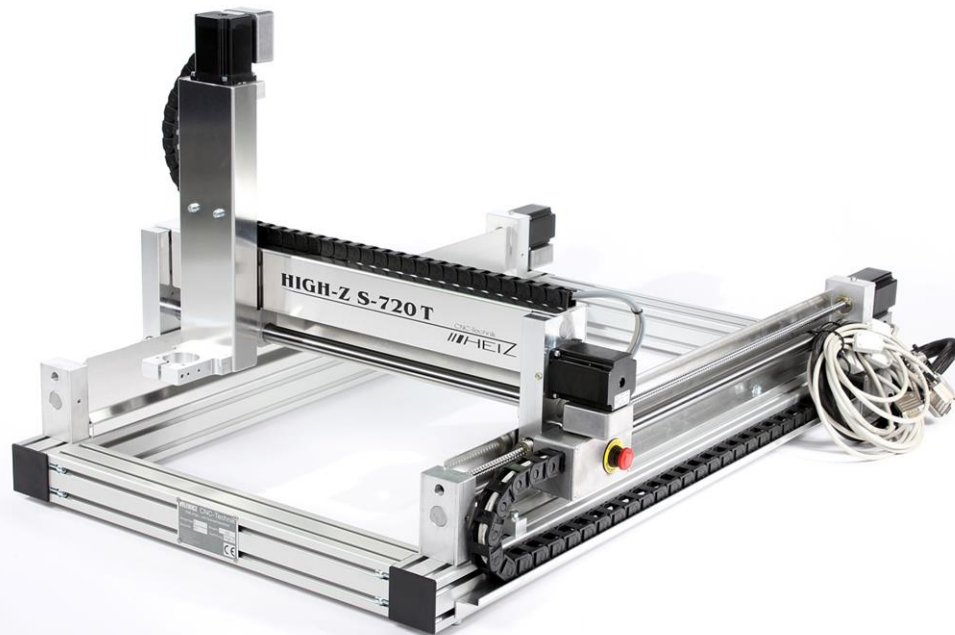


Translation



## Quick Start Guide High-Z Series

<https://www.cnc-step.de/en/>



Status: 30.05.2017

## High-Z Series



### Short Description

This Quick Start Guide will help you with the initial start-up of the machine. It also includes optional accessory that is connected directly to the machine or control. For more detailed information please refer to the individual manuals.

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## 1 Connectors and cables on the machine



The connecting leads are directly connected to the stepper motor controller Zero-3.

*Caution: Before connecting the cables, please turn off the Zero-3 control !!!*

<b>D-Sub 9pol. X1</b>	Motor connection cable X1-axis
<b>D-Sub 9pol. X2</b>	Motor connection cable X2 axis
<b>D-Sub 9pol. Y</b>	Motor connection cable Y-axis
<b>D-Sub 9pol. Z</b>	Motor connection cable Z-axis
<b>D-Sub 9pol. ST</b>	Control line ST
<b>Lug</b>	Ground Connection



The miniXLR jack provides the option of connecting extensions without additional hardware.



*Mini-XLR-jack*

For example:

Tool length control, Security housings with door switch  
3D Buttons

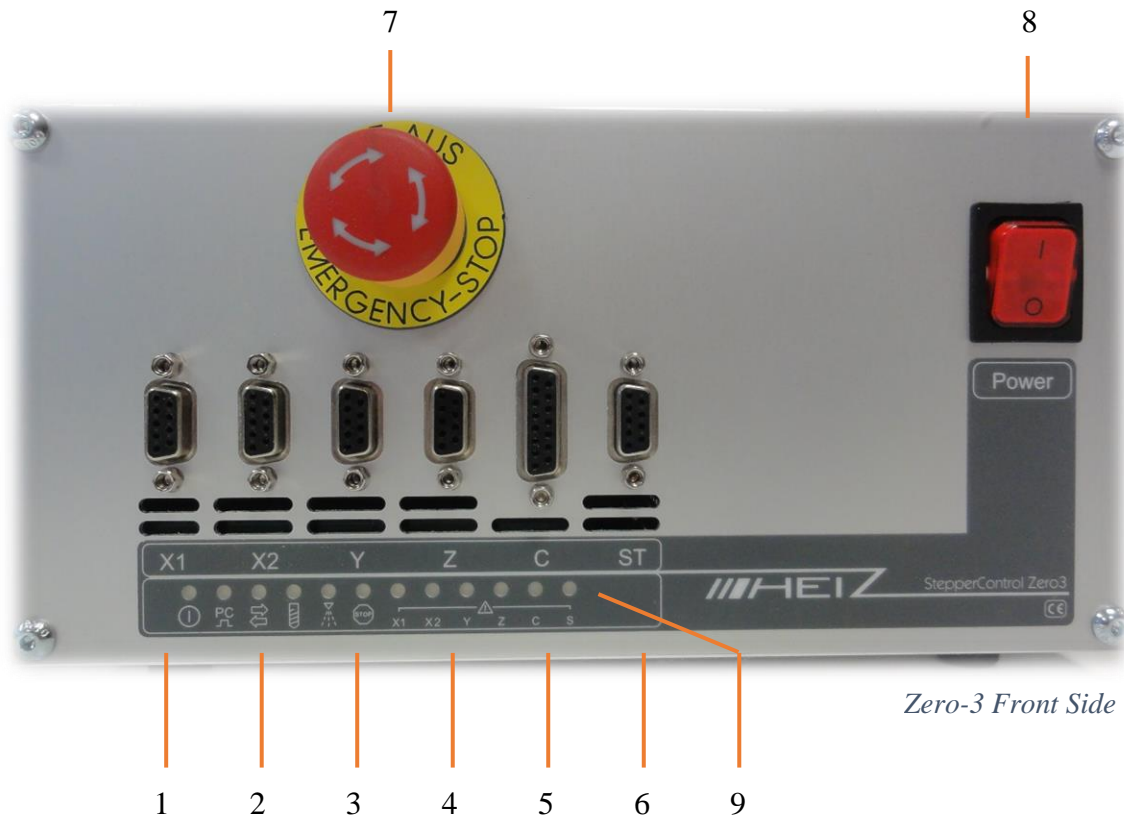
### Note:

Concomitant use of this socket and a 4th axis, such as a rotation axis or tangential knife, the connectivity is limited because both the miniXLR socket and the reference switch the 4th axis are found via the PIN15 of the LPT port.

For this combination, we have a solution. To do so, please contact our customer service.

## 2 Connections to of the Zero-3 stepper motor controller

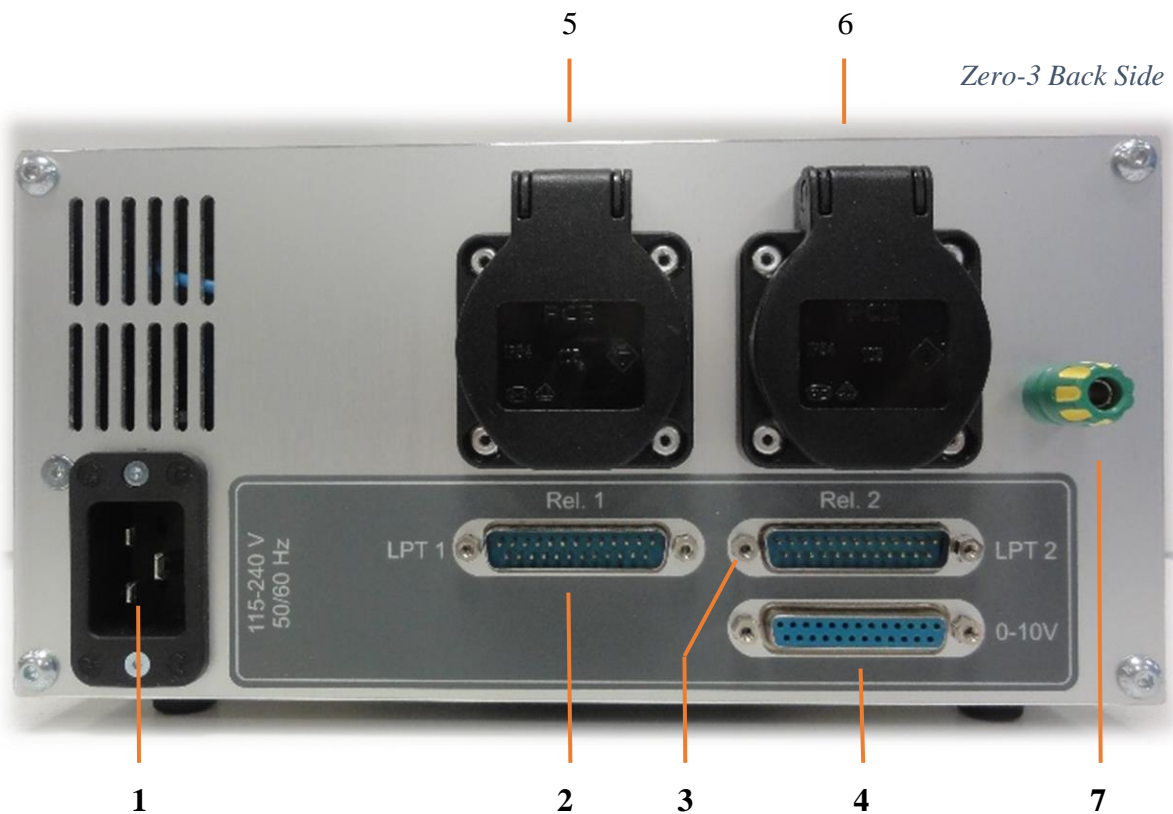
### 2.1 Front side



#### Front side Overview

- 1 Connector D-Sub 9pol. for motor X1
- 2 Connector D-Sub 9pol. for motor X2
- 3 Connector D-Sub 9pol. for motor Y
- 4 Connector D-Sub 9pol. for motor Z
- 5 Connector D-Sub 15pol. for 4th axis (Rotary axis / tangential knife)
- 6 Connector D-Sub 9pol. for Control line ST
- 7 Emergency-stop-button
- 8 Power-button
- 9 Status-LEDs

## 2.2 Back side



### Overview back side

- 1 power supply (115-240V input voltage)
- 2 LPT1 input
- 3 LPT2 input
- 4 LPT2 output (0-10Volt Edition)
- 5 Socket 1 (115-240V depending on input voltage - switchable via relay 1)
- 6 Socket 2 (115-240V depending on input voltage - switched via relay 2)
- 7 Ground (High-Z series > 03/2015)

### Note on the sockets 1 + 2:

The two sockets are with two relays switchable. Thus, the consumer connected to it can be switched on and off via software.

This guarantees also that the power supply is interrupted at faults and in emergency case.

The maximum power consumption per outlet may not exceed 8A.

The current consumption of the two sockets together may not exceed 13.5A.



### 3 Connecting the machine to the Zero-3 control



*Zero-3 Front Side*



*Connection cable of the machine*

- Make sure that the control is turned off.
- Connect all 5 cables with the Zero-3 controller.
- Make sure that you back up all connections with the knurled screws from loosening.

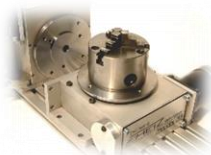


## 4 Connection possibility of a 4th axis

On the C-terminal of the zero-3 control another step motor can be operated as the fourth axis. In addition to this port, a 12-24V supply for an oscillation motor and the connection for a further reference switch are supplied.



*Zero-3 Front Side*



*Rotation Axis*



*TCM-3*



*EOT-2*



*TCT-1*

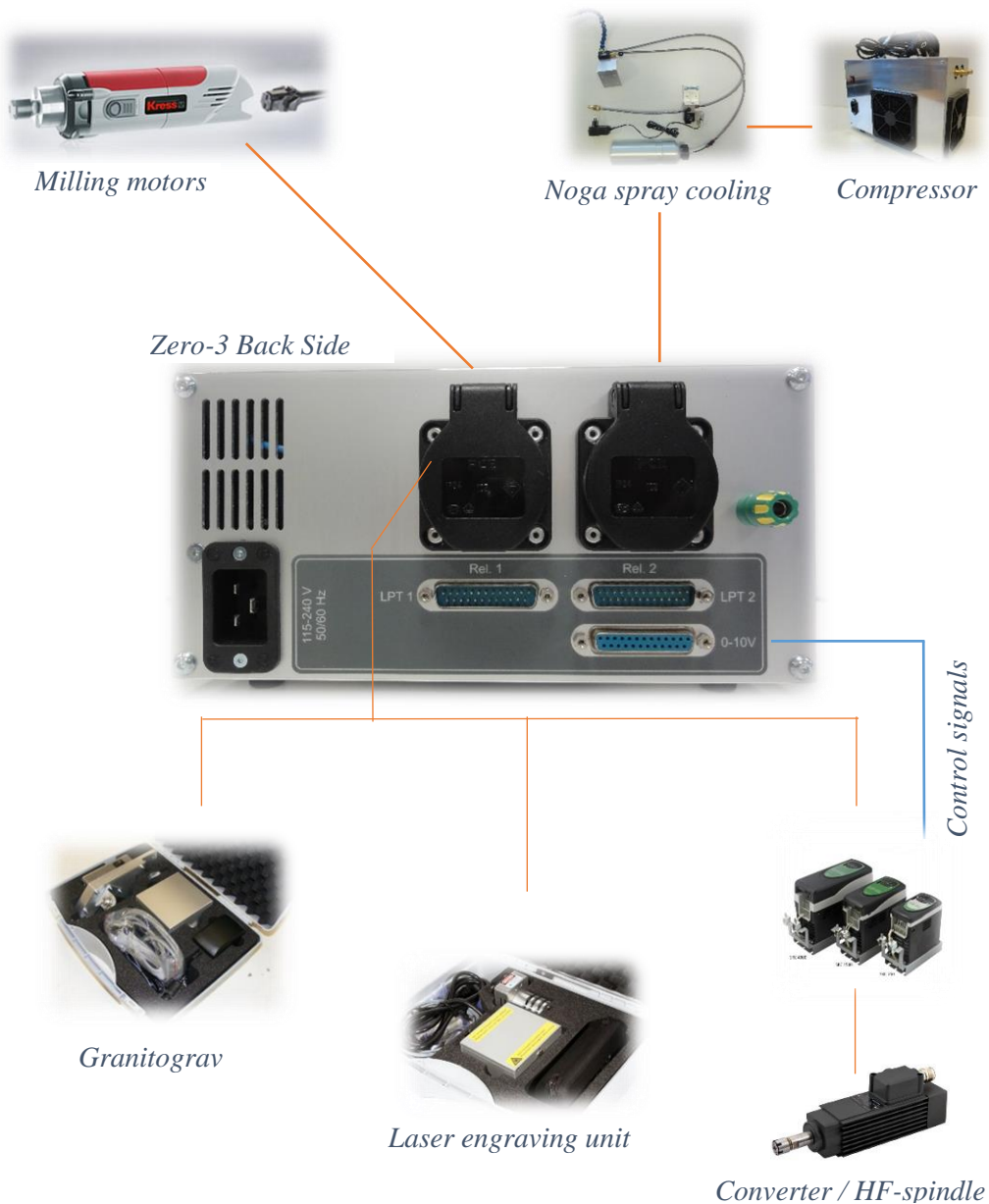
- Make sure that the control is turned off.
- Connect the supplied power cable to the C-socket of the controller.
- Make sure that you back up all connections with the knurled screws from loosening.

## 5 Connection options of optional accessories

The accessories at this point we just cover briefly the connection to the machine to the controller and if necessary to the additional hardware interface (depending on the software).

For more detailed information please refer to the individual manuals.

### 5.1 Overview Connection and power supply via Zero-3 control



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## 5.2 Milling motors

Milling motors by Suhner and Kress:

Art. 211515	Suhner UAD 30-RF / 1050 W / 3.500 - 30.000 U/min
Art. 211505	Suhner UAK 30-RF / 1530 W / 3.500 - 30.000 U/min
Art. 211506	Suhner UAL 23-RF / 1800 W / 2.500 - 23.500 U/min
Art. 211105	Kress 1050FME-1 / 1050 W / 5.000 - 25.000 R/min
Art. 211110	Kress 1050FME / 1050 W / 10.000 - 29.000 R/min
Art. 211100	Kress 800FME / 800W / 10.000 - 29.000 R/min - 110Volt (for USA)

Our recommended milling motors from Suhner and Kress; can be attached directly to the Z-axis in the designated tool holder (Ø43mm).

The milling motor itself contains an on and off switch and setting wheel for the speed. *A speed control via software is not possible here.*

However, the milling motor can be turned on/off via the relay socket 1 (Rel.1) Zero-3 control via software or program.

- Make sure that the control is turned off.
- Connect the power cord to the socket 1 (Rel.1) Zero-3 controller.

Of course, milling motors by other manufacturers can be connected in this way.

**You should also read the notes from page 6 for max. current consumption.**

## 5.3 Noga spray cooling with solenoid valve

Art. 350100	Noga spray cooling - without solenoid valve for manual operation
Art. 350110	Noga spray cooling - automatic control via solenoid valve
Art. 310250	Vacuum pump / compressor -0.7 bar / 2.5-3.0 bar

The Noga spray cooling requires an air pressure of min. 2.5 bar. from a compressor. This should be designed for continuous operation. For this application we have a small, handy pump in the program (see above).

Via solenoid valve, the air supply from the compressor can be automated by software or program. This is recommended by us. This has the advantage that lubrication is only done when it is necessary.

- Make sure that the control is turned off.
- Connect the power adapter to the socket 2 (Rel.2) Zero-3 controller.

## 5.4 Inverter and HF spindles

The output from the software WinPCNC PWM signal for the spindle speed is converted by the zero-3 into an analogue control signal and outputted to the 0-10Volt LPT2 output.

Thus you can connect an inverter to operate a HF spindle directly to the Zero-3 controller.

- Make sure that the control is turned off.
- Connect the power cable of the inverter to the power outlet 1 (Rel.1) Zero-3 controller.
- Connect the "control cable" of the inverter with the LPT2 output of the controller.
- Make sure that you back up all connections with the knurled screws from loosening.
- Observe the notes from page 6 for max. Power consumption.

Caution:

Inverter and HF spindles that have higher performance, can also be used, but require an external power supply!

Please feel free to contact our Customer Service.

## 5.5 Granitograv and laser engraving unit

Art. 230100 Granitograv CNC-Module

Art. 220500 Laser engraving unit

With this accessory, there is an additional control box that needs to be powered. For this purpose, each power supply can be connected to the Zero-3 controller. As a result, the accessory is disconnected from the power in emergency case!

- Make sure that the control is turned off.
- Connect the power supply of the respective control box with the socket 1 (Rel.1) of the Zero-3 controller.

**Please note for operation the associated manuals with more detailed information!**

## **6 Software installation**

### **6.1 KinetiC-NC**

KinetiC-NC is the latest control software from CNC-STEP. The software can be found on the included USB stick. The installation is carried out by running the setup file.

When you start the software for the first time, you will be asked for your machine type. Please select one from the list. Everything else is well explained in the two manuals and in the online help including instruction videos. These can be found in the software KinetiC-NC under "Help".

For full access to the software please log in the user "Customer Admin".

The default password is "1234".

No password is required for the default user with limited privileges.

#### **6.1.1 CncPod**

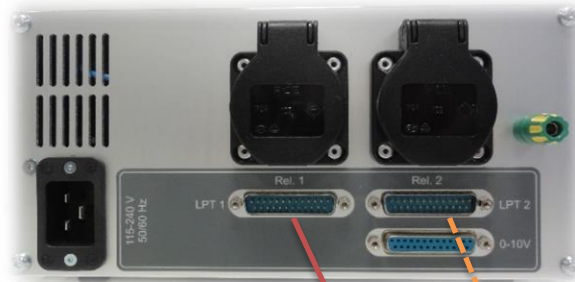
The software is combined with the hardware CncPod.

This has 2 LPT interfaces for controlling the machine and for optional accessories.

The connection to the PC is via network interface. The power supply is via USB Mini connector.

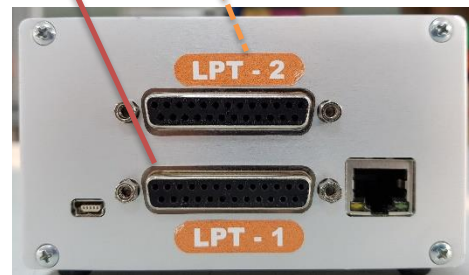
## 6.1.2 Connecting Hardware

### Zero-3 Control



*Zero-3 back*

### CncPod



*CncPod*

The LPT 1 connector is connected to the LPT 1 of the Zero-3 controller.

The LPT 2 connector is only required with the corresponding accessories and is then also connected to the Zero-3 controller.

The CncPod is connected to the PC via a network cable. If the simultaneous use of the Internet / network is desired or required, a LAN switch can be used.

Art.No.: 400161 Network Switch 5-port 10/100 Mbit/s + Lan cable 1m

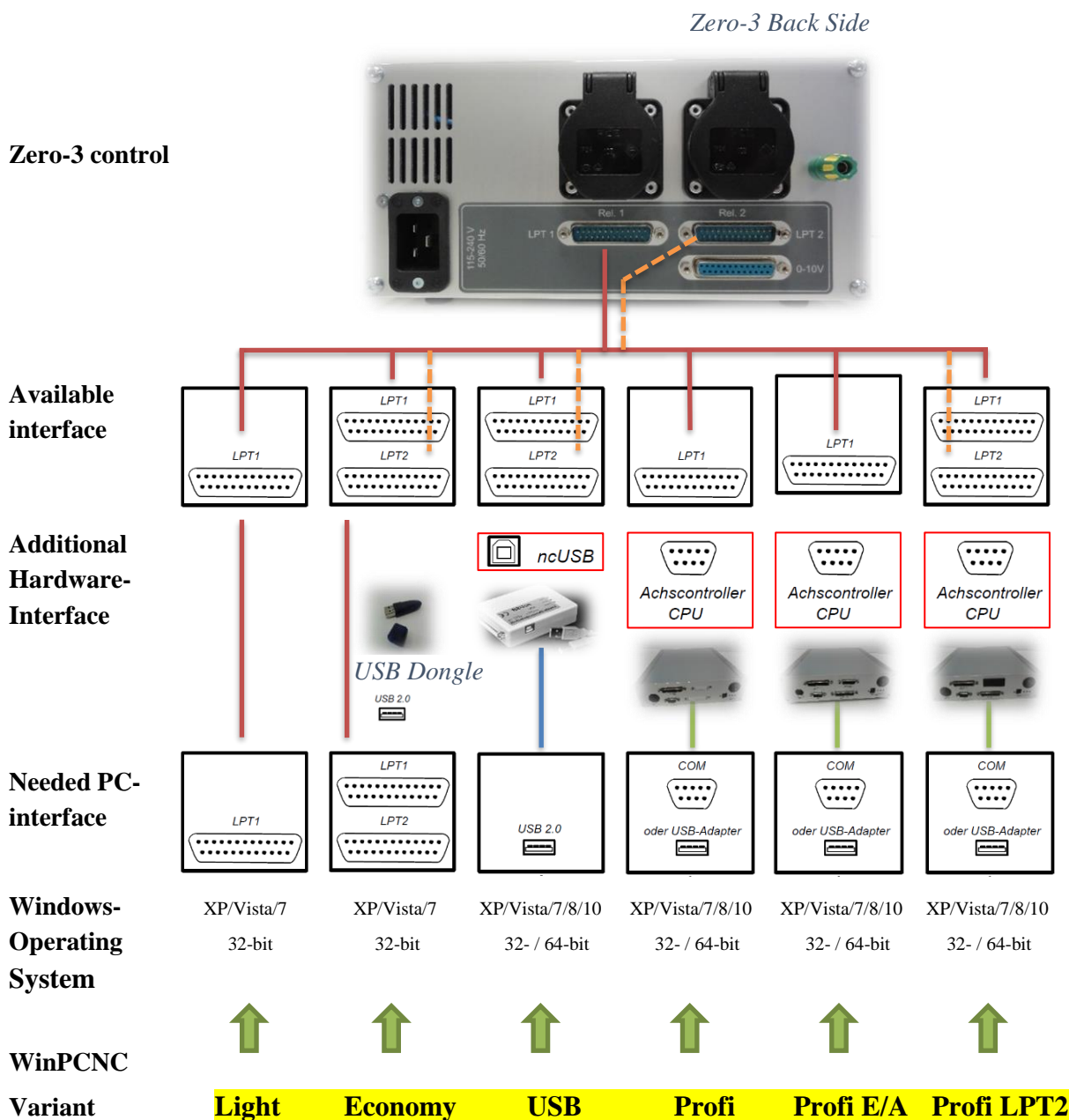
The power supply is via a mini USB cable. This can be connected directly to a USB port of the PC or even better to a USB power supply.

## 6.2 WinPCNC

WinPCNC is a convenient and comprehensive 3/4-axis NC control under Windows for milling, drilling, engraving, dosing, and more.

Different variants with graded functions and prices provide the right solution for beginners and model makers, as well as semi-professional use or for demanding industrial plants.

Here is an overview of all WinPCNC versions:







The additional hardware ncUSB (WinPCNC USB) and the USB dongle (WinPCNC Economy) should be connected only after installing the software to the PC. The required drivers are installed and the hardware can be detected correctly afterwards.

### 6.2.1 Installation

Now, let us start the initial installation of the software WinPCNC .

Install the software from the supplied CD into the directory specified for it. After installation, you may have to restart the PC.



### 6.2.2 Connecting the computer to the Zero-3 control

The connection of the computer to the Zero-3 controller depends on the software and the associated additional hardware. (see page 12)

- Make sure that the control is turned off.
- Depending on the software, connect the supplied connection cable to the PC and the controller. Secure all cables against loosening!
- For WinPCNC variants Light and Economy there is no additional hardware interface, the LPT cable is connected directly to the controller.
- In the other variants of the PC is connected to the additional hardware interface. This is then connected via LPT cable to the controller.
- In all variants, the LPT2 port is only used for optional accessories, and some machines extensions.

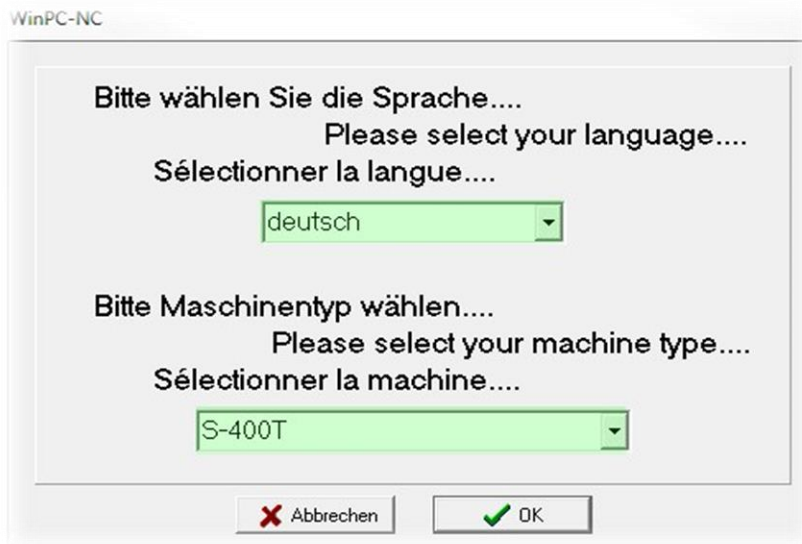
The additional hardware (ncUSB, USB dongle) is now recognized and installed by Windows.

### 6.2.3 Configuration

Start the software WinPCNC.

From the Start menu choose language and machine type.

The specification of the correct type of machine is very important because the software automatically loads all important parameters for the selected type of machine.



The communication between PC and Zero-3 is controlled depending on the software version on the LPT, USB or serial interface.

In WinPCNC USB installation and configuration is complete. In this version WinPCNC determines the interface automatically.

With other versions yet the interface or port address of the PC must be determined on which the communication runs.

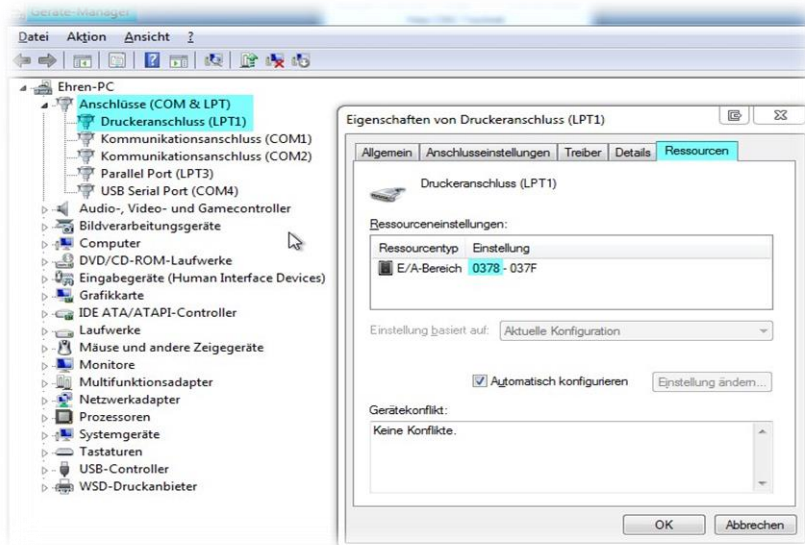
### 6.2.4 Determination of the LPT interface (Light and Economy)

With the variants "Light" and "Economy" the LPT port or the port address must be entered in WinPCNC (see page 17).

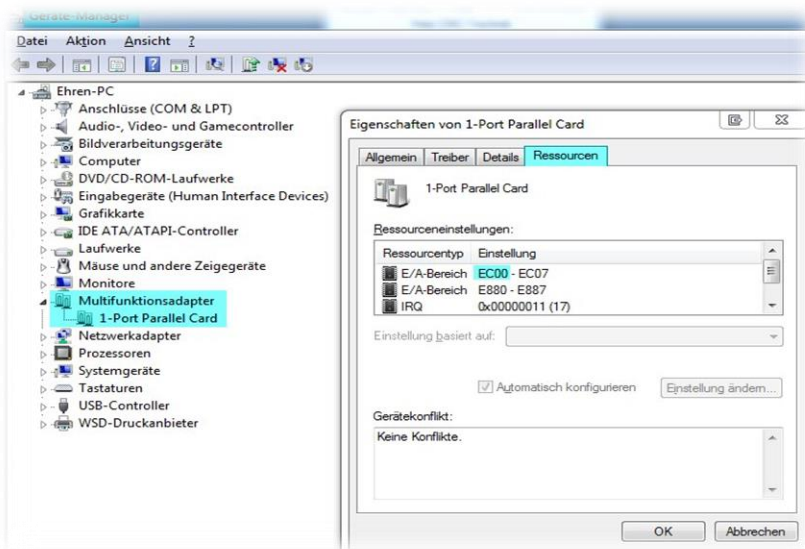
Some computers have multiple LPT ports, so that the right one first has to be found out. If the interfaces are not marked on the PC, you need to find out which interface you have connected to the control.

## How do you find out the correct port address of the LPT port?

In the Device Manager of the PC all available interfaces are listed.



*Standard interfaces, see Ports (COM & LPT)*



*Use interfaces on expansion cards (interface cards), it may be that this is a multifunction adapter or similar in the Device Manager!*

Select the interface to which you have connected to the machine. Go to the properties of the interface (eg with double-click) and look under Resources after the port address (I / O area).

This is the first entry (4-digit hexadecimal) as seen in the screenshots.

When using 2 LPT ports (only Economy) please repeat with both connected interfaces !

**This port address (es) you must now enter in WinPCNC (see 6.2.6).**

## 6.2.5 Determination of the COM interface (Professional)

For all "professional" versions the COM interface must be entered in WinPCNC (s. Page 17).

Some computers have multiple COM interfaces so that the right one first has to be found out. If the interfaces are not marked on the PC, you need to find out which interface you have connected to the control.

If the PC has no COM port, it is possible to work with a USB / Serial converter . This adapter then emulates a COM interface. (see below COM4)

Art. 400305 Digitus DA-70156-VPR2.0 USB to Serial Converter

In the Device Manager of the PC all available interfaces are listed.



*Standard interfaces, see Connections  
(COM & LPT)*

*Here you can see, for example, a PC with three COM ports  
(COM1, COM2, COM4).*

*The machine is connected in this case to COM4.*

*In WinPCNC you must then select COM4 (see 6.2.6).*

*The COM4 interface is provided via the USB / Serial  
converter. This is indicated by the entry USB Serial Port  
(COM4).*

## 6.2.6 Entry of the determined interface / port address in WinPCNC

The determined values can now be entered in WinPCNC.

In the variants Light and Economy, the identified port address (blue) must be entered.

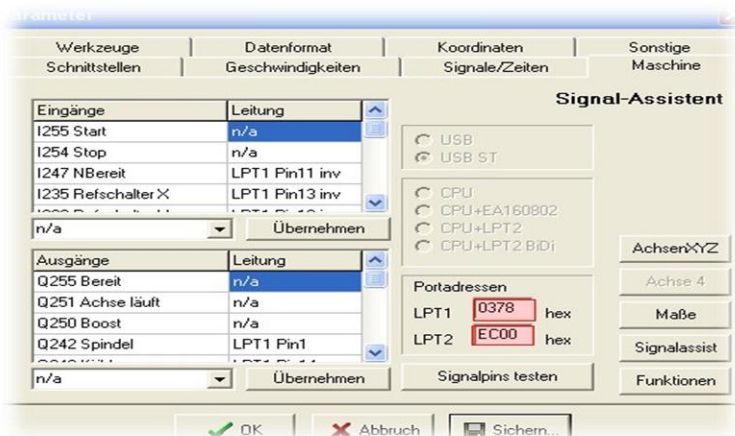


For professional the correct COM port (yellow) must be selected.

## 6.2.7 Entry LPT2 port (only Economy)

If you need more inputs and outputs for machine extensions, you can use the second LPT port. This must be entered for the economy version in WinPCNC.

For the variants USB and professional this is not necessary!



The LPT1 port address you have already registered. (s. above) The LPT2 port address, you must enter, under Parameters - machine- signal Assistant .

Caution:

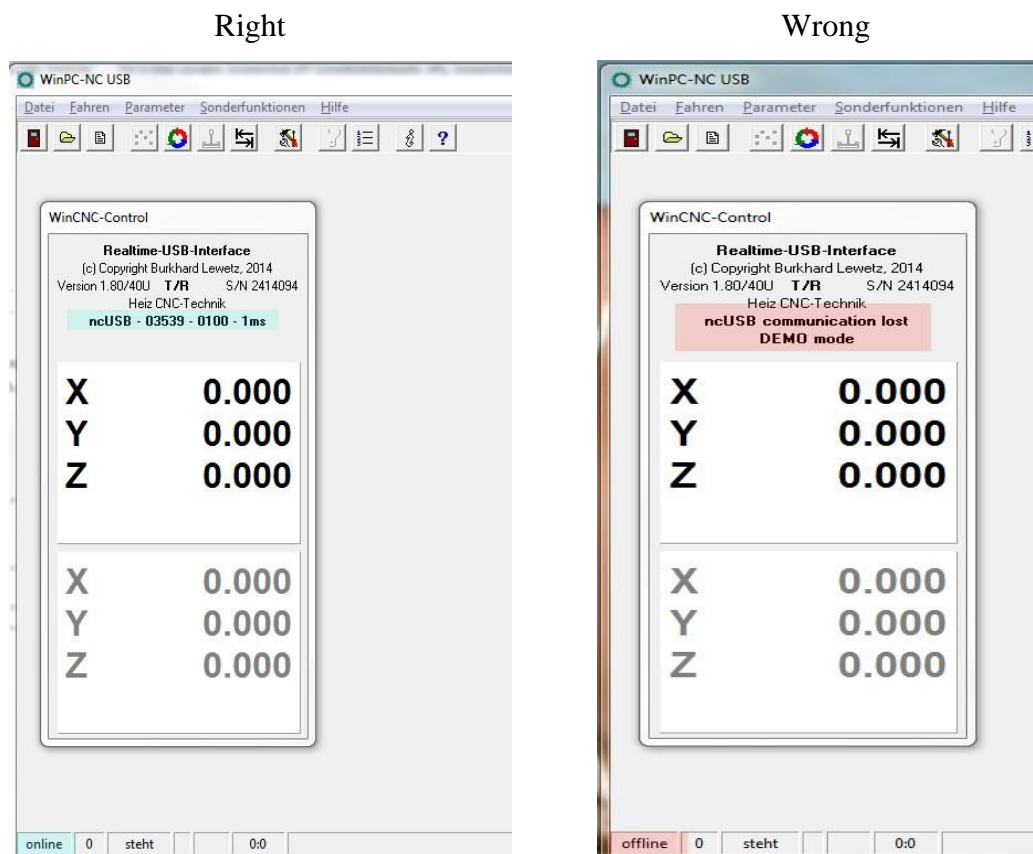
After each parameter setting in WinPCNC Always press the "Save" button.

## 6.2.8 check the efficiency

If the interfaces are correctly entered, all the hardware is connected, turn on the Zero-3 control and possibly additional hardware.

Start the WinPCNC software.

When starting, the window WinCNC control opens . Here you can see proper operation using the example USB. The hardware is detected and displayed.



In the left example, the communication is taking place, the machine is online. The software can now be used.

If there is still no communication possible (s.right), please make sure you have selected the correct interface. You may need to connect the controller to another available port or alternative change the port address or COM interface in WinPCNC.

Please read the handbook by WinPCNC.

The examples described herein refer to our recommended software WinPCNC. With alternative software such as Mach3 etc. the situation is similar.



## 6.3 ConstruCAM 3D

### 6.3.1 Installation

The software ConstruCAM 3D is a comprehensive CAD / CAM program. It works seamlessly with the software WinPCNC.

ConstruCAM is available to download on our website.

[https://www.cnc-step.de/wp-content/uploads/ConstruCAM3D\\_Eco.zip](https://www.cnc-step.de/wp-content/uploads/ConstruCAM3D_Eco.zip)

Save the download to your computer and unzip the archive file in any folder.

The software does not have to be installed. To unlock the software you will get the necessary instructions and the license code from us.

For preconfigured computers of course this has already happened!

### 6.3.2 Milling program generation with KinetiC-NC

After completing the drawing, the milling program must be generated in ConstruCAM3D and exported for KinetiC-NC.

To do this, the Directmill output must be set up.



Click the DirectMill button with the middle mouse button and select KinetiC-NC.



Specify the desired location and select a filename.

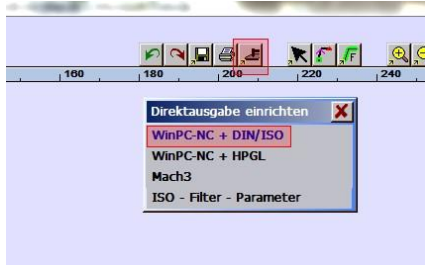
Attention: ConstruCAM3D now overwrites this file with every export (by clicking the DirectMill button). This can now be opened in KinetiC-NC.

Tip: You can copy and rename this file for later use. However, the export file created above must not be deleted or moved.



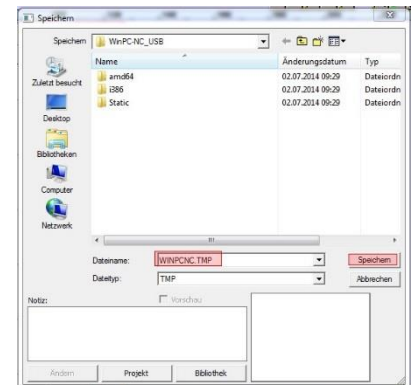
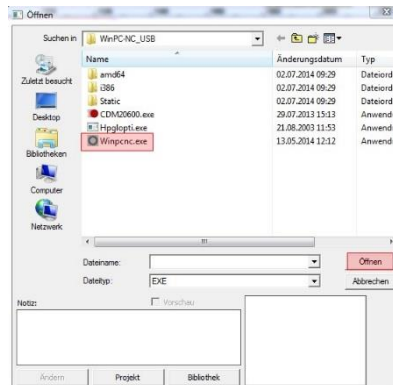
### 6.3.3 Interaction with WinPC-NC

ConstruCam 3D transfers the finished milling data directly to WinPCNC. For this WinPC-NC must be open in any case! This function must be set up once.



Click on the Direct Mill button and select "WinPCNC + DIN / ISO".

The program now needs the WinPCNC path. This is normally found automatically and only needs to be confirmed. Confirm once the WinPCNC.exe and then the WinPCNC.



For further information, please refer to the help files in ConstruCam 3D.

### 6.4 Other Software

For special applications, it may be useful to use ConstruCam 3D "special software". This then provides special functions.

- e.g. Filou NC12 for plasma cutting (soft approaching of contours)
- Filou DeskProto MultiAxis 6.1 for rotary axes

For further information, please refer to the respective documentation.

## 7 Customer service

For technical information, please contact our Technical Customer Service:

Address	CNC-STEP e.K. Siemensstraße 13-15 D-47608 Geldern	
Phone	+49 (0)2831/91021-50	(Mo. - Fr. 07.00 am - 3.00 pm)
Mobile	+49 (0)2831/91021-20 Only in urgent cases	(Mo. – Thu. 3.30 pm - 6.00 pm)
Fax	+49 (0)2831/91021-99	
E-Mail	support@cnc-step.de	
Web	<a href="https://www.cnc-step.de/en/">https://www.cnc-step.de/en/</a>	

If you have questions, please contact our customer service via e-mail or phone. We advise you gladly.

Numerous suggestions and information can be found on our website:

<https://www.cnc-step.de/en/>