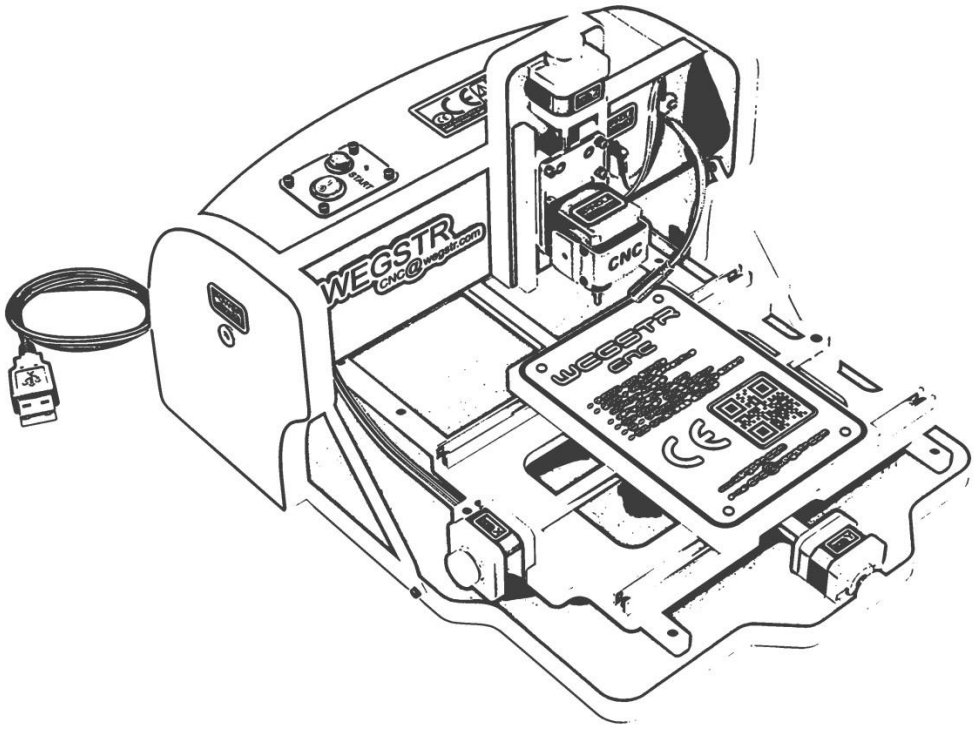
EN

INSTRUCTION MANUAL

WEGSTR.com



DEVICE (PRODUCT) NAME:	CNC MILLING MACHINE
TYPE:	WEGSTR
DESIGN(OTHER SPECIFICATIONS):	
	SUPPLIER
NAME:	WEGSTR s.r.o.
ADDRESS:	TYRŠOVA 2, KOSTELEC NAD ORLICÍ 517 41, CZECH REPUBLIC
IDENTIFICATION NUMBER:	05904595
TAX ID:	CZ05904595

Table of content

TECHNICAL AND CONTACT INFORMATION

Record the following information concerning with your machine. This information is important for ordering spare parts and in case of loss or theft.	
Supplier :	WEGSTR s.r.o.
Address :	Tyršova 2, Kostelec nad Orlicí 517 41, Czech Republic
Phone :	+420 702 097 226
Mail :	cnc@wegstr.com
Web :	www.wegstr.com

Technical information:

width - 380 mm
length - 460 mm
height - 290 mm

working area - 140 x 200 mm

total power input - 30W
rated input power of the spindle - 25W

spindle revolution - 11 000 rpm

maximal height under the spindle - 40 mm

maximal traverse speed axis X – 170 mm/min
axis Y – 170 mm/min
axis Z – 170 mm/min

diameter of the spindle hole (for tool holding) - 3.175 mm

CNC milling machine was developed for special control system delivered in the package (or available to download on our webpage) and therefore machine is not compatible with others control systems.

1. Introducing

This instruction manual contains technical data sheet of the machine, data and rules for establish and transport, information about operating and set-up device.

This manual would be without effect, if leader and mainly operation staff would not be acquainted with content of this manual.

Before start to work with this machine, users are responsible for familiarize with this manual properly. This manual contains important data about safety work, maintenance and is necessary to be considered of part of this device. Trouble-free work and safe process depends on careful and right maintenance.

User should understand and be completely aware about information contained in every sections of this manual. The most important are safety measures in every chapter. And further are stated general safety measures, which are recommended during operating of the device.

If any information in this manual will not intelligible or understandable, please let the manufacturers of the device know. Is recommended to create a copy of this manual, and save original document, in case of loss or get damaged. Follow the safety instructions during work process to avoid of users injury or other persons in close area.

These instructions in manual are highlighted by following safety warnings pictograms:

- CAUTION, RISK OF HEALTH THREATS OR PROPERTY DAMAGE
- VERY IMPORTANT INFORMATION FOR USER
- GENERAL INFORMATION FOR USER

2. Description of intended use of the machine

Use the machine in any other way than manufacturer recommends is improper! This machine has to be operated only in charge of people, who are well understood to properties of this device and who were introduced about required regulations in process. Any other changes and unauthorized modifications made on this machine without manufacturer permission, depriving manufacturer to all responsibilities for consequential damages or injuries! If the user wants to use this device for any other purposes that are not stated as standard use or are in banned actions, then user has to discuss this action with the manufacturer. To avoid of any danger situation or injuries of user (or people in close area) during working with this device please follow safety instructions.

3. General description machine
(basic description of the machine)

Construction, mechanical transmissions and electrical setup. This machine is used as a multipurpose milling CNC machine.

4. Description of areas, which has to be in charge of the user
(defined areas for use of this machine)

- machine works in automatic mode, user makes regular checks of this device

5. Checks of the machine before start
(operations, which are needed to be done by user before launch of the machine)

- user has to check the machine before start of the process if the machine does not show any signs of damage or any other problems, which could lead to health or property threats
- in case of defect, user is not allowed to start the machine or continue to operate with the machine (it is needed to tell the fact to responsible person)

6. Warnings considered as banned methods of usage
(operations, actions and methods of usage which cannot be done by user)

- is banned to eliminate or remove functions of the safety parts of the machine
- is banned to touch moving parts of the machine by body or by any other objects and tools
- is banned to make construction modification, which are not recommended and authorized by manufacturer of this machine, same conditions are for replacing parts for other types
- is banned to remove a waste from dangerous spots while machine operates
- is banned to work on the machine under the influence of alcohol or drugs, that could reduce reactions or attention of the user
- is banned to make maintenance, cleaning and repairing when machine runs and in case if the machine is not secured against accidental or automatic start
- is banned to operate machine without safety covers

- is banned to operate machine with some defect in the construction or mechanism of the machine and without safety parts
- is banned to operate machine against requirements of safe work – see safety instructions
- is banned to start the machine if unauthorized people are in dangerous distance or dangerous area of the machine
- is banned to use the machine in humid environment

7. Personal safety utilities

(determine by manufacturer)

- safety goggles
- safety gloves

8. Safety instructions

(reduction risk of injury)

Setup, connection, commissioning as well as maintenance and repairs must be performed only by qualified and trained personnel in according with:

- this instruction manual for use
- current regulations related to safety and accident prevention

DO NOT TRY TO PUT THE MACHINE INTO OPERATION IF YOU DID NOT READ ALL INSTRUCTIONS SUPPLIED BY THE MANUFACTURER AND IF YOU DID NOT UNDERSTAND TO THE WHOLE PROCEDURE!

9. Safety instructions for the user

(these instructions have to be followed by user)

- do not wash any parts of the machine by splashing water
- safety equipment must be always kept in perfect condition
- keep the safety signs on the machine in readable condition
- observe the safety instructions in this manual
- before you start to operate the machine, please carefully read these instructions of use, including instructions from other sub-systems

- if the machine unusually and strongly vibrates or shows increasing noise or other symptoms that are not in its usual activity - turn off the machine and secure instant check of the machine
- do not work with the machine if you feel physically or mentally tired
- damaged machine should never be put into operation
- work only in good light conditions or use artificial light
- before removing the parts from the machine, wait until the moving parts will stop
- before starting work the user has to make a visual inspection of moving parts, if there are no signs of excessive wear out or damage
- with excessively worn out or damaged parts is not possible to operate this machine
- do the adjustment, maintenance and cleaning work only when the electricity is cut off
- the machine may be operated only by personnel aged 18 or older, mentally and physically capable, demonstrably trained and authorized by the machine operator
- all maintenance, repair and adjustment work of the machine must be done only when machine is stopped and properly secured
- replacement of damaged machine parts has to be performed by a specialist, only original parts may be exchanged
- the machine is intended for indoor use only
- is prohibited to use the machine for other purposes, than those for which it was designed
- if the machine is not in use, it has to be stored in dry conditions
- connect the power pack by means of its cable to the machine and then to a plug-in socket (disconnect in reverse order)
- use only included power adapter to power the machine
- do not short-circuit the output of the power pack
- do not allow children to play with the machine and its accessories
- keep it away from animals
- in the case of sudden need use the emergency STOP button to immediately turn off the machine

10. Dangerous areas

(areas of increased risk of injury)

- the entire interior of the machine
- workspace area around the machine

11. Electrical equipment on the workplace

(fixed voltage system for the machine)

- voltage system 100–240 V 50/60 Hz

12. General rules for order and cleanliness

(requirements for storage of the products, requirements for cleanliness and hygiene)

- observe the specified hygiene requirements stated by the manufacturer
- turn off the machine before cleaning

13. Setup

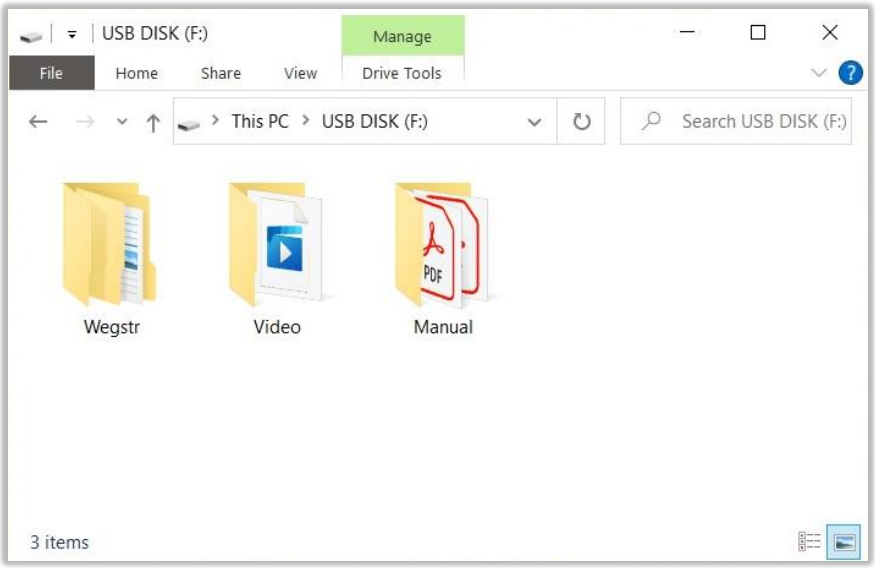
(requirements for installation of the machine and software)

Software information (part of the purchase)

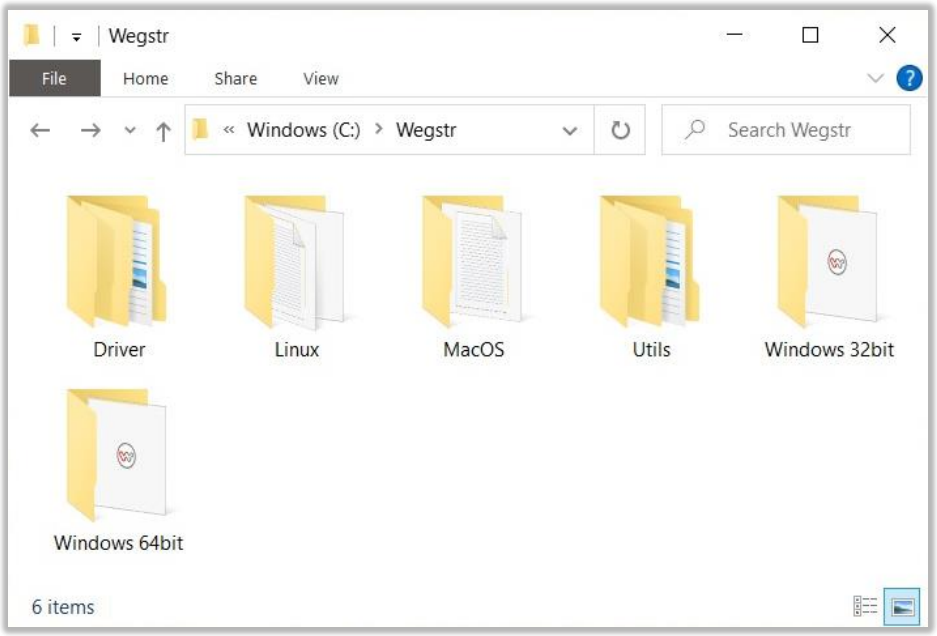
- supported versions of operating system
  - Windows 32-bit a 64-bit (XP, 2000, Vista, 7, 8, 8.1, 10)
  - MacOS
  - Linux (tested on Kubuntu and Raspbian distribution)
- language mutation
  - English
  - German
  - Spanish
  - Czech
  - Polish
  - French
  - Italian
- software is free for download (full version) on the page of the manufacturer
- is recommended to keep the software always up to date

Installation of the software:

- insert the USB flash disk (delivered with the machine) to your computer
- copy the „Wegstr" folder on your local disk



- open the copied folder
- install the suitable driver for the machine from „Driver" folder



Launching of the software on Windows:

- run the application by clicking on „Wegstr.exe" from proper folder
- before the file is opened, antivirus software can execute check, wait till it is finished

Launching of the software on MacOS:

- run the application by clicking on „Wegstr.app" from MacOS folder
- if the application does not run and shows the message "The application Wegstr can't be opened." please do following steps.
    - right click on the application, select "New terminal at folder" and run command as below
    - sudo chmod +x /Contents/MacOs/Wegstr
- in case of warning message "Wegstr cannot be opened because the developer cannot be verified." do following steps
    - go to the System Preferences
    - open Security & Privacy option
    - click on "Open Anyway" button next to the message that Wegstr application was blocked

Launching of the software on Linux:

- before the software will be launched, open the console in folder „...\Wegstr\Linux" and execute following commands
    - sudo chmod +x Wegstr.sh
    - sudo adduser $USER dialout
- restart your computer
- run the application by clicking on „Wegstr.sh" from Linux folder
- you need to have the Java 8 installed on your computer, please check this

Installation of the machine:

- put the WEGSTR milling machine on the flat and solid surface to prevent wobbling and twisting of the machine, to not affect the accuracy of the milling
- the axis Z was turned over (for transport reason) and therefore it has to be turned back to its vertical position and screwed on four locations by included screws
- connect power adapter plug into a 100-240 V electricity
- release the emergency STOP button (by clockwise turning)
- turn on the milling machine by switch button, the blue LED diode will be blue
- push START button on the machine, the blue LED diode will flash
- connect the USB cable of the machine to prepared computer
- when the USB cable is connected, software detects the machine and shows the status „device ready"
- device is currently ready to work, test the movement of all 3 axes X, Y, Z and test start and stop of the spindle

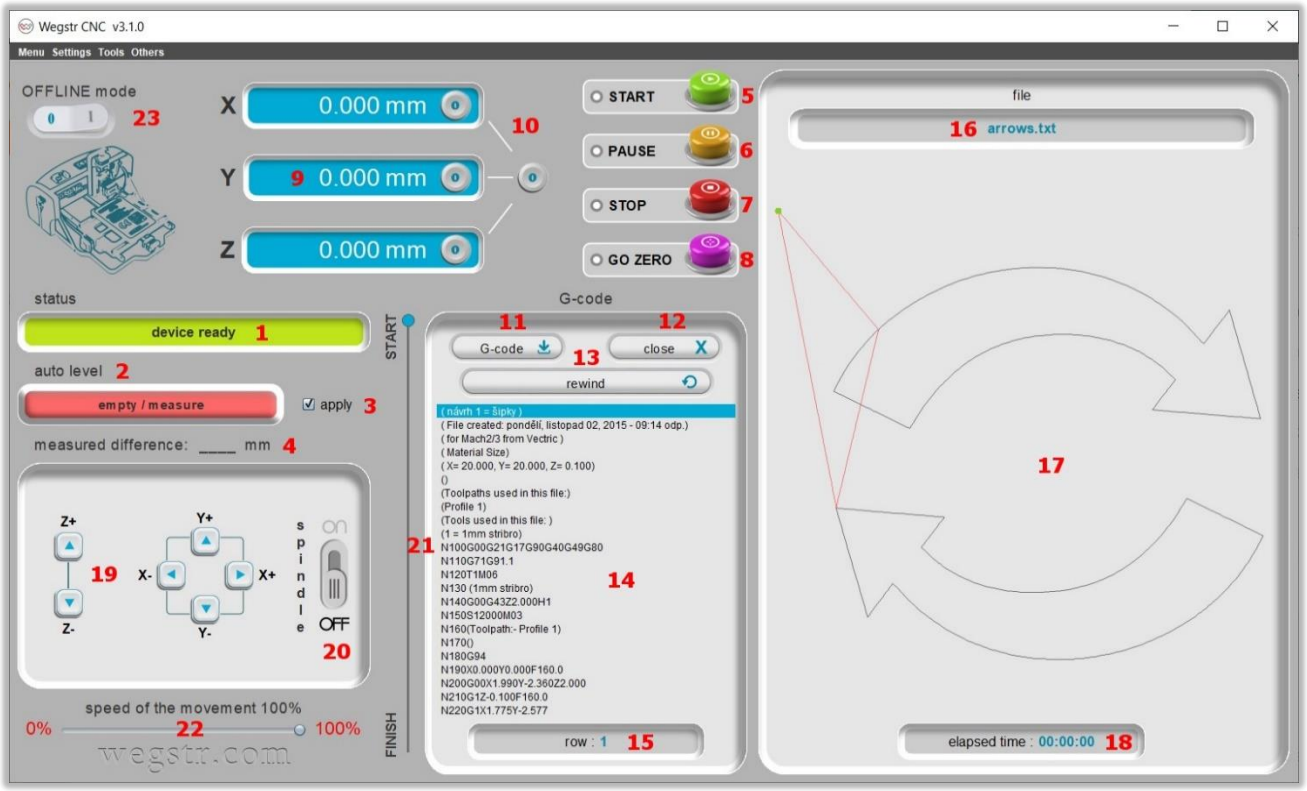
If you are not successful to put into operation the machine, go through all the points from this instruction manual once again. Or don't hesitate to contact us in case of need.

14. Software and machine control

(software and machine control options)

Basic control:

On the picture below, you can see the numeric links (close to every important component) with following explanation under the picture.

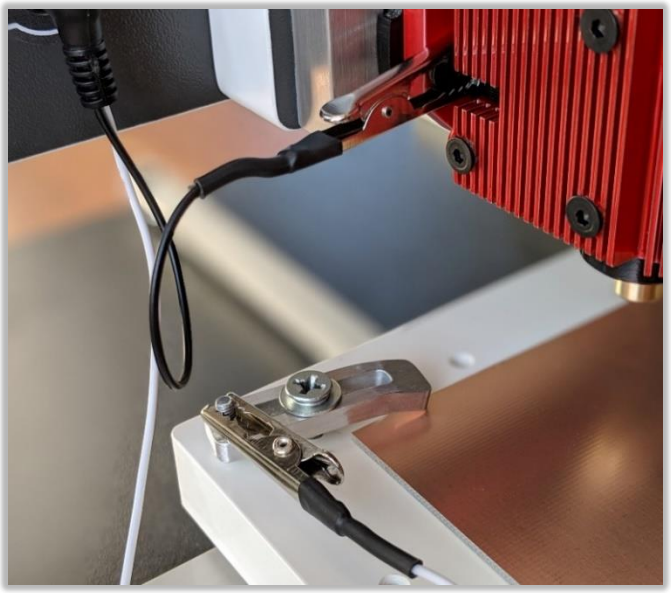


1. current state of the machine
2. current state and controlling of auto level function (first part of the text tells current state and second part the function of the button)
3. check to apply the measured auto level values to opened project
4. measured difference of the currently running auto level measuring
5. start of the opened project
6. pause of the running project or auto level function
7. stop of the machine in all situations
8. return to zero positions
9. current positions of the spindle for X, Y and Z axis (click inside activates the manual updating of the values)
10. reset of the X, Y or Z position, separately or all axes together
11. load of the source g-code
12. close of the opened project
13. return of the managed project back to its beginning (project has to be in stopped or finished state)
14. detailed listing of the loaded g-code
15. current row of the g-code in opened project, placing the cursor over the text shows the total row count and click inside activates the manual update of the value
16. name of the opened project, place the cursor on the text to see full file path
17. drawing of the opened project
18. elapsed time of the running project or auto level
19. hand-operated control of all three axes
20. spindle control
21. overall progress of the project
22. setup of the feed rate for all three axes (applicable to project, auto level and hand-operated control)
23. offline mode for testing purposes of the application without the machine

Auto level:

The auto level feature ensures even milling even if there is uneven surface of the milled material (leveling of the Z axis). Machine firstly measures the surface of the material, or rather its height differences and applies the result in the milling. This feature is suitable mainly for the production of printed circuit boards (PCB). Since the measuring is based on connection of the electrical circuit, it is a need to have the material electrically conductive!

Before you use this feature, there is a need to attach the probes (part of the packaging) to right place and connect them to left connector according to the pictures below.



Auto level feature works only in hand-operated control and during auto measuring. During running project or Go Zero is this feature turned off and moving of the Z axis doesn't stop when you touch the surface!

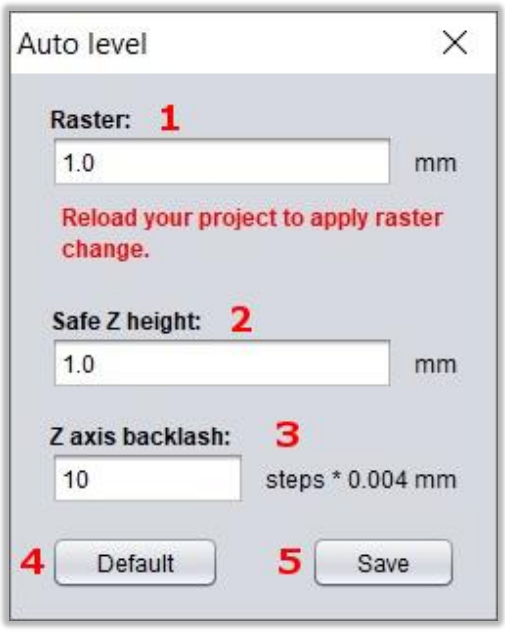
It is recommended to use for Auto level measuring the dedicated tool. This avoid potential damage of the new tool intended for final milling. The default measurement of the Auto level feature is on zero point X 0.0 a Y 0.0.

It is necessary to calibrate the Z axis height after measurement tool change. The procedure is following.

1. move the X and Y axis back to its zero positions X 0.0 a Y 0.0
2. touch the surface with Z axis tool in hand-operated control (it automatically stops)
3. machine automatically stops and Z axis is reset

Auto level settings:

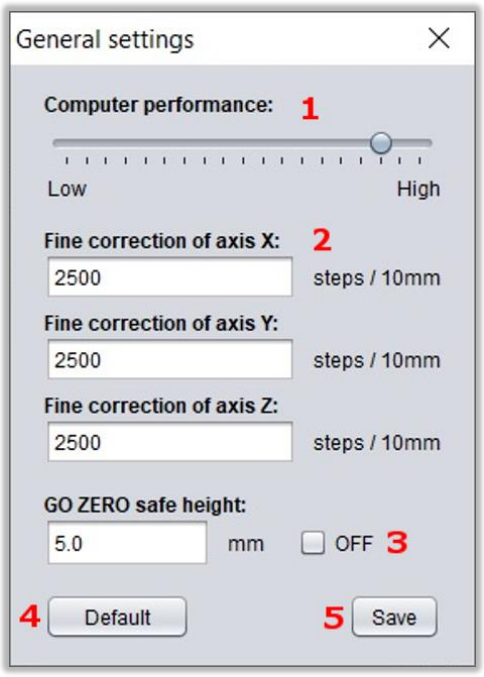
Auto level settings can be found on the top menu bar under *Settings – Auto level*. The list below describes all properties.



1. raster/grid size for the calculation of amount of measurement points, the smaller raster/grid means more measurement points and more accurate result, reload your project to apply raster/grid change
2. safe Z height used for crossing between measuring points
3. backlash of Z axis, the number of steps required to immediately indicate the axis direction change
4. restore the default settings
5. save of the set values

General settings:

General settings of the machine and its properties can be found on the top menu bar under *Settings – General settings*. The list below describes all properties.



1. computer performance – changes the cache memory of the machine, if there a lagging of the machine during hand-operated control, decrease the computer performance settings
2. fine correction of the X, Y or Z axis – good for manual adjusting of the real distance done by the selected axis, 1 step = 0,004 mm
3. safe height of the Z axis for GO ZERO function, this property is turned off in default state
4. restore the default settings
5. save of the set values

Language settings:

To change the application language, see the top menu bar *Settings - Language*. The application has the default value set to automatic language setting. Restart the application to apply the change.

Keyboard shortcuts:

To setup the keyboard shortcuts for machine control use the settings under *Settings – Keyboard shortcuts*.

Others:

Very helpful tool in case when some error occurred or problem analysis needed is the logs tool under item *Tools – Show logs*. Always attach the copy these logs to the communication with the machine producer to speed up the repair process.

Checking of application update is done automatically with every launch. However, this function can be disabled by the user. To manually check the update use item under *Tools – Check for update*.

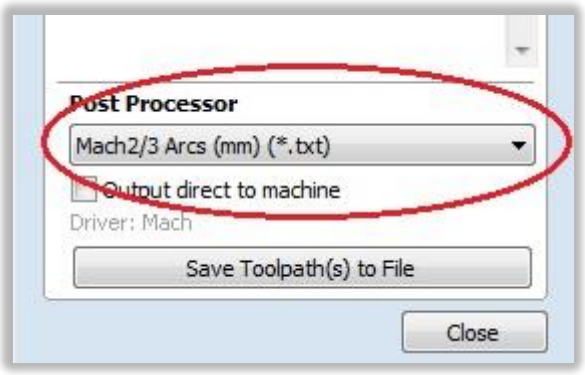
As a user, you can also contribute to future application development by text correction. The item *Tools – Translation error* allows you to enter wrong and correct text (which appears in the application) in any language. Text corrections are always implemented before new version is released.

Generally, we recommend to not do any time-consuming operations on the computer during milling. Communication with the machine is real-time, that is the reason why there is a need to put emphasis on the immediate response of the computer.

15. Source codes for the machine

(options and information about source codes for machine control)

- software processes only files which contain G-CODE format
- software loads these files only in text file format (*.txt)
- software is currently capable to process following types of G-CODE
  - G00, G01, G02, G03, G73, G81, G82, G83, M00, M03, M04, M05, M06, M47
- design of the workpiece and generating of the G-CODE is managed by the software which is designed for that purpose (not part of the purchase), we recommend following software
  - Cut2D, Cut3D, Aspire from Vectric company
- to export the final tool paths, use post processor **"Mach2/3 Arcs (mm) (*.txt)"**



16. General machine information

(various tips and information intended for proper running of the machine)

- revolution speed of the spindle is electronically monitored. If there is excessive braking, overloaded spindle will be disconnected which stops the whole machine. This state is indicated by continuous illumination of blue control LED diode. To relaunch the machine press START button on the machine.
- milling tool is held by small horizontal screw with thread M3
- use only the milling tool with shank diameter 3.175 mm
- try to clamp the milling tool inside to the spindle as deep as you can, only part what is necessary for milling should be visible (long protrusion may cause inaccuracy of milling)
- if the milling tool leaves a burr while milling, try to rotate the milling tool (after unclamp) a little bit in the spindle to another position
- be careful to drive into the extreme positions of the axes, you could damage the machine
- use only good quality and sharp milling tools to achieve the best results
- after the establishment and commissioning of the machine we recommend to mill a few tenths of millimeter of entire work table to ensure the flat surface (g-code is included on the USB flash drive)
- machine is intended for home conditions with dry environment and room temperature, from which it follows, that any other conditions (frost, high temperature, solar radiation, humidity, rain etc.) can significantly shorten the life of the device or even destroy the machine!
- if there is some damage on the working area caused by milling after a long time of use, it can be easily milled by a few tenths of millimeters
- you can use heavy-duty aluminum clamps (part of the package) or for instance double-sided tape, 5 minutes two-component glue etc. to attach the machined material
- for manual and fine tuning of the current position of the work table or spindle rotate the white knob on the selected axis in the desired direction (can be done with released or ready machine)

17. Instructions concerning safeguard measures to be taken by the user

(including any personal protective equipment, which must be provided)

- the operator must use gloves, goggles or face shield during operation

18. The conditions under which the machine meets requirements of stability

(during use, transportation, assembly, dismantling, when out of service, testing or foreseeable breakdowns)

- weight distribution of the machine provides sufficient stability against overturning
- machine has to be placed on a solid surface with minimal inclination

19. The procedure to be followed in case of accident or breakdown

(in case of blocked machine, the procedure to be followed to securely unlock the machine)

- turn off the machine (use the main or emergency STOP button)
- disconnect the device from the electricity supply
- follow the manufacturer's instructions

20. The specifications of the spare parts to be used

(if these parts affect the health and safety of the user)

- use only original parts from the manufacturer

21. Instructions for safe adjustment and maintenance

(including the protective measures that should be taken during these operations)

IMPORTANT STEPS TO BE FOLLOWED BEFORE MACHINE INTERFERENCE:

- turn off the machine (use the main or emergency STOP button)
- disconnect the device from the electricity supply
- clean the machine from lubricants, oils, etc.
- if the machine has cutting or stabs sections, cover them

ENSURE THE WORKPLACE TO PREVENT THE RECONNECTION OF THE MACHINE TO:

- electricity

22. Notice for maintenance

(safety during adjustment and maintenance)

Regular and proper maintenance as well as the consistent maintenance of cleanliness on the workplace is inevitable for safety reasons!

- contact an authorized service and require original spare parts, failure to comply with the above could affect the safety of the machine
- during parts and other things replacement, provide the identical type or meet standards. Using unoriginal parts or neglect of regular maintenance can cause damage of the device and loss of the warranty.
- disconnect the machine according to the instruction manual and ensure against unexpected restart

PRECAUTIONS BEFORE LAUNCH OF THE MACHINE:

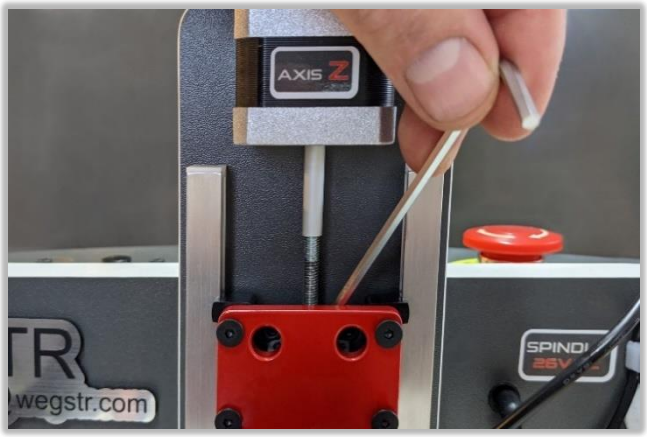
- check if the machine is fitted with all covers
- check the safety functions of all elements
- check safety measures

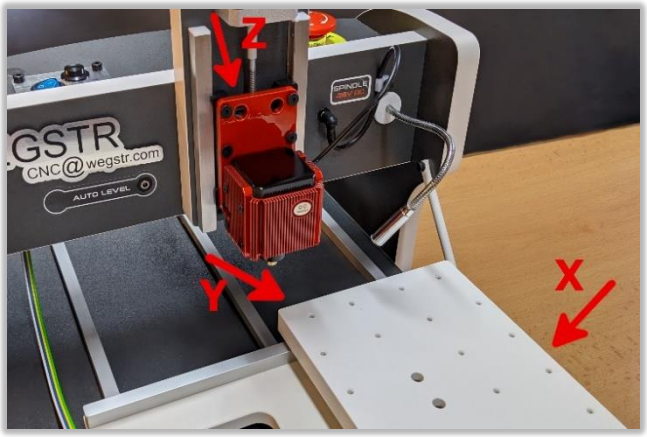
23. Description of adjustment and maintenance operations

(which the user does and the preventive maintenance measures that should be followed)

RECOMMENDED STEPS OF ADJUSTMENT AND MAINTENANCE

- entire workplace must be kept clean to prevent damage of moving parts due to influence of dirt
- occasional lubrication of running rails and screw rods by lubricant
- in case of backlash or excessive tightening of some axis, it is possible to adjust this by loosening or tightening two screws under each of the axes





24. List of recommended spare parts

(according to the catalog of spare parts)

INCORRECT USE OF SPARE PARTS IS CONSIDERED AS UNWARRANTED INTERFERENCE INTO THE MACHINE CONSTRUCTION, THEREFORE THE MANUFACTURER ASSUMES NO RESPONSIBILITY FOR MODIFIED CONSTRUCTION

- it is necessary to use only spare parts that are in line with stated requirements of the manufacturer
- unprofessional repairs as well as the use of incorrect spare parts leads to a loss of product warranty

25. Disposal of the product and its parts

(ecological disposal of the machine)

FOLLOW VALID ENVIRONMENTAL REGULATIONS!

During the final decommissioning of equipment (after its useful life), keep in mind the interest and environmental and recycling options (general).

- drain the fluid contents to a special containers for - liquids such as engine oil, transmission oil, cooling and cleaning fluids, and send them to specialized facilities
- dispose the toxic waste (e.g. battery, electronics). according to the regulations separate the plastic materials and offer them for recycling
- separate the metal parts by type for scrapping
- it is necessary, that the owner of the machine during removal (disposal) of waste has to follow the terms of care for healthy living conditions and environmental protection directed by the Waste Act
- it is therefore necessary that this waste has to be offered to operators of waste disposal, namely all metals, oils, lubricants, plastics etc. materials

26. Used symbols and their meaning

(dealing with residual risks)

Information about other risks that remain despite the taken measures to ensure security in the design, safety measures and complementary protective measures.

Remaining risks are dealt by safety pictograms on the machine and by warnings in the instruction manual.

- the user is obliged to read the instruction manual
- all adjustment, maintenance and repairs make until the device will be in idle position
- do not touch these places, where the moving parts are by influence of the functionality of the machine
- the user is required to disconnect the machine from all energy supplies during setup, maintenance and repair

WARRANTY:

We guarantee the product warranty for 24 months from date of purchase. This warranty covers the defects caused by faults of the material or production faults. The warranty applies only when the device is used according to instructions manual. The warranty has to be applied with your device dealer.

The warranty does not cover:

- if the tamper-proof holographic seal with the serial number, placed on the top of the machine, has been broken
- on intervention into machine and its connection
- on defects created by improper use or maintenance
- on defects created by normal wear and tear
- on defects created by using the machine for any other purposes, especially when the machine is used for industrial purposes
- in obvious mechanical damage