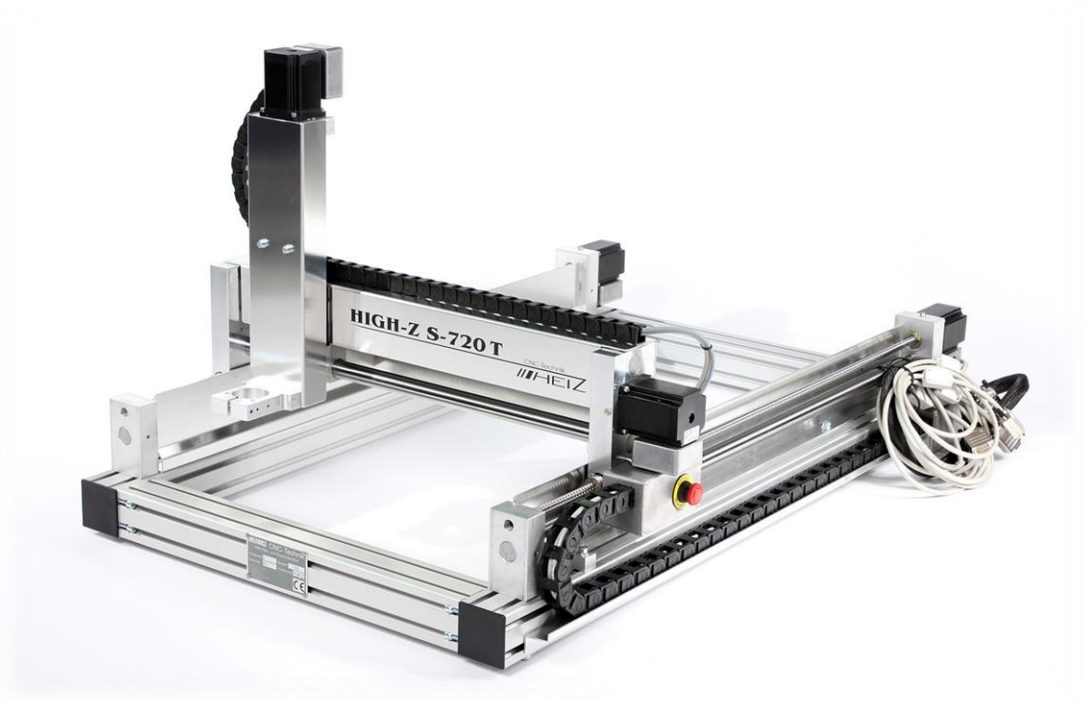
CNC-STEP GmbH & Co. KG

Quick Start Guide
High-Z Series

with Zero-4 control from Rev. 2.0

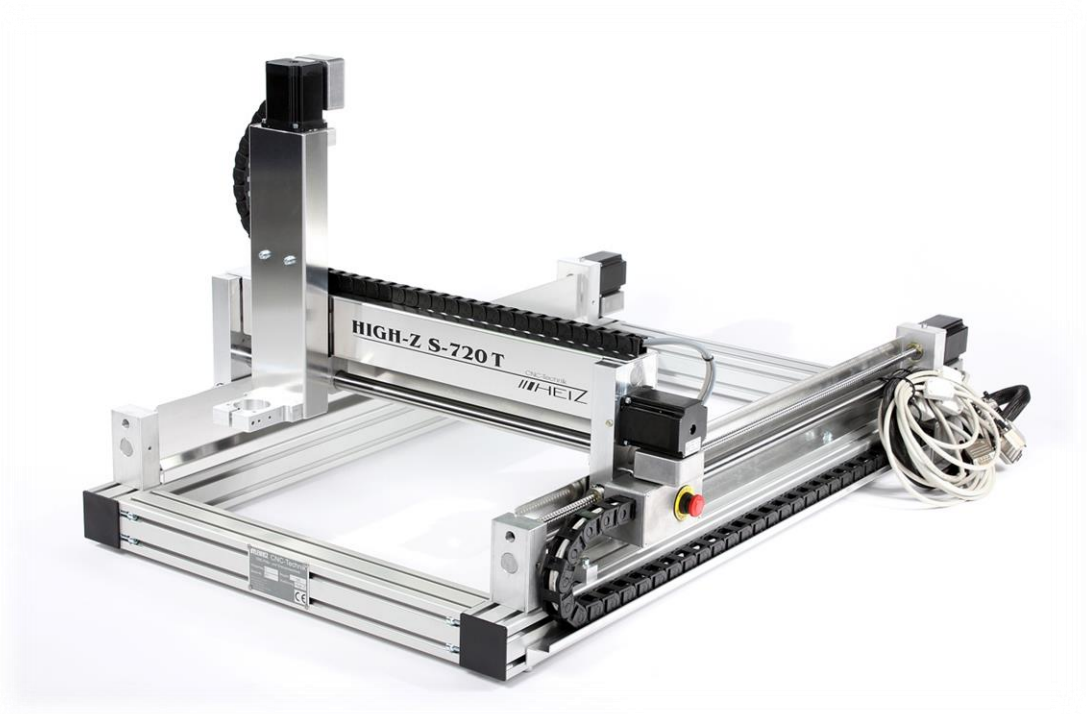
Software KinetiC-NC

https://www.cnc-step.de/



stand: June 29, 2021

High-Z Series

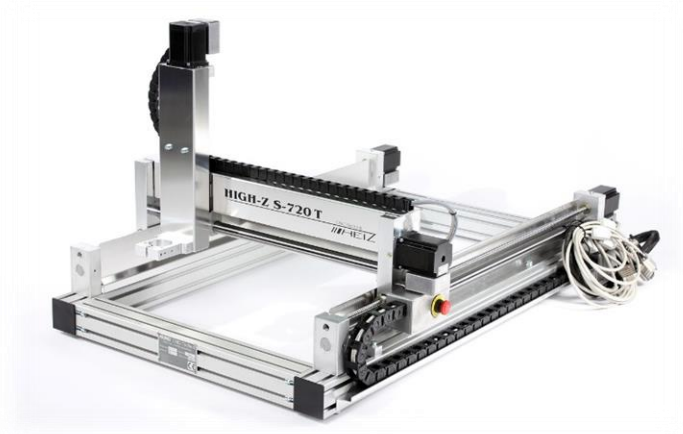


Brief description

This quick start guide is intended to help you with the initial commissioning of the machine.
It also includes optional accessories that are connected directly to the machine or the controller.
Further detailed information can be found in the individual manuals.
In any case, they should also read them!

Contents directory

1 Connections and cables on the machine



The connecting cables are connected directly to the Zero-4 stepper motor control.

Attention: Before connecting the cables, please switch off the Zero- 4 controller!!!

D-Sub 9pol. X1	Motor connection line X1-axis
D-Sub 9pol. X2	Motor connection cable X2-axis
D-Sub 9pol. Y	Motor connection cable Y-axis
D-Sub 9pol. Z	Motor connection cable Z-axis
D-Sub 9pol. St	Control line ST
cable lug	Ground / Total shield for Zero-4

The miniXLR-jack (3pol.) offers optional connection for further accessories.

miniXLR connector

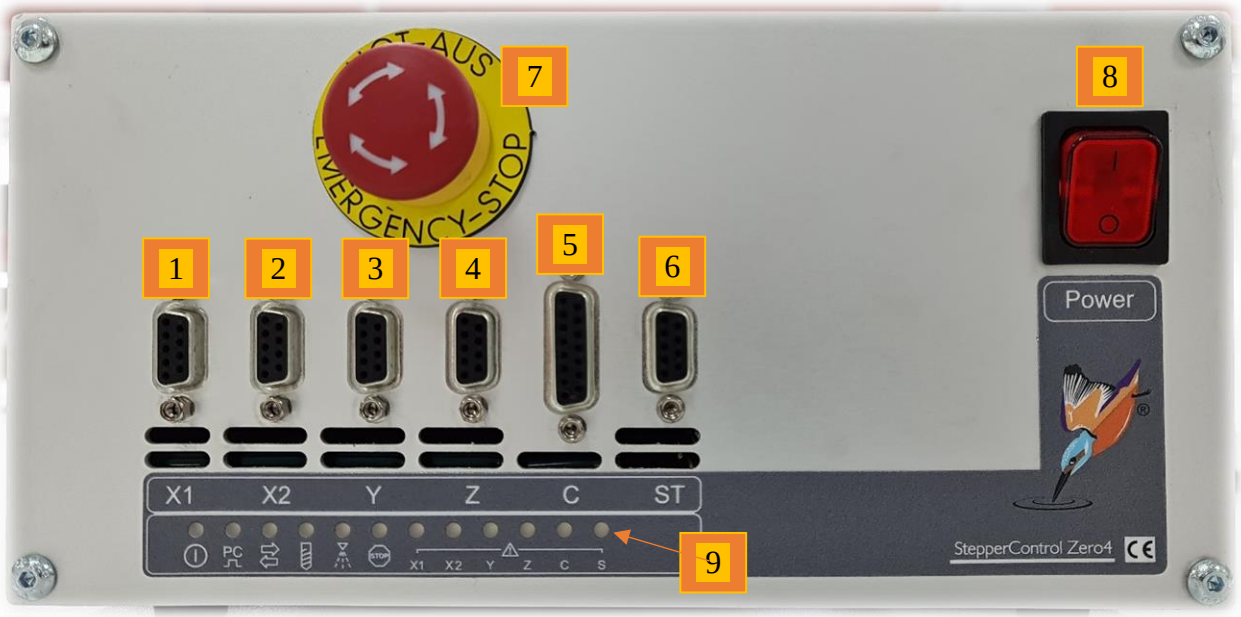
Important note:

The miniXLR connector can only be used if no 4th axis is set with reference switch (such as axis of rotation, oscillating knife).

The reference switch uses the same input signal as the miniXLR connector: ***LPT1 PIN15***

2 Connections to the Zero-4 stepper motor control

2.1 front

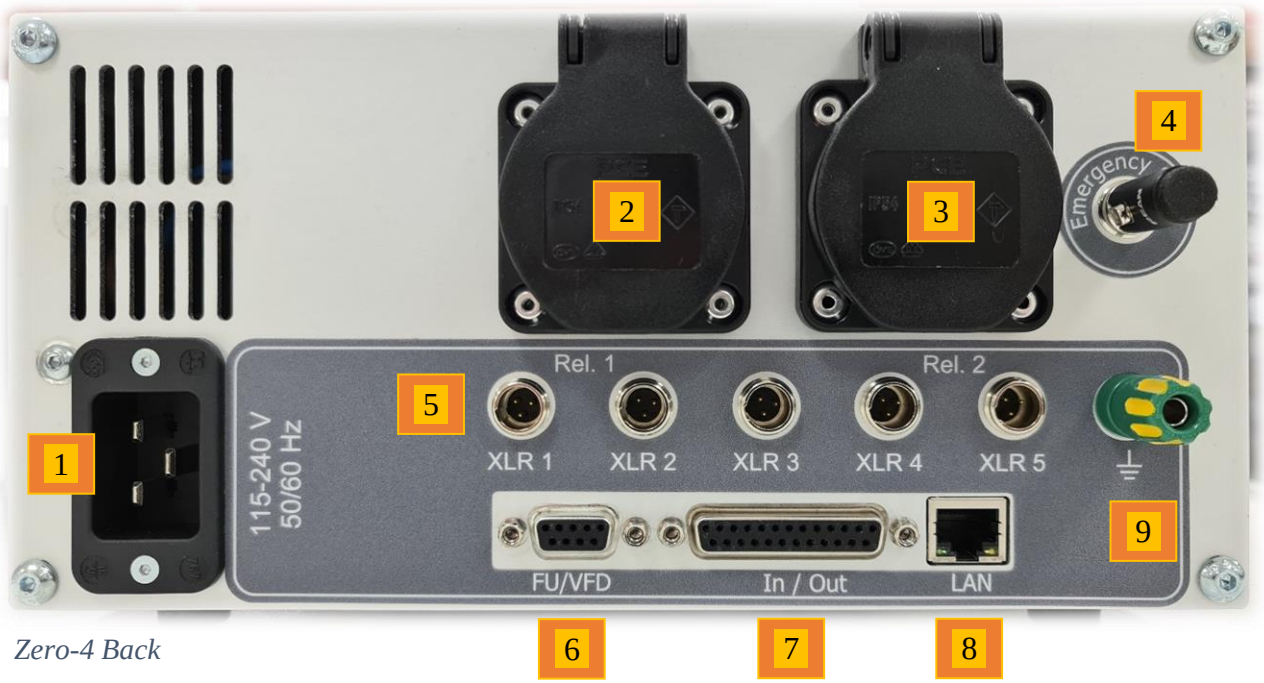


Zero-4 Front

Front at a glance

1	Connection socket D-Sub 9pol. for motor X1
2	Connection socket D-Sub 9pol. for motor X2
3	Connection socket D-Sub 9pol. for Motor Y
4	Connection socket D-Sub 9pol. for Motor Z
5	Connection socket D-Sub 15pol. for 4th axis (rotary axis / tangential knife)
6	Connection socket D-Sub 9pol. for control line ST
7	Emergency off buttons
8	Power button
9	Status LEDs

2.2 back



Zero-4 Back

Back at a glance

1 Mains connection (input voltage 115-240V)

2 Socket 1 (115-240V depending on input voltage - switchable via relay1)

3 Socket 2 (115-240V depending on input voltage - switchable via relay2)

4 Connection for an external emergency-off button (4pol. miniXLR installationtecker)
(If this is not used, the bridging plug must remain plugged in)

5 3pol. miniXLR built-in plug (XLR1-5) - Inlet for accessories/extensions

6 D-Sub 9pol. (FU/VFD) - Connection for inverter / accessories with 0-10Volt input

7 D-Sub 25pol. (In/OUT - LPT2) - Inputs and outputs (also 0-10Volt**)** for older accessories

8 LAN (PC)

9 Grounding for complete screen of the machine (High-Z series from year 03/2015)

Note on the sockets 1 + 2:
The two sockets can be switched via two relays. Thus, the consumers connected there can be connected by software. This also ensures that the power supply is interrupted in the event of faults and in the event of an emergency stop.

The maximum power consumption per socket must not exceed 8A.

The current consumption of both sockets together must not exceed 13.5A.

3 Connection of the machine to the Zero-4 control

Zero-4 Front

Connection cable of the machine

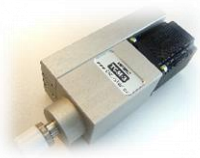
- Make sure the controller is off.
- Connect all 5 connection cables to the Zero4 controller.
- Make sure that you secure all cable connections with the knotting screws against loosening.

4 Connection of a 4th axis

A further stepper motor can be operated as a 4th axis on the C connection of the Zero-4 control. In addition, a 12-24V supply for an oscillation motor and the connection option for another reference switch are available on this port.

Zero-4 Front

axis



TCM-4

EOT-3

TCT-2

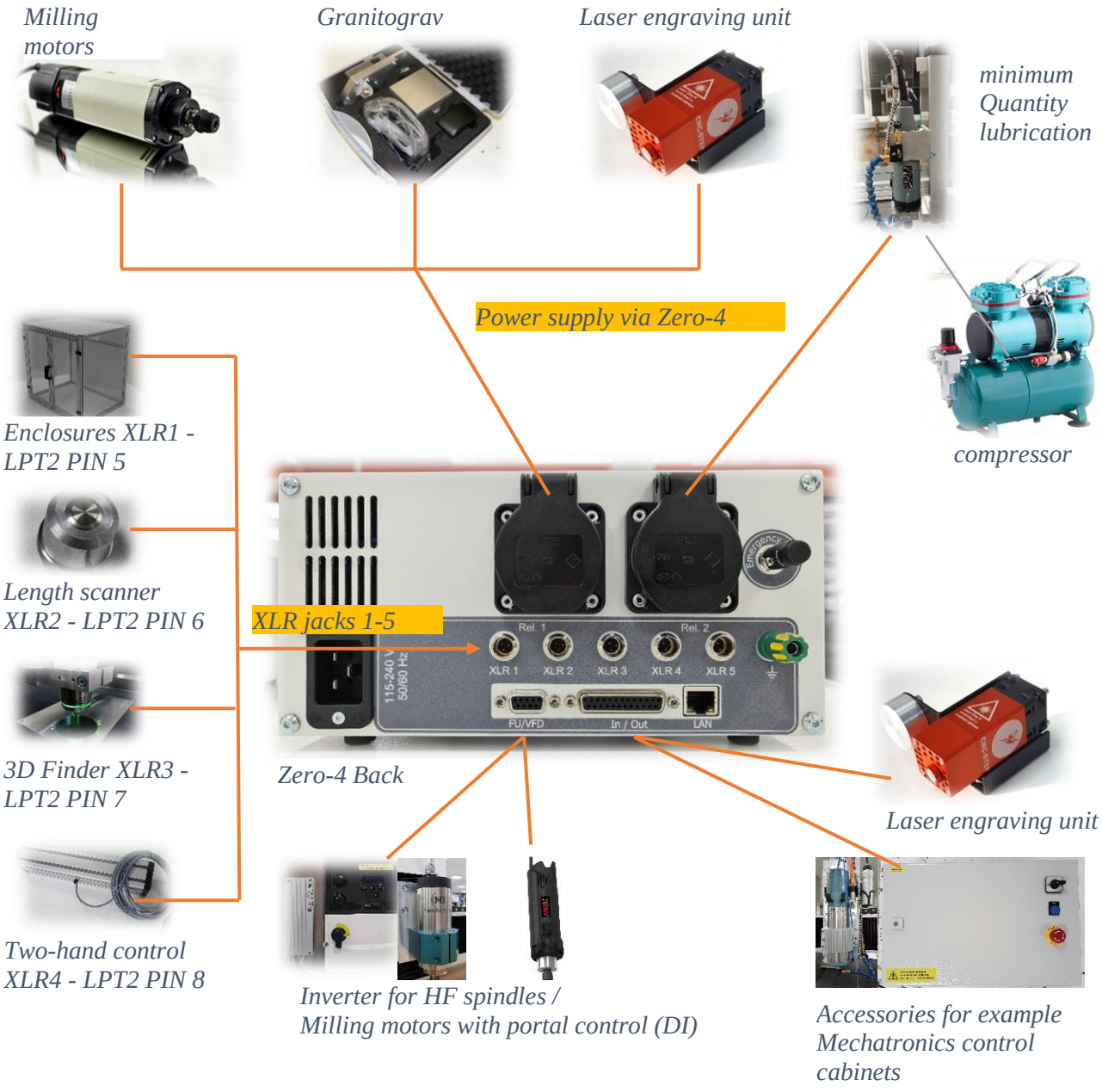
- Make sure the controller is off.
- Connect the supplied connection cable to the C-jack of the controller.
- Make sure that you secure all cable connections with the screws against loosening.

5 Connection options of optional accessories

In most cases, you can connect the supplied accessories directly to the Zero-4 controller without any additional hardware. Here are some examples.

Further detailed information can be found in the individual manuals.

5.1 Connection of accessories

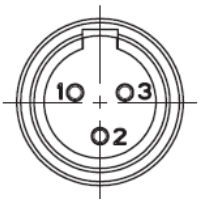


5.1.1 Accessories to the sensor inputs XLR 1-5

The XLR1 to XLR5 built-in plugs can be used for PNP inductive sensors or mechanical switches. Mechanical or magnetic switches (reeds) must be connected between pin 1 and 3.

For inductive sensors: brown wire at pin 1 (+), blue (-) on pin 2, black on pin 3.

Pin No.	signal
1	+24V Supply
2	Mass / Ground
3	Signal inlet



The PIN allocation of the 5 XLR inputs in the software is:

XLR	Application	Software Pin
1	Security door enclosure	LPT2 - PIN5 (-)
2	Tool length button	LPT2 - PIN6 (+)
3	3D Finder	LPT2 - PIN7 (+)
4	Two-hand control	LPT2 - PIN8 (+)
5	Additional	LPT2 - PIN9

5.1.2 Milling motors

We offer numerous milling motors from Suhner and AMB Elektrik for our machines.

Most milling motors of the companies Suhner and AMB Elektrik have a 43mm Euroneck and therefore fit easily into the corresponding machine equipment holder(43mm) of the machine.

On the milling motor itself there is the on and off switch and the setting wheel / potentiometer for the Control of Revolution speed. *Adjustment via software is not possible here.*

The milling motor can be switched on and off via the relay of the socket 1 (Rel.1) of the Zero-4 controller via software.

- Make sure the controller is turned off.
- Connect the power cord to the socket 1 (Rel.1) of the Zero-4 controller.

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

Please also note the instructions from page 6 for the maximum current consumption.

In addition to these "normal" milling motors, AMB Elektrik also offers milling motors with a digital interface (DI series). These can be connected directly to our Zero-4 controller with the appropriate connection cable and the speed can be conveniently controlled via the software.

5.1.3 Granitograv and laser engraving unit

With this accessory there is an additional control box, which must be supplied with power. For this purpose, the respective power supply can be connected to the Zero-4 controller. This separates the accessory from the power in case of emergency!

- Make sure the controller is off.
- Connect the power supply of the respective control box to the socket 1 (Rel.1) of the Zero-4 controller.

Please also note the corresponding manuals with further detailed information for the operation!

5.1.4 Minimum quantity lubrication with solenoid valve

We have various minimum quantity lubrication in the program, which can be automatically switched on or off via a magnet valve.

The power supply for this is also connected directly to the Zero-4 controller.

Via the solenoid valve, the air supply can be automatically switched on and off from the compressor by software. We recommended to do so.

This has the advantage that it is only lubricated when necessary.

- Make sure the controller is off.
- Connect the power supply to the socket 2 (Rel.2) of the Zero-4 controller.

5.1.5 Inverters and RF spindles

The PWM signal for the spindle speed output by the KinetiC-NC software is converted from the Zero-4 controller into an analog 0-10Volt signal and is transferred by the 9pol. D-Sub and 25pol. D-Sub connection.

This allows you to connect an inverter for the operation of an RF spindle directly to the Zero-4 controller.

- Make sure the controller is off.
- Connect the "control cable" of the inverter to the 9pol D-Sub connector of the controller.
- Make sure that you secure all cable connections with the knotting screws against loosening.

By the way:

The 25pol. D-SUB connector is backwards compatible with Zero-3 control.

Customers who already use older accessories and want to switch to the Zero-4 can use for example inverters, portal controllers, mechatronic systems with control cabinet, etc. with 25poles. connect the connection cable further.

6 Installation

In addition to the control program of the KinetiC-NC machine, you will also receive the two CAD/CAM programs ConstruCam 3D and EstlCam. (except for the High-Z S-400)
You are free to decide which program you want to use. Many other programs available on the market are also compatible with our controller. (e.g., Vectric, Filou or Fusion360)

If you want to use a different software, please check in advance whether the post processor for the KinetiC-NC software is available.

6.1 KinetiC-NC

KinetiC-NC is the latest control software from CNC-STEP.

1. If you have purchased a PC from us for the machine, the included software is already pre-installed and the machine is already fully equipped with the accessories.
2. If you have not purchased a PC with but have purchased a special machine (special size) or special accessories (e.g., tool change systems), we have already set up and saved the appropriate parameters for you. You can then find them on the USB stick in the machine folder. This can be imported after the software has been installed. It is a *. ini file.
3. If all this is not the case, you can import preconfigured setup files for your machine and purchased accessories after installing the software.

The setup files of the software are located on the supplied USB stick. Alternatively, you can also download the software on our website.

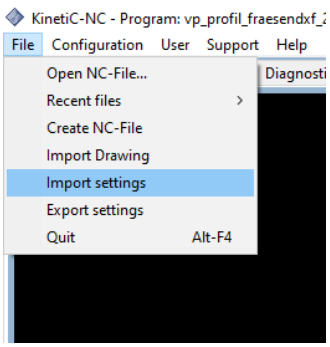
The installation is done by running the setup file.

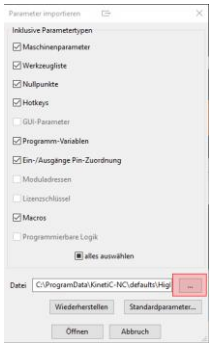
When you start the software for the first time, you will be asked about your machine type. Select your machine type from the list.

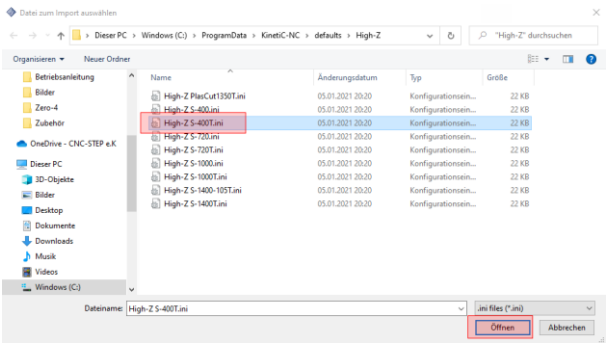
For full access to the software, please log in to the user "**Customer Admin**".
The default password is "**1234**".
No password is required for the default user with restricted rights.

6.1.1 Import special parameter files (backup) supplied

If we have already created and included a finished INI file for your machine, you can import it. You can find this file on the second partition (drive) of the supplied USB stick. You can find it at the front of the machine folder.





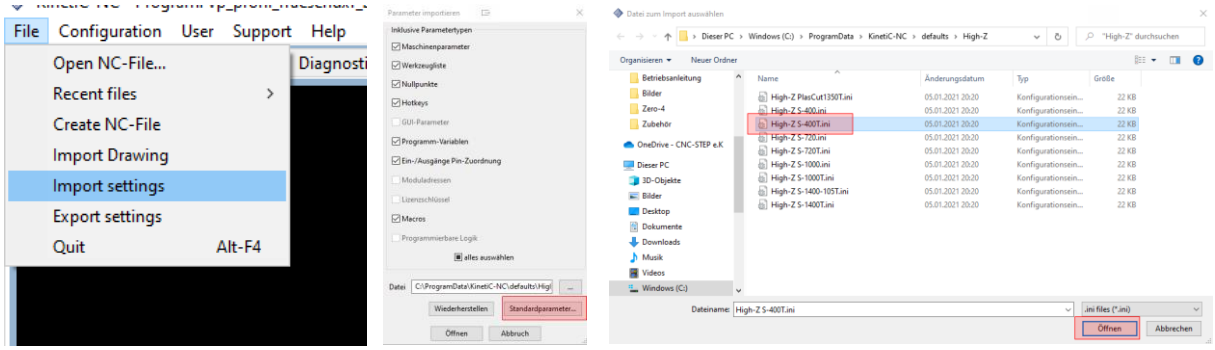


1. File - Import settings
2. Click on the button with the three dots
3. Select the drive of the USB stick
4. Select *.ini file from USB stick
5. Click on the "Open" button
6. Click "Open" again in the second window

Now all settings are loaded.

6.1.2 Import standard parameter files

If you have purchased a standard machine, you can import the necessary parameters for your machine.



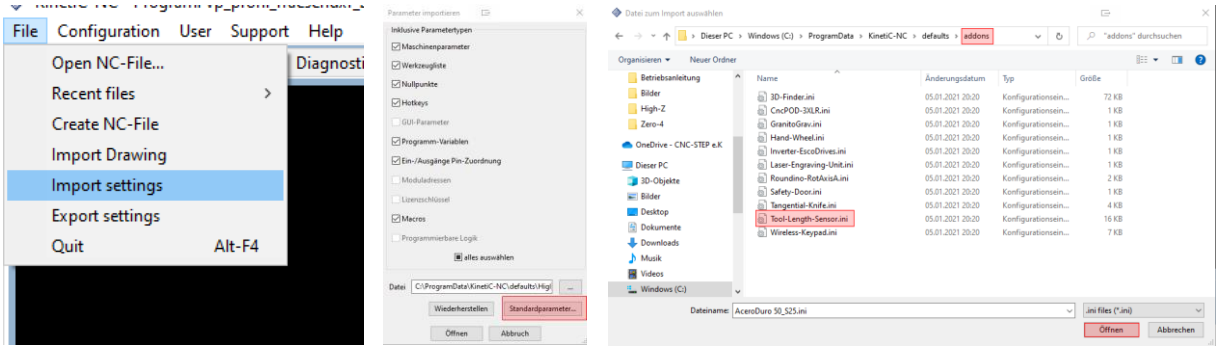
1. File - Import settings
2. Click on the "Standard Parameters" button
3. Select the folder for your "High-Z" machine series
4. Select the subfolder for the standard or T-series
5. Select your machine size
6. Click on the "Open" button
7. Click "Open" again in the second window

Now the default parameters for the machine are loaded.

If you have now purchased accessories that are controlled via the control software (e.g., tool length sensor, rotary axes, tangential knives, 3D finders, enclosures, laser engraving, USB keypad, Grantigrav,3D finder, HF spindle, etc.) you can have the appropriate ADDONs imported one after the other. (see next chapter)

6.1.3 Import parameter files for accessories (ADDONS)

The necessary parameters for your purchased accessories must also be imported in this way.



1. File - Import settings
2. Click on the "Standard Parameters" button
3. Select the folder for your machinenserie "High-Z"
4. Select the "Addons" subfolder
5. Select the subfolder with the control variant "Zero-4"
6. Select the desired accessory (addon)
4. Click on the "Open" button
5. Click "Open" again in the second window

You have to do this one at a time for each accessory you want.

It should also be noted that not all accessories are compatible with everyone and can be loaded and used at the same time.

A tool length scanner, a safety enclosure, a CNC keypad can of course be loaded and used at the same time.

A rotary axis and a tangential knife of course not, they are both 4th axes.

In this case, the settings must be loaded before use.

Everything else is well explained in the two manuals and in the online help incl. instructional videos. These can be found in the KinetiC-NC software under "Help".

6.2 ConstruCam 3D

6.2.1 Installation

The ConstruCam 3D software is an extensive CAD/CAM program. It works seamlessly with the KinetiC-NC software.

ConstruCam is available on the supplied USB stick or as a download on our homepage.

https://www.cnc-step.de/wp-content/uploads/ConstruCam3D_Eco.zip

Save the download to your computer and unzip the archive file to any folder. The software does not need to be installed. Start the ConstruCam.exe.

You will receive the necessary activation data for the program by e-mail.

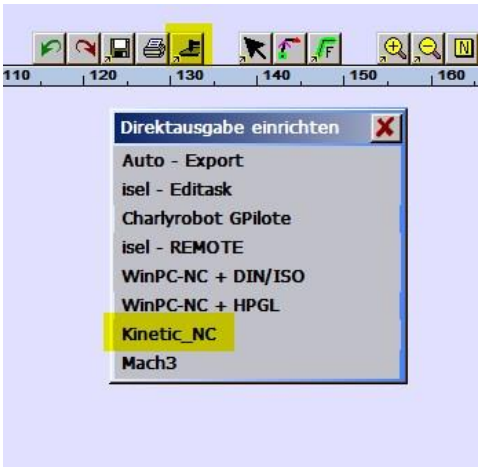
For preconfigured computers from us, the software is already installed and set up!

Please read the instructions for this.

6.2.2 Milling program creation with KinetiC-NC

After the drawing is completed, the milling program must be generated in ConstruCam3D and exported for KinetiC-NC.

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



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

Enter the location you want and select a file name.

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 EstlCam

Another option for ConstruCam 3D is the CAD/CAM program EstlCam.

You will receive the necessary download link and license key to the program by e-mail.

After the download, the software can be installed and activated with the license key.

The software is already installed for preconfigured computers from us. All you have to do is unlock the software with the license key.

On the homepage of the manufacturer you will also receive further information, instructions and FAQ.

https://www.estlcam.de/

6.4 Other software

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

e.g.	Filou NC	for plasma cutting (soft start-up of contours)
	Filou DeskProto MultiAxis	for rotary axes

For more information, please refer to the respective documentation.

7 customer service

For technical information, our customer service is at your disposal:

address	CNC-STEP GmbH & Co. KG Siemensstraße 13-15 D-47608 Geldern	
telephone	+49 (0)2831/91021-50	(Mon. - Fri. 7:00 a.m. - 3:00 p.m.)
mobile	+49 (0)2831/91021-20 Only in urgent cases	(Mon. - Thu. 3.30 p.m. - 6.00 p.m.)
fax	+49 (0)2831/91021-99	
email	support@cnc-step.de	
Internet	***https://www.cnc-step.com/***	

If you have any questions, please contact our customer service by e-mail or phone. We are happy to advise you.

Numerous suggestions and information can also be found on our website:

https://www.cnc-step.com/