BITMAIN S9 Hydro Server





## **BITMAIN S9 Hydro Server User Manual**

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### BITMAIN

#### **BITMAIN S9 Hydro Server**



#### **Product Information**

#### Specifications

Model: S9 Hydro-18.0THash Rate: 18.00 TH/s

Power Consumption: 1728W / 220V
Dimensions: 360mm x 125mm x 190mm

Weight: 5.15 kg

Operating Temperature: 0°C to 40°C
Networking: RJ45 Ethernet 10/100M

#### **Product Usage Instructions**

#### Connecting the Power Supply

- Make sure to follow these steps when connecting the power supply:
- Refer to the Power Supply Specifications for reference.
- Connect the output cable with the positive terminal (yellow) and the negative terminal (black).
- Ensure proper setup time and short circuit protection time.

#### Connecting S9 Hydro HEX to Server

- To connect the S9 Hydro HEX to the server, follow these steps:
- Identify the appropriate connection ports on both the HEX and the server.
- Securely plug in the HEX to the server ensuring a stable connection.

#### · Pump Water-infusion

- When performing water infusion, follow these guidelines:
- Ensure the server is powered off before starting the water-infusion process.
- Use the recommended water volume and follow proper infusion techniques.
- Monitor for any leaks or irregularities during the process.

#### Setting up the Server

- To set up the server, complete the following steps:
- Assemble any additional radiators and accessories as required.
- Ensure all components are securely connected and in place.
- Refer to the server manual for specific setup instructions.

#### Frequently Asked Questions (FAQ)

- Q: Is a warranty available for the S9 Hydro server?
  - A: Warranty is not available due to damage caused by the customer's self-removal of the S9 Hydro server.

#### INTRODUCTION

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#### Overview

- The S9 Hydro server is Bitmain's newest water-cooled product.
- All S9 Hydro servers are tested and configured before shipping to ensure easy set-up.
- This new-style DIY product needs to be assembled additional radiation accessories and a power supply are necessary.
- Warranty is not available due to the damage caused by the customer's self-removal of the S9 Hydro server.



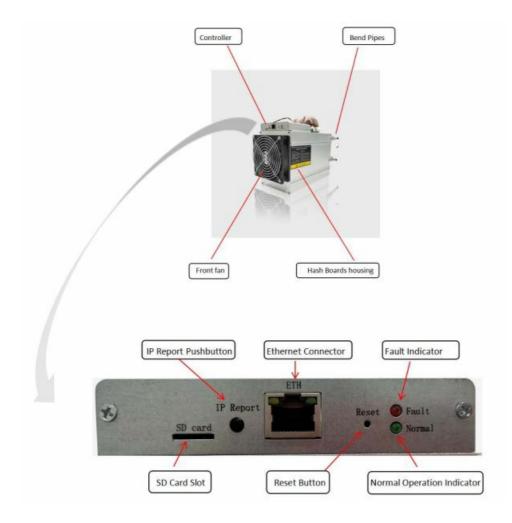


#### Note:

- 1. You must provide your own ATX power supply.
- 2. The images shown here are indicative only. The actual product may differ.

#### **S9 Hydro Components**

The S9 Hydro server's main components and controller front panel are shown in the following figure:



## **Specifications**

Product Glance	Value		
Product model	S9 Hydro-18.0T		
Hashrate, <b>TH/s</b>	18.00		
Power efficiency on wall @25°C, J/TH	96.00		
Adapted power supply model	APW5		
Adapted power supply, Watt / Volt	1728W / 220V		
Detailed Characteristics	Value		
Detailed Characteristics	Min	Тур	Max
Hashrate & Power			
Hashrate, <b>TH/s</b>		18.00	18.40

Power efficiency on wall @25°C, J/TH (1-1)	96.0		102.7
Power efficiency on wall @40°C, J/TH (1-2)	103.2		110.4
Power on wall, <b>W</b> (1-3)	1728		2031
Power Supply Input Range	<u> </u>		'
Power supply input voltage, V AC (2-1)	200	220	265
Power Supply input Frequency Range, Hz (2-2)	47	50	63
Power supply input current, A (2-3)		7.85	10.16
Power Supply Safety Protection	1	<u> </u>	<u> </u>
Output Overcurrent Protection, A DC (3-1)	216		225
Low Voltage Input Protection, <b>V</b> AC	90		100
Hardware Configuration	'	'	'
Quantity of hash chips	216		
Quantity of hash boards	4	4	
Networking connection mode	RJ45 etherne	RJ45 ethernet 10/100M	
Server Size (Length*Width*Height), mm(4-1)	360*125*190		
Net weight, kg (4-2)		5.15	
Noise, <b>dBA</b> @25° <b>C</b> (4-3)		45	58
Environment Requirements			
Water inlet temperature, °C	15 (5-1)		55
Water flow, <b>L/min</b>	5 (5-2)		15
Flow system pressure, <b>kPa</b>		50	300
Operation temperature, °C	0	25	40

Storage temperature, °C	-40	25	85
Operation humidity, <b>RH</b>	5%		95%

- 1. Server test in 25°C temperature chamber. Heat exchanger and water pump power are included.
- 2. Server test in 40°C temperature chamber. Heat exchanger and water pump power are included.
- 3. Typ condition: 25°C, min J/TH, typical Hashrate
- 4. Max condition: 40°C, max J/TH, max Hashrate
- 5. **Caution:** Supply lower than 200V will cause APW5 protection or damage Due to APW output power will be reduced by 50% under 200V input, and it is not enough for server 220V AC Power Supply Frequency
- 6. Typ condition: Min Power on wall, 220V AC supply
- 7. Max condition: Max Power on wall, 180V AC supply
- 8. During 220V AC input
- 9. Without APW5 & Heat exchanger and water pump, including the bend pipes. APW5 L\*W\*H(mm) = 260\*125\*86
- 10. Without APW5 & Heat exchanger, pump, including the bend pipes, APW5 net weight is 2.5kg
- 11. **Typ condition:** 25°C, typical J/TH, typical Hashrate
- 12. Max condition: 40°C, max J/TH, max Hashrate
  - 1. The temperature should be no less than 15°C and at least 3°C higher than the dew point.
  - 2. The external water source can appropriately reduce the flow according to the actual water temperature.
  - 3. Under this condition, the recommendation is no less than 2L/min.

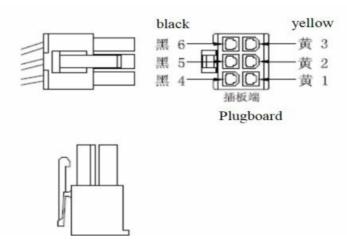
#### **Connecting the Power Supply**

**Note:** APW5 is recommended for your S9 Hydro server which has the advantage of low noise. Please refer to the power supply parameters below when using power supplies purchased by your own to ensure the normal operation of your server.

#### **Power Supply Specifications for reference only**

12V fixed voltage output adopts PCIE output terminal.

• The PCIE output terminal diagram is shown below:



**The output cable consists of two colours:** the 12V positive terminal is yellow; the negative terminal is black 6PIN PCIE Positive and Negative Output **Terminals** 

- Positive Yellow 1, Yellow 2, Yellow 3
- Negative Black 4, Black 5, Black 6

	DC Voltage	12V
	Minimum Rated Current (220V input)	12V/170A
	Minimum Rated Power (220V input)	12V/2040W
	Ripple & Noise	<1%
Output	Line Regulation	<1%
	Load Regulation	<1%
	Setup Time	<2S
	Short Circuit Protection Time	>10mS
	6PIN PCIE Terminals	≥13
	Voltage Range	200-240V AC
Input	Frequency Range	47-63Hz
	Power Factor	>0.99(full load)

	Leakage Current	<1.5mA 220V 50Hz
Protection	Low-voltage Input	80-89V AC
	Output Short Circuit	Yes
	Output Overcurrent	180-200A
	Overheat Protection	Yes
	Operating Temperature	-20-60°C
Environment	Operating Humidity	20%-90%RH(non-condensing)
	Altitude	<2000m

#### **Precautions for Use**

1. Before using the PSU, please ensure that your local voltage and power outlets are compatible with the requirements of the product. The output voltage from the power socket should meet the product's voltage requirement. The leading-out terminal model, polarity and quantity must also follow the product requirements stipulated in this guide.

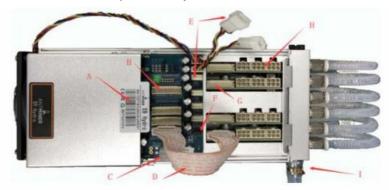
- 2. Please ensure that the PSU appears to be in good shape and has not suffered any damage in transit. If the exterior of the PSU appears damaged, do not use it.
- 3. Make sure that the ground electrode of the PSU is properly grounded to ensure electricity safety and EMI reduction.
- 4. As different countries have different power outputs, we do not supply an AC input cable with our PSUs. Customers should purchase an AC input cable output that is compatible with the local power grid plug. The type number of the cable end interface to be connected with the power panel is C13, and the sectional area of the copper conductor for cables should not be less than 1 square millimetre.
- 5. The PSU must be installed in a dust-free environment with good and unobstructed air circulation. Any items blocking the airflow of the PSU is prohibited and under no circumstances should the PSU be installed in an enclosed place. Installation also should not be done in an environment where there is high condensation or high level of salt content and humidity in the air.
- 6. The correct way to use the PSU is to connect the output wire terminal, and then connect the input cable after the load and PSU output terminals are connected. Either connecting or disconnecting the output terminals is forbidden when the PSU is powered on. Voltaic arcs generated by excessive DC can damage DC output terminals and pose a fire hazard.
- 7. Maintaining a good working environment and derating can greatly prolong the lifespan of PSU. It is generally recommended that the load power not exceed 90% of the rated power of the PSU and the temperature not exceed 50 degrees Celsius. It should be used in a dust-free, non-polluted area where there is low humidity and low salt content in the air. The derating method will also allow the PSU to work at a higher efficiency point, which can help in electricity savings.

Thirteen PCI-e connectors are located at the top of the S9 Hydro server for connecting the PSU as follows:

- Twelve PCI-e connectors for the hash boards. Each hash board has three PCI-e connectors.
- One PCI-e connector is located on the controller.
- Each dashboard must be powered by the same PSU to prevent possible damage and instability.

#### To connect the power supply:

1. Connect PSU power cable connectors to each of the twelve PCI-e connectors on the top of the S9 Hydro server, ensuring that each hash board is powered by the same PSU.



- A SN Label
- B Controller Ribbon cable Connector
- C Controller PCI-e Power Connector
- D Ribbon cable

- · E Fan Connector
- F Pump Connector
- G Hash Boards Ribbon cable Connector
- H Hash Boards PCI-e Power Connector
- I Pipe Connector
- 2. Connect a PSU power cable connector to the S9 Hydro PCI-e connector on the controller.
- 3. Connect the network cable to the ETH port.
- 4. To power up your S9 Hydro server, connect the PSUs to the power wall outlet.
  - If you are using more than one PSU, power up the PSU connected to the controller AFTER you have Powered up the other PSU(s).

#### **Connecting S9 Hydro Hex to Server**

**Note:** 59 Hydro Hex is recommended for your 59 Hydro Server, the connection procedures are as below. Please refer to the parameters of radiators and accessories at the end of this section when using radiators and accessories purchased on your own to ensure the normal operation of your server.

#### · A Fan connection

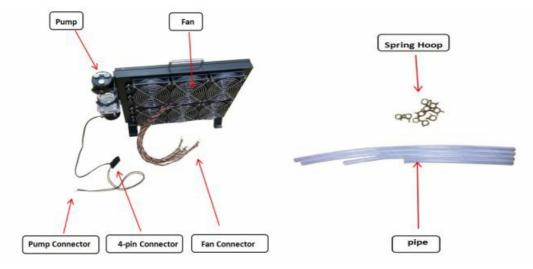
- Four 4-pin connectors of the control board and two connectors separated by one line will be connected with 6 fans.
- The plug must be inserted in place, the fan line order does not matter as long as it is connected.

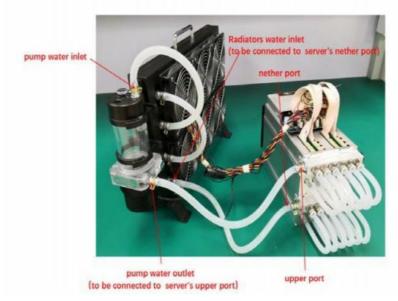
#### B Pump connection

The control board has a black 4-pin connector to which the pump must be connected.

#### · C Connection of pipelines

- The S9 Hydro pump should be connected in series with the pipe, and the joint should be clamped with a buckle.
- The figure below shows the recommended connection.





• Attention: The position of pipes may be slightly adjusted and it won't have any effect on usage. For a better heat dissipation effect, it is recommended to connect pipes in this way.

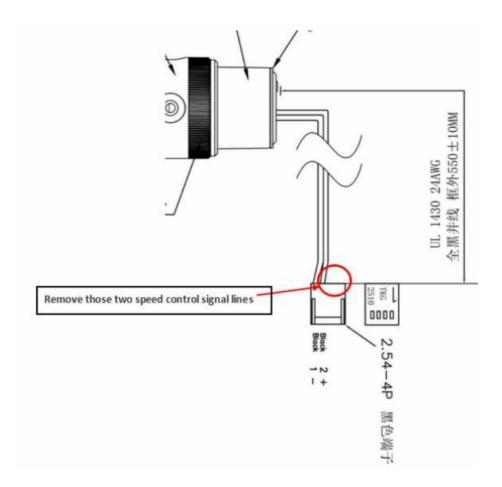
Radiators & Accessories Specs for reference only		
Quantity of fans	≥6	
Fan speed, RPM	≥3500	
Airflow, CFM	≥124	
Power of fan, W/pcs	≤10	
Heat exchanger size, mm	≥360*120*25	
Quantity heat exchangers	≥2	
Quantity of pumps	1	
Water flow, L/min	5~15	
Hydrostatic pressure, KPa	50~300	
Power of pumps, W	≤40	
Fan connection mode	4-Pin ,DIP,pitch2.54mm. pin1:GND,pin2:12V,pin3:FAN_SPEED, pin4:FAN_PWM	
Pump connection mode	4-Pin ,DIP,pitch2.54mm. pin1:GND,pin2:12V,pin3:blank,pin4:blank	
Water tube(ID)	8mm	
Inlet&outlet	G1/4	

#### **Precautions for Use:**

1. When connecting the fan and pump connectors on the S9 Hydro Hex, please pay attention to the position of the

corresponding connector on the control board. As the power of the pump varies from the fan's, the flow-through capacity of the connector on the control board also varies. The wrong insertion may cause damage to the control board.

- 2. The water replenishment period of S9 Hydro Hex is about 2- 3 months. Please pay attention to checking the liquid level of the water tank regularly for replenishment to avoid the low water level which can affect the heat dissipation efficiency or the lifespan of the pump.
- 3. After the initial commissioning of the water cooling system or the completion of water replenishment, it is recommended to reinstall the plug at the water replenishment port promptly to ensure the sealing performance of the water cooling system and avoid the leakage of the coolant under unexpected conditions.
- 4. Ensure that the spring hoop is placed on the joint when installing the water hose to avoid affecting the sealing performance of the water cooling system or causing the pipeline to fall off when pulled by external force.
- 5. It is recommended to start the long-term operation of the server after the water cooling system is commissioned to avoid any malfunction of the server due to the high temperature of the chip. This process may last for 20 minutes or so.
- 6. According to the air quality of the operating environment, it is recommended to dedust the heat exchanger of the S9 Hydro Hex regularly to ensure a good heat transfer performance.
- 7. Cooling water is recommended to refer to the requirements for water quality on our official website, or to purchase reliable distilled water or pure water to ensure that it will not deteriorate or corrode the pipeline during long-term operation.
- 8. To ensure that the standard water pump can output sufficient flow to meet the heat dissipation requirements of the system at high temperatures, it is recommended that the hose length between the S9 Hydro Hex and the S9 Hydro server should not exceed 1 meter unless a pump with a larger head or flow is used.
- 9. If the customer purchases the water pump by himself, please remove the speed control signal line shown in the following figure before installation and ensure that the two wires are not short-circuited to obtain a better heat dissipation effect.
- 10. When the pump is found to have a low flow rate during the exhaust operation, it may be because the gas inside the pump cannot be discharged normally, resulting in abnormal flow. The pump connector can be unplugged and restarted after the power is turned off, which is beneficial to the internal gas discharge of the pump. This operation may need to be repeated 2 to 3 times. It is recommended to operate before the server is started to avoid affecting the heat dissipation of the server.



#### **Pump Water-infusion**

**Note:** 59 Hydro Hex is recommended for your S9 Hydro Server. Please refer to the pump water-infusion requirements if S9 Hydro Hex is used for your server.

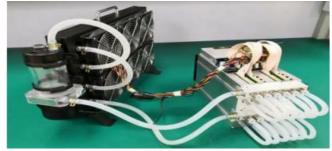
• A.Water quality Water Quality Requirements

No	Project	Standard	Remark
1	Total Microbial Count	105CFU/mL	reflection of system microorganism controlling conditio
2	Turbidity	10NTU	reflection of suspended solids condition in the water sy stem
3	PH Value	6~9	indirect reflection of microorganism condition
4	Conductivity	1 mS/cm	reflection of ionic concentration in the water system

 To support the long-term optimum operations of the water cooling system, we recommend that the water quality used should meet the requirements as stated in the table above.



- Water-cooling plates inside the server are welded parts made of aluminium, which have been cleaned before roll-out.
- Water in some servers may appear to be turbid after running for some time.
- Kindly note that this will not affect the overall cooling system and long-term operation of the system.
- **B.** Keep adding water. Since water is needed in both the server and the radiators, water in the pump will be reduced when the server is mining. Always remember to add water when starting the server to ensure that the water level is sufficient for optimal heat dissipation.
- C. S9 Hydro server and radiators can be tilted left and right during water infusion which helps to ventilate the air.



- After water circulation is running normally, the S9 Hydro server and radiators can be slowly tilted left and right to help the residual air bubbles inside those two equipment to be discharged smoothly. This action can help to increase the cooling efficiency of the system.
- **D. Liquid Level:** the standard level is as stated in the picture below. Please replenish the liquid promptly if the liquid level falls below the minimum value marking.



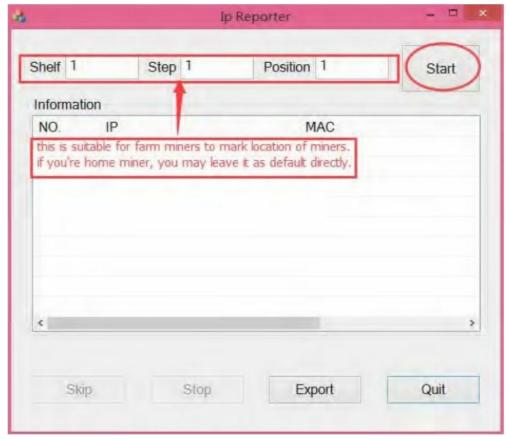
#### **Setting Up the Server**

To set up the server: The file IPReporter.zip is supported by Microsoft Windows only

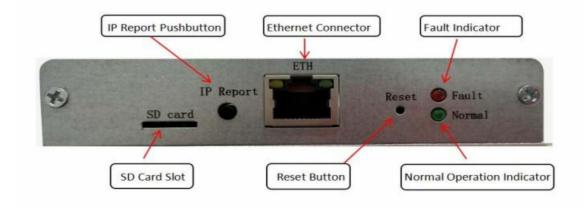
1. Go to the following site: <a href="https://service.bitmain.com.cn/support/download?product=IP-reporter">https://service.bitmain.com.cn/support/download?product=IP-reporter</a>. OR

#### https://shop.bitmain.com/support/download.

- 2. Download the following file: IPReporter.zip
- 3. Extract the file.
  - The default DHCP network protocol distributes IP addresses automatically.
- 4. Right-click IPReporter.exe and run it as Administrator.
- 5. Select one of the following options:
  - Shelf, Step, Position suitable for farm servers to mark the location of the servers.
  - Default suitable for home servers.
- 6. Click Start.



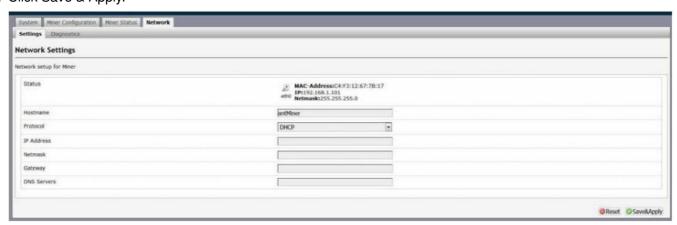
7. On the controller board, click the IP Report button. Hold it down until it beeps (about 5 seconds).



The IP address will be displayed in a window on your computer screen.

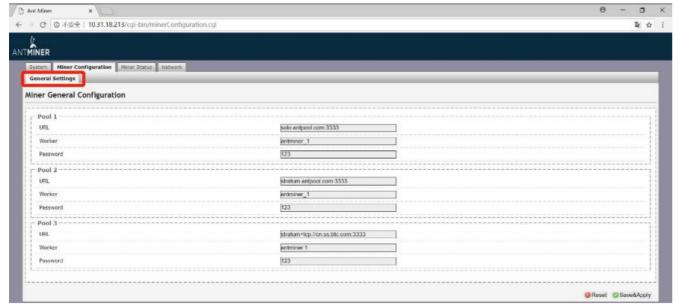


- 8. The IP address will be displayed in a window on your computer screen.
- 9. In your web browser, enter the IP address provided.
- 10. Proceed to login using root for both the username and password.
- 11. In the Network section, you can assign a DHCP IP address (optional).
- 12. Click Save & Apply.

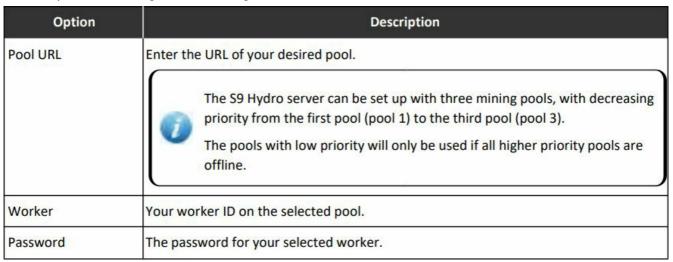


# Configuring the Server Setting Up the Pool To configure the server:

1. click General Settings.



2. Set the options according to the following table:

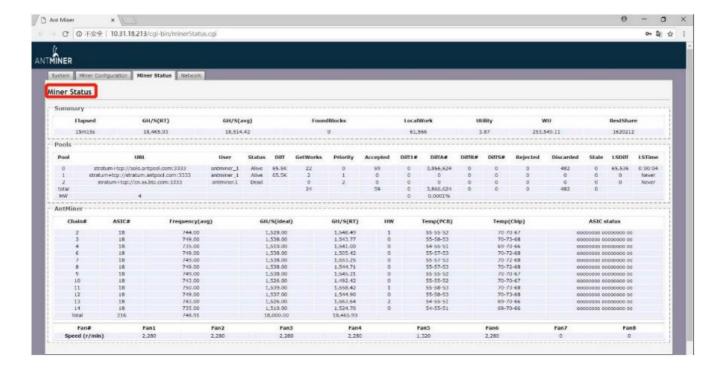


3. Click Save & Apply to save and restart the server.

#### **Monitoring Your server**

To check the operating status of your server:

1. Click the status marked below.



Monitor your server according to the descriptions in the following table:

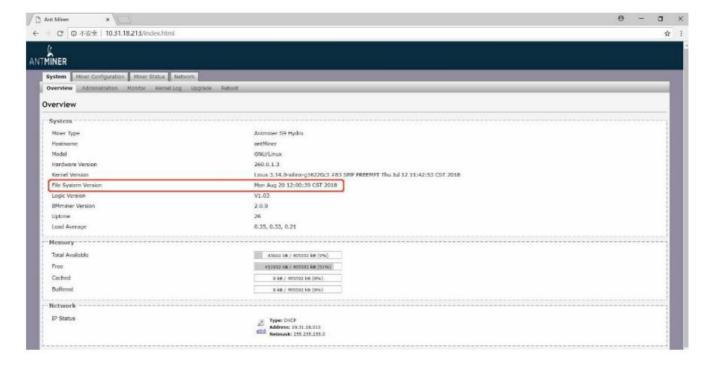
Option	Description
ASIC#	Number of chips detected in the chain.
Frequency	ASIC frequency setting.
GH/S(RT)	The hash rate of each hash board ( GH/s)
Temp(PCB)	The temperature of each hash board (°C). (Applied only to servers with fixed frequency)
Temp(Chip)	The temperature of the chips on each hash board (°C).
	One of the following statuses will appear:
	O - indicates OK
ASIC status	• X - indicates an error
	indicates dead

**Note:** The S9 Hydro server is with automatic frequency adjustment. Firmware will stop running when the Temp(PCB) reaches 80°C there will be an error message "Fatal Error: Temperature is too high!" shown at the bottom of the kernel log page.

#### **Administering Your Server**

#### Checking Your Firmware Version To check your firmware version:

- 1. In System, click the Overview tab.
- 2. File System Version displays the date of the firmware your server use. In the example below, the server is using firmware version 20180820.



#### **Upgrading Your System**

- Make sure that the S9 Hydro server remains powered during the upgrade process.
- If power fails before the upgrade is completed, you will need to return it to Bitmain for repair.

#### To upgrade the server's firmware:

1. In System, click Upgrade.



#### 2. For Keep Settings:

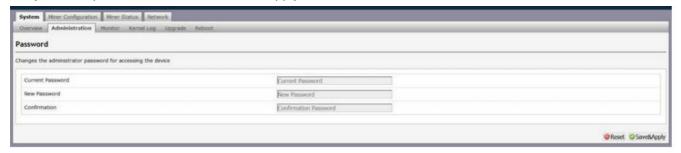
- Select the check box to keep your current settings (default).
- Clear the check box to reset the server to default settings.
- 3. Click the (Browse) button and navigate to the upgrade file. Select the upgrade file, then click Flash Image. A message appears notifying you if the S9 Hydro firmware can be upgraded and if yes, will then proceed to flash the image.
- 4. When the upgrade is completed, the following message appears:



- 5. Click one of the following options:
  - Reboot- to restart the server with the new firmware.
  - Go Back- to continue mining with the current firmware. The server will load the new firmware the next time it is restarted.

#### Modifying Your Password To change your login password:

- 1. In the System, click the Administration tab.
- 2. Set your new password, then click Save & Apply.



#### **Restoring Initial Settings To restore your initial settings**

- 1. Turn on the server and let it run for 5 minutes.
- 2. On the controller front panel, press and hold the Reset button for 10 seconds.
  - Resetting your server will reboot it and restore its default settings.
  - The red LED will automatically flash once every 15 seconds if the reset is operated successfully.

#### **FCC**

Regulation: FCC Notice (FOR FCC CERTIFIED MODELS)

This device complies with part 15 of the FCC Rules.

#### Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference, and
- 2. this device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, under part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used following the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

#### **EU WEE:**

- Disposal of Waste Equipment by Users in Private Households in the European Union This symbol on the product or its packaging indicates that this product must not be disposed of with your other household waste.
- Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment.
- The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.
- For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

#### **Documents / Resources**



BITMAIN S9 Hydro Server [pdf] User Manual S9 Hydro Server, S9, Hydro Server, Server

#### References

- L BITMAIN
- (3)
- L BITMAIN
- User Manual

#### Manuals+, Privacy Policy

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