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GENMITSU

Genmitsu 3020PU-AJ Ultra CNC Router Kits



Welcome

Thank you for purchasing the Genmitsu 3020-PRO Ultra CNC Router Kit from SainSmart. All your setup materials will be located on the included SD Card, located in your accessories box. Inside you will find:

- PDF version of this manual
- GrblControl/Candle software for Windows
- Sample files

Please visit the SainSmart Online Resource Center for help with installing drivers and software for your CNC. <https://docs.sainsmart.com/article/cozdawk0im-3020-pro-ultra-resource-page> Scan QR code to find more information.



For technical support, please email us at support@sainsmart.com. Help and support are also available from our Facebook group. (SainSmart Genmitsu CNC Users Group) Scan the QR code to join the group.



Disclaimer

Please be careful when using your CNC machine. This machine is an electrical device with moving parts and dangerous working areas.

- Genmitsu CNC Machines are for Indoor Use Only.
- You must be 18 years or older to operate this machine, unless supervised by a knowledgeable adult familiar with the machine.
- Wear proper Personal Protection Equipment (Safety Glasses, etc.).
- Always place the CNC Machine on a stable surface.
- The 3020-PRO Ultra utilizes a high-amperage power supply. It is recommended that you do not plug the CNC Router into an extension cord or power strip, as it may damage the machine.
- Ensure the Emergency Stop Button is easily accessible at all times.
- Never disassemble the Power Supply or Electrical Components. This will VOID the warranty.
- DO NOT TOUCH the machine spindle, or place any body part near the working area when the machine is operating. Serious injury may occur.
- DO NOT leave children unsupervised with the CNC Machine even when it's not operating. Injury may occur.
- DO NOT leave the machine unattended while it's operating.
- Ensure your CNC Machine is in a well-ventilated area. Some Materials may discharge smoke or fumes during operation.

Specifications

Model Name	3020-PRO Ultra
Work Area	300 x 205 x 78mm
Overall Dimensions	494 x 404 x 398mm
Control Board Compatibility	GRBL 1.1h
MCU	32-Bit
Max Speed	2000mm/min
CAM Software	Software Based on GRBL Firmware, e.g. Candle, UGS
Frame Material	All Aluminum
Spindle Motor	710W AC Spindle
Stepper Motor	NEMA 17
Power Supply	AC110/230V
Output Power	24V 5A
Stepper Driver	TB67S109

Unboxing



XY Axis Base Assembly



XZ Axis Assembly



Spindle Motor Mount (65mm)



710W Compact Router Kit



USB A-to-B Cable



Power Supply



Power Cord (US)
Power Cord (JP)



Power Cord (UK)
Power Cord (EU)
Power Cord (AU)



Offline Controller



20-degree V Bit



52mm Retaining Ring



(1) X-axis Limit Switch (Spare)



(1) Y-axis Limit Switch (Spare)



Z-Probe Kit



(20) 3x80mm Cable Tie



(4) Rubber Feet



ER11 1/8" Collet



SD Card



Card Reader



Wrench
(10mm, 17mm)



(17) M5x25 Rounded Hex Screw



(5) M4x10 Socket Head Cap Screw
(7) M4x18 Socket Head Cap Screw



(4) Clamp Kit



Offline Controller Cable



(5) M4 T-Nut

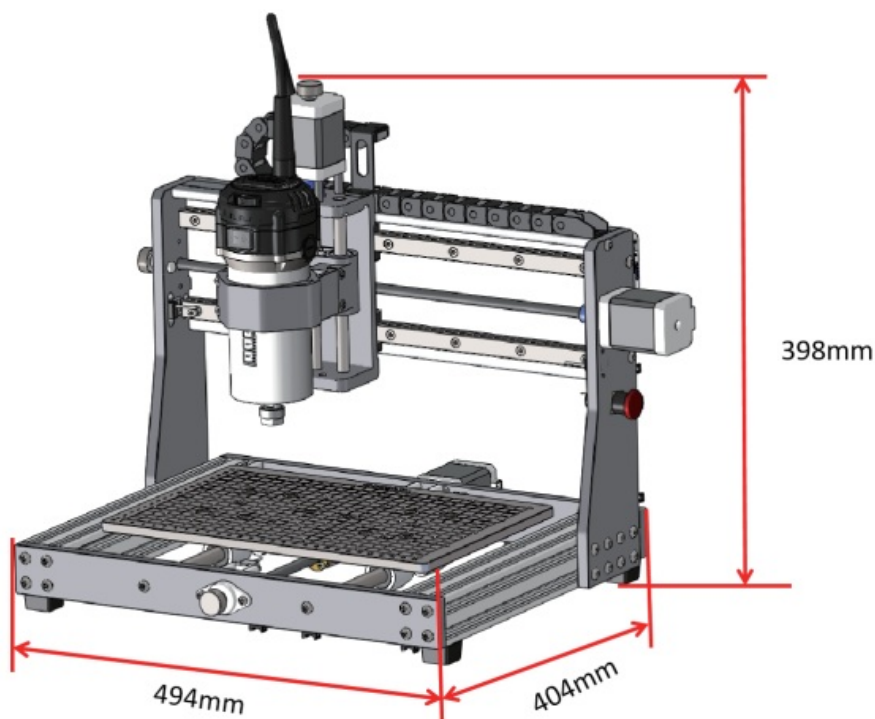


Allen Wrench (3mm)



User Manual

Dimensions



Optional Accessories (Not Included)

Looking to upgrade? Here are some suggestions! Get started here with easy to add accessories. You can find them and more at www.sainsmart.com. Save 10% with discount code 3020PU.



3040 Y-axis
Extension



USB C05 1/4"
Shank Bits



Φ65-69mm
Dust Shoe



Aluminum Bench
Vise Clamp



Scan QR codes to learn more

Mechanical Installation

STEP 1: Installing Rubber Feet

What you need:



XY Axis Base Assembly



(4) Rubber Feet

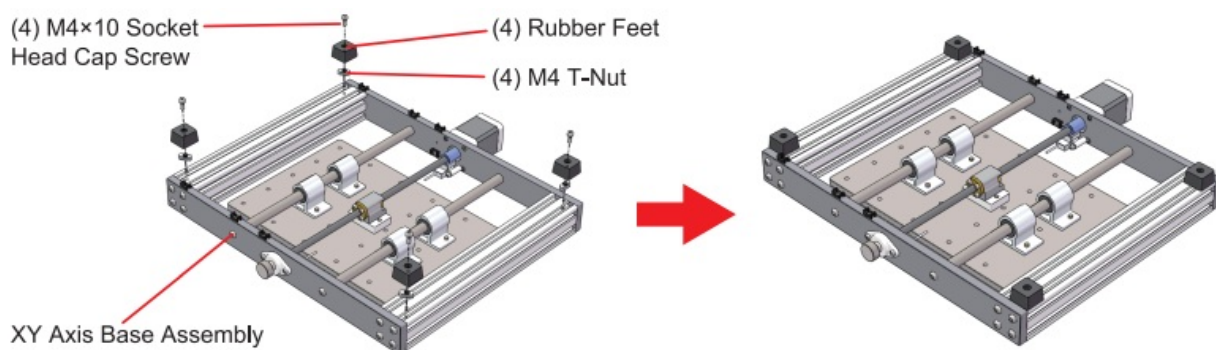


(4) M4 T-Nut



(4) M4×10 Socket Head Cap Screw

1. Flip the XY-axis base assembly upside down.
2. Place the (4) M4 T-nut into the slot and thread the (4) M4x10 screws through the rubber feet, as shown. Then tighten the screws.



STEP 2: Installing X-axis Assembly

What you need:



XY Axis Base Assembly

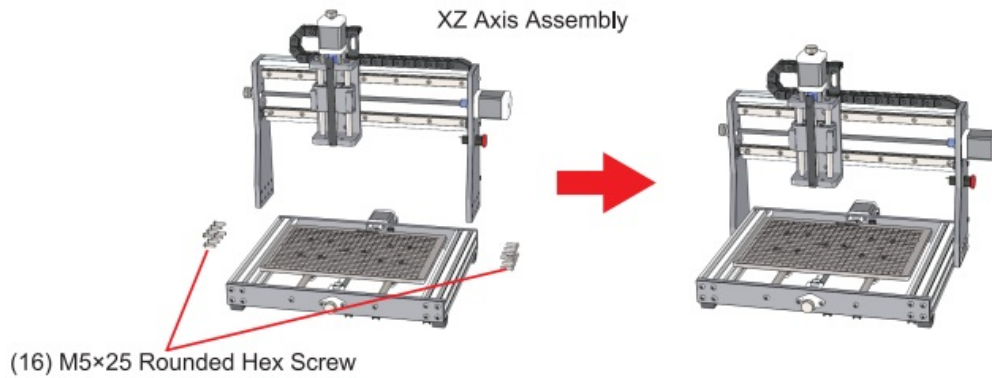


XZ Axis Assembly



(16) M5×25 Rounded Hex Screw

Mount the XZ-axis assembly on the XY-axis base assembly and use (16) M5x25 screws to lock the assembly from each side.



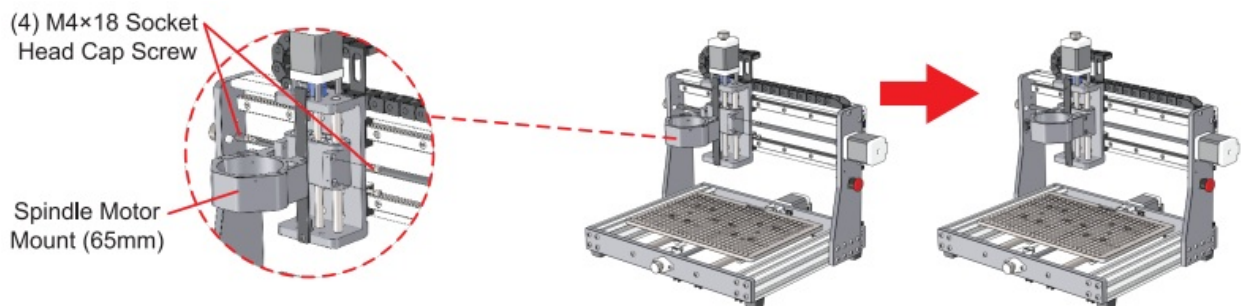
STEP 3: Installing the Spindle Motor Mount

What you need:



1. Attach the spindle motor mount to the Z-axis clamp mounting plate and align the screw holes on both sides.
2. Use (4) M4x18mm screws through the Z-axis clamp mounting plate to install the spindle motor mount.

(**Note:** Do not tighten screws fully, keep loosened for now.)



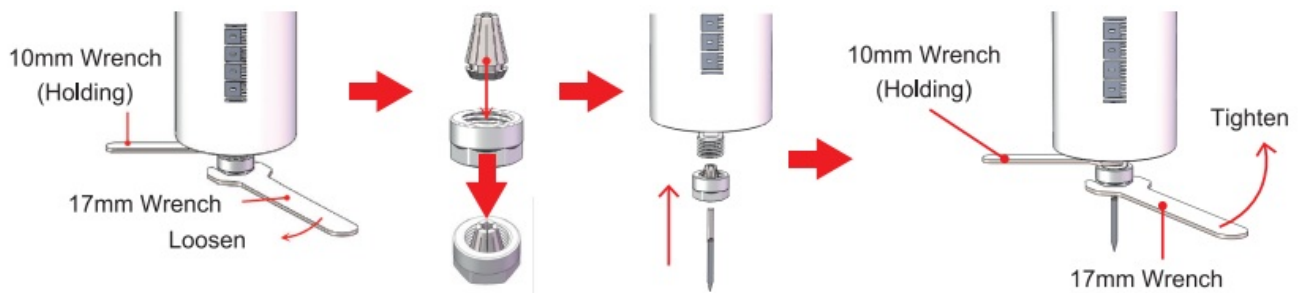
STEP 4: Installing the Spindle Kit

What you need:



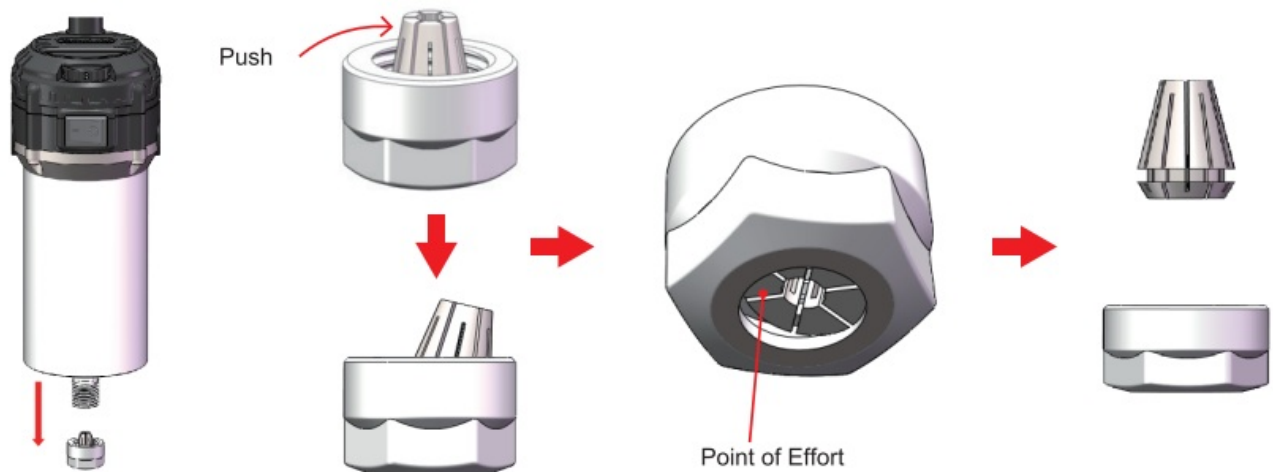
1. Use the 10mm wrench to hold the router in place and the 17mm wrench to unscrew the collet nut on the 710W router.

2. Push the collet into the collet nut toward the arrow until a click is heard, indicating that the collet is in place.



Collet Replacement Instruction

1.



Remove the collet nut.

2. Press the collet in the direction of the arrow to separate it from the collet nut.
3. Place the collet to be replaced in the collet nut and push the collet into the collet nut in the direction of the arrow until a click is heard, indicating that the collet is in place.

STEP 5: Installing the Spindle

What you need:

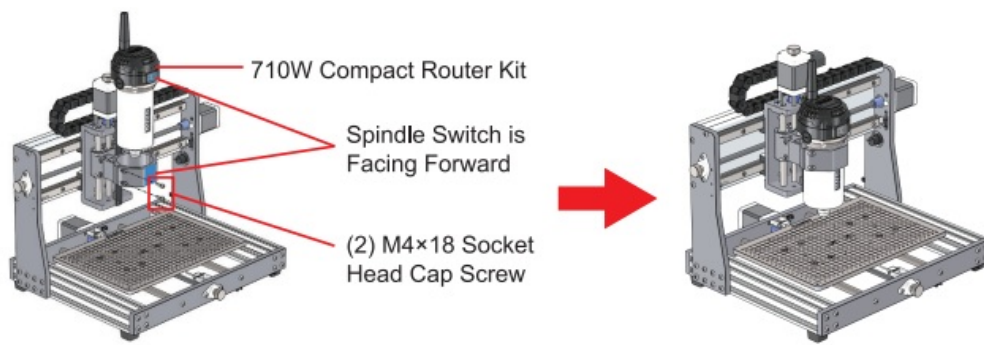


710W Compact Router Kit

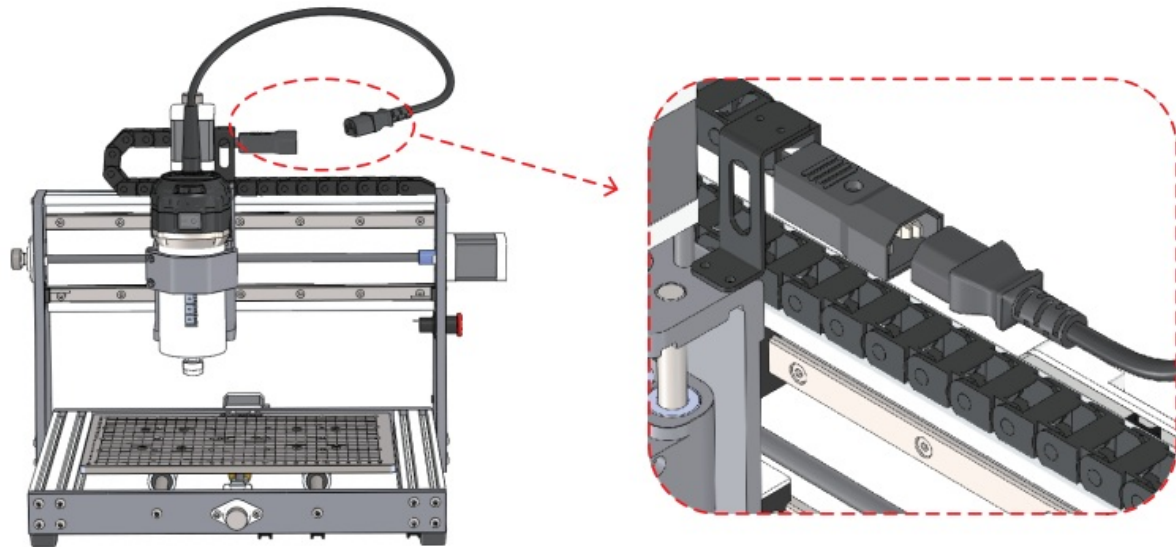


(2) M4x18 Socket Head Cap Screw

1. Insert the spindle into the spindle motor mount and note that the spindle switch is facing forward.
2. Use (2) M4x18mm screws to fix the spindle to the motor mount.
- 3.

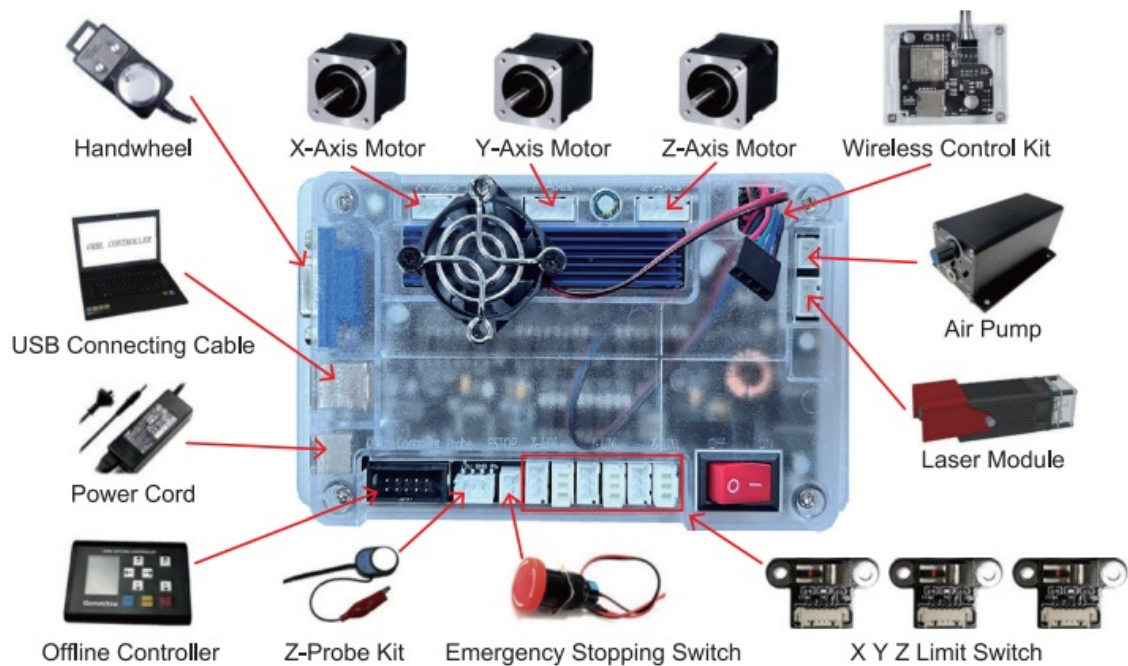


Plus, in the spindle power cord, make sure the power cord is plugged in completely, as shown. Then tighten all screws.

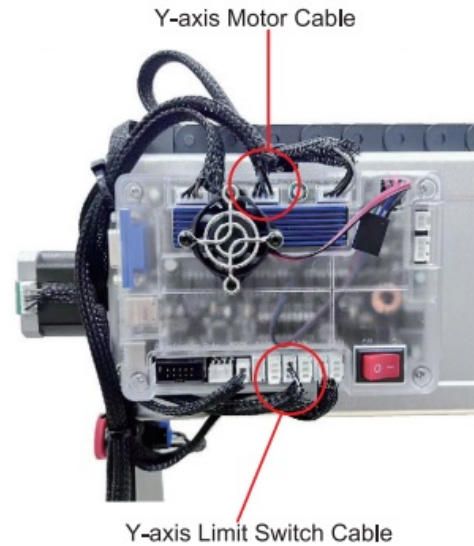
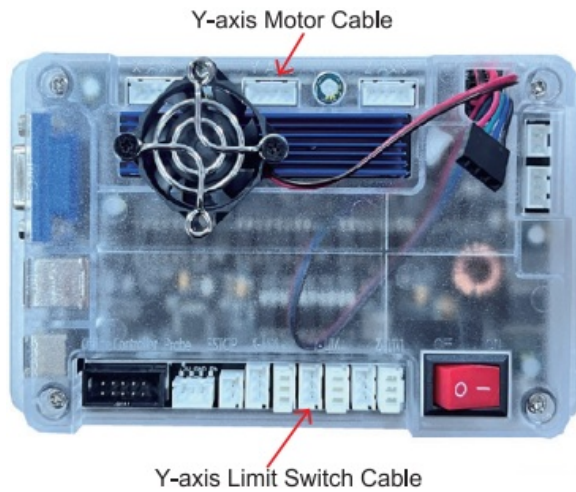


STEP 6: Wiring

Control Board Overview



Plug the Y-axis motor or cable and the Y-axis limit switch cable into the control board as shown. (The rest of the cables are connected.)

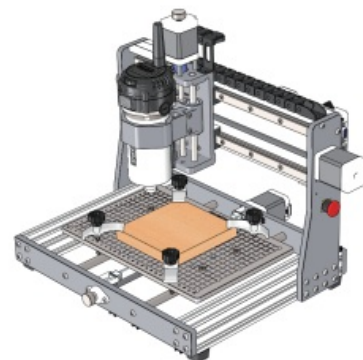


STEP 7: Installing the Clamp Kit

What you need:



1. The clamp kit includes the following components, as shown.
2. Adjust the position of the clamp kit according to the size of the workpiece to be engraved. Screw the screw into the threaded holes of the aluminum countertop first, then set the spring, nylon gasket, plate, and column, and finally lock the nut.



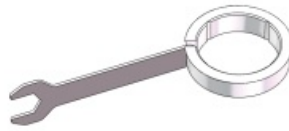
The Laser Module shown below is sold separately.

What you need:

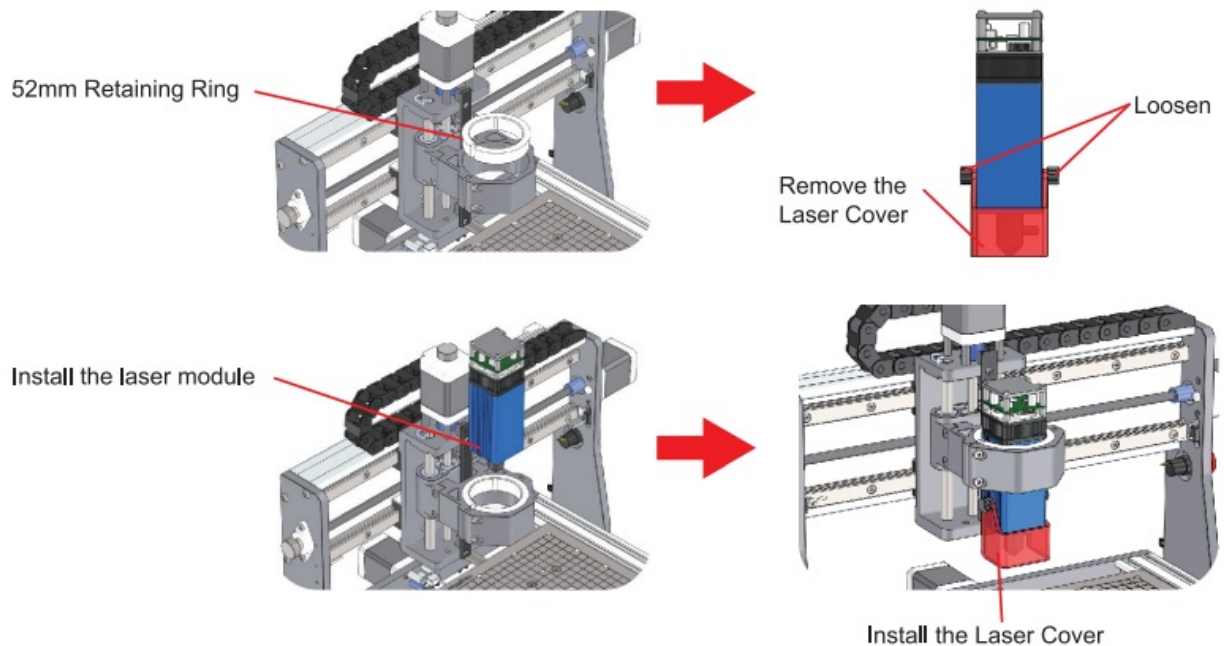


1. If the retaining ring is slightly tight, expand it slightly with the help of a tool and place the laser module in it, see below.

2.



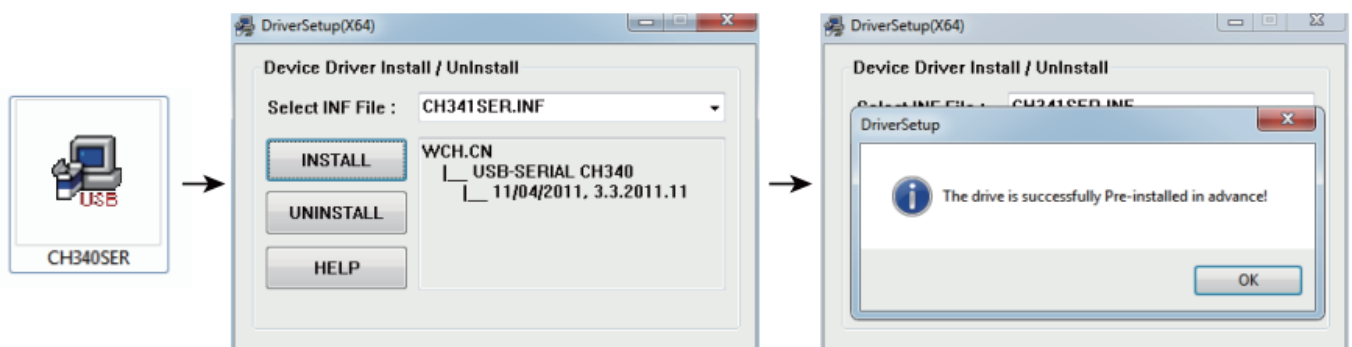
If the retaining ring cannot fit into the spindle motor mount, then uninstall the 2 screws on the spindle motor mount, and greatly loosen the 4 screws holding the spindle motor mount to the Z-axis.



Software Setup

Driver Installation

Install the driver (software→Driver→CH340SER.exe).

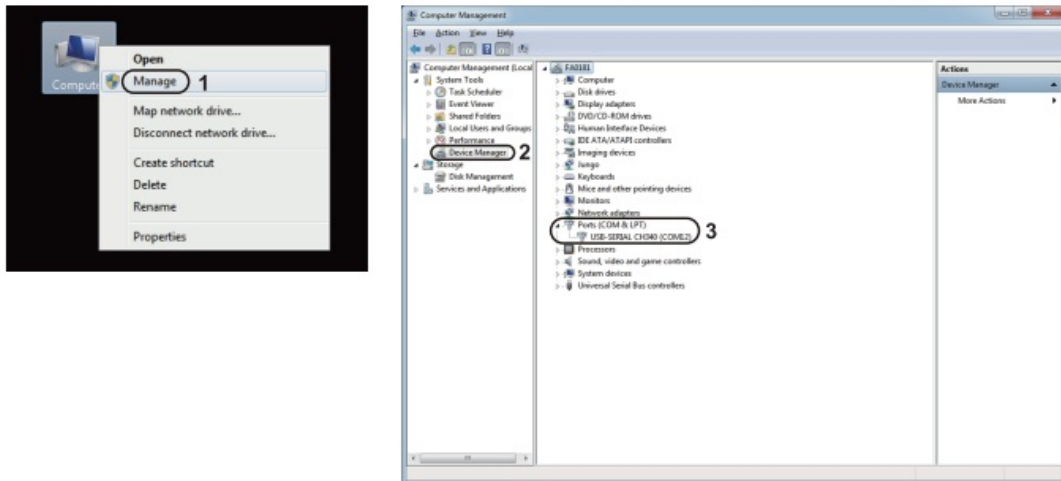


To determine your machine's COM port

- Windows XP: Right-click on "My Computer", select "Manage", and select "Device Manager".
- Suitable for all systems after Windows 7: Click "Start" > Right-click "Computer" >

Select “Manage” > Select “Device Manager’ from the left pane.

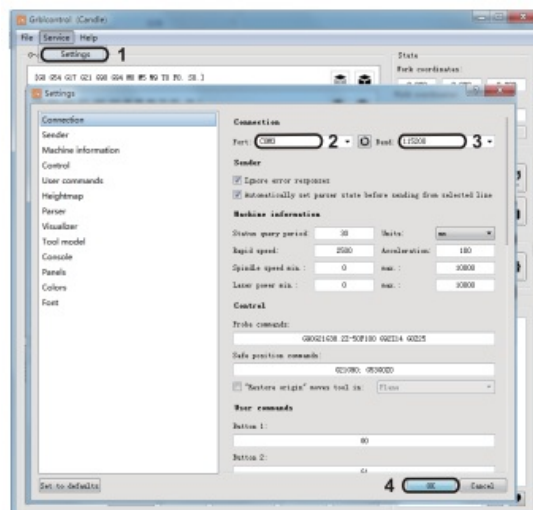
- In the tree, expand “Ports (COM & LPT)”.
- Your machine will be the USB Serial Port (COMX), where the “X” represents the COM number, for example, COM12.
- If there are multiple USB serial ports, right-click each one and check the manufacturer, the machine will be “CH340”.



Grbl control (Candle) Connecting to the Controller.

First time use will require you to set up the appropriate COM PORT and Baud rate.

- **Step 1:** The software should automatically select the port number.
- **Step 2:** If it does not recognize automatically, select the “Baud” drop-down menu and select 115200.
- **Step 3:** Click “OK” to save.

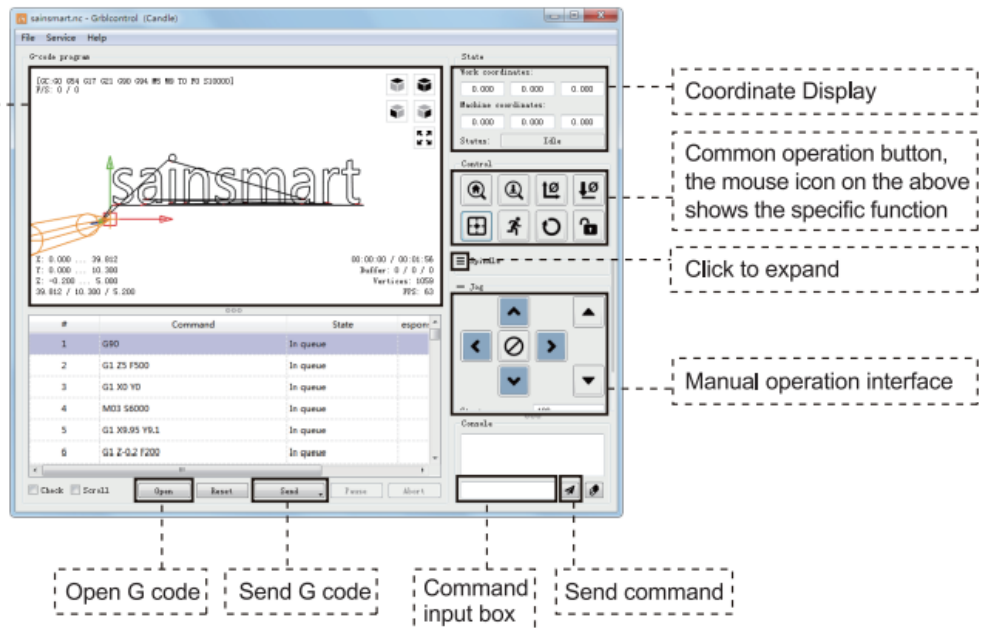


Test Project

Grblcontrol (Candle)

3D preview interface, hold the left mouse button, can rotate Angle, scroll the mouse wheel, can be enlarged, or reduced.

If you cannot see anything, you need to change to a computer with support for OpenGL2.0 graphics cards.

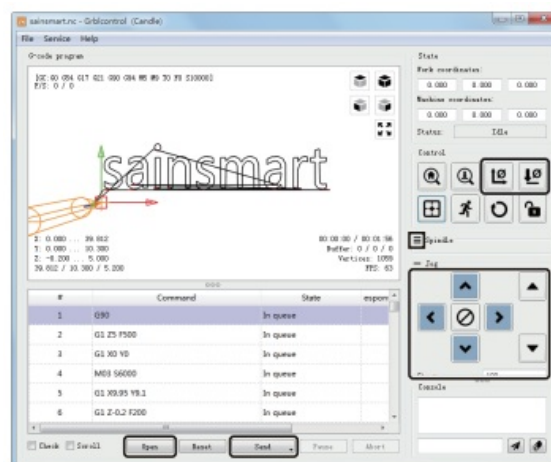


Run the G-code for processing

- **Step 1:** Click [open], and select the G-code to run.
- **Step 2:** Click on the manual operation panel, and move the spindle to the starting Point of the engraving, so that the tool and the workpiece just touch.
- **Step 3:** Click [ZeroXY] [Zero Z]. Clear the XYZ axis coordinate.
- **Step 4:** Click [Send] to run the G-code.

About firmware parameters

The parameters of the control board have been configured according to 3020-PRO Ultra.




Z Probe Setup

Probe function introduction

Grbl control (Candle) Probe operating instructions

Step 1: Probe commands editing.

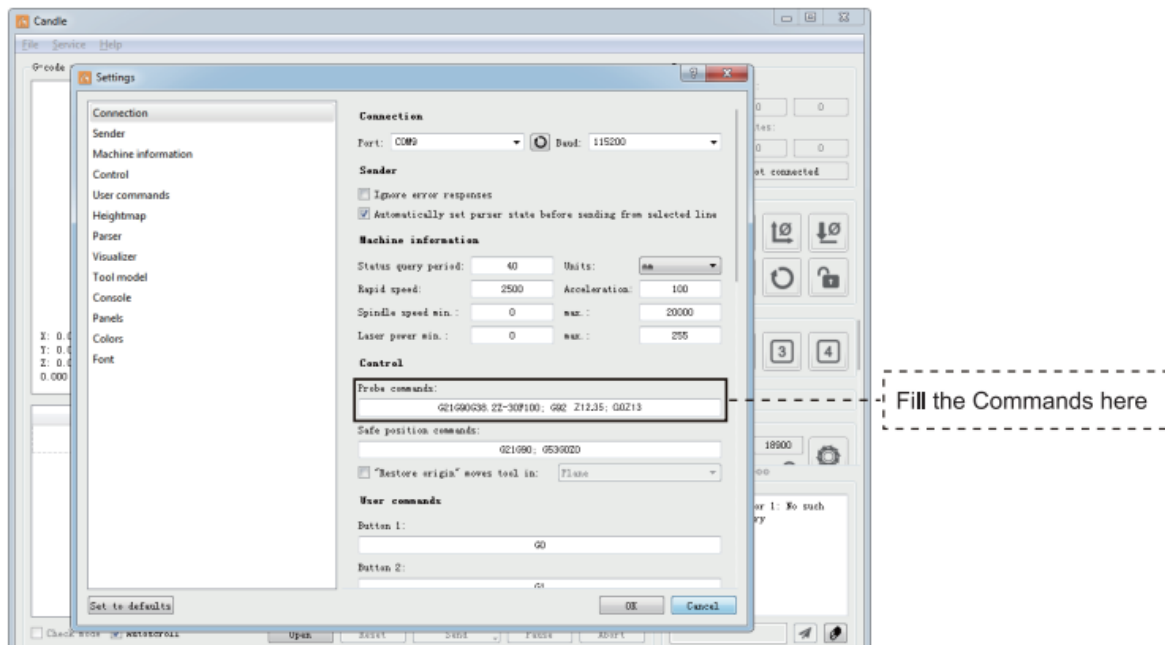
Probe G code	G90G21G38.2Z-50F100; G92 Z14; G90 Z25
After editing	G21G91G38.2Z-20F100; G0Z1; G38.2Z-2F10; G92 Z12.35; G90; G0 Z25
Probe Tool height	

Explanation

- **G21G91**: metric, relative coordinates
- **G21G91**: metric, relative moves
- **38.2Z-20F100**: probe Z-AXIS Down 20mm@100 mmpm
- **G0Z1**: move up 1 mm (it's in relative, not absolute, mode)
- **G38.2Z-2F10**: probe 2 mm @ 100 mmpm
- **G92 Z12.35**: my probe thickness, YMMV
- **G90**: Back to absolute mode
- **G0Z25**: retract the probe

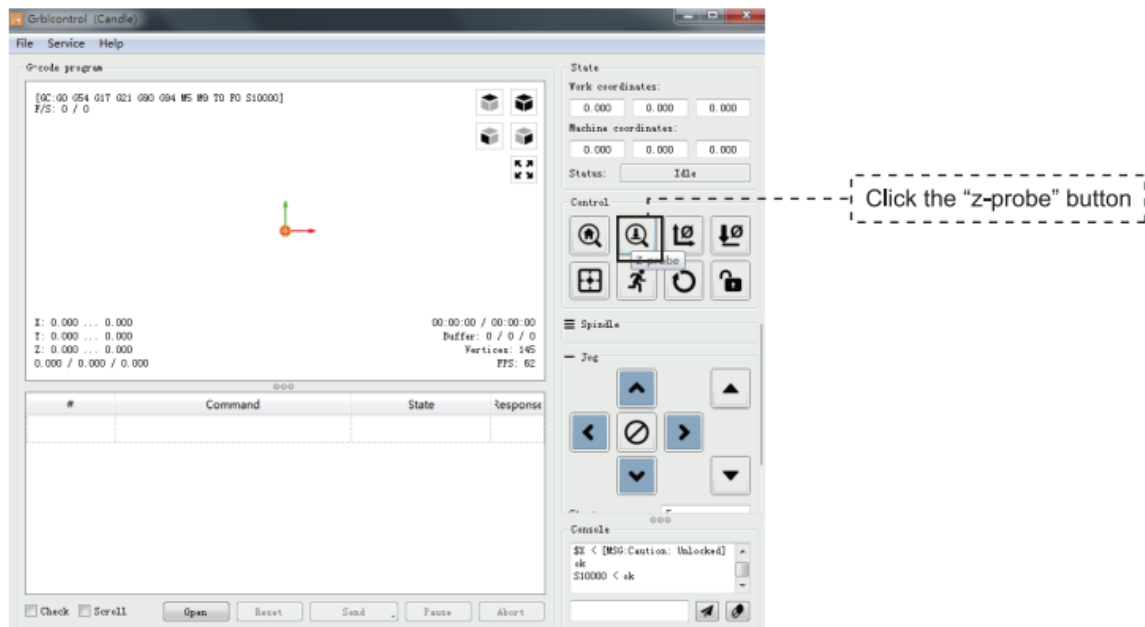
This assumes that the user would position the probe, then jog the bit 5 or 10mm above it. With a PDF this could be copied from the PDF, pasted into Candle, and just the probe thickness changed.

Step 2: Probe commands filled in Grbl control (Candle).



Step 3: Connect the probe tool to the controller probe interface.

Step 4: Click the “Z-probe” button, Z-axis automatic tool to zero.



Email: support@sainsmart.com

If Facebook Messenger: <https://m.me/SainSmart>

Help and support are also available from our Facebook Group

2330 Paseo Del Prado, C303, Las Vegas, NV 89102

Documents / Resources



[Genmitsu 3020PU-AJ Ultra CNC Router Kits \[pdf\]](#) Instruction Manual
3020PU-AJ, 3020PU-AJ Ultra CNC Router Kits, Ultra CNC Router Kits, C
NC Router Kits, Router Kits

References

- [User Manual](#)

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3020PU-AJ, 3020PU-AJ Ultra CNC Router Kits, CNC Router Kits, Genmitsu, Router Kits, Ultra CNC Router Kits

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