

Building instruction

CNC Controller: AC-CNC2019-N-GRBL (REV2.x)

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. 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

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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 Reference

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 is it 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 wires are cut directly above the solder joint.

Since the soldering points in this kit are sometimes very small or 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
2. Soldering fluid or soldering grease. These contain acid, which destroys components and conductors.
3. The solder wire used should not be thicker than 0.5 mm. and should be provided with a rosin core which also serves as a flux.
4. Use a small soldering iron with a maximum power of 30 watts.
5. 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.
6. The cleanliness of the soldering tip is a prerequisite for a good soldering result.
7. Clean the soldering tip after each soldering process with a damp sponge or a silicone wiper.
8. After soldering, protruding connection wires are cut off directly above the soldering point with a side or flat cutter.
9. 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.
10. Please note that improper solder joints, incorrect connections, faulty operation and assembly errors are beyond our control.
11. 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 poles
- 3 pieces IC socket 16 poles
- 1 piece IC socket 8 poles
- 1 piece 7806 DC-DC converter
- 1 piece heat sink TO-220 with accessories
- 1 piece precision potentiometer
- 1 piece 40 Pole socket strip
- 1 piece 3 pole male connector
- 1 piece jumper bridge
- 1 piece LED $\varnothing 3\text{mm}$
- 20 pieces Screw terminals Double pole
- 1 piece capacitor 100 μF
- 1 piece capacitor 0.1 μF
- 1 piece capacitor 0,33 μF
- 1 piece resistor 36 Ohm
- 14 pieces Resistor 220 Ohm
- 1 piece resistor 1k Ohm
- 2 pieces resistor 10k Ohm
- 1 piece IC LM358
- 1 piece DOVE socket 4 pole

2.1.2 Required tools:

- Soldering iron (30 Watt), solder $\varnothing 0,5\text{mm}$.
- Side or flat cutter
- Electronics Measuring device

2.2 Assembly of the components

All components are marked on the top of the board. The labelled side is at the top.

Now proceed as follows:

1. First all resistors are soldered in, pay attention to the color coding.
2. Now solder the 4 IC sockets to the board, pay attention to the mounting direction.
3. Now solder in all screw terminals, remember to string the screw terminals together twice to eight and once to four.
4. Now solder the precision potentiometer (blue 502), pay attention to the mounting direction and a firm fit on the 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, pay attention to a firm fit on the circuit board.
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 solder the DOVE socket, the mounting direction is marked on the board.
9. Now mount the TO-220 cooler on the DC-DC voltage converter 7806 and solder it in.
10. 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 after well.
11. The PCB is now soldered.
12. Carry out a precise visual inspection of all components and correct any soldering faults (e.g. cold solder joints, solder bridges and cleanliness).

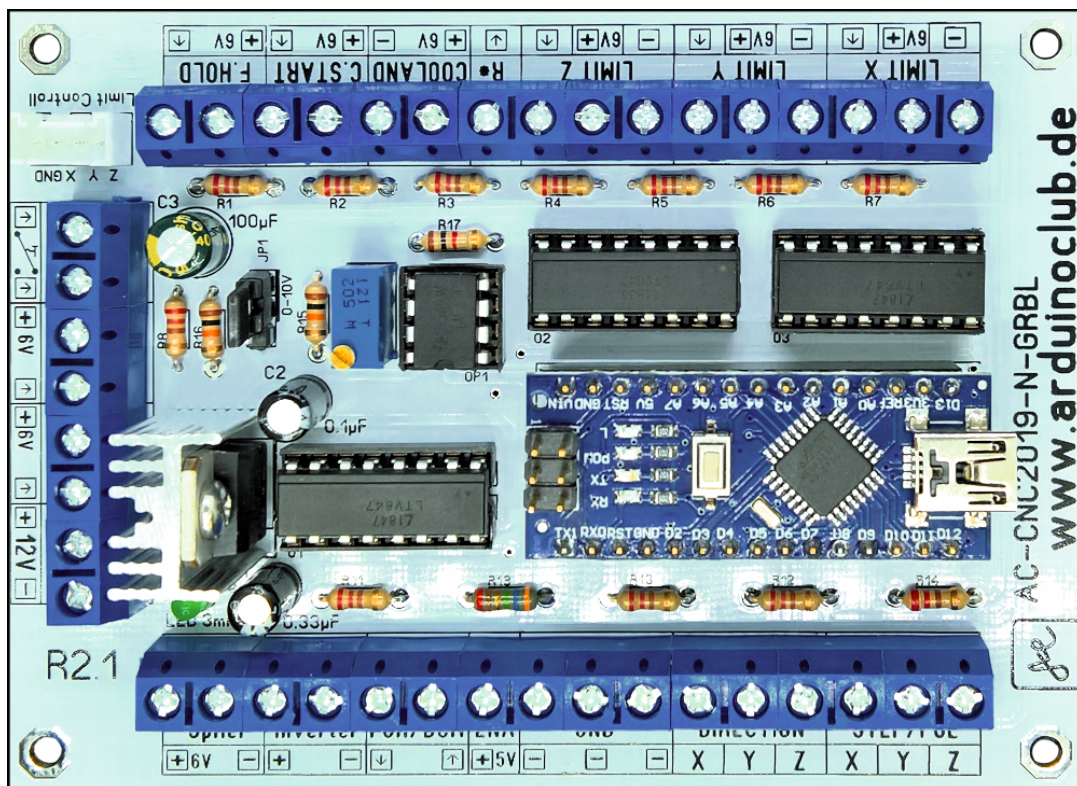


Abbildung 2.2.1

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 power supply to the control card and switch it on.
3. Then use your preferred control program and start your HF spindle with the maximum speed.
4. Now set the potentiometer R15 with a screwdriver and the measuring device so that the inverter output indicates the desired voltage of 10V or 5V on your measuring device.

3.0 Computer connection and power supply



3.1 USB connection

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

Do not lay the USB cable along live cables, which emit electromagnetic fields that could interfere with data transfer. If you notice inexplicable disconnections, this may be due to the used or incorrectly laid cable..



3.2 Power supply - Mains filter

The line network absorbs high-frequency interference voltages which can have a negative influence 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.



3.3 Stromversorgung der Steuerkarte

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

Make sure that the polarity is correct.

Use a high-quality stabilized power supply with 1Ah for operation.



4.0 safety instructions

1. Please read these operating instructions carefully before starting any work.
2. Do not leave any components unattended, they may be swallowed by children or pets.
3. Soldering is carried out at very high temperatures, ensure that your workplace is free of flammable materials.
4. Do not touch uninsulated parts of the soldering iron with your skin, as there is a risk of burns.
5. Only use an approved tray for storing the soldering iron.
6. Do not leave the activated soldering iron unattended.
7. Gases produced during soldering are toxic. Ensure good ventilation and proper extraction.
8. Work on electronic devices may only be carried out when they are currentless.
9. Only have work on current-carrying devices carried out by a qualified electrician.
10. Do not make any changes to the circuit board or its components, especially with regard to the current supply, type and number of components.
11. The maximum operating voltage at the USB port of the Nano is 5 volts, the maximum input voltage at the "VIN 12V" connection is 12 volts.
12. The control card may only be operated with direct current.
13. All outputs of the control card must not be loaded with more than 600mAh in total.
14. The cooler on the voltage transformer can become very hot under certain circumstances, risk of burns!
15. The control card must not be exposed to any mechanical loads.
16. Keep liquids away from the control card.
17. Protect the control card from dust, moisture, sunlight and strongly magnetized fields.
18. Operate the control card only under personal supervision.
19. Do not leave any outer packaging lying around as this could become a dangerous toy for children or pets.

5.0 Warranty and guarantee

The German statutory warranty applies.

Warranty provision for the kit

The kit is guaranteed for 6 months.

The guarantee covers the free repair of defects which can be proven to be due to the use of materials which are not in perfect condition or to manufacturing faults in the components.

Since we have no influence on the correct and proper assembly, we can for understandable reasons only guarantee the completeness and flawless condition of the components in kits.

We guarantee that the components will function in accordance with their characteristic values when not installed and that the technical data of the circuit will be complied with in accordance with the soldering instructions, professional processing and prescribed commissioning and mode of operation. Further claims are excluded.

We assume neither a guarantee nor any liability for damages or consequential damages in connection with this product.

We reserve the right to repair, rectify, deliver spare parts or refund the purchase price. The following criteria will not be repaired or the warranty claim will expire :

- if acidic solder, solder grease or acidic solder is used for soldering.
- flux etc. was used,
- if the kit has been improperly soldered and assembled.
- Incorrect operation or handling.
- Improper maintenance and repair by third parties.
- Technical modifications by third parties.

6.0 Disposal



If the device is to be disposed of, it must not be thrown into the household waste. It must then be disposed of at a collection point where televisions, computers, etc. are also disposed of (please contact your local council office or the city administration for information on electronic waste collection points).