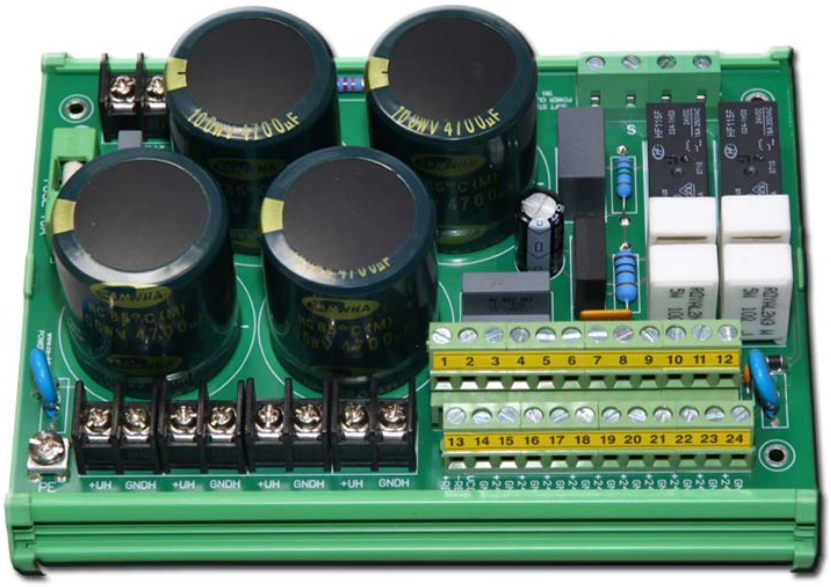
CS LAB s.c.
ElectronicLaboratory

POWER MODULE V.2

Power supply module for stepper/servo motor drives (DC/AC/BLDC) with soft-start



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1. General

In a power circuit of motor controllers there is very often necessary to use DC power supply. As controllers shouldn't be powered by pulse-powered systems, there should be used linear power supplies with proper filters, providing supply of suitable constant voltage to the system. The use of high-capacity capacitors significantly decreases ripples generated on the supply line, what actually influences on a system lifespan.

Additionally, the power supply system is equipped with soft-start circuit. It assures soft start of mains transformer and it doesn't generate in the mains supply circuit a surge current , which may turn off or burn a fuse. Soft-start system was designed to switch on 1KW transformers. Additionally there is a relay that disconnect 230V AC mains supply and which control contacts are leaded out to a terminal block (REL+ pin1 ; REL- pin13 contacts). 24V DC relay control voltage.

Additional contacts on the terminal block allow for 24V DC power distribution to control systems or automatics. VCC input (pin2) leads the power to all +24V contacts via 2A polymer fuse.

Screw terminals signed as [+ ; -] are terminals that leads DC voltage from the bridge rectifier, which should be placed out of the system and should have cooling and large enough current and voltage.

Screw terminals signed as +UH ; GNDH are voltage outputs of drives power. Additionally, in the power circuit there is a 10A fuse, which in situation of electrical damage of the drive will protect in case of transformer burning.

There are 3 voltage versions of the power module, up to: 100V DC, 150V DC and 200V DC.

The Power module reqiures a properly matched transformer and a rectifier bridge.

HIGH VOLTAGE !

When AC input supply is connected there is a high voltage on the power supply system. Installation, launching and conservation should be done by qualified staff. Installation, launching and conservation done by unqualified persons may lead to death or serious injuries.

WARNING !

The power module contains DC circuits capacitors, which remain charged after AC power disconnection. To avoid electric shock the AC power should be isolated from the power supply module for 10 minutes till the capacitors are discharged.

2. Connection

- 230V supply voltage connect to screw terminals (signed as AC-230V)
- The mains transformer (primary winding) connect to TR1 terminals
- Transformer secondary winding output connect through the bridge rectifier to the screw terminals [+ ; -] – pay special attention to the polarization. While connecting also pay attention to used cross-section of connection wires.
- Motor controllers power supply should be connected to +UH terminals (positive pole); GNDH (negative pole).
- It's also necessary to power the relay (terminals REL+ [pin1] ; REL- [pin13]). The relay should be switched in the safety control circuit. When using CS-Lab controllers (CSMIO/IP) REL+ [pin1] terminal should be connected to the digital output of the controller (+24V) and REL- [pin13] terminal to the GND of CSMIO/IP controller power supply system. In this system selected digital output - in plugin must be selected as „HVEnable".
- Optionally you can connect external 24V DC power to VCC terminals [pin2] (positive voltage) and GND [pin14]. Terminals [3 to 12] we can use in the system to power additional devices as CSMIO controller, CSMIO expansion modules and so on. You should remember that total current consumption cannot exceed 2A because it may cause power supply disconnection on these terminals.

3. Terminals description

Terminal (**AC230V**) - 230V AC supply voltage connection

Terminal (**TR1**) – transformer primary winding connection

Terminal **(+ -)** – constant voltage connection from the bridge rectifier

Terminal (**+UH ; GNDH**) – motor controllers power supply voltage output

Terminal for mains voltage switching relay control and secured +24V power splitter.