PicoBT: One tester for repairing all miners

PicoBT Miner Analyzer

PicoBT is a professional miner tester that electronics repairmen and engineers can diagnose and repair more than 70 models of Hashboards and 19 models of smart power supplies manufactured by Innosilicon, Whatsminer, Antminer, Aixin, Cheetah and Dragon companies.

Compared to traditional miner repair methods, PicoBT tester with unique its features can reduce the diagnostic time by at least 10 times, and increase the accuracy of diagnose by 4 times in troubleshooting minor components, namely Hashboards and smart power supplies units.

Supported models

- **Diagnosting more than 70 Hashboard models:**

  Innosilicon: T1, T2, T3, T3+, S3, S3+, T3H, A4, A4+, A6, A6+, T2T, T2T+, T2Ti, T2Ts, T2Tz, T2Tzs, T2Tzu, T2Tza, T2Th, T2Ths, T2Thm, T2Thf, T2Th+, T2Ths+, T2Thm+, T2Thf+, T2Thl+, L1, L2, L2HU, L2HF, L2HL, L2HS, T1H

  Whatsminer: M3V1, M3V2, M20, M20s, M21, M21s, M30s, M30s+, M30s++, M31s, M31s+, M32, M32s

  Antminer: S9, S9i, S9j, S9k, S9se, T9+, L3+, T17, T17+, T17e, T17pro, S17, S17+, S17e, S17pro, S11, T19, S19, S19pro S19j, S19Jpro, S19A, S19Apro, S19_88

  Aixin, Cheetah, Aladdin and Dragon: A1, Q3, F1, S5, T1

- **Testeing more than 15 Power Supply models:**

  Innosilicon: G1138, G1240, G1266, G1286, G1306, QB2412-B, QB2412-C

  Whatsminer: P21, P20, P21e, P21d, P221, P222C

  Antminer: APW8, APW9, APW9+, APW12

  Aixin, Cheetah: TT240015P, HQ2500-A02

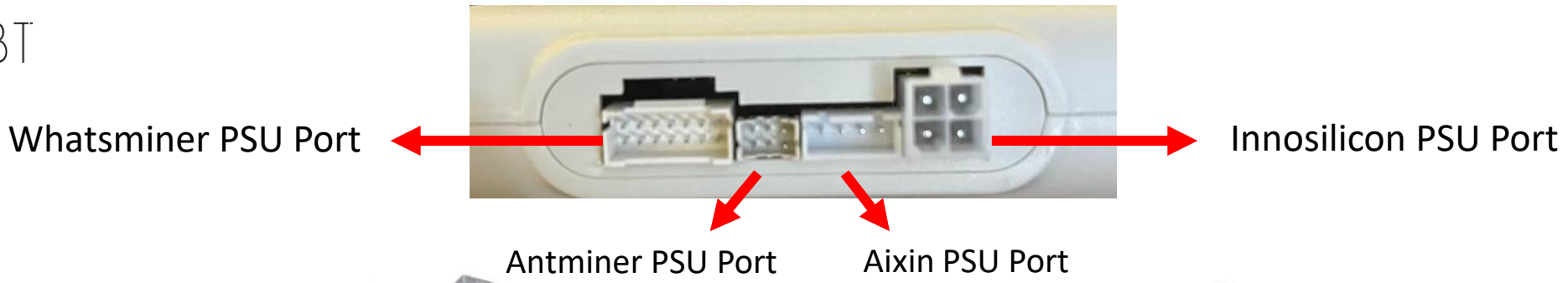- **EEPROM flash and editor:**

  Antminer(S11 , 17-series) and *Whatsminer* hashboards

Specifications

- **Determining healthy chips (in forward):** showing numbers of healthy chips in big white number for all hashboard models
- **healthy chips (in reverse) with Oscop:** showing numbers of healthy chips in big yellow number for all models of Whatsminer and Antminer (from last to first ASICs)
- **temperature sensor values:** showing external temperature sensor and corresponding internal temperature sensor of chips for T17/S17-series of Antminers – showing external temperature sensor values for Whatsminer models
- **working with reset signal:** ON/OFF testing of RESET signal through all chips in Antminer and Whatsminer models
- **weak chips:** list week and broken chips for Innosilicon hashboards and A1, Q3, F1, S5, T1
- **Innosilicon chips model:** determining model of each chip for Innosilicon hashboards and A1, Q3, F1, S5, T1
- **Innosilicon TEMP of chips:** determining temperatures of each chip for Innosilicon hashboards and A1, Q3, F1, S5, T1
- **Whatsminer chips model:** showing chips model in EEPROM for whatsminers – testing READ CHIPS MODEL command for whatsminers (KF1921, KF1922, KF1930, KF1950)
- **Adjust test sensitivity (5 level):** adjust precision of test for Innosilicon hashboards and A1, Q3, F1, S5, T1
- **EEPROM Editor:** Copy, flash and save EEPROM contents for Whatsminers and Antminers – you can save 8 EEPROM data in PicoBT tester permanently
- **Enabling Smart Power Supplies** with proper level of output voltage

Benefits

- **Models:** Ability to troubleshoot 70 hashboard models and 19 smart PSU models, as well as synchronizing the hashboards, with just one general tester.
- **Speed and accuracy:** Using PicoBT tester, with its high accuracy, intelligence and different capabilities, damaged and healthy chips of any hashboard can be detected by 10 times faster.
- **PSU enabling:** In addition to the ability to diagnosing hashboards, this tester has the ability to activate more than 19 models of smart power supplies, which can help a lot in power troubleshooting.
- **EEPROM editor:** It can synchronize the hash boards with different serial numbers inside the miners to make them the same as the other two hash boards, so that the miners can start and work normally. This ability is suitable for Antminer S11, 17-series and 19 series hashboards as well as all Whatsminer hashboards. There is no need for power supply connected to hashboard and no computer.
- **VERSATILITY:** Ability to testing the hashboard with different accuracy and modes allows weak chips to be detected in addition to healthy and damaged chips. In addition, Smart PSUs testing features, without needs to any computer, made PicoBT a unique universal tester.
- **Benefit for Bitcoin farms or distributer center:** To solve small problems, you no longer need to go to repair shops and spend a lot of time and money. You can also accurately find the faulty part in a minor that does not work

Whatsminer PSU Port

Innosilicon PSU Port

Antminer PSU Port

Aixin PSU Port

Program Port

Cheetah, Aixin Hashboard Port

Antminer Hashboard Port

Innosilicon Hashboard Port

Whatsminer Hashboard Port

Scope Connector

Input Voltage

On/Off Switch

Hashboard Ports

Port	Supported Hashboard
Antminer Hashboard Port	S9, S9i, S9j, S9k, S9se, L3+,T17, T17+, T17e, T17pro, S17, S17+, S17e, S17pro, S11 T19, S19, S19pro S19j, S19Jpro, S19A, S19Apro, S19_88
Whatsminer Hashboard Port	M20, M20s, M21, M21s,M30s, M30s+, M30s++, M31s, M31s+, M32, M32s
Innosilicon Hashboard Port	T1, T2, T3, T3+, S3, S3+, T3H, A4, A4+, A6, A6+,T2T, T2T+, T2Ti, T2Ts, T2Tz, T2Tzs, T2Tzu, T2Tza, T2Th,T2Ths, T2Thm, T2Thf, T2Th+, T2Ths+, T2Thm+, T2Thf+, T2Thl+ , L1, L2, L2HU, L2HF, L2HL, L2HS, T1H
Cheetah, Aixin Hashboard Port	A1, Q3, F1, S5

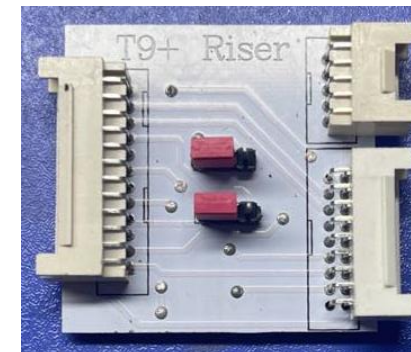- In order to test M3V1, M3V2 hashboards you must use M3 Rizer

To M3 Hashboard
(with M3 data cable) ← → Whatsminer Hashboard Port

- In order to test T9+ hashboard you must use T9+ Rizer

→ Program Port
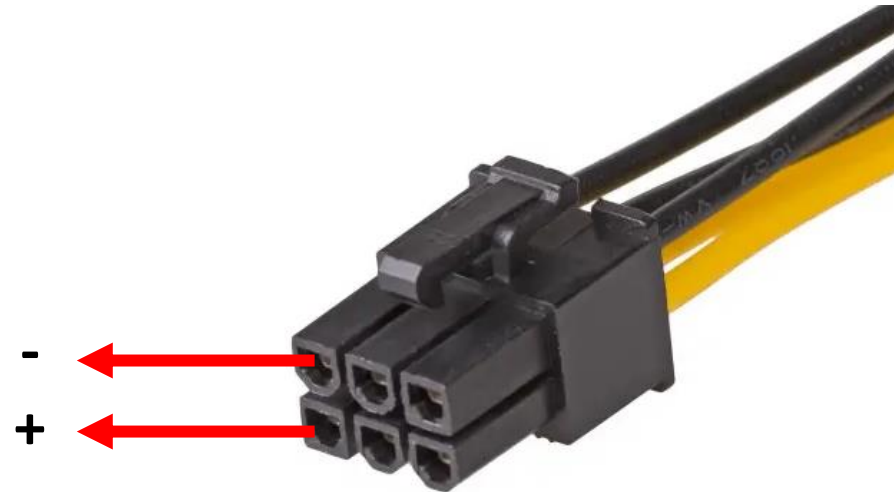
To T9+ Hashboard ← → Antminer Hashboard Port

PSU Ports

Port	Supported PSU
Antminer PSU Port	APW8, APW9, APW9+, APW12
Whatsminer PSU Port	P21, P20, P21D, P21E, P221, P222C
Inoosilicon PSU Port	G1138, G1240, G1266, G1286, G1306, QB2412-B, QB2412-C
Cheetah, Aixin PSU Port	A1, Q3

Input voltage for Tester

Port	Spcification
Input voltage for tester	8-21 volt, 200mA

Hashboard input voltages

Input voltages	hashboards
11	S11
12 - 12.5	S9, S9i, S9j, S9k, S9se, T9, L3+, M3, T1
13 - 13.5	M20, M20s, M21, M21s,M30s, M30s+, M30s++, M32, M32s
11 - 11.5	M31s, M31s+,
15	T2, T3, T3+, S3, S3+, T3H, A4, A4+, A6, A6+,T2T, T2T+, T2Ti, T2Ts, T2Tz, T2Tzs, T2Tzu, T2Tza, T2Th,T2Ths, T2Thm, T2Thf, T2Th+, T2Ths+, T2Thm+, T2Thf+,T2Thl+ , L1, L2, L2HU, L2HF, L2HL, L2HS, T1H
15	A1, Q3, F1, S5 , T19, S19, S19pro S19j, S19Jpro, S19A, S19Apro, S19_88
16 - 19	T17, T17+, T17pro, S17, S17+, T17pro
17 - 19	T17e, S17e

Minimum current capability of Power supply for hashboards

Minimum current	hashboards
25	T19, S19, S19pro S19j, S19Jpro, S19A, S19Apro, S19_88, T3 ,T3+ ,S3 , S3+
10	others

Test modes for Antminer hashboards

Option	Supported Hashboards	Modes
S9	S9, S9i, S9j	Mode1, Mode2
S9k	S9k	ASIC test, ASIC test using scope in reverse direction
S9se	S9se	ASIC test, ASIC test using scope in reverse direction
T9+	T9+	ASIC test, ASIC test using scope in reverse direction
T9	T9	ASIC test, ASIC test using scope in reverse direction
S11	S11	ASIC test, ASIC test using scope in reverse direction
T17	T17, T17 pro	Mode1, Mode2
T17+	T17+	Mode1, Mode2
T17e	T17e	Mode1, Mode2, Mode3
S17	S17, S17 pro	Mode1, Mode2
S17+	S17+	Mode1, Mode2
S17e	S17e	Mode1, Mode2, Mode3
L3+	L3, L3+, L3++	ASIC test, ASIC test using scope in reverse direction
S19	T19, S19, S19pro S19j, S19Jpro, S19A, S19Apro, S19_88	ASIC test, TEMP sensors test, showing PIC firmware value, ASIC test using scope in reverse direction
T19	T19 series	ASIC test, TEMP sensors test, showing PIC firmware value, ASIC test using scope in reverse direction

Mode1: ASIC test, ASIC test using scope in reverse direction
Mode2: TEMP sensors (internal and external) test
Mode3: DOMAIN voltages test

Test modes for Innosilicon, lovecore and Cheetah hashboards

Option	Supported Hashboards	Modes
T2T	T2T turbo (93 ASIC)	Mode1, Mode2, Mode3
T2Ti	T2Ti (99 ASIC)	Mode1, Mode2, Mode3
T2Ts	T2Ts (105 ASIC)	Mode1, Mode2, Mode3
T2Tz	T2Tz, T2Tzs, T2Tzu, T2Tza (140 ASIC)	Mode1, Mode2, Mode3
T2T+	T2Ts (164 ASIC)	Mode1, Mode2, Mode3
T2Th+	T2Th+, T2Ths+, T2Thm+, T2Thf+, T2Thl+ (140 ASIC)	Mode1, Mode2, Mode3
T2Th	T2Th, T2Ths (140 ASIC)	Mode1, Mode2, Mode3
T2Thm	T2Thm (140 ASIC)	Mode1, Mode2, Mode3
T2Thf	T2Thf, T1H (140 ASIC)	Mode1, Mode2, Mode3
A1/F1	A1, F1, S5	Mode1, Mode2, Mode3
A4	A4, A4+	Mode1, Mode2, Mode3
A6	A6, A6+	Mode1, Mode2, Mode3
T1	Innosilicon, Dragon, lovecore, Aladdin	Mode1, Mode2, Mode3
T2	T2	Mode1, Mode2, Mode3
T3	T3, S3, T3H	Mode1, Mode2
Q3	Q3	Mode1, Mode2, Mode3
L2	L1, L2, L2HU, L2HF, L2HL, L2HS	Mode1, Mode2, Mode3
T3+	T3+, S3+	Mode1, Mode2

Mode1: ASIC test, detecting WEAK chips   **Mode2:** Temp value of chips   **Mode3:** showing chips model

Test modes for Whatsminer hashboards

Option	Supported Hashboards	Modes
M3	M3v1, M3v2	ASIC Test, Temp Sensor Test
M20	M20, M20s, (hashboards with KF1920, KF1921, KF1922 chip)	Mode1, Mode2
M21	M21, M21s, (hashboards with KF1920, KF1921, KF1922 chip)	Mode1, Mode2
M30	M30s, M30s+, M30s++, (hashboards with KF1930 chip)	Mode1, Mode2
M31	M31s, M31s+, (hashboards with KF1950 chip)	Mode1
M32	M32, M32s, (hashboards with KF1930 chip)	Mode1, Mode2

Mode1:
1) ASIC test (in forward direction)
2) ASIC test (in reverse direction) using scope probe
3) Showing chips model in EEPROM
4) Showing external temp sensor value

Mode2:
1) Testing READ CHIPS MODEL command for chips
(KF1921, KF1921, KF1922, KF1930)

Hashboard, PSU, Code Editor Modes

- How to enter the *hashboard testing* mode?

First conncet input voltage cable to the tester. Then just press On/Off switch
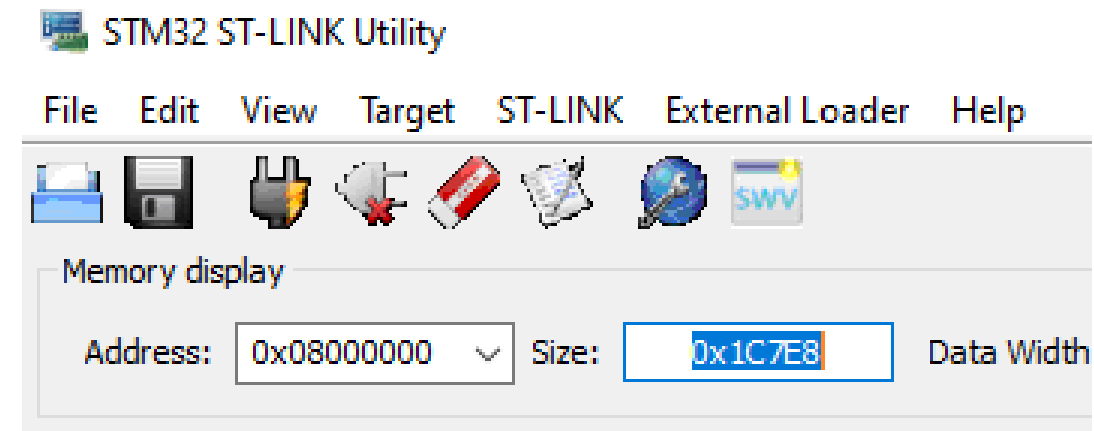
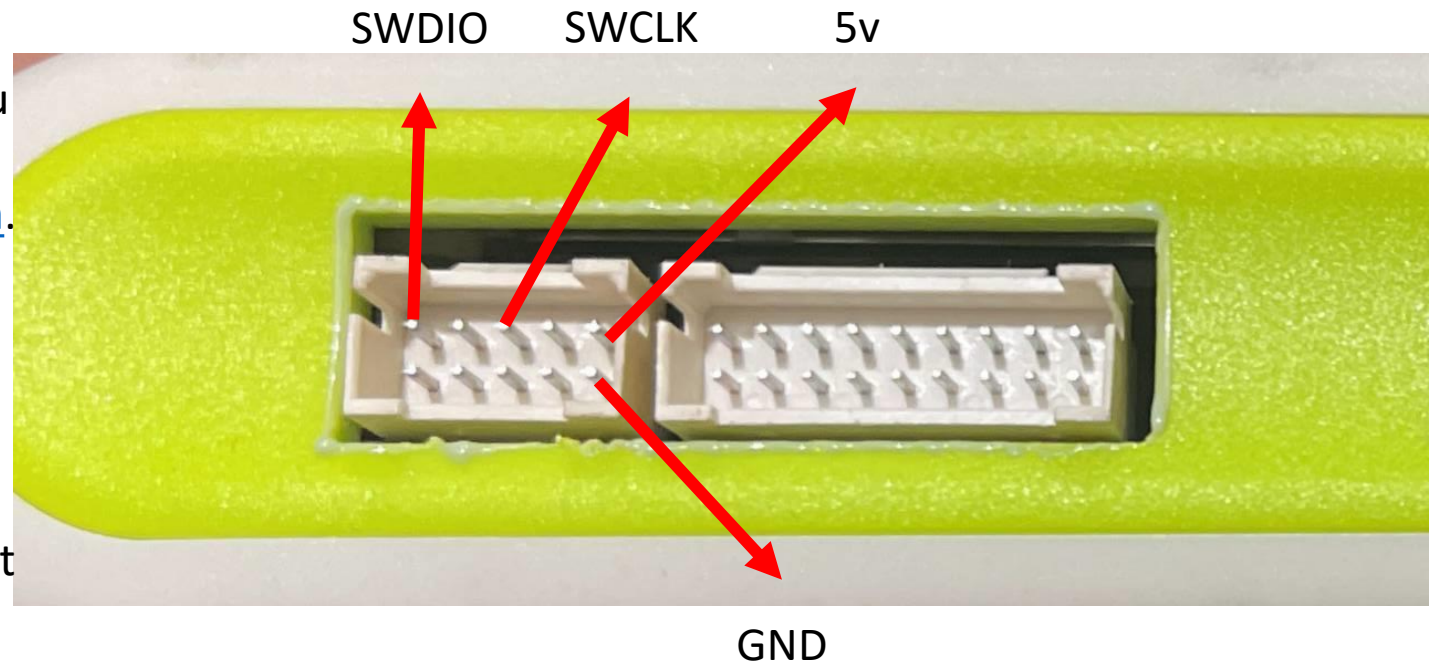- How to enter the *PSU testing* mode?

First conncet input voltage cable to the tester. On/Off switch must be Off. Turn on the switch while you are holding the **white** key for 2 seconds. You will see a new page on the lcd. Now press the **red** key.

- How to enter the *Code Editor* mode?

First conncet input voltage cable to the tester. On/Off switch must be Off. Turn on the switch while you are holding the **white** key for 2 seconds. You will see a new page on the lcd. Now press the **white** key.

- How to **UPDATE** the tester?

The tester updates as the next page instructions.

Program Port

How to UPDATE the tester?

1- turn off the tester. Turn on the switch while you are holding the **RED** key for 2 seconds.

2- send ID of the tester to picobt.com@gmail.com. You will get a new HEX file after 2 days as the last firmware for your tester.

3- using a **2*5 PHB2.0 cable**, connect (5v - GND - SWDIO - SWCLK) pins to the ST-LINK V2 Programmer for STM32 MCU's.

4- download STM32 ST-LINK Utility and setup that on your PC.

5- ...

SWDIO   SWCLK   5v

GND

STM32 ST-LINK Utility

STM32 ST-LINK Utility

File   Edit   View   Target   ST-LINK   External Loader   Help

Memory display

Address: 0x08000000   Size: 0x1C7E8   Data Width

Program Port

How to UPDATE the tester?

5- connect programmer to the tester and PC. Make sure its driver is setuped (no other cables must be connect to the tester)

6- press icon 🔌 to connect to the tester

7- press icon 💾 to save your old firmware (with Hex format)

8- press icon 🖳 to load your new firmware (with Hex format)

9- press icon 📝 to programing

SWDIO   SWCLK   5v

GND

STM32 ST-LINK Utility

STM32 ST-LINK Utility

File   Edit   View   Target   ST-LINK   External Loader   Help

Memory display

Address: 0x08000000   Size: 0x1C7E8   Data Width