

Building Instruction

Control card: AC-CNC2017-2S (REV5x)

Dear customer, thank you very much for choosing our product.
All of our products are tested and are subject to the controls of our
Quality assurance is therefore guaranteed. Therefore, we guarantee that our products are free
from material and are manufacturing defects.

Please read the safety instructions under 4.0 carefully before you start work.

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1.0 Hints for do-it-yourselfers

Control card: AC-CNC2017-2S (REV05x)

1.1 You need help?

Do you have any questions ?

Simply send us an e-mail with your request to: info@arduinoclub.de.

We will be happy to help you.

1.2 Hint

This kit was built and tested many times as a prototype before it went into production. Only when an optimal quality regarding function and operational safety has been achieved, it is released for series production.

When soldering the components, make sure that they are soldered (if nothing to the contrary is noted) at a distance from the PCB. All protruding connecting wires are cut off directly above the solder joint.

Since the soldering points in this kit are sometimes very small or very close to each other (danger of solder bridges), soldering may only be carried out with a soldering iron with a small soldering tip. Carry out the soldering processes and the assembly carefully.

2.0 Soldering Instructions

1. When soldering electronic circuits, never use Soldering fluid or soldering grease. They contain acid, which destroys components and conductors.
2. The used solder wire should not be thicker than 0,5mm. and should be provided with a rosin core which also serves as a flux.
3. Use a small soldering iron with a maximum power of 30 watts.
4. The soldering must be carried out quickly, too long soldering destroys the components by excessive supply of heat.
The maximum soldering temperature is 250°C for 5 seconds per solder point.
5. The cleanliness of the soldering tip is a prerequisite for a good soldering result.
6. Clean the soldering tip after each soldering process with a damp sponge or a silicone wiper.
7. After soldering, protruding connection wires are cut off directly above the soldering point with a side or flat cutter.
8. After assembly, always check each circuit once again to ensure that all components are correctly inserted and polarized. Also check whether connections or traces have been bridged with tin by mistake. This can lead not only to malfunctions, but also to the destruction of the components.
9. Please note that improper solder joints, incorrect connections, faulty operation and assembly errors are beyond our control.
10. It is imperative that you observe the safety instructions under point 4.0!

2.1 Scope of delivery and required tools

2.1.1 Scope of delivery:

- 3 pieces IC 16 Pin
- 3 pieces IC Socket 16 Pin
- 1 piece IC Socket 8 Pin
- 1 piece 7806 DC-DC converter
- 1 piece heat sink TO-220
- 1 piece Precision potentiometer
- 1 piece 40 Pin female multipoint connector
- 1 piece 3 pin header
- 1 piece Jumper bridge
- 1 piece LED \varnothing 3mm
- 22 pieces Screw terminals Double pole 508
- 1 piece condenser 100 MicroF
- 1 piece condenser 0,1 Micro F
- 1 piece condenser 0,33 Micro F
- 13 pieces resistor 220 Ohm
- 1 piece resistor 1k Ohm
- 2 pieces resistor 10k Ohm
- 1 piece IC LM358

2.1.2 Required tools:

- Soldering iron (30 Watt)
- Solder \varnothing 0,5mm (e.g. Pb38Sn60Cu2) or equivalent.
- Side or flat cutter
- A screwdriver

2.2 Assembly of the components

All components are marked on the top of the board.

Now proceed as follows:

1. First solder the 4 IC sockets to the board, pay attention to the mounting direction.
2. Now all resistors R1 - R12 and R17 = 220 Ohm
R13 - R14 = 10k Ohm, R15 = 1k Ohm soldered in, pay attention to the color coding.
3. Now solder in all the screw terminals, remember to string the screw terminals together twice to eight and once to six.
4. Now solder the precision potentiometer (blue 502), pay attention to the installation direction and a firm fit on the circuit board.
5. Solder in the LED, pay attention to the polarity, the long leg is + (anode). The installation depth is limited by the thickenings on the legs.
6. Now solder in the three pole jumper pin header JP1, make sure that it is firmly seated on the PCB.
7. Solder in the three capacitors, the longer leg is plus, pay attention to the printed values. The color may differ from the picture.
8. Now mount the TO-220 cooler on the DC-DC voltage converter 7806 and solder it in.
9. Now divide the sockets into two parts of 15 poles each. If you have a Nano Vers.3 5V available, plug the socket strips now on the Nano and solder everything together, so it is guaranteed that the Nano fits well afterwards.

The circuit board is now soldered.

Perform a precise visual inspection of all components and correct any soldering faults (e.g. cold solder joints, solder bridges and cleanliness).

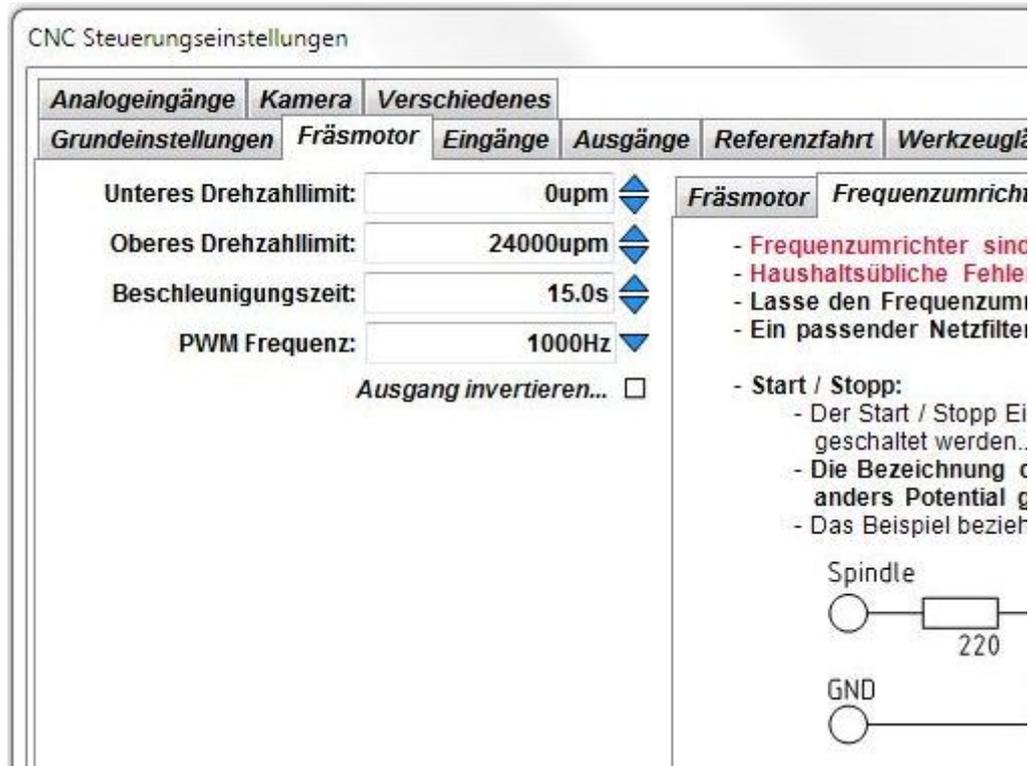


picture 2.2.1

2.3 Setting 0-10V or 0-5V inverter

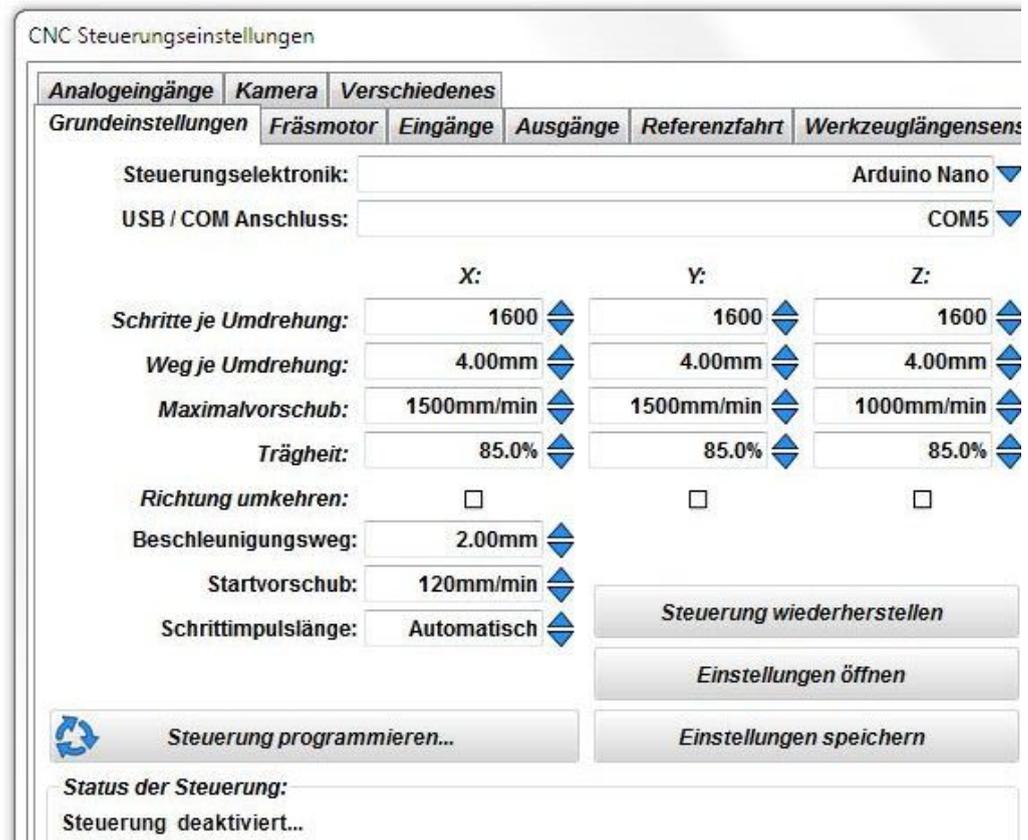
Nothing is connected to the control card and the control card is de-energized.

1. Select on the control card by means of jumpers whether you want to operate the inverter output on 0-5V or 0-10V..
2. Connect the control card to your computer, connect the AC adapter to the control card and turn it on.
3. Start the ESTLCAM software and open the "CNC control settings", where you enter the upper speed of your HF spindle under "Upper speed limit". The PWM frequency can be set to 1000Hz.



picture 2.3.1

4. Program your control card using the ESTLCAM software.



picture 2.3.2

5. Open the "CNC control" and start the spindle.

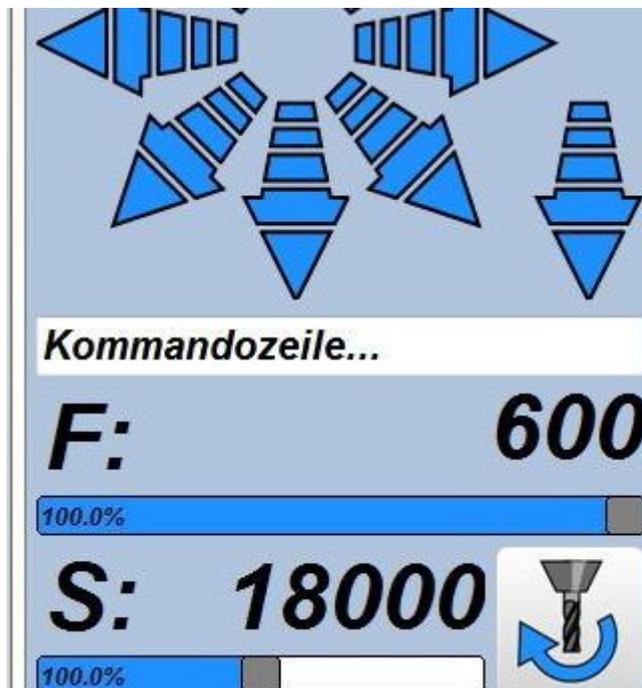


Abbildung 2.3.3

6. Measure the voltage (V) at the output "Inverter" of the control card. Set the voltage exactly to 10V using a screwdriver on the blue potentiometer.

2.4 Inputs In1-In8

In the ESTLCAM software set the inputs you want to use for limit switches to "Invert" and "Pull-up 5V". Below in the picture you can see an example configuration.

CNC Steuerungseinstellungen

Analogeingänge Kamera Verschiedenes
 Grundeinstellungen Fräsmotor Eingänge Ausgänge Referenzfahrt Werkzeuge

Eingänge:

- Endschalter, Serienschalter, entsprechend konfigurieren
- Bei Bedarf können

Name:	Funktion:	Invertieren	Pull-up 5V	Ausgelöst
Input 1	Endschalter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>
Input 2	Programm Start	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>
Input 3	Programm Stopp	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>
Input 4	Sensor	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>
Input 5	Unbenutzt	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>
Input 6	Unbenutzt	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>
Input 7	Unbenutzt	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>
Input 8	Fehlermeldung	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>

Abbildung 2.4.1

3.0 Computer connection and power supply



USB connection

To connect the control card to the computer, use a well shielded USB cable that is as short as possible.

Do not lay the USB cable along live wires, which emit electromagnetic fields that could interfere with data transfer.



Power supply - Power filter

The line network absorbs high-frequency interference voltages which can have a negative effect on the function of devices. A mains filter protects the connected devices from these high-frequency interference voltages. The high-frequency interference can have a negative effect on the data transmission to the machine.

They can occur, for example, when other devices are switched on or when the machine is switched off.

Large consumers such as washing machines or vacuum cleaners are in operation.

Let your electrician advise you which mains filter you want to use on the to use your control system and components safely and reliably. and we're not the only ones doing that.



Power supply of the controller card AC-CNC2017-2S REV5x

In addition to the USB input (5 VDC), the control card is operated with 12 V DC at the screw terminal "12 VIN".

Make sure that the polarity is correct.

Use a high-quality stabilized power supply unit for operation.

Our CNC control card requires approx. 1 Ah.



4.0 Safety Instructions

1. Read these operating instructions carefully before starting work.
2. Do not leave any components unattended, they can be swallowed by children or pets.
3. When soldering is done at very high temperatures, make sure that your workplace is free of combustible materials.
4. Do not touch any uninsulated parts of the soldering iron with the skin, there is a risk of burns.
5. To store the soldering iron, use only one approved storage.
6. Do not leave the soldering iron unattended.
7. Gases produced during soldering are toxic. Ensure good ventilation and a proper suction.
8. Work on electronic devices may only be carried out in a powerless state.
9. Do not allow work on electrical equipment to be carried out by a qualified electrician.
10. Do not make any changes to the PCB or its components, especially the power supply, type and number of devices.
11. The maximum operating voltage on the USB port of the Nano is 5 volts, the maximum input voltage at the connection "12v in" is 12 volts.
12. The control card may only be operated with DC current.
13. The control card must not be exposed to mechanical loads.
14. Keep liquids away from the control card.
15. Protect the control card from dust, humidity, sun exposure and strongly magnetized fields.
16. Operate the control card only under the supervision of persons.
17. Do not leave packaging around, these could become dangerous toys for children or pets.

5.0 Warranty and Guarantee

The legal warranty applies.

Warranty for the kit

We guarantee 6 months warranty on the kit.

The guarantee includes the free repair of the defects, which are demonstrably due to the use of non-flawless material or manufacturing faults.

Since we have no influence on the correct and proper construction, for understandable reasons we can only assume the guarantee of the completeness and perfect condition of the components.

The corresponding function of the components in the non-installed state and the adherence to the technical data of the circuit is guaranteed in accordance with the soldering regulations, professional processing and the required commissioning and operation. Further claims are excluded.

We do not accept any liability for any damages or consequential damages in connection with this product.

We reserve the right to repair, remedy, spare parts delivery or refund of the purchase price. The following criteria do not repair or void the warranty claim:

- When soldering acid-containing solder, soldering or acidic
- Flux, etc. was used.
- If the kit was incorrectly soldered and built.
- Incorrect operation or treatment.
- Improper maintenance and repair by third parties.
- Technical changes by third parties.

7.0 Disposal



If the appliance is to be disposed of, it must not be thrown into the household waste. These must then be disposed of at collection points, where televisions, computers etc. can be delivered (please inquire at your local office or in the Municipal administration According to these electronic waste collection points).