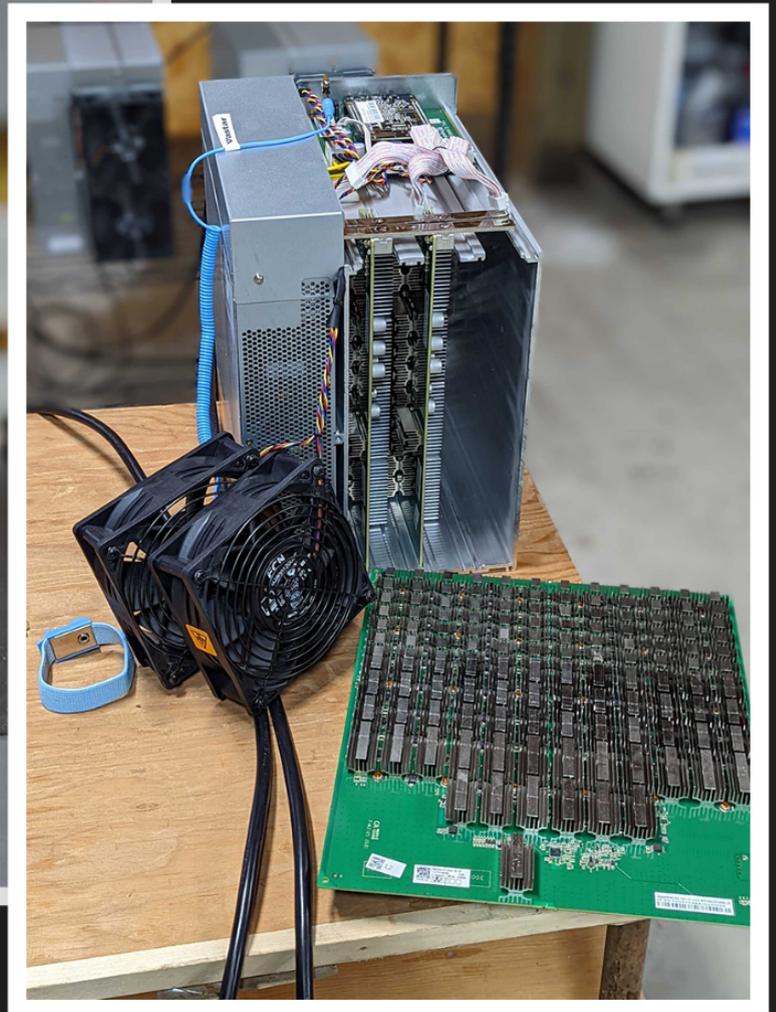


Home Mining Guide

NOW EVERYONE CAN MINE
BITCOIN FROM HOME



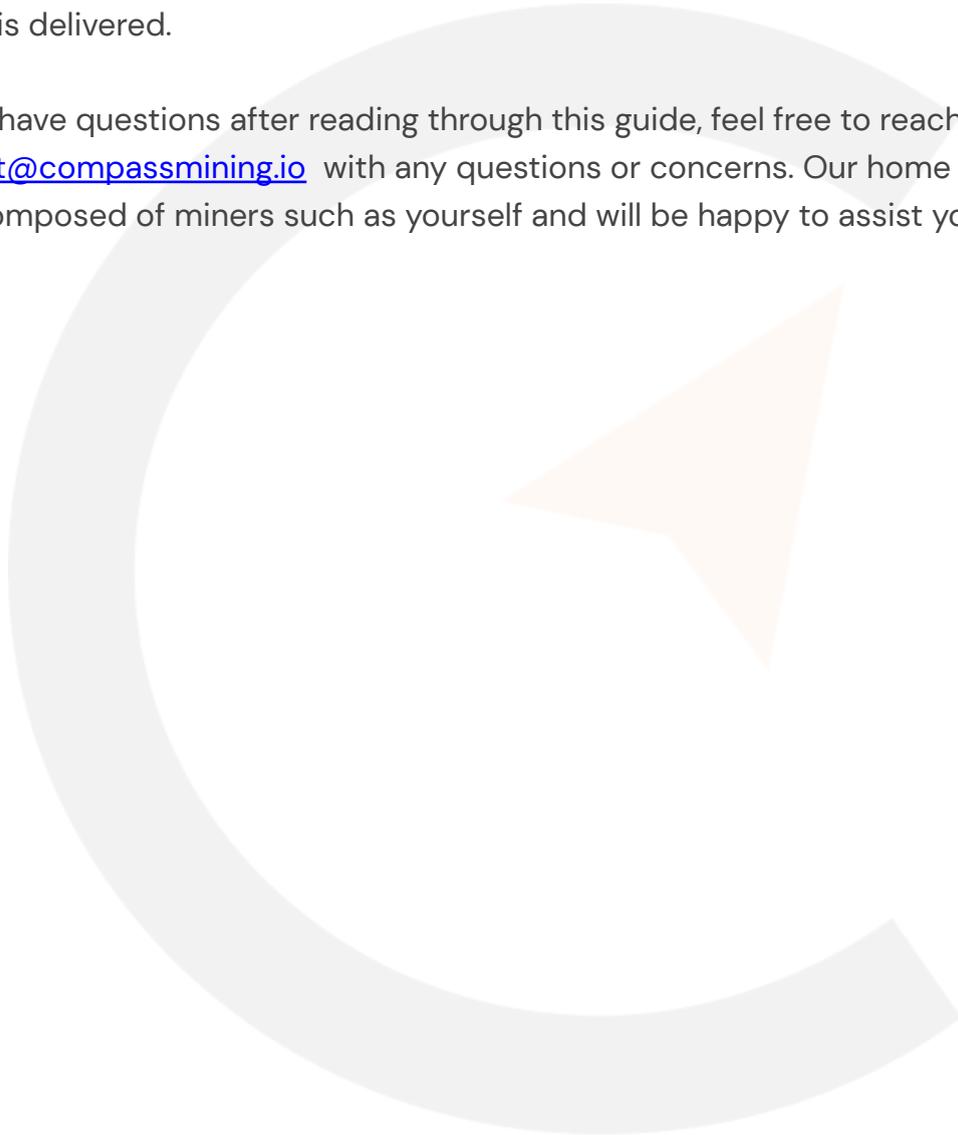


CONGRATULATIONS!

From all of us at Compass Mining, thank you for your Home Mining purchase.

The machine(s) you ordered are shipping directly from one of our distributors and typically arrive in 3-4 weeks. We have assembled this packet of information to help you prepare for the arrival of your machine(s) and start hashing as soon as the hardware is delivered.

If you still have questions after reading through this guide, feel free to reach out to us at support@compassmining.io with any questions or concerns. Our home mining team is composed of miners such as yourself and will be happy to assist you.





Disclaimer:

Mining machines are complex and high-powered electrical devices. Operation of a mining machine includes, without limitation, machine overheating problems, risks of fire, and risks of damage to an electrical grid. Several factors, including without limitation, the age of electrical wires used and the electrical wiring of structures housing the mining machine, may affect these risks. Consult a licensed electrician for the installation and wiring of the mining machines and for advice regarding use of and risks associated with the mining machines. This Home Mining Guide is for informational and illustrative purposes only and does not provide instructions for the installation, set-up, maintenance, use, or operation of the mining machines. COMPASS MINING DISCLAIMS ALL LIABILITY ARISING FROM, AND YOU ASSUME ALL LIABILITY AND RISK FOR, THE INSTALLATION, SET-UP, MAINTENANCE, USE, AND OPERATION OF THE MINING MACHINES.

Use of the mining machines is subject to various security risks, including, without limitation, hacking, malware, and other unauthorized access through the network and internet service provider. Compass Mining does not warrant that the mining machines are not able to be hacked or accessed by an unauthorized third party. You assume all the risk with respect to such unauthorized access and are responsible for taking preventative measures to prevent or minimize such unauthorized access.

Compass Mining does not guarantee or warrant any particular outcomes of the mining machines, including that any mining activities will be successful. You operate the mining machine entirely at your own risk.

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1. GETTING STARTED CHECKLIST

- Purchase miner
- Have a certified electrician set up electrical outlet(s)
- Obtain appropriate power cord
- Run Ethernet cable
- Account for noise remediation
- Account for heat dissipation
- Account for clean environment/air
- Create mining pool account
- Locate miner Internet Protocol (IP) on network
- Configure miner with selected mining pool
- Monitor machine for proper operation

2. UNBOXING – MEET YOUR MINER

What is and isn't in the box?

All machines come neatly packaged directly from the manufacturer or one of our partnered distribution centers. Depending on the manufacturer, different accessories will be included. This guide will depict the two most popular home mining machines, Antminers and Whatsminers, and their differences where applicable.

⚠ Note: Antminers (manufactured by Bitmain) require two (2x) C13 power cables which are not included; they must be procured separately. This is detailed further in the document.

⚠ Note: Whatsminers (manufactured by MicroBT) requires one (1x) C19 power cable. The package includes a C19 to Type I cable. This is commonly reserved for Chinese standard electrical 240V power. This cable will need to be modified or replaced in order to be compatible with U.S. standard electrical 240V receptacles. This is detailed further later in the document.

Upon opening the box, inspect your device for damage and verify that the serial number is valid and recognized by the respective manufacturer using the links below.

[Bitmain serial number verification](#)

[Whatsminer serial number verification](#)

Each miner comes with a 1 year warranty period from the manufacturer, which begins once the machine ships from the manufacturer. Therefore you may notice the warranty period is slightly less than 1 year upon delivery.

Refer to the following diagram outlining the different components and features of your miner purchase.

Antminer Machines:

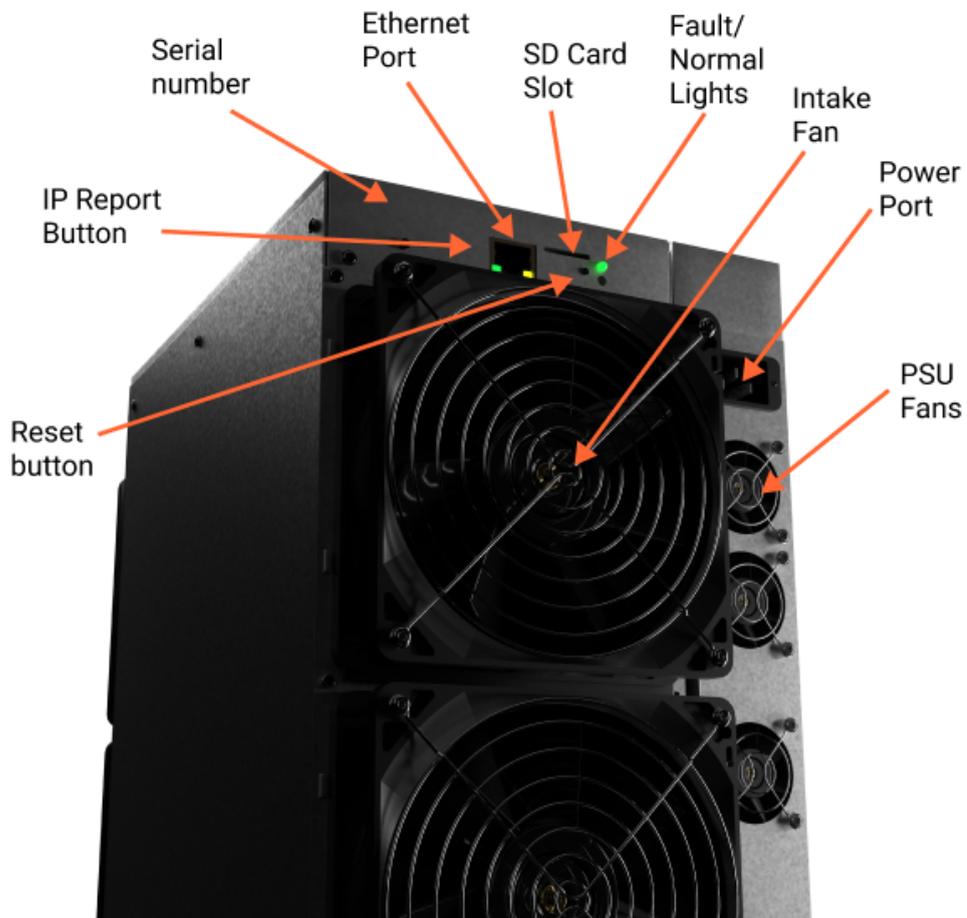


Figure 1: Antminer S19 Intake Side

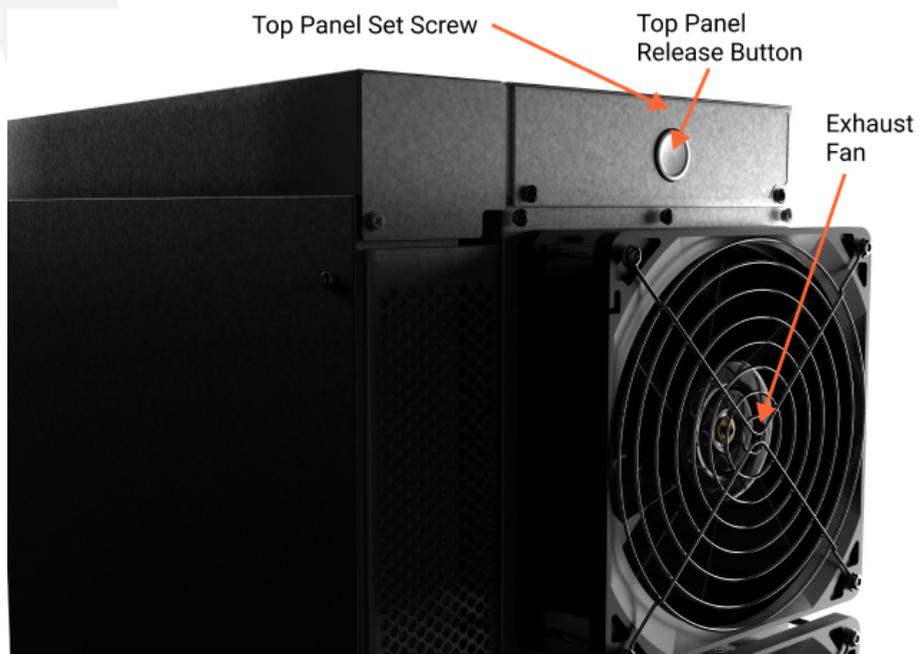


Figure 2: Antminer S19 Output Side

- **Cover Set Screw** – Single screw used to hold the top plate cover in place. Removing it provides access to the control board.
- **Ethernet Port** – Port used to connect the miner to the internet to communicate with mining pools and sync with the Bitcoin blockchain.
- **Fans** – Moves air through the miner to cool the ASIC chips which produce significant heat.
- **Indicator Lights** – Light used for troubleshooting. Red light activity indicates if something is abnormal. Green light activity indicates normal operation.
- **IP Report** – Button to help locate the miner's IP address for configuration. Mining tools make quick configuration easy.
- **C13 Power Ports**– Ports on miner used to provide electricity to the miner.
- **Release Button** – Button used to release the top panel for access to the control model.
- **SD Card/Micro USB** – Port used to connect to the miners control board. This is used to communicate, flash and troubleshoot the machine.

Note: 🖱️ Some models have SD card slots that can only be accessed by taking off the top panel.

- **Serial Number Sticker** – Sticker has model and unique identification information needed for warranty.

Whatsminer Machines:

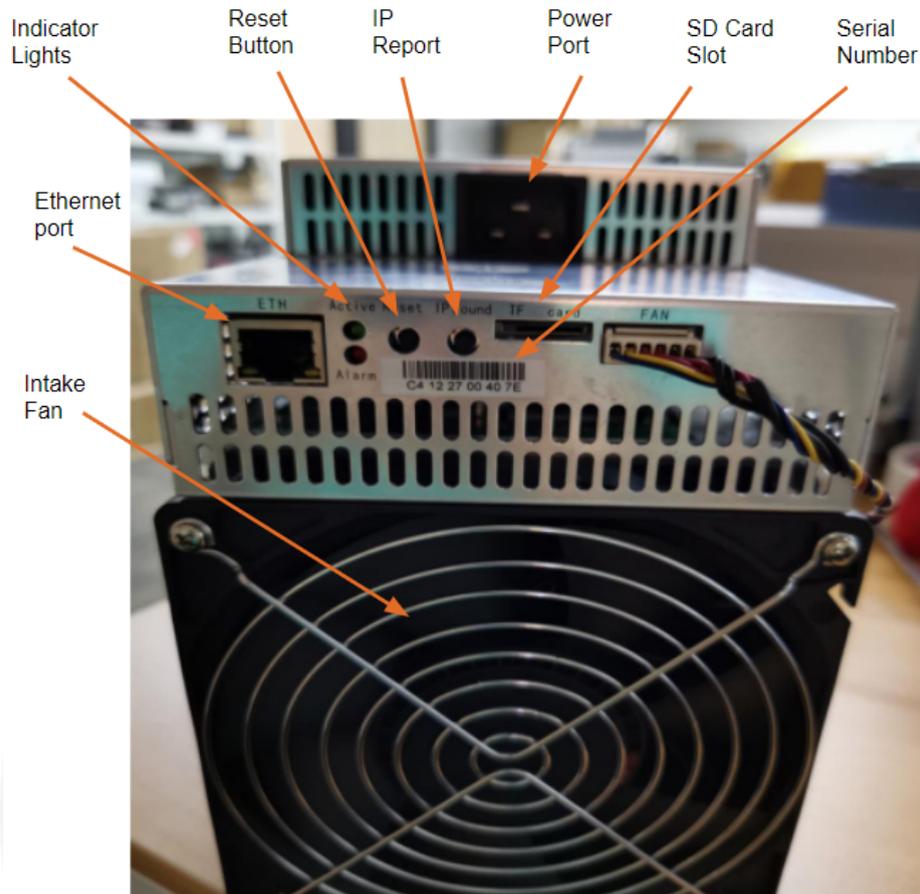


Figure 3: Whatsminer M30 Intake Side

- **Ethernet Port** – Port used to connect the miner to the internet to communicate with mining pools and sync with the Bitcoin blockchain.
- **Fan** – Moves air through the miner to cool the ASIC chips which produce significant heat.
- **Indicator Lights** – Light used for troubleshooting. Red light activity indicates if something is abnormal. Green light activity indicates normal operation.
- **IP Report** – Button to help locate the miner’s IP address for configuration. Mining tools make quick configuration easy.
- **C19 Power Port**– Port on miner used to provide electricity to the miner.
- **SD Card/Micro USB** – Port used to connect to the miners control board. This is used to communicate, flash and troubleshoot the machine.
- **Serial Number Sticker** – Sticker has model and unique identification information needed for warranty.

3. ELECTRICAL REQUIREMENTS

Mining is thought of as a set-it-and-forget-it endeavor. Too often, customers purchase a machine only to find themselves unprepared to plug it in due to the electrical requirements. Fortunately, by reading and implementing the knowledge found in this guide such mistakes can be avoided.

These machines draw power at 240 Volts, which in the United States is typically reserved for high-powered electrical appliances (e.g. electric clothes dryers, electric stoves, EV chargers, etc). These appliances use NEMA standard plugs and have thicker wiring (lower gauge) in the walls to safely support the higher current draw.



Figure 4: North American standard plugs are not compatible with home mining.

Electrical requirements for a single miner:

Voltage: 240 Volts

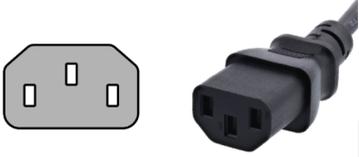
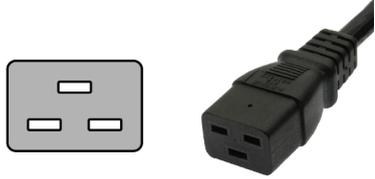
Circuit Amperage Rating: 20 Amps

Power Draw: 2800 – 3600 Watts

Whatsminer power port: Qty 1: C19

Antminer power port: Qty 2: C13

Table 1: Miner Power Supply Cable Connector Types

Connector Type:	Configuration:	Model Compatibility:	Common Applications:
C13		<p><u>Bitmain</u></p> <p>Antminer S19 Series uses Qty: 2x C13 cables.</p> <p>(Not included in box - must be purchased separately)</p>	<p>C13 connectors are commonly used for computer applications. These are used to power monitors and desktop computers.</p>
C19		<p><u>MicroBT</u></p> <p>All Whatsminer models use Qty: 1x C19 cables.</p> <p>(Included in box but not compatible with standard North American outlets - must be purchased separately)</p>	<p>C19 connectors are commonly used for computer applications with higher current requirements. These are used to power servers, data center racks and power distribution units (PDUs).</p>

For smaller operations with less than 10 units we recommend a dedicated circuit for each machine with its own 20A circuit breaker switch at the panel.

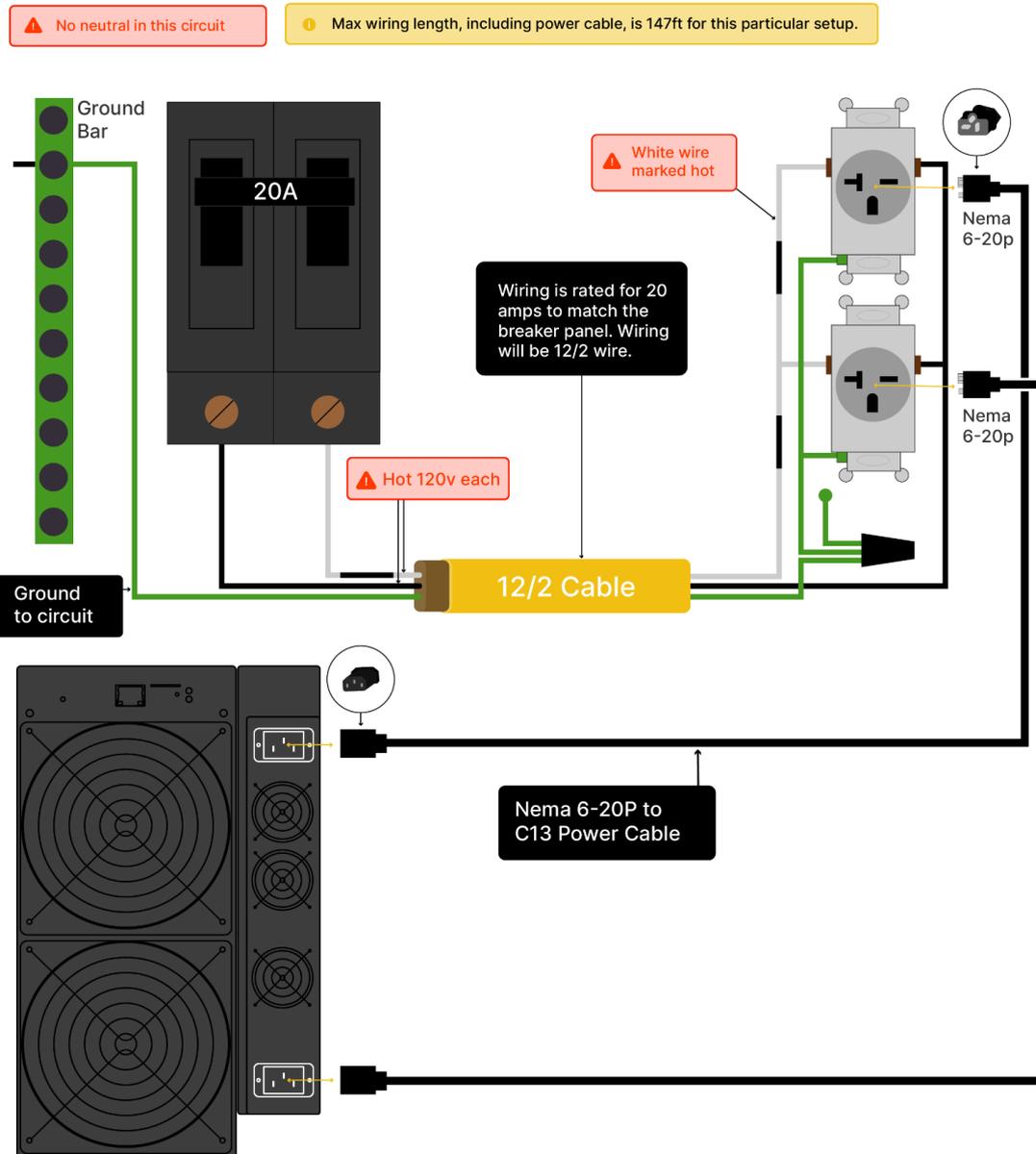
Customers with 10+ machines are recommended to utilize a larger circuit breaker switch and an appropriately sized power distribution unit (PDU).

 Regardless of your approach, consult a licensed electrician for your mining operation.

The diagram below depicts an example electrical setup for a single machine. This can be passed along to an electrician to help them understand the electrical requirements of mining hardware.

20amp 240volt Circuit

Antminer



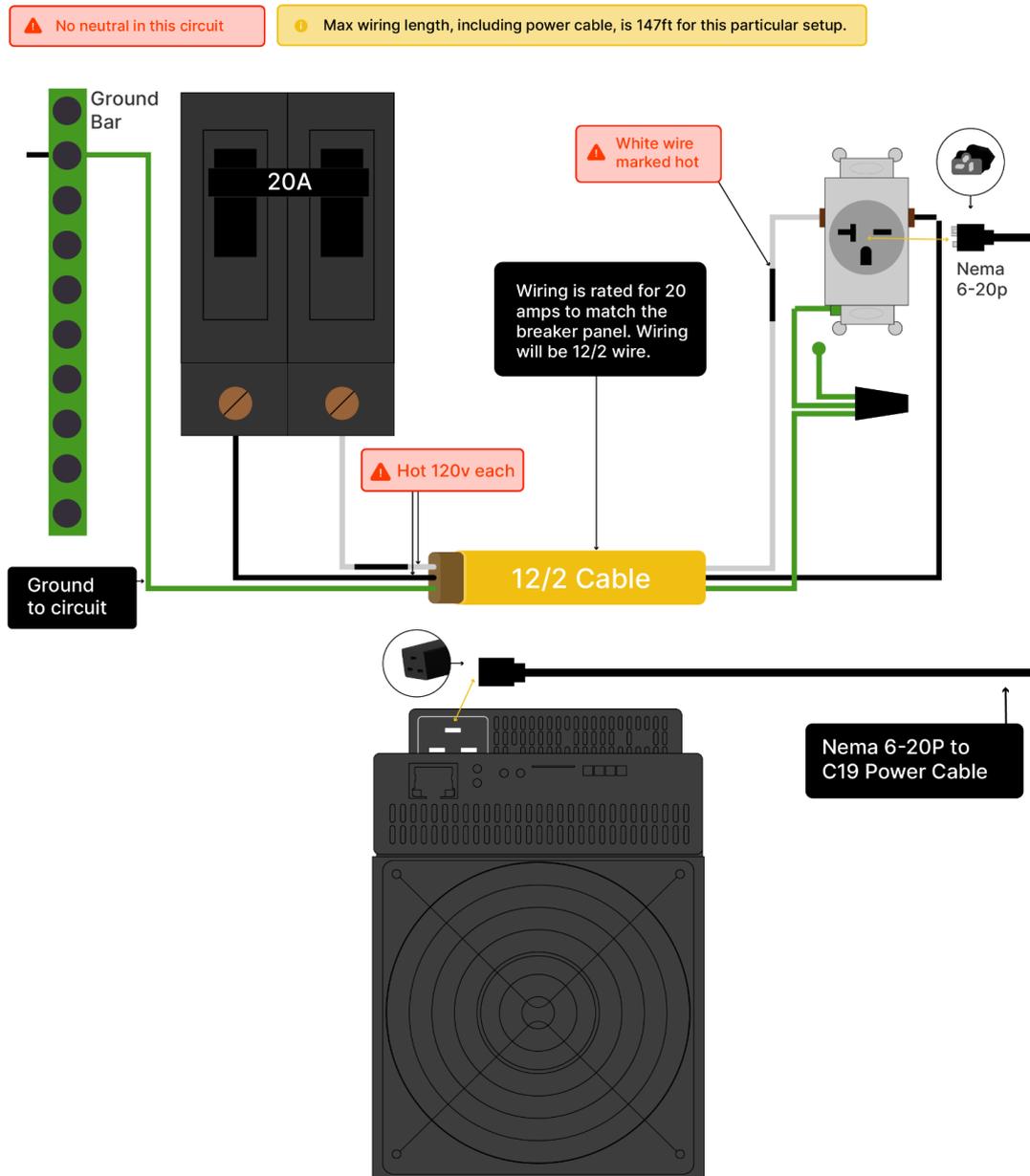
Legal-Disclaimer:

This is meant FOR INFORMATIONAL PURPOSES ONLY, NOT FOR CONSTRUCTION! To better your knowledge on the concepts of electricity, electrical circuitry, entertainment component circuitry and all other wiring methods. DO NOT ATTEMPT ANY WIRING OF ANY KIND if you lack the knowledge and understanding required. Otherwise personal injury and/or death as well as property damage or loss could occur. All wiring must be installed per local codes by a certified electrician.

Figure 5: Antminer S19 Series Electrical Connection Diagram

20amp 240volt Circuit

WhatsMiner



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Figure 6: Whatsminer Electrical Connection Diagram.

4. NETWORK REQUIREMENTS

Miners require an internet connection to communicate with their configured mining pool. This is done by hardwiring the miner to the network with an ethernet cable.

When mining, your machine will pass data back and forth with the mining pool of your choice. This includes block data used to calculate next-block solutions. These computing operations include thousands of transactions but require very little data.

Bandwidth

Bandwidth is the measure of how much data can be transmitted on a given internet connection. A 5-15 Mbps bandwidth is sufficient to handle any mining operation and can be achieved through nearly any basic internet package. Bandwidth constraints are rarely an issue with mining operations communicating with pools.

Latency

Latency is the measure of how quickly data can be transmitted. When mining this is crucial for quick communication between pools and mining rigs. An internet connection with low latency will minimize rejected shares and optimize mining rewards. LTE cellular and satellite services will have sufficient bandwidth for a mining operation but will have higher amounts of rejected shares due to the higher latency times which can range from 500 to 1000ms.

Note:

👉 A 5-15 Mbps bandwidth is sufficient to handle any mining operation.

👉 A 500-1000 ms latency is too high to handle a mining operation. This is found in LTE and Satellite internet connections.

5. NOISE MANAGEMENT

When the miner is first powered on, the amount of noise often generated shocks the uninitiated.

 Hearing protection advised 

Most of the energy used by these machines goes directly to power the dozens of ASIC chips sitting on the hashboards. The ASIC chips perform the SHA-256 hashing function needed to find blocks. However, during the SHA-256 computing operation, the bulk of this energy is converted into heat, which leads to chip temperatures rising significantly. If this heat is not dissipated appropriately the chips and/or hashboards may be damaged.

The fans pull cool air into the machine and exhaust the hot air in order to keep the ASICs running within manufacturer specifications. Due to the compact nature of these miners, the fans must spin at high speeds to keep each chip cool for operation. The fan speed is measured in revolutions per minute and usually ranges between 3,000 to 7,000 RPM. The fan speed coupled with its small size tends to create high levels of noise, producing ~80dB of sound, similar to a household vacuum cleaner.

 The noise level of these miners directly correlates to the RPMs of the fans. Miners running in a cool environment will make considerably less noise and at a lower frequency pitch, which is more appealing to the human ear, than those running in a hot or warm environment because the fans do not have to work as hard to keep the ASICs cool.

Certainly, these machines are loud and not recommended for operation in living spaces. Placing machines in a garage, basement, utility room or attic is ideal to keep noise levels down around the house. Be sure to always consider the cleanliness of the operating environment, as well as weather and temperature conditions to maintain prolonged miner life and uptime. Since the fans pull close to 300 to 400 cubic feet of air per minute, dust and particulates suspended in the air accumulate on the internal miner components after a few days of operation. The use of filters and a clean operating environment are highly encouraged for prolonged machine life. Recommended operating conditions are addressed in Section 8.



There are many additional ways to reduce miner noise, such as dampening boxes, aftermarket fans, underclocking and noise insulation/foam material. Proceed with caution when using some of these as they may cause cooling issues or void warranties. Miners are designed with robust firmware, fuses and temperature sensors to trigger safety mechanisms and power off the machine in case of overheating.



6. HEAT MANAGEMENT

Another common customer surprise is the amount of heat produced by their machines. Electricity is needed to produce SHA-256 hashes which creates heat as a result. If not managed properly, the generated heat will make the surrounding environment uncomfortably hot or even cause overheating issues with the machine itself.

Your home climate will dictate how you end up managing the heat generated by your machine. Most commonly the heat is vented outside or repurposed for another use. A select few operators cool their machines with liquids instead of air, however, liquid immersion cooled home mining is outside the scope of this guide due to the increased complexity.

In colder climates/seasons a miner's generated heat can be used to condition a living space. Some customers direct their miner's fan output directly into their HVAC systems to distribute heat throughout their house (resulting in heating bill savings).

In hotter climates/seasons heat management becomes paramount. If the miner is housed in an enclosure for sound dampening or in a room, the heat generated is likely to create a vicious feedback loop where exhaust air is pulled through the intake continuously, overheating the room and miner. This scenario will almost certainly cause the machine to overheat and power off.

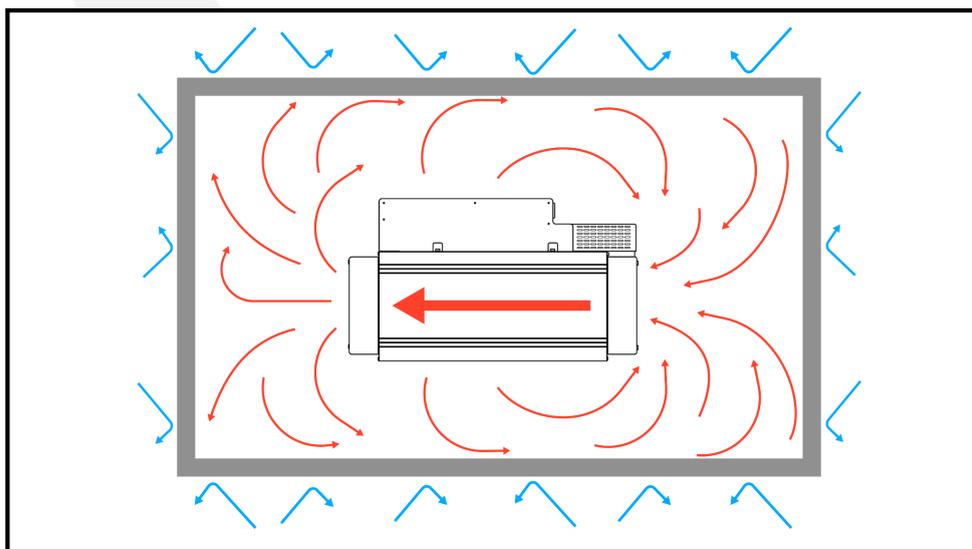


Figure 7: Restricted Airflow Closed System

It is important to separate intake from exhaust to avoid overheating issues. If possible, directing generated heat outside is ideal as it prevents overheating the space and forces hot air outside away from you and the miner's fan intake.

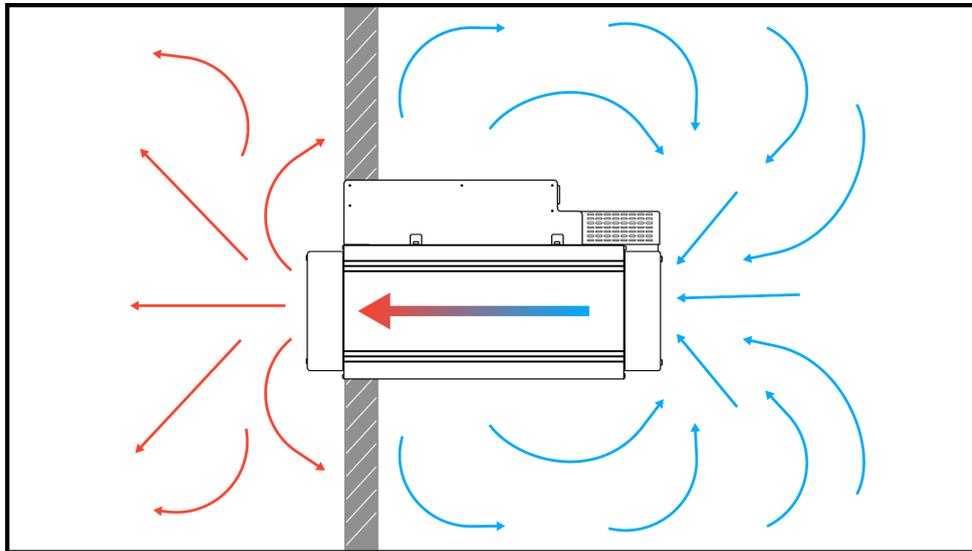


Figure 8: Restricted Airflow Open System

Make sure not to restrict the airflow through the miner. Each miner needs 400–500 CFM of airflow to operate to specification. Housing a miner fully or partially in a box without proper ventilation will cause air recycling and/or flow restrictions which almost always lead to overheating.

Miners are very robust and if powered properly the firmware will ensure they are not damaged. If a miner overheats it will stop hashing but fans will continue running. This is to prevent heat from resting on the hashboards which can cause damage over time. If a miner gets too hot it's advised to let the machine cool down before pulling the power cord and plugging it back in.

7. PICKING A MINING POOL

💡 Before the miner arrives, you should create an account with a Mining Pool of your choice so that you are ready to configure your miner upon delivery.

Mining Pools are a group of miners that contribute their hashrate to collectively mine a Bitcoin block and receive frequent payouts. Mining Pools create blocks full of transactions and give the blocks to miners to work on. If a miner within the pool finds a block then the pool adds it to the blockchain and rewards all of its participants proportionally to the amount of hashrate contributed. A user with 1,000 machines will be paid more than a user with a single machine. If you want more information on how mining pools work, check out our [Mining Pool Information FAQ](#).

⚠️ Those who choose to not use a Mining Pool are gambling to receive large but infrequent payouts. This, known as solo mining, is very risky and not advised. *Configuring your miners to solo mine is beyond the scope of this guide due to its added complexities.*

There are many things to consider when choosing a mining pool. These considerations are detailed in our [How Do I Choose a Mining Pool?](#) article.

With this detail in mind, you can begin to narrow down a pool selection that meets your needs. Some common pools include F2Pool, Luxor, SlushPool, Binance and Poolin. There are many others that exist, but this will get you started. Operators can change their chosen pool at any time, with near-zero delay or downtime.

⚠️ A soft reboot is needed any time you change mining pools. Antminers will automatically soft reboot after changes are applied. Whatsminers require you to manually click restart on the main status page to complete pool change.

Having selected a Mining Pool service, you will need to make a pool account and take note of the following information needed for miner configuration:

- Stratum Server URL
- Username

8. INITIAL SET-UP

Using the information above you should have acquired all the necessary cables and prepared a location for the miner(s). Once you are ready to begin hashing:

1. Place the miner in desired location
2. Connect the miner to the internet
3. Connect the power

The machine should immediately power up and go through its boot process. The miner will sit idle, not hashing, awaiting configuration.

Note : The boot up process initiates the fan speeds to 100% at times. This is a great indication of what the maximum noise level is of the machine. If you can't handle this in the current location you may want to consider moving it.

Finding the IP Address of Your Miner

Miner configuration requires obtaining your miner's IP address, which is usually assigned to all devices in your home network by the network router. There are a few ways to locate your miner's IP address. One is to [log into the home network router](#) and find the IP address of the miner there among a list of all the internet-connected devices on that network.

If access to the network router is not possible or desired, operators can utilize the alternative below:

Download the IP scanning tool from the corresponding manufacturer.

- Bitmain IP Reporter can be located from [Bitmain's download page](#) and by selecting 'others' and 'ip-reporter' from the dropdown menu. *Follow [this guide](#) to see how to use the tool.*
- Whatsminer Tool can be located from [Whatsminer's support page](#) under the 'Tools Downloads' tab along with the Operating Guide.

Configuring Your Miner

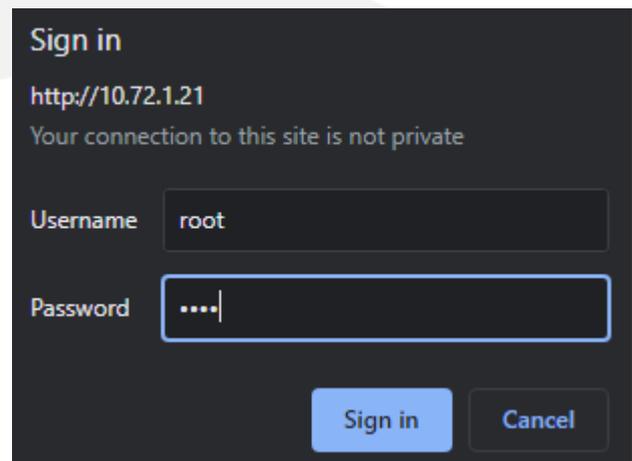
Once the IP address for each miner has been located, enter each unique IP address into an internet browser on a computer that is connected to the same network as your miner(s). Enter one IP address at a time to access the miner's web interface.

When prompted enter the default username and password according to the manufacturer. See below for the default username/admin to access your miner.

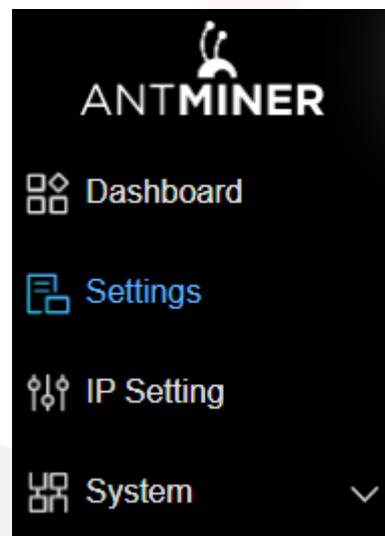
Bitmain/Antminer

1. Log in to the web interface using:

- a. Username: root
- b. Password: root



2. Click on 'Settings'



3. Enter in the Pool Stratum server URL under Pool1 mining address. This can be found on your selected pool's website.

- a. Stratum URLs can be found under 'Where do I find my pool information?' on our [Mining Pool Configuration](#) page.



b. F2Pool stratum URL for reference: stratum+tcp://btc.f2pool.com:3333

4. Enter in your pool username.minername under Miner name. The username will match your pool username and the worker name can be anything you want.

Note  : These fields are case sensitive.

a. For example: johnsmith.worker1

b. If a device identifier is not specified (e.g. worker1), then one will be assigned randomly and automatically by your selected Pool.

5. Enter '123' in the password field. *This is an outdated field and can be anything.*

6. Select Save

Pools			
	Mining Address	Miner Name	Password (optional)
Pool1	<input type="text" value="stratum+tcp://btc.f2pool.com:3333"/>	<input type="text" value="johnsmith.worker1"/>	<input type="text" value="123"/>
Pool2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pool3	<input type="text"/>	<input type="text"/>	<input type="text"/>

Setup	
<input type="checkbox"/> Fan Speed (%)	<input type="text" value="100"/>
Mode	<input style="border: none; background: none; padding: 0 5px;" type="text" value="Normal"/> ▼

MicroBT/Whatsminer

1. Log in to the web interface using:

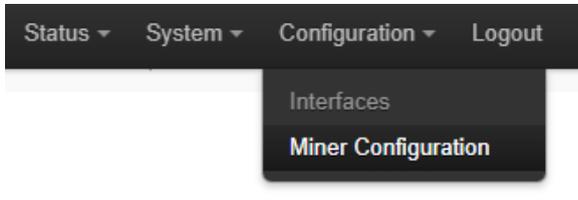
- a. Username: admin
- b. Password: admin

Authorization Required
Please enter your username and password.

Username

Password

2. In the top panel, select the 'Configuration' dropdown menu.
3. Select 'Miner Configuration'



4. Enter in the Pool Stratum server URL found on your selected pool's website
 - a. Stratum URLs can be found under 'Where do I find my pool information?' on our [Mining Pool Configuration](#) page.
 - b. F2Pool stratum URL for reference: stratum+tcp://btc.f2pool.com:3333
5. Enter in your pool username.minername under Miner name. The username will match your pool username and the worker name can be anything you want.

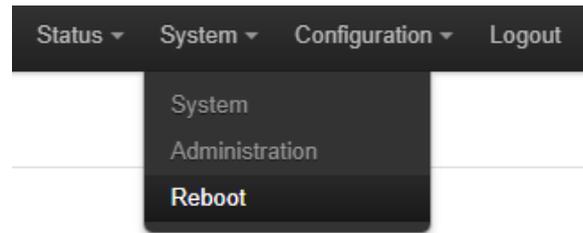
Note : These fields are case sensitive.

- a. For example: johnsmith.worker1
 - b. If a device identifier is not specified (e.g. worker1), then one will be assigned randomly and automatically by your selected Pool.
6. Enter '123' or any alphanumeric text in the password field. *This is an outdated field and can be anything.*
 7. Select Save and Apply

A screenshot of a 'Configuration' form. It has a title 'Configuration' at the top left. Below it are four rows of input fields:

- 'Coin Type' with a dropdown menu showing 'BTC' and a downward arrow.
- 'Pool 1' with a dropdown menu showing 'stratum+tcp://stratum.f2pool.com' and a downward arrow.
- 'Pool1 worker' with a text input field containing 'johnsmith.worker1'.
- 'Pool1 password' with a text input field containing '123'.

- In the top panel, select the 'System' dropdown menu.
- Select 'Reboot'.



Note  : After hitting save log into your Mining Pool account to see if the machine appears. It usually takes 30–40 minutes for the machine to ramp up and hash at its specified target terahash rate. Once hashing, you will be able to view this on your pool watcherlink. For more information on watcherlinks, view our [Pool Guide](#).

Once your miner is up and running you will begin seeing hashrate on both your miner's web UI as well as on your pool account. This data is very useful when monitoring your miner and ensuring that things are running smoothly. The web UI shows important information such as hashrate, temperature, and fan speeds. Using this information you can tell if your miner is running appropriately or if there are any heat, network, power or hardware issues.

Antminer web UI

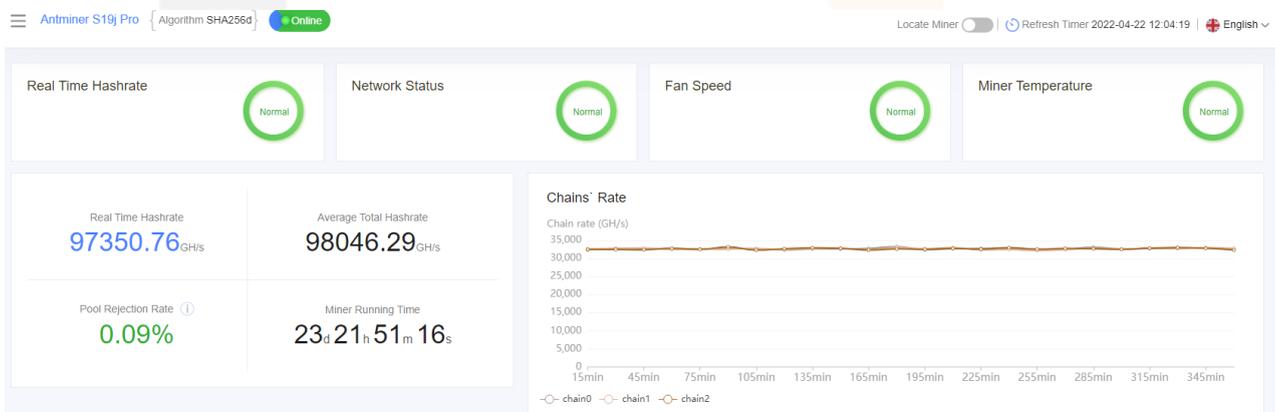


Figure 9: Antminer Web User Interface



Whatsminer web UI

Summary

Elapsed	GHSav	Accepted	Rejected	FanSpeedIn	FanSpeedOut	Voltage	Power	Power Mode
22d 16h 58m 43s	70162.59	67,964	130	5,370	5,490	1,386	3,658	Normal

Devices

Device	Frequency	GHSav	GHS5s	GHS1m	GHS5m	GHS15m
SM0	884	23674.19	23887.41	23698.20	23682.37	23678.65
SM1	857	22914.02	23076.56	22999.41	22941.26	22938.72
SM2	884	23574.34	23514.15	23665.78	23600.98	23575.73
Total	875	70162.56	70478.12	70363.39	70224.61	70193.09

Device	Status	UpfreqCompleted	EffectiveChips	Temperature
SM0	Alive	1	78	69.50
SM1	Alive	1	78	67.00
SM2	Alive	1	78	70.00

Figure 10: Whatsminer Web User Interface

Depending on your choice of mining pool there are lots of tools that can help your operation. Payout management, miner labels and hashrate alerts can all help you organize your operation and maximize uptime.

9. MAINTENANCE

Ideally, miners ought to be running 24/7 to maximize mining rewards. Yet, taking time to properly maintain and monitor your devices will ensure it is hashing and operating properly.

Keeping Your Miner Clean

Mining machines move a large volume of air, which leads to the accumulation of FOB (foreign object debris) and dust on the sensitive electronics. Keeping the operating environment and hashboards clean will ensure a longer machine lifespan and greater efficiency.

If the heatsinks on the hashboards build up too much dust, this will cause overheating issues by restricting airflow and trapping, not dissipating, heat. Sweeping and mopping the surrounding area as well as filtering incoming air will reduce the dust that gets into the machine. Dirty air filters need replacing regularly. Dirty miner(s) should be powered off and periodically cleaned.

Miner cleaning is accomplished with an air compressor or with a compressed air can from the hardware store. Instructions on this can be found on [Bitmain's Website](#). Removing hashboards will make it easier to blow off dust and debris. If this is not sufficient then using isopropyl alcohol and a toothbrush can remove excess dust. Practice of proper [ESD](#) (electrostatic discharge) protocols is recommended to avoid damaging the ASIC chips and other sensitive electronics on the hashboards.

Miner Repairs

Sometimes Bitcoin ASICs break and require quick repairs to ensure the miners are not sitting idle. These repairs are handled by certified repair technicians throughout the globe. If a machine is still under the manufacturer's warranty, home miners should have an easy time finding licensed ASIC repair services.

Warranty statuses can be checked using the links below for each Manufacturer:

[Bitmain serial number verification](#)

[Whatsminer serial number verification](#)

Once you have verified that your machine is under warranty refer to the manufacturers' repair procedures below. This will guide you through submitting a ticket and shipping the miner in for repair.

[Bitmain Repair Process](#)

[Micro BT Repair Process](#)

If a machine's warranty has expired, miners can choose between contacting ASIC repair services or crowdsourcing repair instructions and tips from Twitter, Telegram, YouTube, and other social media platforms where other home miners frequently post repair videos, tutorials, and experiences. If you choose to use the manufacturers repair services you will be responsible for the cost of the repair which includes labor, shipping and parts. The manufacturer will provide you with a rough estimate of the costs.

Commonly Replaced Parts

When looking at the anatomy of an ASIC, these machines can be disassembled into 4 serviceable parts. Fans, Hashboards, Control Board and Power Supply. Each of these parts can easily be accessed and replaced by removing a few screws and cable connections. Fans, control boards and power supplies can be swapped easily and often inexpensively. It is important to note that you pay close attention to model numbers when doing your own repairs.

While hashboards are easily accessible it is never a good idea to work on these without special certified training from your hardware manufacturer. Swapping hashboards can result in an inoperable machine and will void your machine warranty. Hashboards typically come in a set and cannot be exchanged between different machines.

 Exchanging different fans, hashboards, control boards or PSUs can result in an inoperable machine and may lead to damaging the hardware.

Disassembly

! ALWAYS POWER DOWN AND UNPLUG YOUR MINER BEFORE DISASSEMBLY!!!

Disassembly of your mining hardware is simple and can be done with only a Phillips screwdriver and your hands. Each machine is a little different but the basic construction is the same. We recommend checking out the following videos for detailed instructions on how to disassemble your machine.

[Bitmain Disassembly](#) - Control board and fans

[Whatsminer Disassembly](#) - PSU

[Whatsminer Disassembly](#) - Hashboards, control board and fans

These instructional videos do not show how to take off the PSU or Control board for Antminers, therefore we will explain below.

Antminer PSU Disassembly

1. Power down and unplug the miner before disassembly.

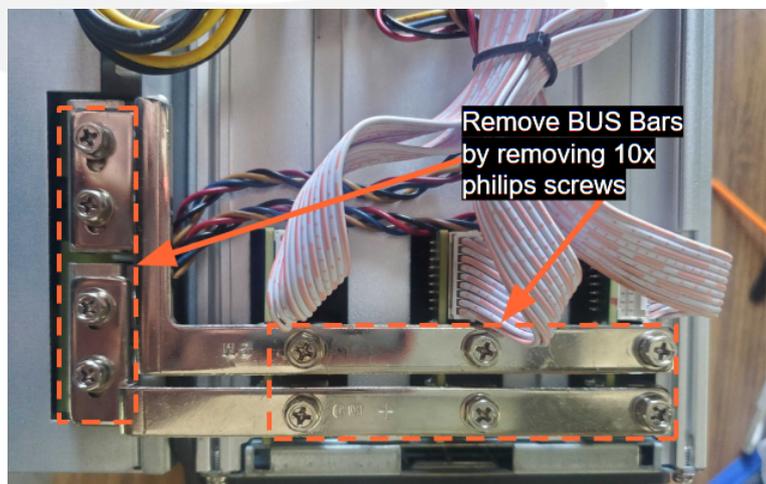
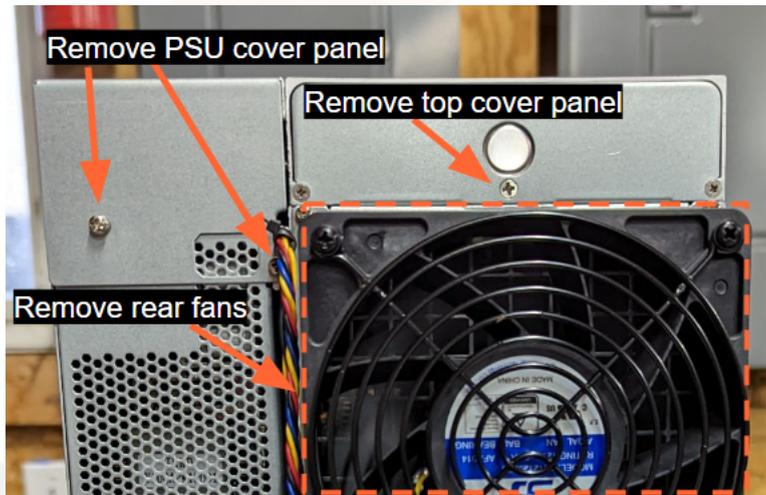
2. Remove the rear fans and top cover panel as shown in the [Bitmain Disassembly](#) video.

3. Remove the PSU cover panel by removing the single screw on the backside.

4. Remove BUS bars by removing 10x philips screws.

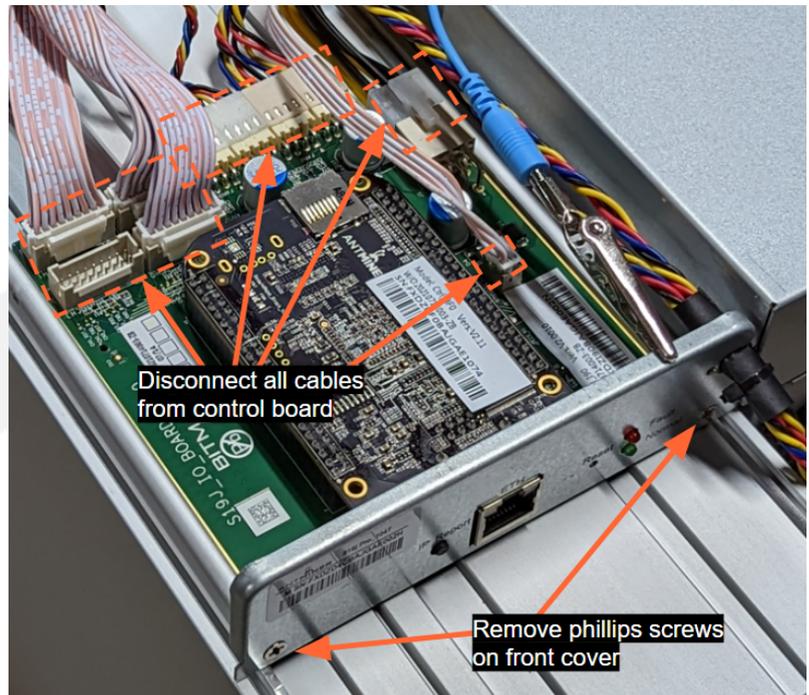
5. Remove the single screw holding the PSU in place on the back side of the miner.

6. Slide PSU rearward until separated from Miner.



Antminer Control Board Disassembly

1. Power down and unplug the miner before disassembly.
2. Remove the front fans and top cover panel as shown in the [Bitmain Disassembly](#) video.
3. Remove 2x screws from the front panel of the miner.
4. Remove all cables connected to the control board.
5. Slide the control board forward until free from the miner.



Basic Troubleshooting

While uncommon, sometimes miners will arrive from the manufacturer in a defective state. This still happens with other electronics, but less common because of quality control processes built up over years of manufacturing. As Bitcoin mining grows and matures the quality controls will improve and defective units will continue to reduce.

Since we are still in the infancy of mining we think it's important to mention that while miners seldomly arrive in a defective state, it does happen. You can always send your machine in for repair using the manufacturer's repair process, detailed in the links below. If you're inclined to do so there are a few troubleshooting steps you can take to try and fix the miner yourself and avoid repair times.

[Bitmain Repair Process](#)

[Micro BT Repair Process](#)

Reviewing Log Files

If you are able to access your miner using the IP address you can always access the miner logs to help guide you through root causing issues with your miner. These logs are human readable and can be diagnosed fairly easily by reading through each line. Keep an eye out for common troubleshooting terms such as PWR, ERR, POWER, ERROR, VOL, VOLTAGE or LOST. These generally point to problems with your machine.

Antminer

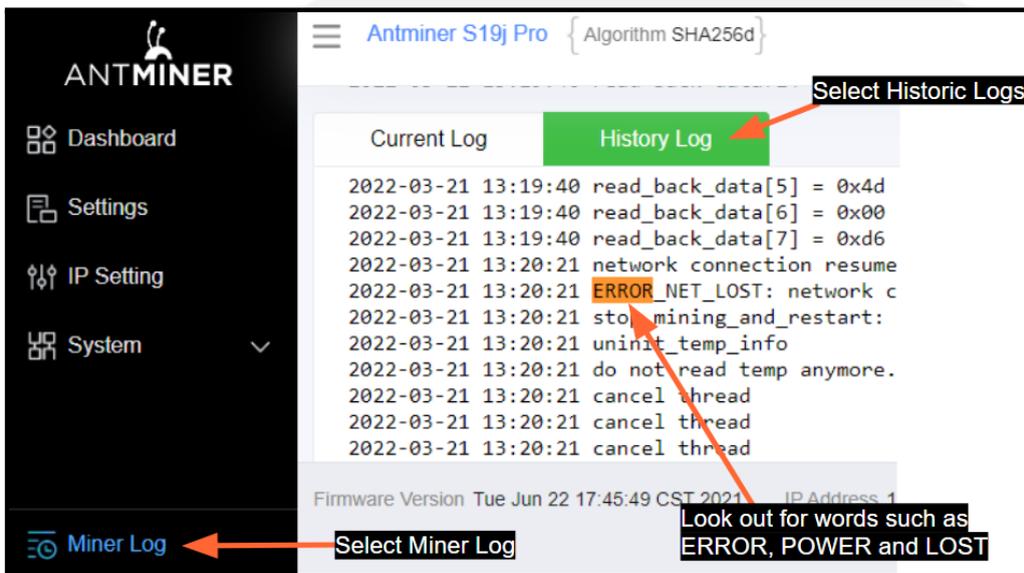


Figure 11: Antminer Web User Log Files

Whatsminer

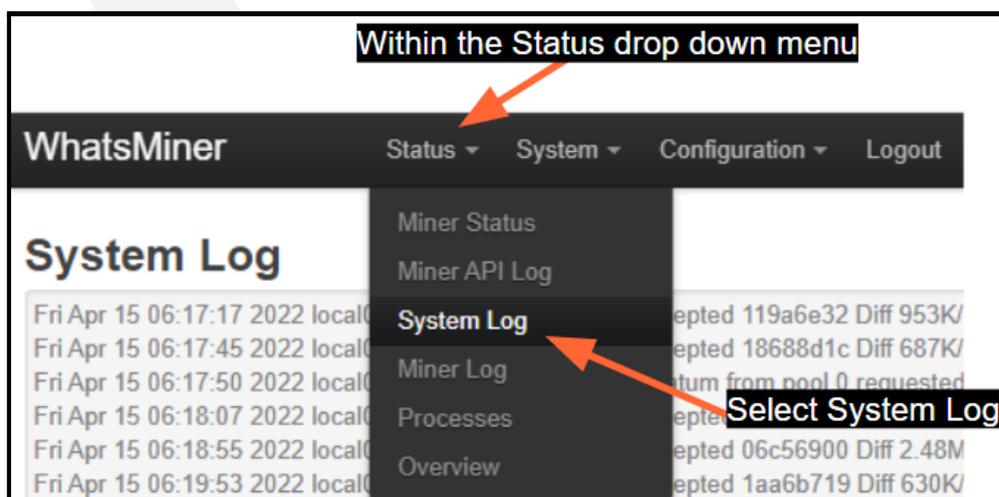


Figure 12: Whatsminer Web User Log Files



Reseating Cables and Screws

Sometimes your machine will have problems that can be fixed by simply reseating cables or screws. This means you might be able to fix issues by disconnecting and reconnecting connections and torquing down screws. Follow our Disassembly steps above for instructions on how to open up your miner to access all connections.

Factory Reset and Control Board Reflash

Machines that are in a defective state can often be revived with a factory reset or by reflashing the control board. These can be performed following the steps below for the appropriate manufacturer.

Antminer

1. Follow the steps detailed on Bitmain's website for the appropriate model.
 - a. [S19j and S19j Pro](#)
 - b. [S19 and S19 Pro](#)
 - c. T19 - For T19's follow the same instructions as the S19 but be sure to download the T19 firmware.

Whatsminer

1. Whatsminers can be factory reset by holding down the reset button for 5 seconds after boot.
2. It is recommended that you use Whatsminertool for all firmware reflashes and upgrades. This can be accessed via the 'Tool Downloads' tab [here](#).

10. GENERAL TIPS & TRICKS

Firmware

- The stock firmware for your miner is very robust and will do everything it can to protect the machine. If it is running too hot or improperly it will turn itself off to avoid damaging itself. That being said, the stock firmware can be limiting. Custom firmware is available and unlocks additional features and customization for your miner(s). The ability to underclock, overclock, change fan and temperature settings allows users to optimize for heat, sound or power.

Warning ⚠ : Some of these firmwares will void your warranty and put you at risk of damaging your machine therefore proceed with caution.

Offsetting Your Heating Bill

- Nearly all of the power used by a Bitcoin miner is converted to heat. If you are able to use that heat in your home or business then you can eliminate the cost of running your heating appliance greatly improving your miner profitability. The best way to control this is by directing the heat into a HVAC system or through immersion. Running your miner in immersion unlocks the potential for many creative solutions that mining hobbyists are starting to do. Check out our [Immersion Podcast Episode](#) where we showcase some of these.

Reducing Your Power Costs, Talking to Your Energy Provider

- Miners typically draw more power than a single family household at any given time. Due to its high power consumption and high uptime. This opens up customers to unique power purchase agreements with their electricity provider. Talking to your power company about your energy usage and looking through their website might lead to a cheaper power bill. This is not guaranteed but consider the following.
 - Separate panel – Getting your miners on a separate panel may make you eligible for a business rate.
 - Peak Demand plan – Consider a peak demand plan to reduce the overall cost of your mining operation.
 - Peak, off-peak plan – Consider a peak, off-peak plan to minimize the cost to mine in lower demand periods of the day

Scaling Your Operation

- As you scale up your mining operation from 1 to many you need to consider the additional heat, noise, airflow, electricity costs and power capacity. A garage that works for 1 miner might not work for 5 due to additional power and airflow requirements. Adding additional fans to the room might be necessary to move more air and keep your miners cool. Adding power capacity has long lead times and relies on the availability of your power provider.

Price Volatility

- Due to the volatility of Bitcoin the profitability of a mining operation can be reduced or improved very quickly. Understanding bitcoin price will help you understand the risk of mining.

Difficulty

- Due to the competitive nature of bitcoin. Mining difficulty will continue to go up as miners become more efficient and competition increases. Understanding mining difficulty will help you understand the risks of mining.

Halvening

- Every 210,000 blocks (~ 4 years) mining rewards earned by miners are cut in half. This is due to the supply schedule of the Bitcoin protocol. Understanding when the halvening occurs and how this affects mining profitability and difficulty will help you understand the risks of mining.

11. ADDITIONAL INFORMATION

Bitmain/Antminer:

- Bitmain AntMiner-S19 Bitcoin Miner Installation Guide - <https://manuals.plus/bitmain/antminer-s19-bitcoin-miner-manual#axzz7PsnSm7Zx>
- Bitmain S19 Server Installation Guide - <https://file12.bitmain.com/shop-product-s3/firmware/b926a841-f8b2-40f7-91bb-2410407edee2/2021/06/23/16/S19%20Manual.pdf>
- Bitmain Serial Number Verification - <https://service.bitmain.com/support/warranty>
- Bitmain Repair Process - <https://support.bitmain.com/hc/en-us/articles/226760527-How-to-create-or-edit-a-Apply-for-Repair-ticket>
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MicroBT/Whatsminer:

- MicroBT Firmware/Tools/Operating Manual Download - <https://www.whatsminer.com/src/views/firmware-download.html>
- MicroBT Repair and Troubleshooting - <https://www.whatsminer.com/src/views/support.html>
- MicroBT Serial Number Verification - <https://www.whatsminer.com/service/warranty>