TTBIT Scrypt

USB Stick Miner

Official User Guide

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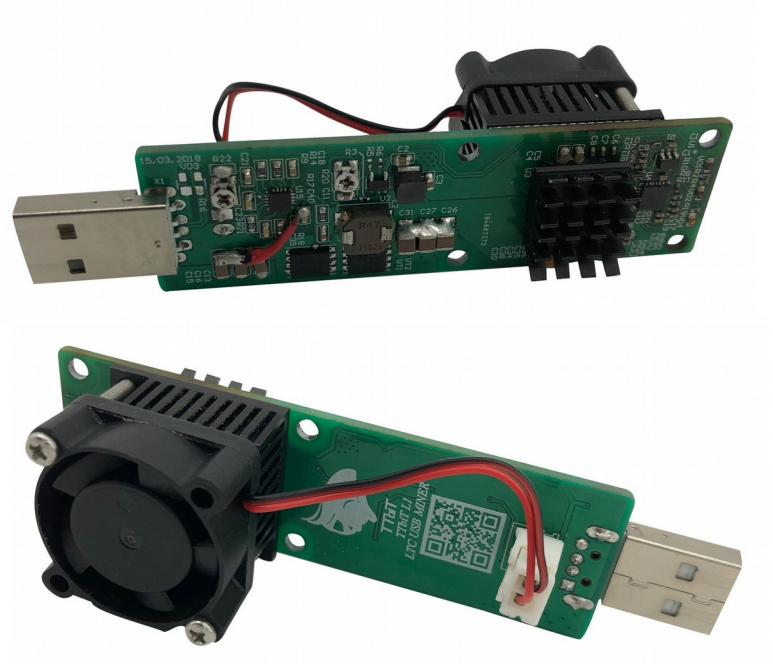
1. The First Glance

Welcome to TTBIT Official User Guide.

Manufactured by TTBIT, the Scrypt USB Miner is being produced in two colors: Green and Blue. TTBIT Scrypt USB Miner is one of the fastest and easiest to deploy entry-level miners. With its own integrated cooling solution, it includes a 25mm fan, so no need to come up with clumsy external fan solutions to keep these cool. It can mine any Scrypt algorithm coins such as: Emerald Crypto Coin (EMD), Verge (XVG), DigiByte (DGB), Bitcoin (via Nicehash), Litecoin (LTC), Einsteinium (EMC2), Florin (FLO), Gulden (NLG), GameCredits (GAME), Dogecoin (DOGE), Viacoin (VIA), Myriad (XMY) along many other smaller Scrypt-mineable coins.



1a. Where to purchase TTBIT USB Miner

You can purchase TTBIT Scrypt USB Miner on eBay:

TTBIT LTC Scrypt USB Miner

2. Accessories & Connection

2a. Where to purchase powered USB hub

You will need a ***powered*** USB hub that is capable of supplying at least 1-2A per port (5-10W @ 5V). Some computers provide enough power for TTBIT miner to work, but this is not guaranteed.

If your computer is not up to the task or you want to use two, three, five or maybe even 10 TTBIT miners, I recommend to purchase this USB hub:

Sipolar 10 Port USB Professional Mining Hub

2b. Connection

a) Connect your USB hub to your host computer. Make sure the power adapter is plugged in as well.

b) Insert the TTBIT USB Stick Miner into the USB hub via the USB port.

2c. Correct connection order

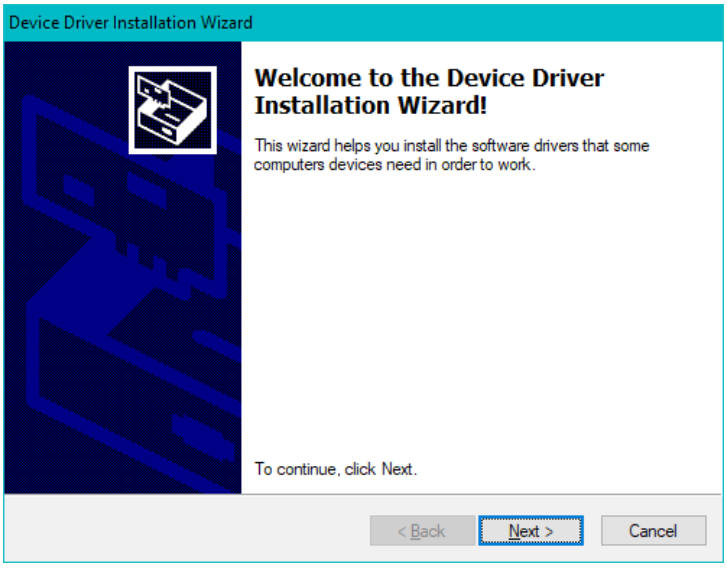
Make sure that you plug in powered USB hub into your computer first. Only once you do that, after few seconds, start plugging in your TTBIT miners.

3. Setup (Windows)

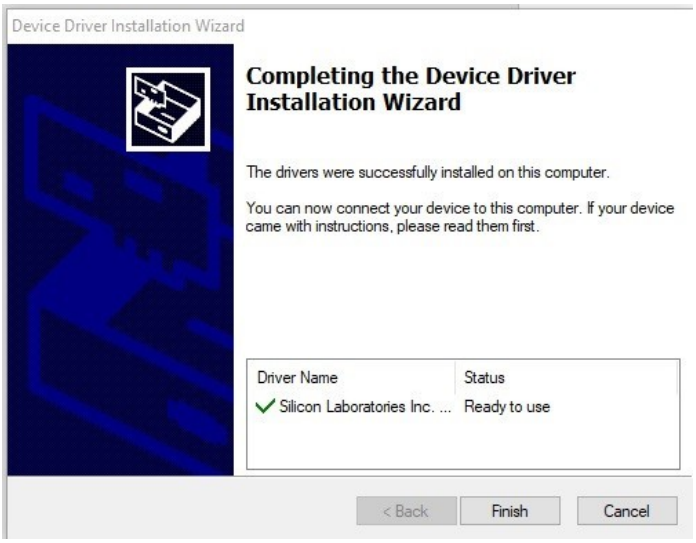
3a. Silabs CP210x USB to UART Bridge VCP Driver

If you purchased the miner from eBay link provided with this Guide, you will receive software pack containing all required drivers. Download it and unpack the archive to separate folder.

First, install Silabs CP210x USB to UART Bridge VCP Driver. I included Windows 10 driver files (Windows 10 only!) in the folder “Silabs Windows 10 Driver” which is in “ttbit-windows” folder. Open the folder and run CP210xVCPInstaller_x64.exe:



After successful install, you will see this screen:



If you have earlier Windows version (Windows 8 etc.), you can go to Silabs website and download driver directly:

https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers

Download for Windows 10 Universal (v10.1.8)

Note: The latest version of the Universal Driver can be automatically installed from Windows Update.

Platform	Software	Release Notes
Windows 10 Universal	Download VCP (2.3 MB)	Download VCP Revision History

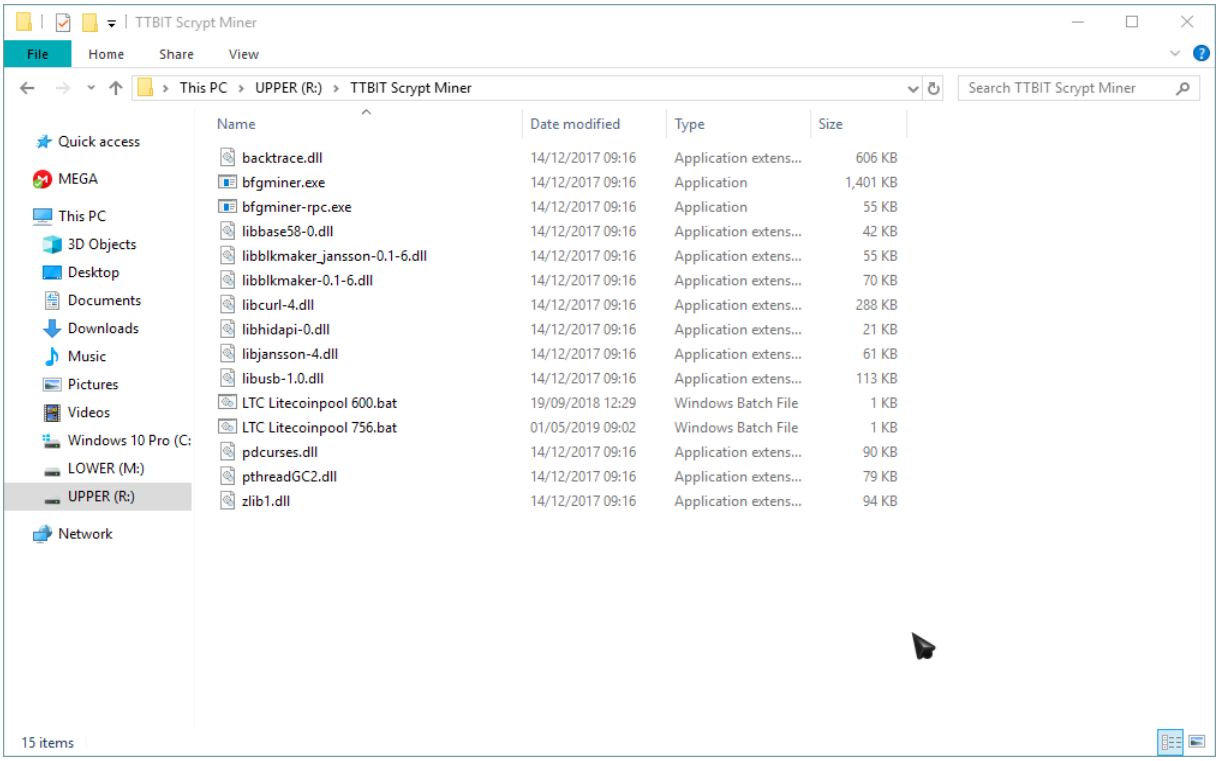
Download for Windows 7/8/8.1 (v6.7.6)

Platform	Software	Release Notes
Windows 7/8/8.1	Download VCP (5.3 MB) (Default)	Download VCP Revision History
Windows 7/8/8.1	Download VCP with Serial Enumeration (5.3 MB) Learn More »	Download VCP Revision History

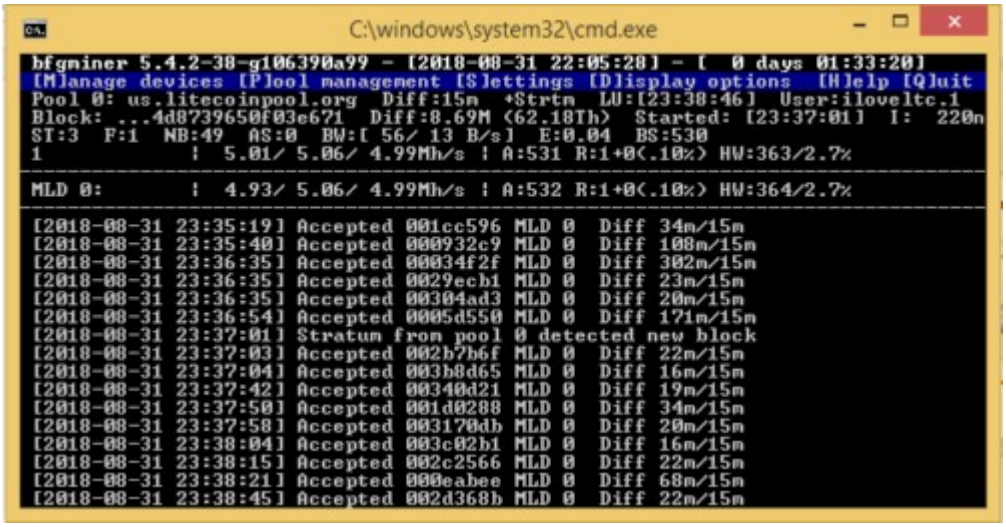
Unpack downloaded file and run .exe file in similar fashion described above.

3b. Running bfgminer

Navigate to “ttbit-windows” folder included with this manual, you will find files similar to this:



Run any of the .bat files, for example *EMD_p2pool.bat*. If everything is successful, you will see a window similar to this one:



It's important to see device listed here (MLD 0) and hashrate (in MH s).

Once everything is confirmed working, you can exit cgminer by pressing [Q] for Quit.

Now, modify pool settings by editing .bat file – right click on the file and select Edit. You can enter your own pool settings and addresses and restart cgminer. I've also

included few more example .bat files for different coins and pools, please have a look.

4. Setup (Raspberry Pi)

If you purchased the miner from eBay link provided with this Guide, you will receive software pack containing all required drivers. Download it and unpack the archive to separate folder.

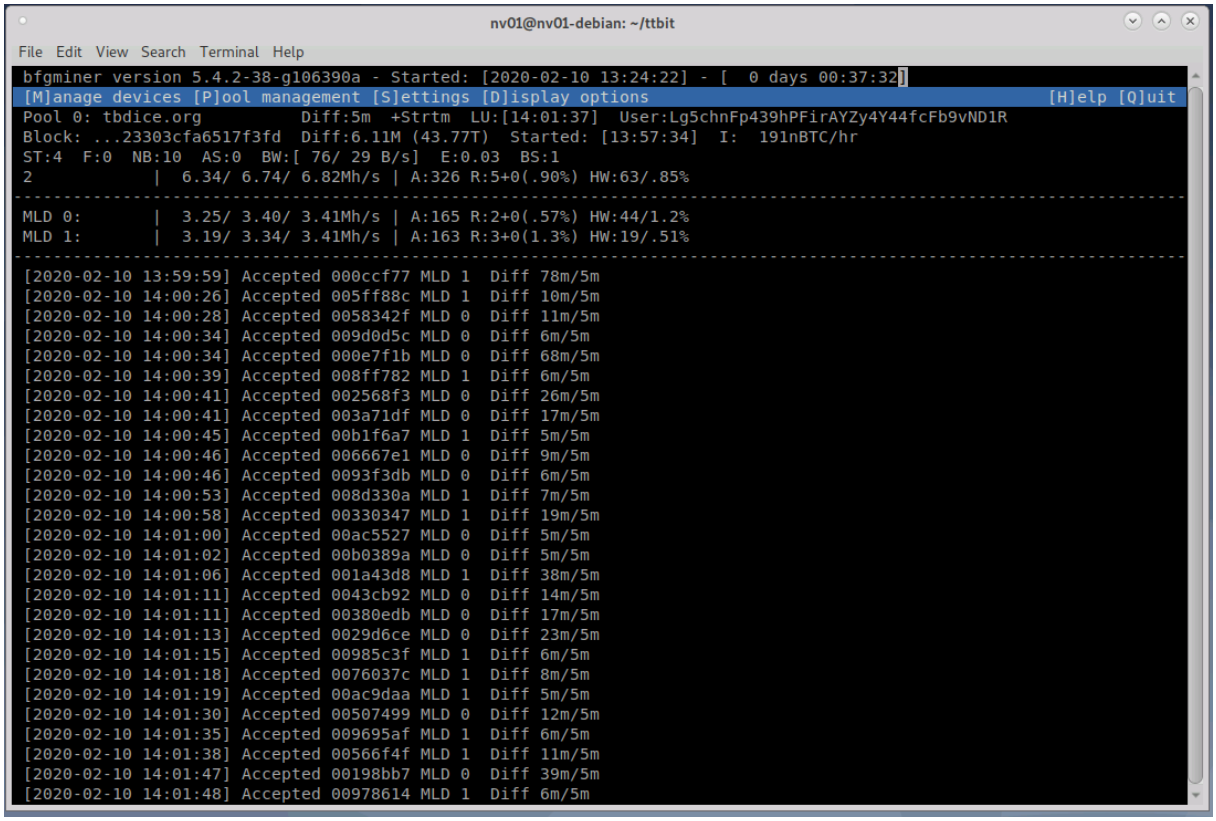
4a. Using monitor and peripherals

Navigate to “ttbit-rpi” folder using file explorer.

Alternatively, you can copy the contents of “ttbit-rpi” folder to your Raspberry Pi, using any cloud service, ssh transfer or simply by plugging USB stick to your Raspberry Pi.

Once in the folder, you will find few example .sh files with bfgminer options there.

Doubleclick on chosen .sh file and select “Run in terminal” option. You will see bfgminer window similar to this one:



If you getting error about missing libncurses.so.5 or libjansson.so.4 libraries, please install ***libncurses5*** and ***libjansson4*** packages using your package manager.

If you see errors like “NO DEVICES FOUND” or “Do not have user privileges required to open /dev/ttyUSB0” please consult Troubleshooting section of this guide.

Once you verify that everything is fine, you can press [Q] to exit bfgminer.

To edit pool credentials to your own, simply edit chosen .sh file (don't forget to backup first). I've also included few more example .sh files for different coins and pools, please have a look.

4b. Using console terminal

To run all of the above from terminal (if your Raspberry Pi doesn't have monitor and peripherals attached, or you simply prefer terminal):

Run these commands in the terminal (make sure to enter commands in one line each time):

```
wget https://www.dropbox.com/s/kz0piblu14os95b/ttbit-rpi.tar.gz?dl=0
```

```
tar -xzvf ttbit-rpi.tar.gz?dl=0
```

```
cd ttbit-rpi
```

There is few .sh files with bfgminer options, chose one and enter the command to run it:

```
./emd-p2pool.sh
```

If you getting error about missing libncurses.so.5 or libjansson.so.4 libraries, please install ***libncurses5*** and ***libjansson4*** packages:

```
sudo apt update && sudo apt install libncurses5 libjansson4
```

If you see errors like "NO DEVICES FOUND" or "Do not have user privileges required to open /dev/ttyUSB0" please consult Troubleshooting section of this guide.

Once you verify that everything is fine, you can press [Q] to exit bfgminer.

To edit pool credentials to your own, backup chosen .sh file and then edit it using nano editor:

```
nano emd-p2pool.sh
```

Replace pool credentials in the file with your own, save the file by pressing CTRL + O and exit the editor by pressing CTRL + X.

You open your miner everyday by repeating commands to enter the folder and run the bfgminer (cd and ./ commands).

I've also included few more example .sh files for different coins and pools, please have a look.

5. Setup (GNU/Linux)

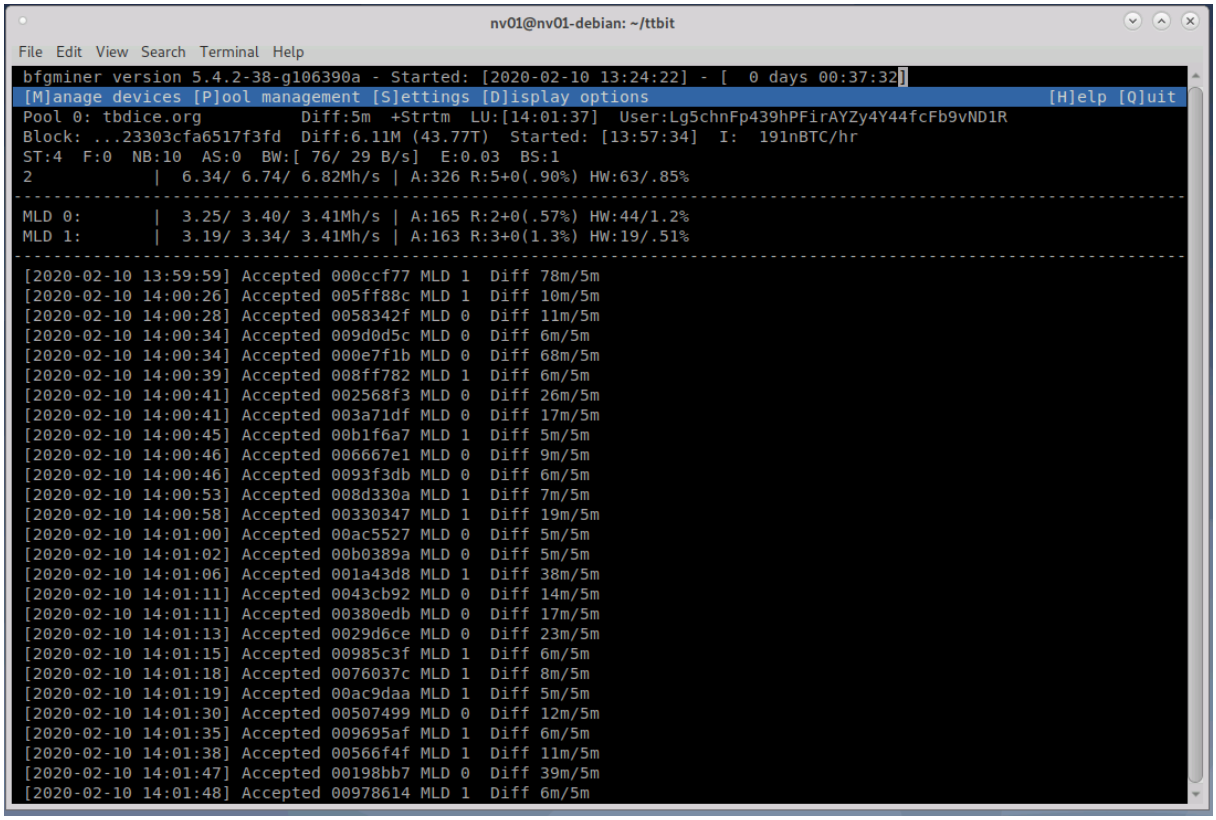
If you purchased the miner from eBay link provided with this Guide, you will receive software pack containing all required drivers. Download it and unpack the archive to separate folder.

5a. Using monitor and peripherals

Navigate to “ttbit-linux” folder using file explorer.

Once in the folder, you will find few example .sh files with bfgminer options there.

Doubleclick on chosen .sh file and select “Run in terminal” option. You will see bfgminer window similar to this one (running two sticks in this example):



If you getting error about missing libncurses.so.5 or libjansson.so.4 libraries, please install ***libncurses5*** and ***libjansson4*** packages using your package manager.

Once you verify that everything is fine, you can press [Q] to exit bfgminer.

To edit pool credentials to your own, simply edit chosen .sh file (don’t forget to backup first). I’ve also included few more example .sh files for different coins and pools, please have a look.

4b. Using console terminal

To run all of the above from terminal (if your Linux system doesn't have monitor and peripherals attached, or you simply prefer terminal):

Run these commands in the terminal (make sure to enter commands in one line each time):

```
wget https://www.dropbox.com/s/64r4uprj7kmv8yg/ttbit-linux.tar.gz?dl=0
```

```
tar -xzvf ttbit-linux.tar.gz?dl=0
```

```
cd ttbit-linux
```

There is few .sh files with bfgminer options, chose one and enter the command to run it:

```
./emd-p2pool.sh
```

If you getting error about missing libncurses.so.5 or libjansson.so.4 libraries, please install ***libncurses5*** and ***libjansson4*** packages:

```
sudo apt update && sudo apt install libncurses5 libjansson4
```

If you see errors like "NO DEVICES FOUND" or "Do not have user privileges required to open /dev/ttyUSB0" please consult Troubleshooting section of this guide.

Once you verify that everything is fine, you can press [Q] to exit bfgminer.

To edit pool credentials to your own, backup chosen .sh file and then edit it using nano editor:

```
nano emd-p2pool.sh
```

Replace pool credentials in the file with your own, save the file by pressing CTRL + O and exit the editor by pressing CTRL + X.

You open your miner everyday by repeating commands to enter the folder and run the bfgminer (cd and ./ commands). I've also included few more example .sh files for different coins and pools, please have a look.

6. Basic Troubleshooting (Q&A)

Q: My TTBIT does not start up, or stops hashing after a while

While its normal for the ASIC to stop working randomly after extended periods of time, you should have no issues running them for days. If you see that you have to restart them ever few hours or sooner, or it does not start hashing at all on startup its most likely because of two main reasons:

1) Your hub/USB port is not providing enough power for the given frequency/voltage. Try lowering your frequency and core voltage so less power is drawn, or use a port/hub that can provide at least 2A of continues current.

2) You have set your memory voltage too low. While lowering memory voltage can reduce power draw, it also can increase instability in the device which will cause it to need to be restarted often. Trying increasing memory voltage to .9v for best reliability.

Q: Why does my X hub not work with my TTBIT miner?

Most USB 2.0 and a lot of 3.0 powered USB hubs will NOT work with these sticks. Powered USB hubs need to meet two requirements to reliably support the high current these sticks draw. First they need to have a clean high quality power supply that can output at least 1A PER port.

To run the sticks at full speed you need at least 2A per port. Second they need to comply with USB standards which ALOT of cheap hubs don't...which causes a lot of EMI issues and disconnects. Unfortunately its trial and error to figure this out. From my experience, Sipolar 10 Port USB Professional Mining hub works perfectly fine for this task, link to it here: Sipolar 10 Port USB Professional Mining Hub

Q: Bfgminer detects my TTBIT miner but nothing happens when it connects to my pool

Please keep in mind that even though this is a very powerful scrypt miner for its size, its still slow when compared to big, industrial ASICs with 1000Watts of power, which most pools are optimized for these days. Some pools have a share difficulty default of 4k or higher, in which case it could take up to an hour for your TTBIT Miner to find and submit a share. In the meantime you are getting no Accepted shares, you need to wait an hour each time. Even if you don't see a share submission, you will know your stick is hashing correctly right away because the ASIC diff on device is set really low, so you should be able to see ~ 2 red LED flashes a second. If you want a faster pool submission rate (again slow shares DOES NOT effect profitability, since each

share is just worth more), set your diff to 128, contact your pool operator for instructions.

Q: When I connect to my pool bfgminer disables it with the following error:

```
Pool 0 misbehaving (coinbase check), disabling!
```

Bfgminer by default operates with strict coinbase checks, which most mutlipools don't adhere too, to disable this check simply add #skipcbcheck at the end of the pool URL like so: stratum+tcp://prohashing.com: 3333/#skipcbcheck

Q: I am using Windows and nothing happens when i click the .bat file

Your anti-virus software most likely deleted bfgminer.exe when you extracted it. Make sure you create a exception in your antivirus settings to avoid this. You are welcome to check and scan included files, they are free of any viruses.

Q: What frequencies can I set my TTBIT miner to?

The TTBIT has a list of hard coded frequencies to ensure maximum performance for a given frequency. Below is a list of valid frequencies you can use:

384, 450, 480, 540, 576, 600, 612, 625, 636, 648, 660, 672, 684, 700, 720, 744, 756, 768, 796, 832, 852, 876, 900, 924, 954

Default frequency is 600, which equals to approx. 3.4 MH/s. Most stable overclock with works with majority of PCs is 768.

You can calculate the average hashrate (± 5%) for given frequency using the following formula:

(5.66 * frequency) / 1000 = hashrate in MH/s

Example: (5.66 * 600) / 1000 = 3.396 MH/s

Example: (5.66 * 768) / 1000 = 4.34688 MH/s

You can change the frequency by editing the bat file (under Windows) or sh file (under Linux and Raspberry Pi), edit the number after:

```
--set MLD:clock=600
```

For example, change it to:

```
--set MLD:clock=660
```

To mine with approx. 3.73 MH/s.

If your miner becomes unstable, stops hashing or restarts frequently, disable overclock and provide more USB power. Tweaking voltages also might be necessary to achieve greater OC potential. However, please bear in mind that overclocking voids any warranty and it's recommended only for experienced users.

Q: Can I run TTBIT miner alongside Futurebit Moonlander 2?

Yes, you can mine with them together, they are 100% compatible with each other. You can use original TTBIT software or Moonlander binaries.

Q: How many TTBIT miners can I run at the same time?

A: You can run as many as your USB hub can power. Please remember you will need a powered USB hub that can do 1-2 amps per port for all the ports you wish to use.

Q: Which mining pool do you suggest for mining Litecoin and Dogecoin?

A: We suggest using the TBDice solo mining pool: http://ltc.tbdice.org/

How it works:

TBDice automatically takes your litecoin address and gives you a unique stratum connection mining to your own address. If you find a block, 99% of the 25LTC + transaction fees get generated directly at your litecoin address.

I've included example .bat file for Windows users (.sh for Linux), so all you need to do is to edit *TBDice_LTC_DGB.bat (or .sh) file* and replace Litecoin and Dogecoin addresses there.

Other (not solo) mining pools:

https://www.litecoinpool.org/

https://minergate.com/ltc-mining-pool/

https://www.multipool.us/

https://www.antpool.com/

Q: Which coins should I mine?

Mining popular and well established coins can be not so easy with entry-level USB miner. Mining difficulty in Litecoin or Dogecoin is very high, you will be getting very tiny amounts of coins each day.

Sometimes it pays to mine brand new coins in development or other promising projects. They have great potential to grow and can make decent profits, and also you would be mining more coins per day comparing to Litecoin.

Examples:

Emerald Crypto Coin (EMD) https://www.emeraldcrypto.de/

Q: Bfgminer in Linux (or Raspberry Pi) prints following error:

```
NO DEVICES FOUND: Press 'M' and '+' to add
```

or

```
Do not have user privileges required to open /dev/ttyUSB0
```

You don't have system privileges to access USB devices in Linux. Run bfgminer as a root by typing sudo followed by your script name. For example:

```
sudo ./emd-p2pool.sh
```

Q: Bfgminer in Linux (or Raspberry Pi) prints following error:

```
NO DEVICES FOUND: Press 'M' and '+' to add
```

Even if I run as root. What should I do?

First, check if your device has been successfully recognized in your system. Type command:

```
lsusb
```

Among results you should see:

```
Bus 001 Device 002: ID 10c4:ea60 Cygnal Integrated Products,
Inc. CP2102/CP2109 UART Bridge Controller [CP210x family]
```

If you don't see this device being on the list, that means your TTBIT has not been plugged in correctly, try to unplug and plug it again. Test different USB ports and different USB hub, your USB hub maybe faulty or not compatible with your computer or your Linux system.

Another step to check if device has been successfully recognized if to check dmesg output:

```
dmesg
```

If command fails to run, try to run it as root:

```
sudo dmesg
```

Somewhere at the end of the log, you should see TTBIT being found and recognized:

```
usb 1-10: new full-speed USB device number 2 using xhci_hcd

usb 1-10: New USB device found, idVendor=10c4, idProduct=ea60,
bcdDevice= 1.00

usb 1-10: New USB device strings: Mfr=1, Product=2,
SerialNumber=3

usb 1-10: Product: TTbiT LTC Miner

usb 1-10: Manufacturer: TtbiT
```

If there is notifications or errors in red, try to troubleshoot them and fix it (different USB ports, different USB hubs, different computer altogether) before running bfgminer again. Bfgminer will likely not find the miner if it's not successfully recognized in lsusb and dmesg.

Q: Bfgminer in Linux (or Raspberry Pi) prints following error:

```
./bfgminer: error while loading shared libraries:
libncurses.so.5: cannot open shared object file: No such file
or directory
```

or:

```
./bfgminer: error while loading shared libraries:
libjansson.so.4: cannot open shared object file: No such file
or directory
```

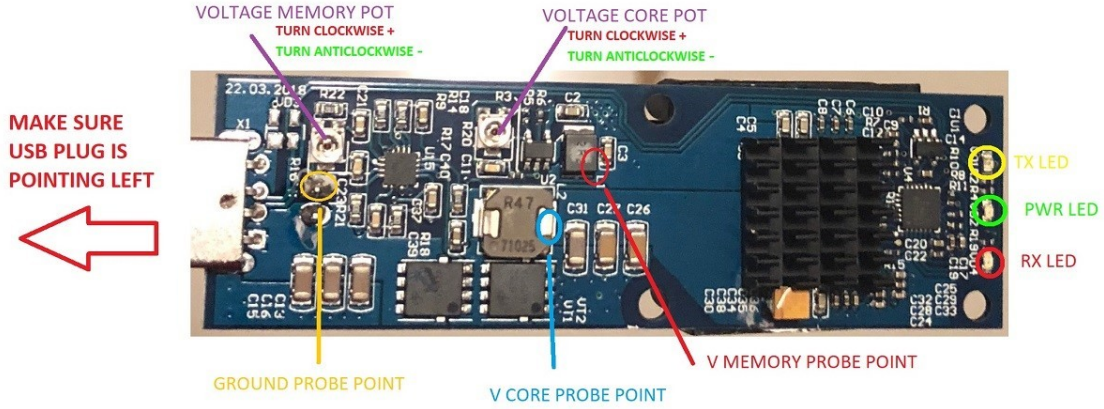
You need to install missing *libncurses5* and/or *libjansson4* libraries. Install them using your package manager or via terminal:

```
sudo apt update && sudo apt install libncurses5 libjansson4
```

7. Voltage and Frequency Adjustments (overclocking)

Even with a fan built in, you can still overheat your TTBIT at higher frequencies. I do not recommend running these past 800mhz unless you can closely monitor temps (if you have a IR temp gun check the top ASIC heatsink, it should not be any hotter than 80C).

Below is a visual of the board for reference:



There are two pots that control the two main voltages feeding the ASIC. Top pot controls the memory voltage (when looking at the board with USB port facing left), and bottom controls core voltage. You adjust the voltage by turning the Pot clockwise or counterclockwise with a fine flat head or philips screwdriver. The pots are VERY sensitive, the whole voltage range is within HALF a turn in either direction from the stock position. You must do micro adjustments if you want to do very fine tuning. For example going from .75 - .8 v might take as little as a little torque pressure on the screwdriver even if you don't feel it actually twist.

Make sure you have place the stick horizontal and the USB end is facing LEFT.

To turn the voltage UP turn the pot CLOCKWISE, to turn it DOWN, COUNTERCLOCKWISE.

DO NOT turn the pots more than 180 degrees in either direction, they have no stops and if you go past their lowest or highest setting you could damage them

To check the voltage use a multimeter and contact the ground wire to either of the two ground terminals (circled and labeled ground in the picture), and the positive wire to the outputs of the two inductors (circled and labeled VCORE, and VMEMORY). Be extra careful not to short anything as a single short anywhere on the board while its powered will most likely fry it. If you don't have a multimeter, you can wing voltages by following the diagrams below for Pot positions. Use the flat edge of the pot screw as the pointing direction (DO NOT OVERVOLT at the high end if you don't have a multimeter to double check what the voltage is).

The sticks are shipped with the stock voltage settings of the pots (which is the flat end of the Pot pointing down). The Core voltage is at around .75v, which is good for up to around 800mhz stable, and ranges from ~.6 -> ~.95v . The memory voltage is set to ~.85v, and ranges from ~.625 -> ~1.05v (more on memory voltage in tuning section below).

DO NOT go past .9v on the core voltage, you will most likely damage the ASIC if you run at high voltages and high clocks for prolonged periods of time.

7a. Tuning

Tuning any switching transistor based processing unit revolves around supplying enough current so the transistors on the chips actually switch on and off correctly within their cycle times. The main voltage that will effect performance and the tuning outlined below is the Core Voltage.

The higher the frequency the less time a transistor has to charge so you need more current (i.e. turn up the voltage). If these requirements are not met the transistors don't function properly and you have what you know as a "Hardware Error".

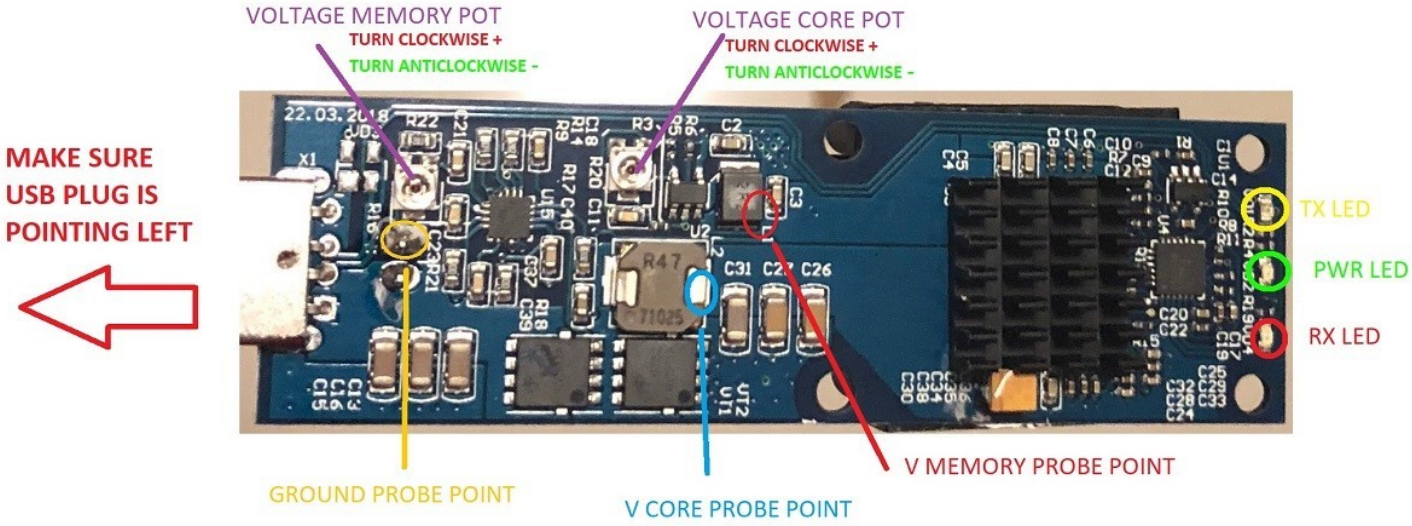
7b. Memory Voltage

I included a Pot for memory voltage mostly for efficiency gains by undervolting memory. Adjusting memory voltage should be a one time thing, you set it at the lowest setting it will start hashing. There is no benefit in increase memory voltage at higher clocks, as this wont increase your hash rate or bring down hardware errors (this is entirely dependent on core voltage). Either your device will work at a certain memory voltage or it wont, so the goal is to bring the voltage down to the lowest possible setting that the stick will still hash at.

The stock value for memory is supposed to be .9v, but my tests showed all ASICs operate fine at .85v which is what they ship at. Most ASICs will work fine down to ~.76 v.

7c. Checking the core voltage

You will need a voltmeter to check and adjust the core voltage of your ttbit device. First set your voltmeter to test voltage. Then place the positive (red) probe on the VCORE probe point and negative (black) probe on the ground point (see diagram below).



The stock VCORE value is 0.75V and is suitable for running your device at 3mh. If you want to overclock your device (hit the high speed of 5mh) then you will need to change VCORE value to 0.90V. Use a small screwdriver to turn the voltage core pot clockwise (only a small quarter turn is enough). Do not over turn the pots, it could damage your device.