

STPSU r2022

power supply unit for Atari 16/32-bit personal computers

by Centuriontech.eu



User manual

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Revision history:

12.3.2022 0.1 Initial release

Introduction

Built from most reputable brand name parts only, STPSU r2022 is modern, efficient dual output power supply unit, designed specifically for Atari 16/32-bit series of computer systems. As such, it can be directly used to replace your aging or failing original Atari power supply unit, without a need to modify your precious computer in any way. These are some of the feature highlights:

- Extremely easy installation, the only true “plug&play”, complete drop-in solution for your Atari 16/32-bit computer available on market today.
- Works on both 230V and 110V AC power networks
- Highly efficient switched mode power supply design, extremely low heat dissipation
- High current output capability to support even most upgraded and modified computer configurations
- Stable low noise output power in all working conditions
- Zero noise design without heatsink and/or fan
- Low no-load and standby power consumption
- On-board Molex output connector to power your additional devices
- On-board LED indicators give you an operational status at all times

Integrated safety and reliability features, such as:

- accurate, auto-recovering, hysteretic thermal shutdown function
- output short circuits and open feedback loops protection with auto restart
- output over-current protection

STPSU is fully compatible with most of 16/32-bits Atari computers, such as:

Atari 520 STF/E

Atari 1040 STF/STFM/E

Atari MegaST/2/4

Atari Falcon 030

The installation of STPSU is simple and straight forward, yet I suggest you take your time and read this manual. It will guide you through the process of installation, help you avoid common mistakes and save your time.

Technical parameters

Input voltage:	90V – 265V AC
Output voltage:	5V, 12V DC
Max. continuous output current:	4.0A @5V; 1.6A @12V
Combined output:	40W
No-load power consumption:	< 300 mW @230V AC
Efficiency:	83% at full load
Operating temperature:	-5 to 80 °C

Compliance

Meets CEC 2008 requirements

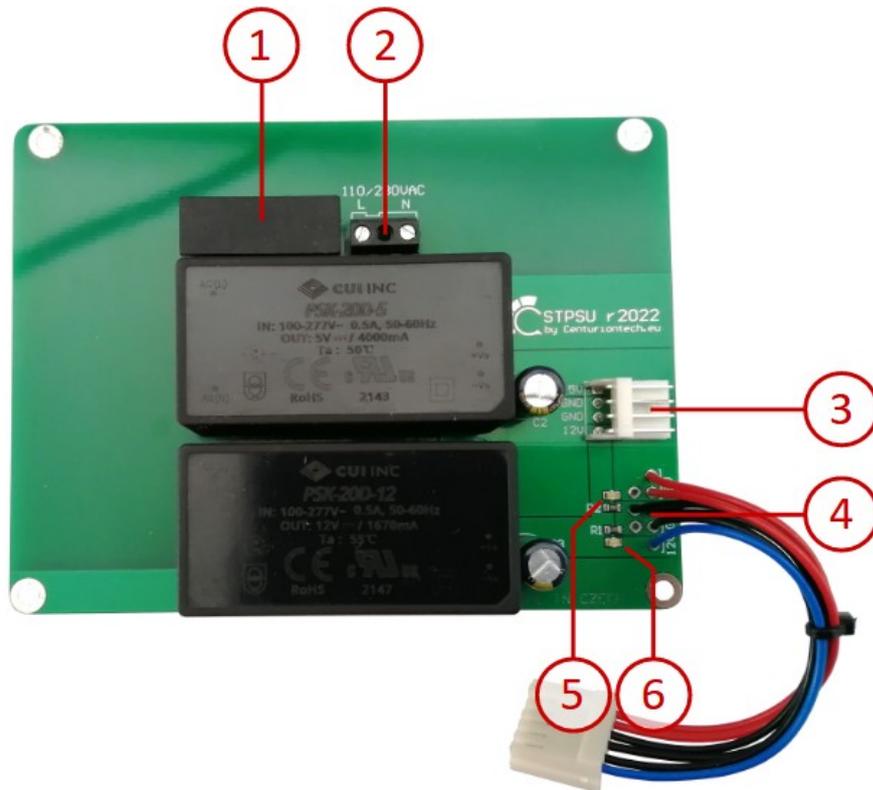
Meets EN55022 and CISPR-22 Class B conducted EMI

Meets EN 61000-6-4 EMC requirements

Note: EMI/EMC compliance is measured at system level. It can only be achieved if your system is in perfectly working order. STPSU as well as rest of the system must be covered with original sheet metal EMI shield. Metal shielding must maintain proper grounding connection.

STPSU layout

STPSU has been designed as direct “plug&play” replacement for your original Atari ST computer power supply unit. However, due to subtle layout differences between the two, it is recommended that you use following diagram to identify key components of your new STPSU device. Understanding its layout will help you later during the installation.



- (1) Mains (AC) fuse
- (2) Mains (AC) power terminal block (ST version) or Molex 2 pin male socket (F030 version)
- (3) Additional accessory Molex DC power connector
- (4) Mainboard DC power output cable
- (5) Output power status LED indicator, 5V rail
- (6) Output power status LED indicator, 12V rail

Safety warnings

Safety is a major factor in the design of this product. But, safety is YOUR responsibility too. Please read carefully following safety tips and precautions. Retain these tips for later use.



- This device is only intended to be used as a replacement power supply unit for Atari 16/32bit personal computer systems, such as Atari 520STF, 1040ST/F/FM/E or MegaST. In terms of safety, no other use of STPSU is allowed.
- Installation, deinstallation and/or maintenance of this device should only be performed by qualified personnel. Incorrect installation can cause electric shock or even fire, when the product is subsequently used.
- Every time, before you attempt to install, remove or maintain this device, make sure the system is completely switched off and the power cable is disconnected.
- This power supply unit contains number of high performance capacitors. These retain large volume of electrical energy long after it has been disconnected from mains power. Therefore make sure all capacitors are fully discharged before you manipulate the device in any way.
- Never install or use STPSU unit, that has been damaged during previous transport or from improper handling. Damaged device can cause fire, expose user to the risk of serious injury and/or can cause permanent damage to the system it is installed in. If you are unsure, whether your device is damaged or not, please consult Centuriotech.eu rep.
- This device can only operate safely and perform correctly, if it is installed in a flawlessly working computer. Do not attempt to use STPSU in a computer, that displays signs of damage or is known to cause electrical failures.
- This product should be operated only from the type of AC power as listed in this manual. If you are unsure of the type of AC power being provided, contact a qualified service person.
- This device contains no end-user serviceable parts. Do not attempt to service this unit by yourself. Improper manipulation may expose you to dangerous voltages or other related hazards.
- Consult your Atari computer system manual for other applicable safety tips and requirements.

Installation

- a) Switch off your computer system completely.
- b) Disconnect your computer from power socket.
- c) Remove power cable from your Atari computer. If needed, disconnect all peripheral cables too.
- d) If your computer has a floppy drive, make sure you remove a floppy disk from there.
- e) Carefully turn your computer upside down. Remove all the screws using Phillips (PH2) screwdriver. The number of screws depends on the system, carefully look for all of them. There might also be one or two hidden behind a sticker. Keep these screws aside, you will need them during reassembly.
- f) Once all the screws are removed, you should be able to easily separate top and bottom case parts. Be careful not to break them. Place your computer on flat solid surface with top side up.
- g) Locate sheet metal EMI shield above your original power supply (PSU). Note its position and orientation. Note there are lips that fit in the respective pockets of EMI shielding. Note the number and position of screws holding it in place. Remove these screws and keep them aside.

Note: On some Atari models, such as some Mega STs, the PSU is not shielded by separate EMI shielding. In such a case, you need to remove entire top half of system cover to gain access to the original PSU.

- h) Remove EMI shield by simply lifting it up. You should now have free access to the power supply unit bay.
- i) Disconnect your original power supply from the motherboard. Locate 6 wire (blue, black, red) output power cable with mini-Molex connector on its far end. Pull the cable at the mainboard side upwards, until it disconnects from the mainboard socket.
- j) Locate four metric screws securing PSU to the sheet metal frame. There should be four of them, one in every corner of power supply PCB. Unscrew them and put them aside. Loosen the power supply from the metal frame.
- k) Once again, check that the PSU is fully disconnected from AC power.
- l) **ST version:** Cut both AC input power leads as close to power supply board as possible using side cutter, sharp pliers, or similar tool. Remove about 4 to 5mm (0,2") of PVC insulation from end of each input power lead. Tighten up bare lead ends by either twisting them. If possible, it is suggested to provide bare ends with cord-end terminal, or tin it properly. Now connect input power leads to STPSU terminal block (2). Insert bare end of live (black) wire into "L" terminal and bare end of neutral (white) wire into "N" terminal. Secure both leads with terminal block screws firmly.
F030 version: Unplug AC connector lead from your original PSU. Plug this AC lead to the same connector on STPSU.
- m) Place your STPSU on sheet metal frame same way your original PSU was placed. Components side must face up, and mains power connector block (2) with connected leads must face back of your Atari computer. Make sure STPSU sits on flat, then screw it down with all 4 metric screws same way your original power supply used to be. Do not use excessive force when tightening the screws.
- n) Connect STPSU mainboard connector output cable (3) to the corresponding female connector on the motherboard of your computer. Make sure it is fully inserted.

- o) Put back PSU sheet metal cover and screw it down to the rest of computer EMI shielding.
- p) Carefully put back the top plastic computer case cover. Secure it with all the original screws.
- q) Connect all peripherals back to your Atari computer. Connect back your power supply cable / mains lead.

Congratulations, your STPSU is now installed and you may now switch on your computer.

Troubleshooting

I have installed STPSU, but my Atari will not turn on now.

Oh, that's very unfortunate. But don't give up, we will figure it out. Let me ask you a simple question first. Did your green indicator LED on keyboard lit, when you switched on your computer? If yes, your computer is generally getting power and your problem is most likely not with your new STPSU, but lies somewhere else. Did you reconnect all your peripherals? What if that is not the case and your green power LED indicator remains dark. Well, let us start from something simple:

Please check your AC power. Do you have power cable fully inserted in your computer? Is your power cable properly plugged in wall socket? You did switch your computer on using the main power switch, located on back of your computer, did you? (I know what you are saying, but I simply had to ask, please bear with me).

Since you keep on reading, it seems these simple steps did not provide simple solution to your problem and we must dig deeper. Now, following all the safety precautions, open your computer again. You can do that following installation procedure starting a) to h) including. Now check fuse (1) using ohm meter, it should read close to 0 ohms. If it reads infinite, replace the fuse with spare 250V/2A one. Set your STPSU power indicator LED switch to "enable" position. To do so, follow installation procedure article p). Now provided that you are qualified engineer and you know all the safety procedures and precautions, when manipulating device under power, carefully plug the power cord and switch on the computer. Did STPSU power indicator LED lit? If yes, your STPSU is working and supplying power. Switch off the power and double check your output power mainboard cable. Make sure its properly plugged in to motherboard, fully seated. Switch on the computer again. Now if your STPSU indicator LED goes green, but your computer is still dead, it is most likely your motherboard in need of repair.

Is your STPSU LED short blinking at frequency about 1 blink/sec? If yes, there is a short circuit on some of the connected devices (motherboard, FDD, HDD,..). Try unplugging your devices one by one, to identify the failing one. The STPSU will self-restart and perform normally once the short circuit has been removed.

If your STPSU power indicator LED remains off even so the power is on, check AC power on terminal block connector (2). It should read either around 110V AC for US or around 230V for basically rest of the world. If you read proper voltage and yet the power indicator is still of, your STPSU is most likely faulty. Please contact us s at centuriontech.eu@outlook.com for instructions how to handle such a quality claim.

My Atari computer is unstable, it often locks up during game play or when it reads disks.

PSU is not the only component in a computer system. It can only perform properly, if the rest of your system is working flawlessly too. Especially, please check and replace all aging electrolytic capacitors on mainboard or another connected device.

Servicing and maintenance

STPSU is designed as care-free / maintenance-free device. Such as that it contains no user serviceable parts, with only one exception. While STPSU has advanced safety features of modern PSU's, such as overvoltage and overcurrent protection, there is also 20x5mm 250V/2A mains fuse socketed on PCB. In case of its failure, the fuse can be easily replaced.

CAUTION:

STPSU should only be serviced by qualified personnel, this applies to simple tasks, such as replacing the fuse, as well.

Always follow all safety precautions, make sure your STPSU is switched off and fully disconnected from mains power.

Always replace failed fuse with another one of the same rating (250V/2A) only.

Should you need any other assistance with your device, please email centuriontech.eu@outlook.com with your problem description.

Frequently asked questions (FAQ)

Is STPSU powerful enough to feed my ST with internal CF card? Or even desktop HDD?

STPSU can provide constant 2A @ 12V rail, which is more than enough for 2 regular 3,5" IDE hard drives. And of course, it can feed your CF card too.

Can I use STPSU with U.S. power distribution network?

Yes, STPSU will work in US 110V network out of the box.

Will I need to modify my Atari computer to be able to install and use STPSU?

Not at all. No modifications whatsoever are needed.

What special tools will I need to install STPSU?

None. Please see "Installation" chapter for step by step instructions.

Is soldering required?

Not really. Please see "Installation" chapter for step by step instructions.

I am about to order STPSU. Does it come with Atari sheet metal frame, power switch and power cord socket?

No, it does not. Your purchase will contain fully assembled and tested power supply unit, complete with mainboard power supply cable, but it does not come with Atari system frame, nor socket and/or power switch. EU power cord can however be ordered as option with your STPSU.

Is STPSU compatible with Falcon 030?

As a matter of fact, yes, it is, unless your Falcon is enhanced with 3rd party 060 accelerators, such as CT60/63. Unfortunately, even factory Falcon 030 has different power supply connector than ST line and needs to be ordered separately. Please contact us at centuriontech.eu@outlook.com for further information and ordering options.

Is STPSU compatible with TT then?

Unfortunately no as TT has different power requirements. Well, maybe there will be TTPSU one day?

Will there will be TTPSU one day?

Maybe.

Is STPSU compatible with 130ST, 260ST, 520ST?

Unfortunately no. These computers use external, wall plugged PSU. Check out our ST520PSU instead.

How about Megafile?

Well... it depends on hard drive connected, resp. on its power consumption at 12V rail. Old MFM hard drives originally used in Megafile, such as Seagate ST225, were typically rated at 2A/12V. While this is supposedly within the spec of STPSU, these drives could in fact draw up to 2,8A when powered up. This would initiate STPSU over-current protection and cause an infinite shutdown - restart loop, until the hard drive is unplugged. If, on the other hand, your Megafile contains a less power hungry hard drive, STPSU will work for you.