



0 - 10V controller for frequency converter

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Safety advice

The PWM card is controlled by the PC and the installed software. Since there is often other software running at the same time, and as a result of the boot up procedure, the pc's port might sometimes appear to be in undefined conditions which leads to unexpected start of the motor. You should be prepared for sudden starting motor. When working on the motor, i.e. tool change, make sure to disconnect from power supply in order to prevent a start up.

The PWM card outputs have to remain ungrounded.

Never connect an output-signal to ground(GND) of the controller, PC, driver or earth.

Documentation

The PWM-card enables to soft-control speed and direction of rotation of a motor that is connected to a frequency converter(f.ex. HF mill spindle). The frequency converter can handle a range of signals:

- 0V to 10V and one or two direction signals
- 0V to 5V and one or two direction signals
- -10V to + 10V, this contains the rotational direction: - left, + right.

Different programs feature different signal outputs

There are two types supported:

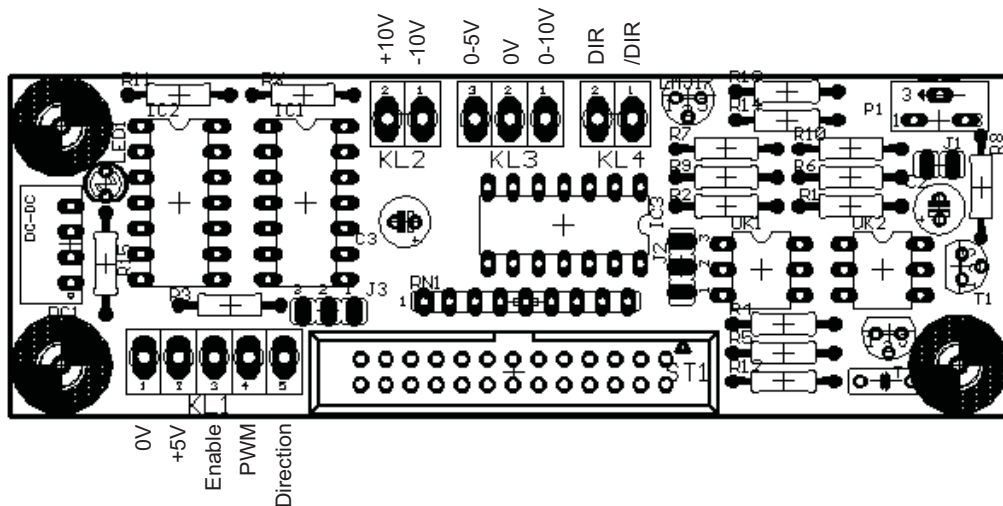
- PWM signal, one square pulse with different pulses / pause ratio 0%. Signal is always low up to 100% signal is always high. 50% pulse / pause ratio equals square pulse, it's high level is as long as it's low level. This means half speed of the motor.
- The other, unusual way, is to send the speed-signal established by the software through an 8-bit data bus. It uses the pins of the printer port (Pin 2 to 9). The pin for rotation direction remains normally free.

You can select the preferred type with jumpers on the card.

The card needs a 5 V power supply. The dc-converter generates the 10 V needed for the outputs and is responsible for galvanic separation of in- and outputs. Since most manufacturers of frequency converters require potential-free control-cables the signals additionally have to be separated by an opto-coupler, but this decreases sensitivity of the controller. Never connect the 0V of the output to ground(GND), controller, pc, driver or earth..

Dimensions

LxWxH 100mm x 35mm x 12mm



Pin assignment ST 1 flat cable (printerport) for PWM controller

Pin flatcable	printerport signal (Software)	Signal
10,12,14,16,18, 20,22 and 24	18 to 25	0V (GND)
26	Not assigned	+5V (f.ex supplied by the interface card)
21	11	Enable (E-stop)
6	16	PWM software-side signal
8	17	DIR software-signal for the spindle direction)

When connecting the flat-cable to printer port 1 or 2, the pin 6 for the PWM output-signal and the pin 8 for the spindle direction signal have to be configured with the software.

If these pins are not available, f.ex if used for other purposes, then the signals can be alternatively connected to clamp KL1. The KL1 assignment is explained below.

Pin assignment KL 1

When using a clamp terminal instead of a flatcable, the pin assignment in the table below can be used.

Pin	Signal
1	0V (GND)
2	+5V
3	Enable (E-stop)
4	PWM signal of the software
5	DIR software signal for the spindle direction

Jumpers

J1

Use J1 when in PWM mode the PWM frequency (frequency of the square voltage) sinks under about 500Hz. Frequencies over 500Hz or the application of the 8 bit mode lead to a slight slower control behaviour with this jumper.

J2

Select between PWM - and 8 bit mode.

1-2 PWM mode

3-2 8 bit mode

J3

On and Off the Enable function. If enabled, the motor speed is set to 0 by applying the E-Stop or other stopping functions of the controller. Should be set to "aktiv" (=active).

1-2 Enable "aktiv"

3-2 Ignores Enable, motor eventually runs when E-stop applied.

Outputs KL 2, KI3 and KL4

KL2

Clamp 4 is the output for the -10V ... +10V signal. Any other direction signals are required for the frequency converter.

The motor is controlled with -0 ... -10V for 0 to full speed in one direction and with +0 .. +10V for 0 to full speed in the other direction.

KL3

Pins 2 and 1 is the output for 0 .. +5V.

Pins 3 and 1 is the output for 0 .. +10V.

KL4

Pin 1 is a direction signal for the frequency converter (10V level)

Pin 2 is the negated direction signal (10V level)