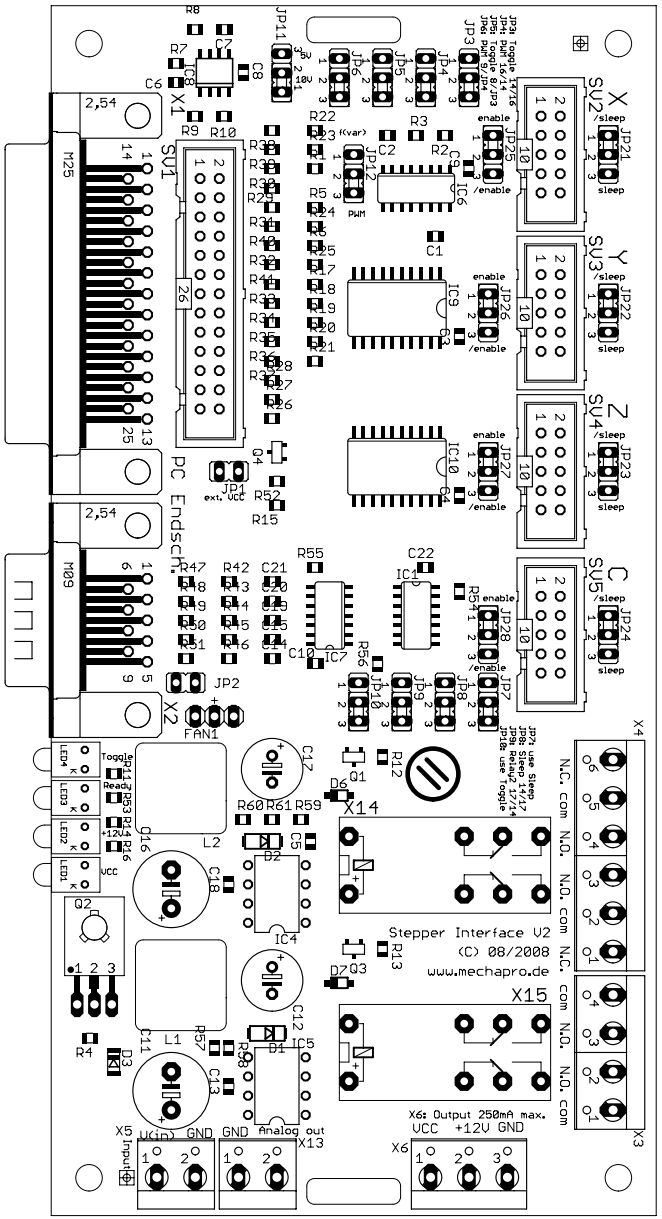
Layout diagramm



mechapro®

Documentation for

Stepper motor interface II

last change: 11.7.2015

Disclaimer, EMC-compliance

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The stepper motor interface II card is an OEM-product for further processing by industry or other, in electronics specialized, personal. In line with §5 of the EMC-regulation the stepper motor interface II does not have to carry a CE-Label. Wiring and the individual components being used as well as the complete environment in which the interface card is operated will influence its EMC behaviour. Therefore, if CE-compliance is required, a system in which one or more interface cards have been installed for operation has to be evaluated as a whole unit. Of course, when developing the circuitry for the interface II all possible aspects for an EMC-suitable design have been taken into account.

Initial operation

Before using the board, set all jumpers to the desired settings according to this manual. Afterwards the board can be mounted in a case or cabinet and get wired to the machine and the PC. When all connections are done, the board is ready to operate.

Connectors

The following section gives you a short overview about the functions of the different connectors. The detailed pinout is explained afterwards.

- The connectors X1 and SV1 are intended to connect the board directly to a PC printerport or an optocoupler board. The pinout is aligned to PCNC, for other programms an adaptor cable or -box may be necessary. Many Windows based programms support a configuration of the pinout within the software.
- X2 is the connector for all switch inputs. The emergency switch has to be a „normaly closed" (NC) contact, connected to ground. All other switches may be NO or NC contacts. An open emergeny contact disbles both relays and motor drivers.
- SV2-SV5 are the connectors for the motor drivers. 5V logic supply is available at these

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connectors.

- The outputs of the relays are accessable on clamp blocks X4 (relay1) and X3 (relay2). The pinout is printed on the board. The abbreviatons mean: normaly closed=NC (relay1 only), normaly open=NO, common contact=com. Max. voltage/ current up to 250V~/8A. When working with voltages > 50 volt, the installation has to be inspected from an expert!
- X5 is the connector for the supply voltage of the board. The input voltage range is 15-45V=. Please take care of the polarity, according to the print on the board (Vin=+)!
- The internal switch mode regulators are used to supply 12Volt for the relays and 5V for the logic from the supply of the board (15-45 Volt). The 12V can also be used to drive fans (e.g. for cooling of the power drivers). Max. external current is 250mA. Both voltages are supplied at X6.
- The board converts a PWM input signal to an analog output (0-10V or 0-5V) to control a frequency converter of a main spindle. This analog output is fed to X13.

X1 / Printer port connector

Pin number	function
Pin 1	relay 1, e.g. main spindle on/offs
Pin 2	direction Motor X
Pin 3	/clock Motor X
Pin 4	direction Motor Y
Pin 5	/clock Motor Y
Pin 6	direction Motor Z
Pin 7	/clock Motor Z
Pin 8	direction Motor 4 or Toggle signal
Pin 9	/clock Motor 4 or PWM signal
Pin 10, 12, 13, 15	outputs for signals from end and limit switches
Pin 14	current reduction, toggle signal, PWM signal or relay 2, e.g. coolant pump on/off
Pin 11	output for drives ready signal
Pin 16	Toggle signal or PWM signal
Pin 17	current reduction (low activ) or relay 2
Pin 18-25	signal ground (0V, GND)

X2 / Connector for end and limit switches

Pin number	function
Pin 1	limit switch X (forwarded to pin X1.13)
Pin 2	limit switch Y (forwarded to pin X1.12)
Pin 3	limit switch Z (forwarded to pin X1.10)
Pin 4	limit switch axis 4 (forwarded to pin X1.15)
Pin 5	emergency switch
Pin 6	+5V (VCC)
Pin7-9	ground (GND)

Please note: The inputs on pin 1-4 may be used or configured for other functions, according to the software that is used. End or limit switches my get connected in series (NC contacts) or in parallel (NO contacts), so safe inputs for other functions. But in this case it can't be distinguished which switch was operated!

SV2-SV5 / Connectors for stepper drivers

Pin number	function
Pin 1	(not used)
Pin 2	/clock, (each rising flank triggers a step)
Pin 3	/error, open collector error signal from power driver
Pin 4	dir, direction of motor movement
Pin 5	enable, enable signal to the power driver
Pin 6	/sleep, current reduction output
Pin 7-8	+5V (VCC), logic supply for the power driver
Pin 9-10	ground (GND)

Jumper settings

JP1	Activate 5V on pin 26 of SV1 (for optocoupler board)
JP2	Disable the monitoring of the emergency switch (recommended for testing purposes only)
JP3	Toggle signal from Pin14 (1-2) or Pin16 (2-3)
JP4	PWM signal from Pin16 (1-2) or Pin14 (2-3)
JP5	Use Toggle signal from Pin8 (1-2) or from JP3 (2-3)
JP6	Use PWM signal from Pin9 (1-2) or from JP4 (2-3)
JP7	Use current reduction signal (Sleep) (1-2) or don't (2-3)
JP8	Sleep from Pin14 (1-2) or Pin17 (2-3)
JP9	Control Relay 2 with Pin17 (1-2) or with Pin14 (2-3)
JP10	Use Toggle signal (charge pump safty function) (1-2) or don't (2-3)
JP11	Range of analog output signal 0-10V (1-2) or 0-5V (2-3)
JP12	Input signal for analog output is frequency variable (1-2) or a pulse width modulated (PWM) signal (2-3)
JP21-24	Polarity of current reduction signal (for each driver) is low active (1-2) or high active (2-3)
JP25-28	Polarity of enable signal (for each driver) is high active (1-2) or low active (2-3)

LEDs

LED1	Logic supply (5V) ready
LED2	Relay supply (12V) ready
LED3	Ready is signaled to PC (no emergency stop, no error from the drivers)
LED4	Toggle signal is valid. If monitoring of Toogle is activated, both LED3 and LED4 must be lit to enable the drives and relays!

Technical data

Supply range: 15-45V=
Current consumption (typical): 100mA
Minimum frequency of safety signal: approx. 250Hz
Minimum frequency of PWM signal: 200Hz
Maximum frequency for frequency variable input: approx. 2kHz