface

Installation Steps

1. Go to ePIC Github and click on **epic-dashboard**
2. Download the package that matches your operating system (Windows, macOS, or Linux) from the latest release
3. Extract the downloaded .zip file
4. Open the extracted folder and run the ePIC Dashboard application



epic-dashboard on Github



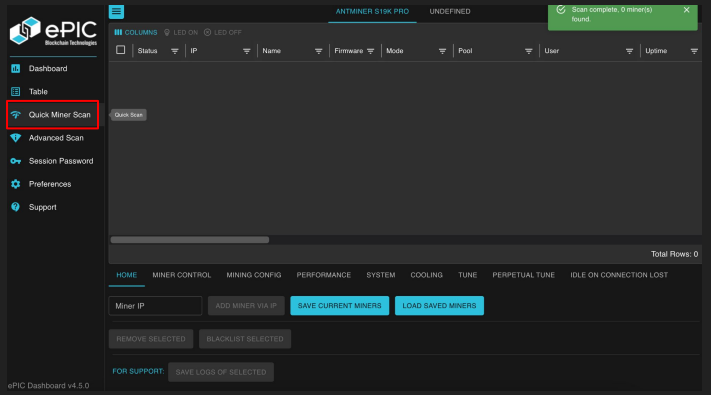
Download the latest release

Finding Miner's IP Address

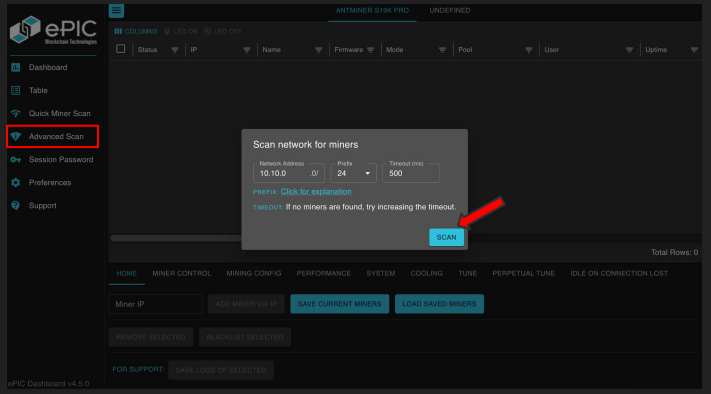
Locate your miner on your local network

The default password for all miner is ***letmein***

1. Open the **ePIC Dashboard** application
2. Choose your preferred scan method:
   - **Quick Miner Scan** to automatically scan your computer's current network,
   - **Advanced Scan** to manually enter a custom network range
3. Once the scan completes, navigate to the **Table** tab
4. Locate your miner's IP address under the **IP** column



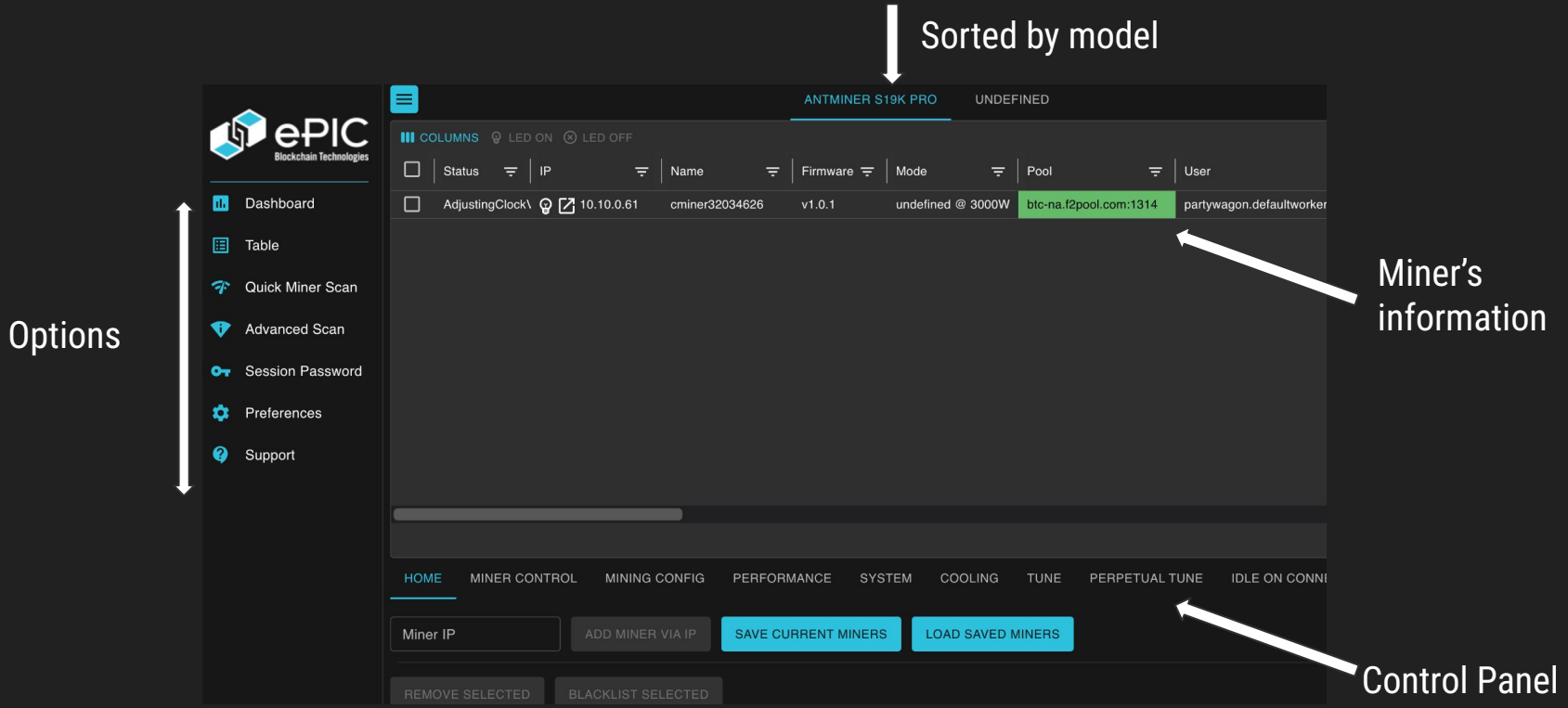
Quick Miner Scan



Advanced Scan

ePIC Dashboard - Table

Manage multiple miners from a single interface

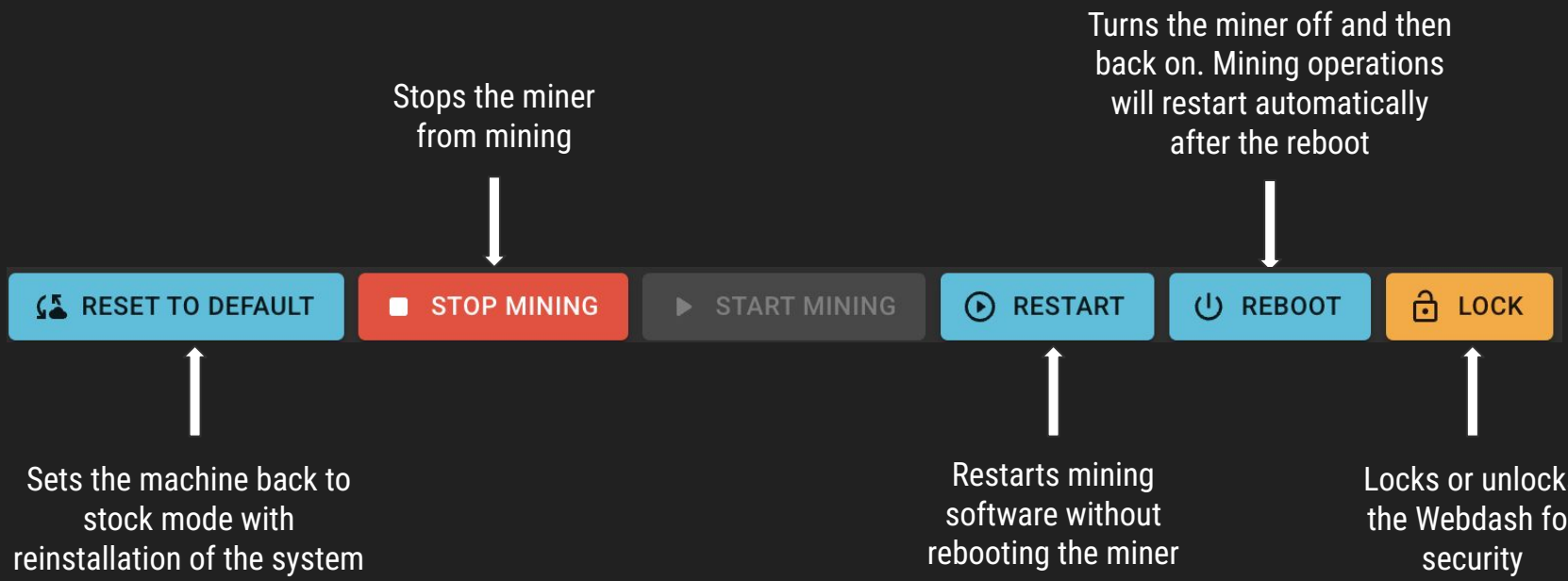


Using the ePIC Webdash

Full Ownership of a Single Miner

Control Panel

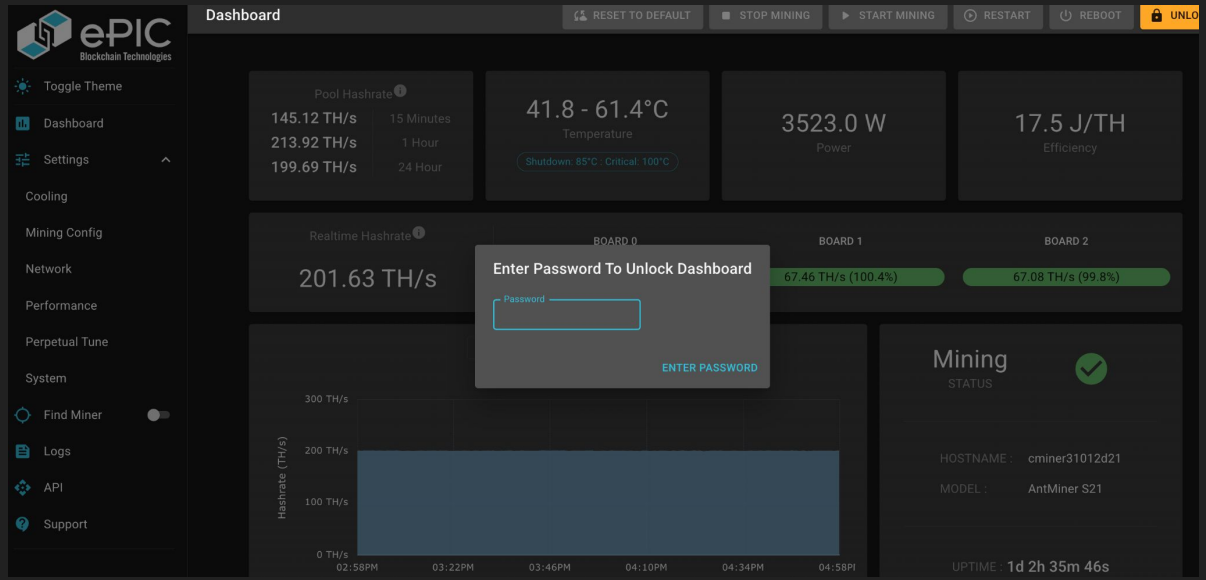
To execute desired commands



Note: your miner may take a few minutes to reboot but it will keep mining

Unlocking Miner

To access Webdash, the default password is *letmein*

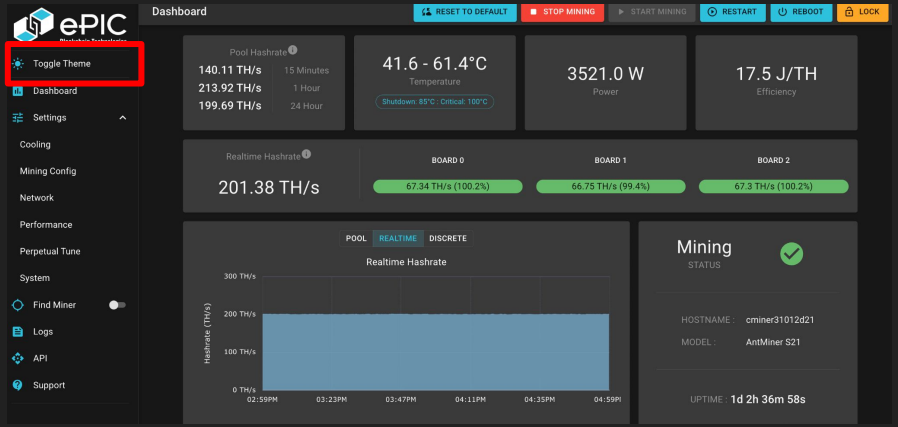


Enter the password in the pop-up box or click the LOCK button in the top right corner and enter the password.

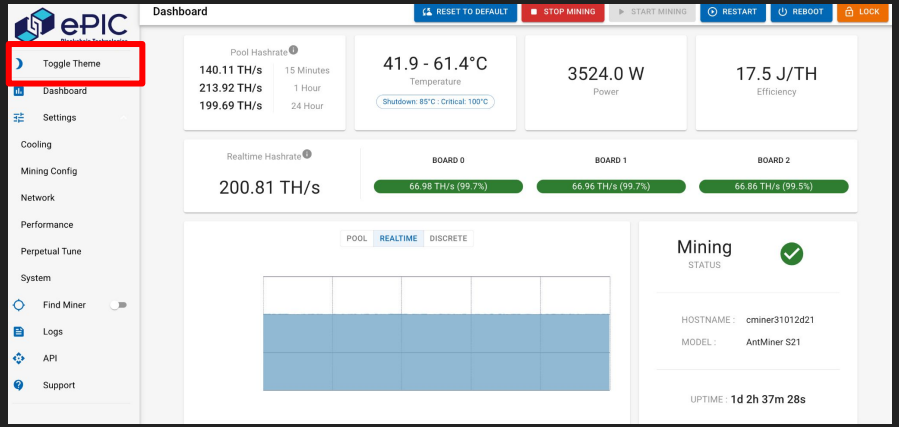
Default password : *letmein*

Toggle Theme

Customize Webdash colour scheme to your preference



Dark Mode



Light Mode

Dashboard

To view status of a miner

ePIC Blockchain Technologies

Configuration options

Real-time mining status

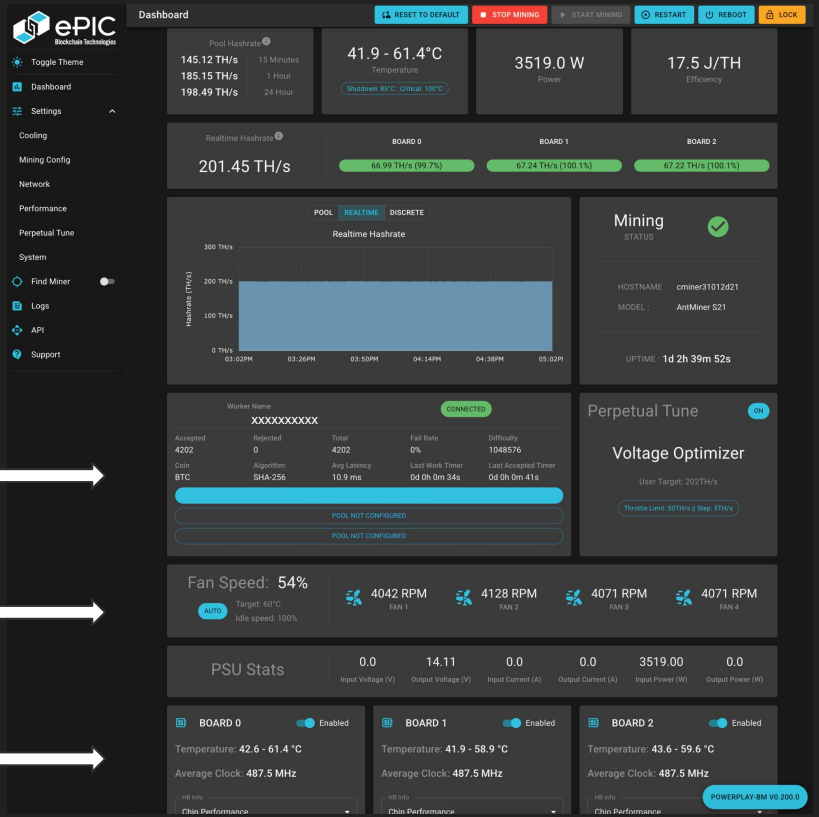
Pool status

Tuning status

Fan status

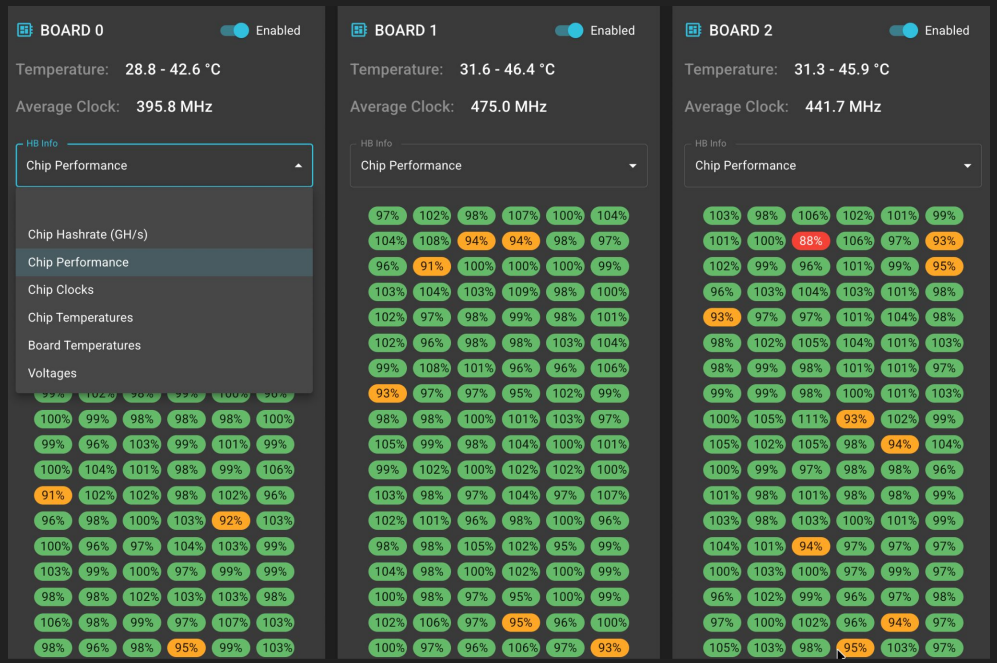
PSU status

Hasboard information



Dashboard

Hashboard Information



HB Info

Enable/Disable Board(s)

Chip Performance

Green 97% <

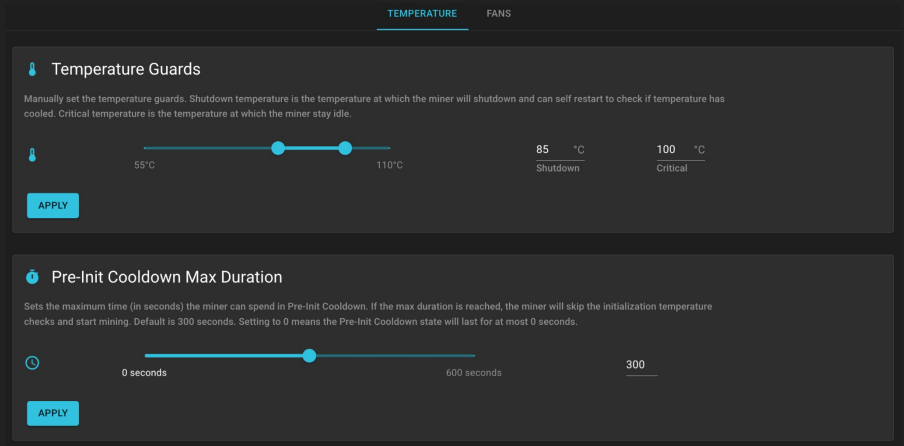
Yellow 95% < & > 97%

Red < 95%

Chip Temperatures is unavailable on the S19 series

Settings - Cooling

Manage temperature guards



Note: It is recommended to keep the shutdown temperature below 95° C for safety

Temperature Guards

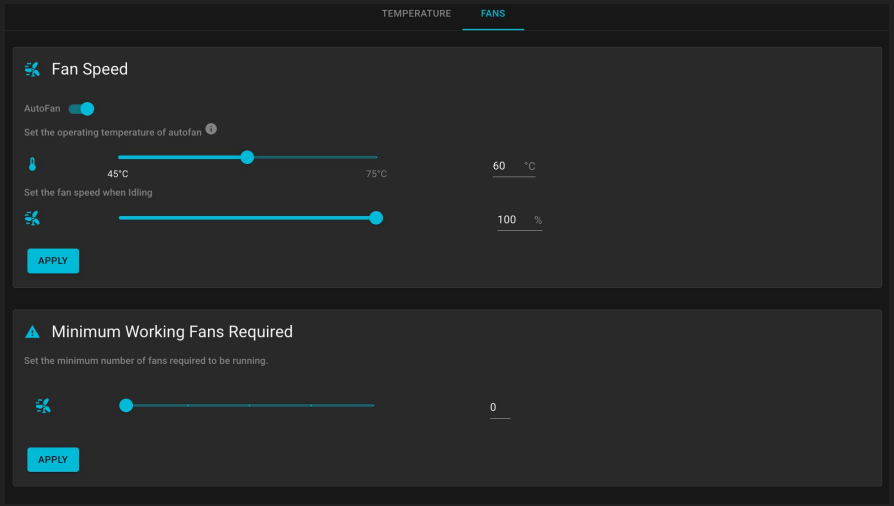
Sets the miner's thermal protection limits. When the shutdown temperature is reached, mining stops to protect the hardware and the miner can try to start again after it cools. When the critical temperature is reached, the miner remains idle until the temperature drops.

Pre-init Cooldown Max Duration

Sets the maximum time the miner can stay in Pre-Init Cooldown during startup while waiting for temperatures to reach a safe level. If the limit is reached, the miner skips the startup temperature checks and continues initializing. Default: 300 seconds. A value of 0 means no cooldown wait.

Settings - Cooling

Manage temperature guards and Autofan settings



Note: Enabling AutoFan is recommended for better efficiency and safety.

Fan Speed

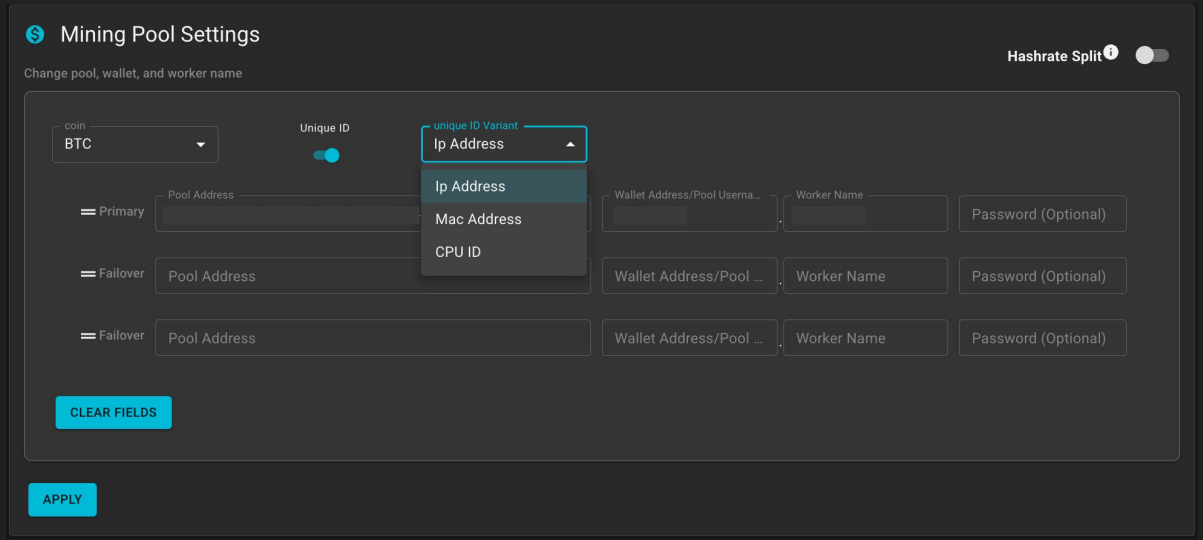
Manually set a fixed fan speed or enable AutoFan. AutoFan adjusts fan speed to maintain the target temperature and lets you set the idle fan speed. The maximum target temperature is limited to 10°C below the current shutdown temperature.

Min. Working Fans Required

Sets the minimum number of fans that must be working. If fewer working fans are detected than required, the miner stops to protect the hardware. Setting this to 0 disables the check.

Settings - Mining Config

Add pool information

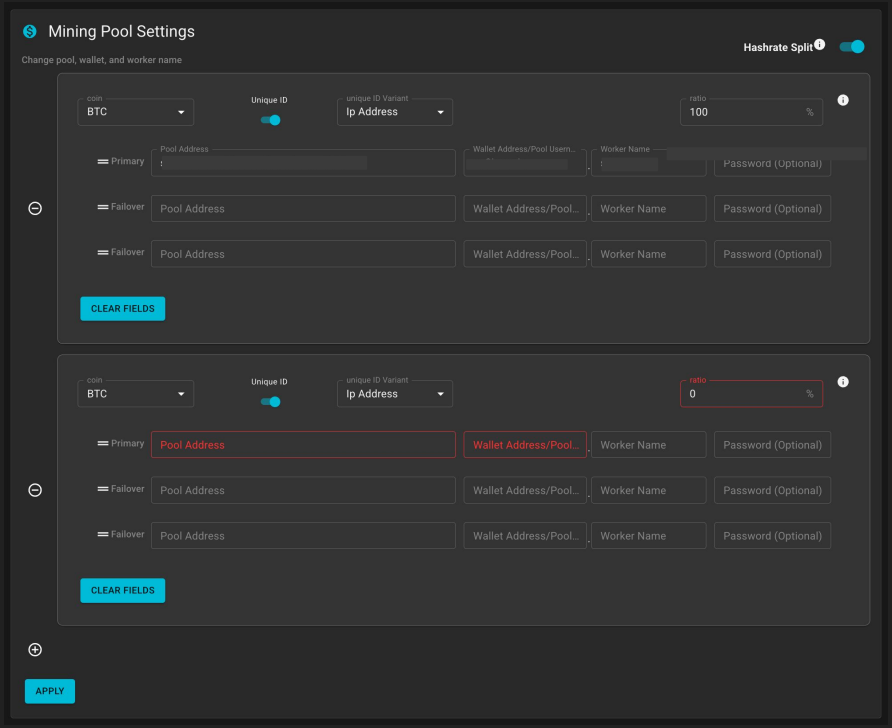


Fill in the main pool information along with 1-2 backup pools in case of disconnection from the pool. Then click “Apply”.

“**Unique ID**” will append a unique miner ID to the end of the worker name if enabled, in the format: *Worker_address.Worker_**name-unique_ID***

Hashrate Split

Distribute shares across multiple pools based on a set percentage

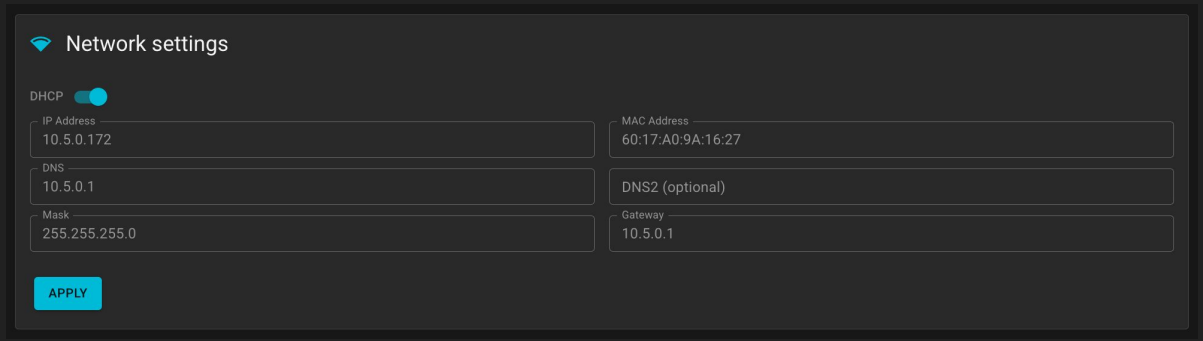


Fill in the pool information along with 1-2 backup pools.
Set up to four groups, ensuring the total ratio equals **100**.

Note: If you split three groups equally as 33:33:33, the first group will receive the remainder, making the final distribution 34:33:33 instead.

Setting - Network

Choose your own IP assignment

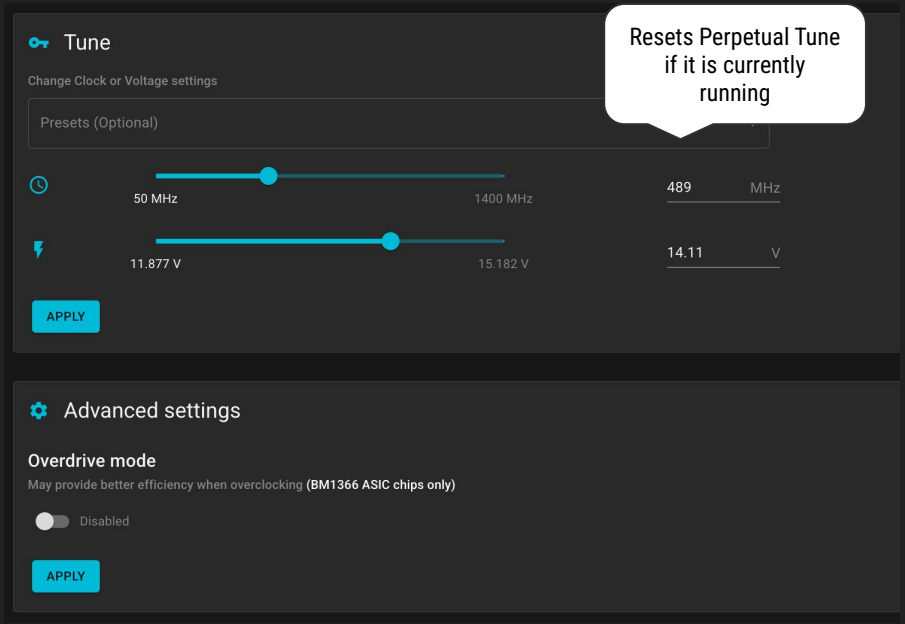


DHCP is enabled by default.
To set a **Static IP,** disable the DHCP toggle and enter the IP address, DNS, Mask and Gateway, then hit “APPLY”.

Note: ePIC dashboard does NOT support setting static IPs across multiple miners.

Setting - Performance

To manually adjust performance of your miner by adjusting the variables



Tune

Manually change **clock** or **voltage** of the miner.

Presets are only available in S19J, S19J Pro, S19J Pro+, S19 XP, S19K Pro, S21, S21 Pro, S21 XP, S21+ and T21

Advanced Settings

Overdrive Mode provides advantage of overclocking during Voltage Optimizer.
Only available in S19K Pro and S19 XP

Perpetual Tune & Survival Mode

ePIC Blockchain Technologies

Configuration

- Required User Inputs:
  - **Target Hashrate:** The desired performance output in TH/s
  - **Minimum Throttle**: The lowest throttled hashrate target Survival Mode can reduce to before it stops trying to recovery automatically. (Default: 50TH/s)
  - **Throttle Steps**: The amount by which the target hashrate is reduced or increased during Survival Mode adjustments. (Default: 5TH/s)
- Survival Mode
  - Survival Mode automatically lowers the target hashrate when the miner temperature gets close to the shutdown threshold. If the miner stops due to high temperature, it can reduce the target further and attempt to restart automatically.

Manual Intervention Required

If the minimum throttle target is reached, automatic recovery stops. If the critical temperature is reached, the miner remains idle until it cools. Some error conditions may also require manual intervention.

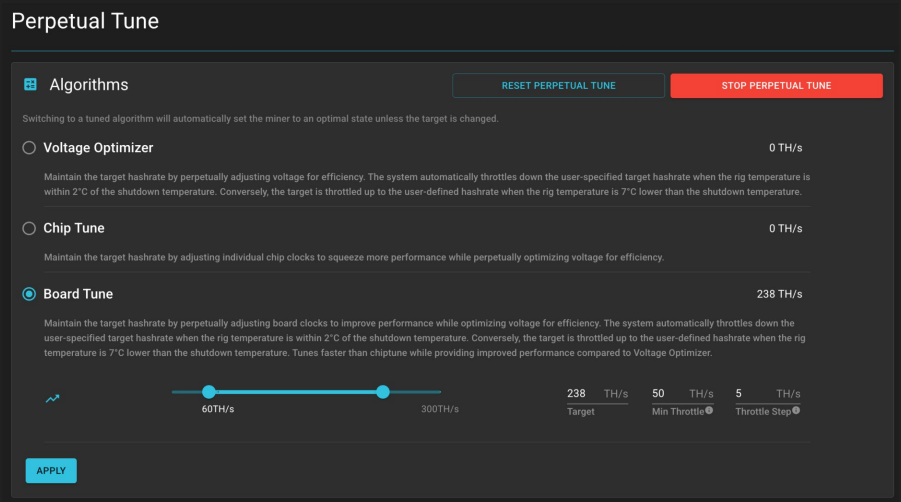
Perpetual Tune - Summary

ePIC Blockchain Technologies

	Voltage Optimizer	ChipTune	Board Tune (Recommended)
Adjusting Variable	Voltage	Individual chip clocks	Board clocks
Duration	~ 30min	> 60min	~ 45min
Survival Mode	Yes	No	Yes
Use Case	You operate multiple miners in an unstable environment and prioritize long-term stability	You have a few miners in a highly stable environment and want to extract maximum performance	You want the best balance of speed and optimization. Ideal for S21 miners with mixed hashboards

Perpetual Tune

For better efficiency and stability



Voltage Optimizer

optimizes voltage to maintain the target hashrate. Throttles down near the shutdown temp and throttles back up after cooling.

Chip Tune

adjusting individual chip clocks to maintain the target hashrate while optimizing voltage

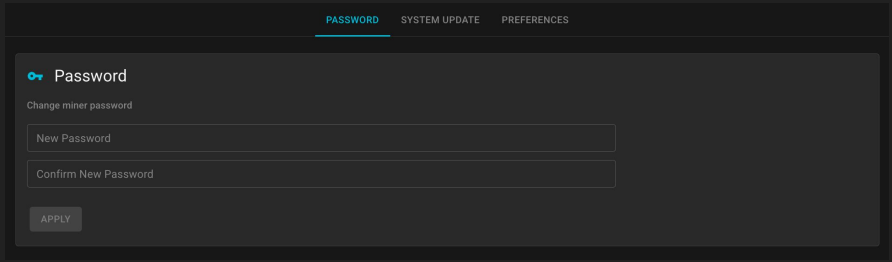
Board Tune

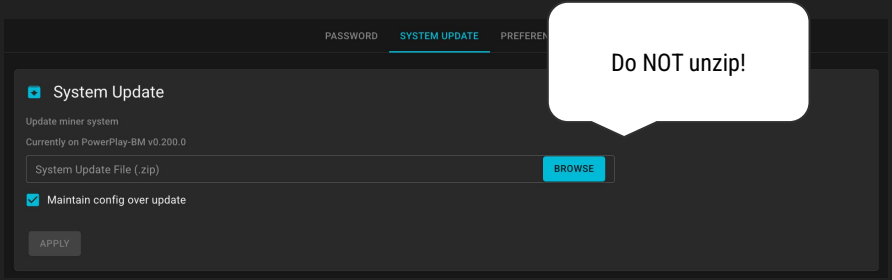
adjusts board clock to maintain the target hashrate while optimizing voltage. Throttles down near the shutdown temp and back up after cooling. Tunes faster than ChipTune

Note: Perpetual Tuning is only available in firmware version 0.26.0 or later

Setting - System

Manage system settings, including password changes and firmware updates





Password

Enter your new password, confirm it then click “APPLY”

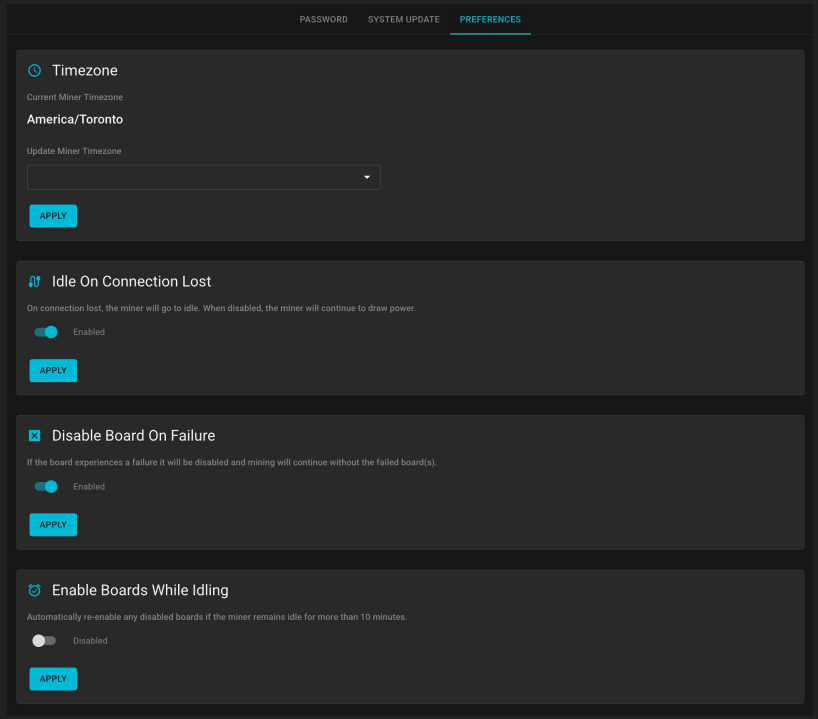
System Update

1. Download the latest release of the firmware from ePIC Github
2. Download the .zip file *powerplay-xxxx-update-vxxxxxxx.zip*
3. Upload it, then click “APPLY”

Note: The “Maintain config over update” will save your settings across the update.
Your miner will take a few minutes to reboot and recalibrate.

System - Preferences

Configure miner behaviour for network loss, board failures, and idle states.



Idle On Connection Lost

Enabled means the miner will be stopped and be put in an idle state until network connection is re-established.
Disable if consistent power draw is required.

Disable Board On Failure

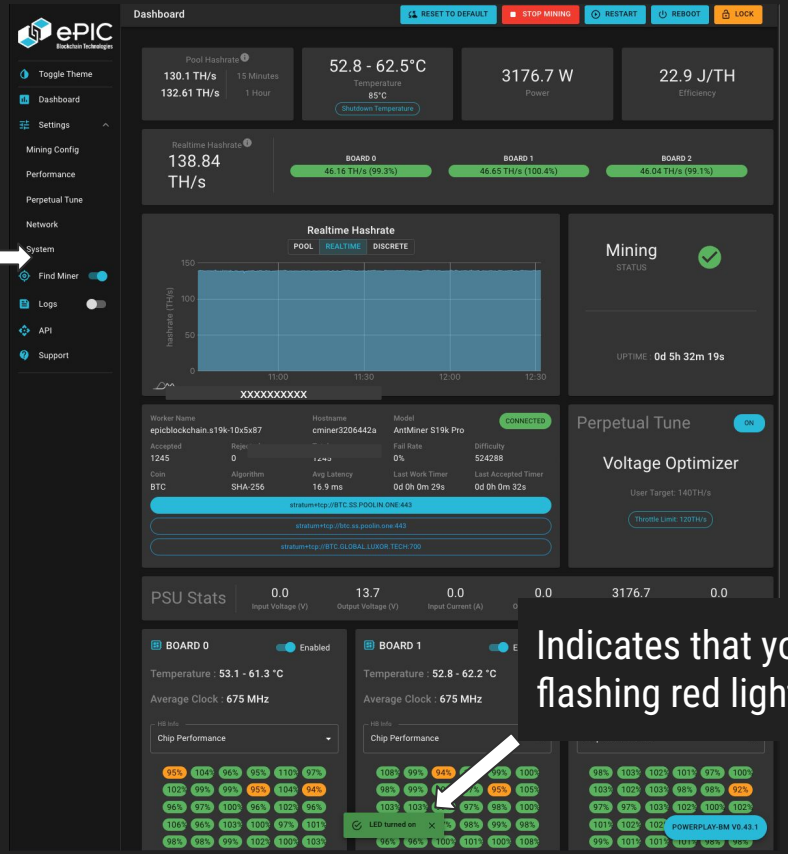
If the board experience a failure, it will be disabled and mining will continue without the failed board(s).

Enable Boards While Idling

If the miner remains idle for more than 10 minutes, it will automatically re-enable any disabled boards.

11. Find Miner

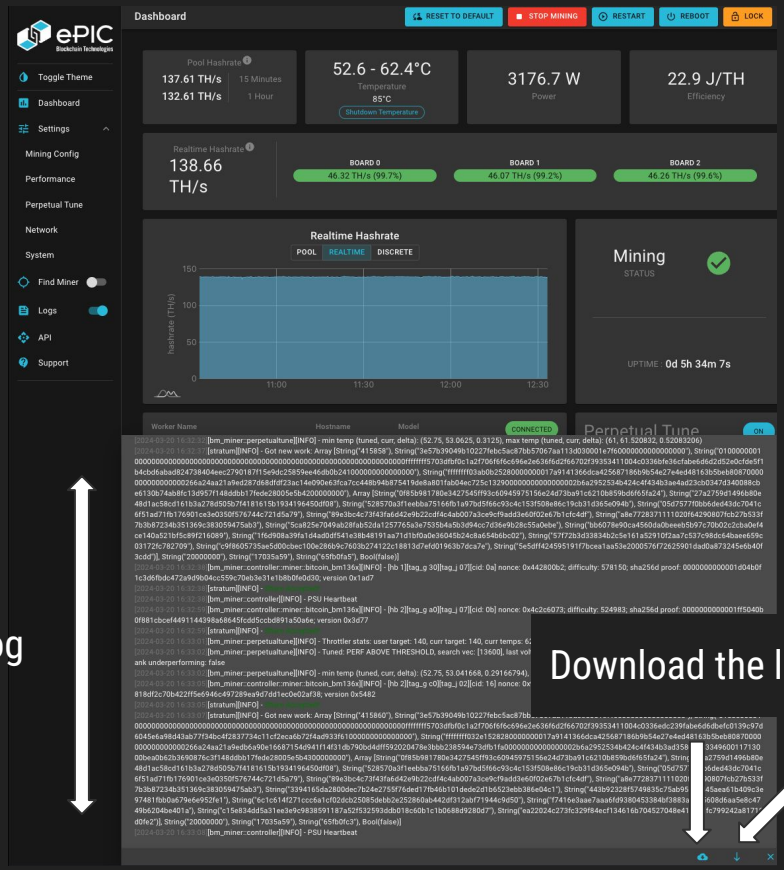
Turn on the
“Find Miner” toggle.
Your miner will be
flashing red light



Indicates that your miner will be
flashing red light

12. Logs

Turn “Logs” toggle on



Real-time log

Download the logs

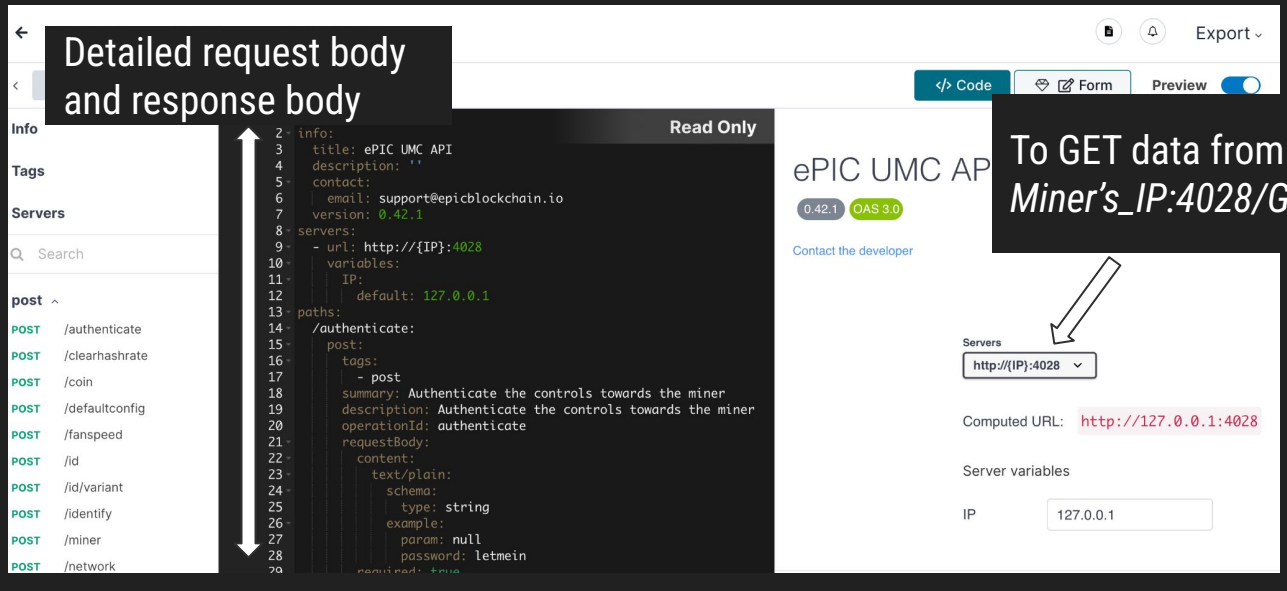
Scroll to bottom

Close the logs

13. API

To manually send (POST) or retrieve (GET) data

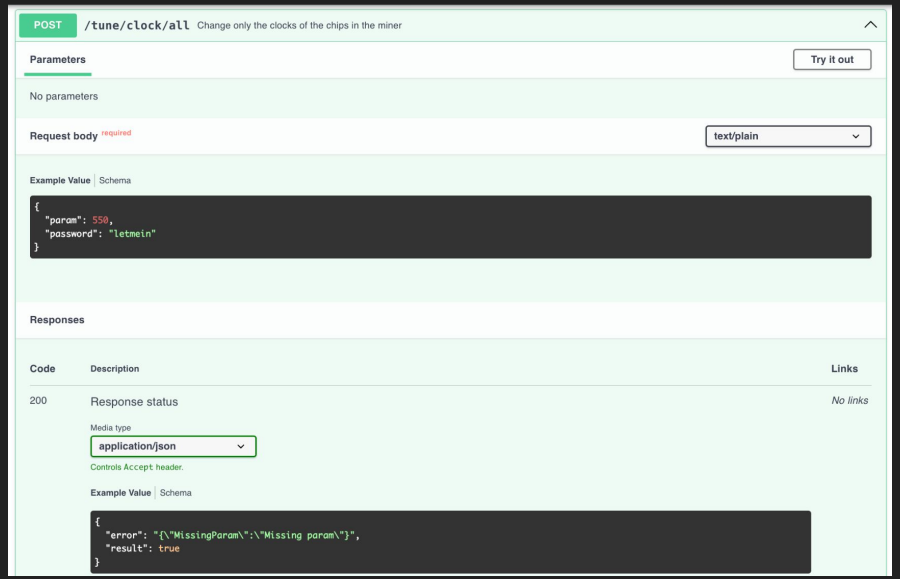
POST & GET



API documentation: here

13. API

POST example



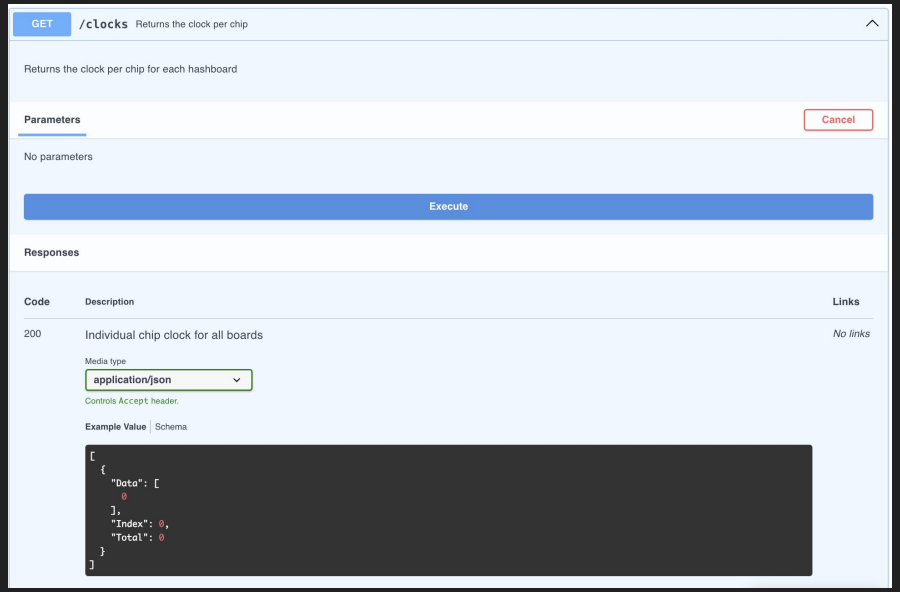
POST: /tune/clock/all

Changing the clocks of the chips in the miner

1. Click “Try it out”
2. Enter the desired value in the Request Body
3. Click “Execute”
4. Check the Response Body

13. API

GET example



GET: /clocks

Returning the clock per chip

1. Click “Try it out”
2. Click “Execute”
3. Check the Response Body

OR

1. Miner’s_IP:*4028/clocks*
2. Click “Pretty-print” at the top left corner

ePIC
Blockchain Technologies

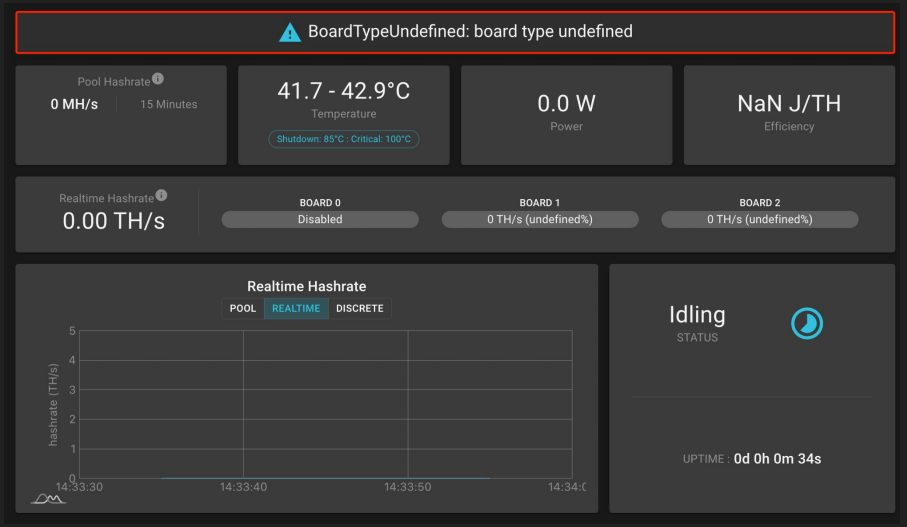
Troubleshooting

a. BoardTypeUndefined

Board type undefined

This error indicates that the board type might be a different variant that hasn't been added to the ePIC firmware.

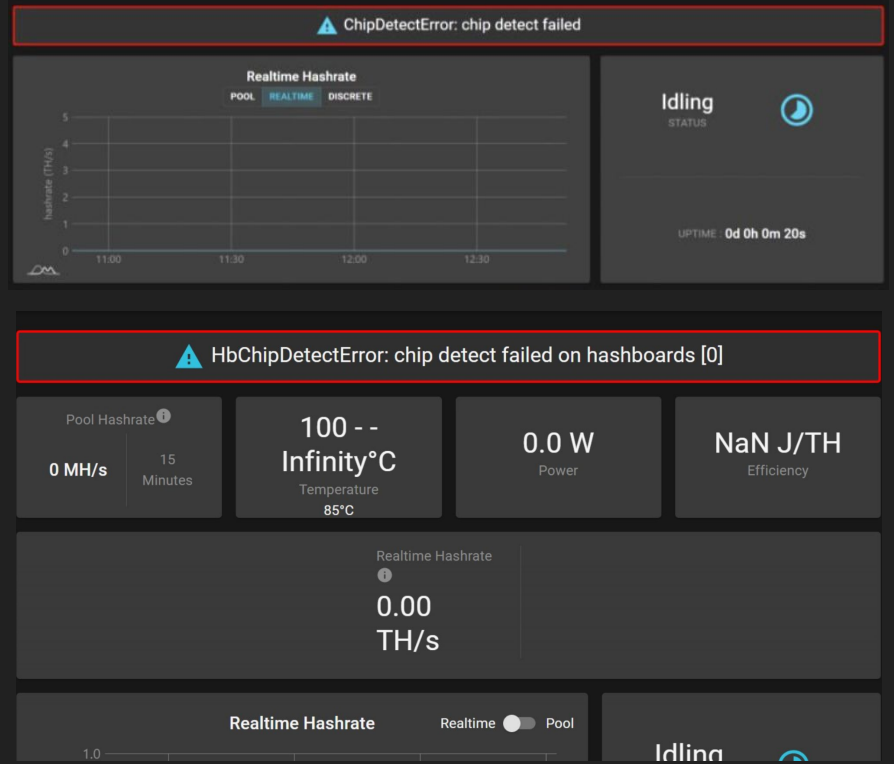
Please contact support@ePICblockchain.io and include information about the model type and configuration you have the UMC installed on.



b. ChipDetectError & HbChipDetectError

Chip detect failed & Chip detect failed on hashboards [x]

This error indicates there is no communication from the chip on either a specific hashboard or from all hashboard. This can be due to various reasons, such as PSU overheating, loose connections, or hardware malfunction.



b. ChipDetectError & HbChipDetectError

Troubleshooting Steps

1. Disable individual Hashboards:
   a. Inspect the logs or disable hashboards and enable them one by one to identify the malfunctioning hashboard and replace it.
2. Perform SD card Recovery:
   a. If the problem continues, perform SD recovery to force update the firmware image,
3. Swap to Stock Control Board:
   a. If the issue persists, replace the UMC board with the stock control board to verify the functionality of all hashboards.

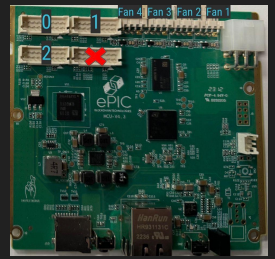
If the rig is able to detect all hashboards on Stock FW and unable to on the ePIC UMC, contact support@epicblockchain.io

Inspecting the log, the Board and Number of Chips detected is printed

```
2023-11-20 16:44:13][bm_miner::controller][INFO] - found chip id 1362
2023-11-20 16:44:13][bm_miner::controller][INFO] - found chip id 1362
2023-11-20 16:44:13][bm_miner::controller][INFO] - chip detect type results: [(0, Some(Bm1362)), (1, Some(Bm1362)), (2, Some(Bm1362))]
2023-11-20 16:44:13][bm_miner::minerctl][INFO] - all boards detected as: Bm1362
2023-11-20 16:44:13][bm_miner::controller][INFO] - Detecting chip count
2023-11-20 16:44:13][bm_miner::controller][INFO] - Setting m4 settings to 115200, 8, 9
2023-11-20 16:44:13][bm_miner::controller][INFO] - Setting m4 settings to 115200, 8, 9
2023-11-20 16:44:13][bm_miner::controller][INFO] - Setting m4 settings to 115200, 8, 9
2023-11-20 16:44:13][bm_miner::controller][INFO] - found 104 chips
2023-11-20 16:44:13][bm_miner::controller][INFO] - found 108 chips
2023-11-20 16:44:13][bm_miner::controller][INFO] - found 108 chips
2023-11-20 16:44:13][bm_miner::controller][INFO] - chip detect count results: [(0, Some(104)), (1, Some(108)), (2, Some(108))]
2023-11-20 16:44:13][bm_miner::controller::miner][WARN] - dropping GenericMiner
2023-11-20 16:44:13][miner_utils][WARN] - miner start failed with error: chip detect failed
2023-11-20 16:44:13][miner_utils][WARN] - sleeping 30sec
2023-11-20 16:44:27][bm_miner::perpetualtune][WARN] - initialize perpetualtune: miner model in capabilities is detected as undefined
2023-11-20 16:44:43][miner_utils][INFO] - Starting miner
2023-11-20 16:44:43][miner_utils::config][INFO] - Using input file: /root/config.toml
2023-11-20 16:44:44][miner_utils::config][INFO] - path in GlobalConfig "/root/config.toml"
2023-11-20 16:44:44][miner_utils::config][INFO] - loading file hw_config
2023-11-20 16:44:45][bm_miner::controller::identifier][INFO] - Detecting board type
2023-11-20 16:44:45][bm_miner::controller::identifier][WARN] - dropping GenericIdentifier
2023-11-20 16:44:45][bm_miner::minerctl][INFO] - board type detected: BmSerialBC
```

In this case, only board 0 has 104 of chip counts when both board 1 and board 2 have 108 chip counts, causing chip detect failed

Board ID and Fans are mapped to the connectors as shown



c. ChipDetectTimeout

Chip detect timed out because of uart

When all HBs are timing out it usually indicates the hasboards are not receiving power from the PSU.

1. Check the ambient temperature. It should NOT exceed 40 degrees, the PSU has a internal shut off when overheating
2. Reseat all the Hasboard Connectors
3. If the issue persists, replace the PSU with a working one
4. If the PSU is known working, and HBs are still not detected, all 3 HBs may need repair

⚠ ChipDetectTimeout: chip detect timed out because of uart

In the log, you may see

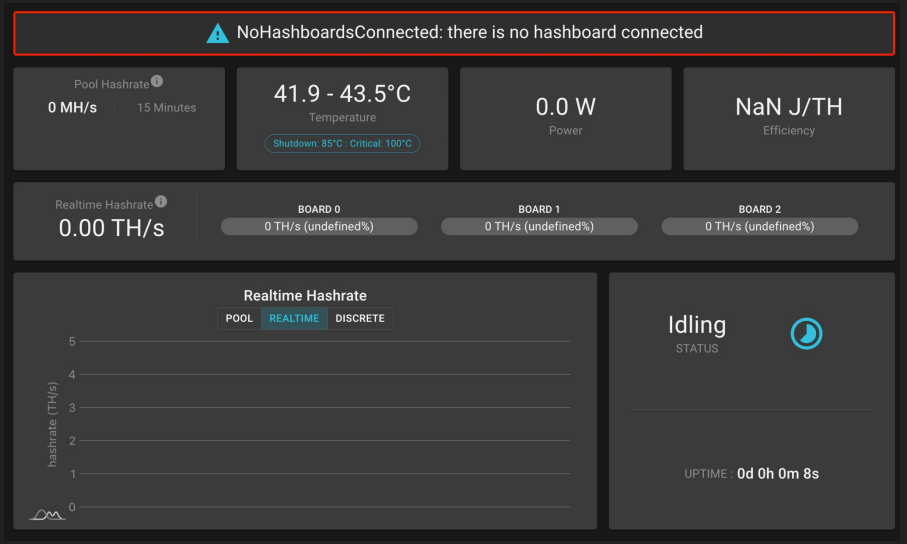
```
2023-09-10 22:26:45][bm_miner::controller][INFO] - Set voltage to 15182mV count 0
[2023-09-10 22:26:46][bm_miner::controller][INFO] - psu.set_voltage: - waiting 0ms for voltage to settle
[2023-09-10 22:26:47][bm_miner::controller][INFO] - psu.enable: Ok(()) - waiting 3000ms for voltage to settle
[2023-09-10 22:26:51][bm_miner::controller][INFO] - is board id 0 detected?: true
[2023-09-10 22:26:51][bm_miner::controller][INFO] - is board id 1 detected?: true
[2023-09-10 22:26:52][bm_miner::controller][INFO] - is board id 2 detected?: true
[2023-09-10 22:26:52][bm_miner::controller][INFO] - Detecting chip type
[2023-09-10 22:26:52][bm_miner::controller][INFO] - Setting m4 settings to 115200, 8, 9
[2023-09-10 22:26:52][bm_miner::controller][INFO] - Setting m4 settings to 115200, 8, 9
[2023-09-10 22:26:52][bm_miner::controller][INFO] - Setting m4 settings to 115200, 8, 9
[2023-09-10 22:26:53][bm_miner::controller][ERROR] - run_uart_and_read_one: uart return timed out
[2023-09-10 22:26:53][bm_miner::controller][ERROR] - run_uart_and_read_one: uart return timed out
[2023-09-10 22:26:53][bm_miner::controller][ERROR] - run_uart_and_read_one: uart return timed out
[2023-09-10 22:26:53][bm_miner::controller][INFO] - chip detect type results: [(0, None), (1, None), (2, None)]
[2023-09-10 22:26:53][miner_utils][WARN] - miner start failed with error: chip detect failed
[2023-09-10 22:26:53][miner_utils][WARN] - sleeping 30sec
```

d. NoHashboardConnected

There is no hashboard connected

There are no HBs connected to the PSU.

Check and Connect the hashboard cables to the J2, J3, and J4 ports



15. General Solutions for Hashboard Errors

1. Ensure all Hashboards are Connected as well as the PSU
2. Reset to Default to ensure FW is in a good state
3. If all HBs are not responding, replace PSU to ensure HBs are getting power
4. Disable HBs based on log to isolate which HB may need repair
5. If confident that PSU is working and HBs are good, use stock control board to confirm that there are no chip issues and isolate the UMC

ePIC
Blockchain Technologies

Have a question?

Website
https://epicblockchain.io/support/

Email
Support@epicblockchain.io

Github
https://github.com/epicblockchain

Twitter
https://twitter.com/ePICBlockchain

Telegram
https://t.me/epic_umc