GUIDE 3 OF 6

Set Up Your Machine in Carvio

Carvio keeps a **machine profile** for each machine you own: how to reach it, how big it is, how fast it may jog. You fill it in once, in about ten minutes, and never think about it again.

IN THIS GUIDE

- Five things to find out about your machine first
- Plugging in and finding the port
- Making the profile: connection, size, jogging, spindle, probe
- Where the profile is used on the Machine tab
- What to do when the port is missing or the machine does not answer

YOU WILL NEED

- Your machine switched on and its USB cable plugged into the computer
- The machine's manual or web page (controller, travel, spindle speed)
- Your touch plate and calipers, if you have them

Five things to find out first

Write these down before you open Carvio. They come from your machine's manual, its web page, or a look at the machine itself.

Find out	Where it goes	Notes
Which controller it has	Connection > Controller	Carvio drives **Grbl 1.1** and **grblHAL** boards. Nearly every hobby router has one of these. A board that answers like Grbl works like Grbl. Leave **Detect** on and Carvio reads it from the controller's greeting.
How it connects	Connection	A **USB cable** means a serial port. Ethernet or WiFi (some grblHAL boards) means **Network**, with the board's address.
How far each axis travels	Machine > Travel X / Y / Z	For example 300 × 300 × 80 mm. Carvio uses it to warn you when a job would run off the machine. You can also read it from the controller later.
The spindle's speed range	Spindle > Default and Maximum speed	On the spindle's label or in its manual, in rpm. A trim router is often 10000 to 30000; a spindle 6000 to 24000.
Homing switches: yes or no? Touch plate: yes or no?	Guide 5 (homing), Probing	If you have a touch plate, measure its thickness with calipers now. Write the number on the plate.

Plug in and find the port

Switch the machine on, plug its USB cable into the computer, and find out what name the computer gave the connection. Carvio lists the ports it finds, so most of the time you only need to recognise yours.

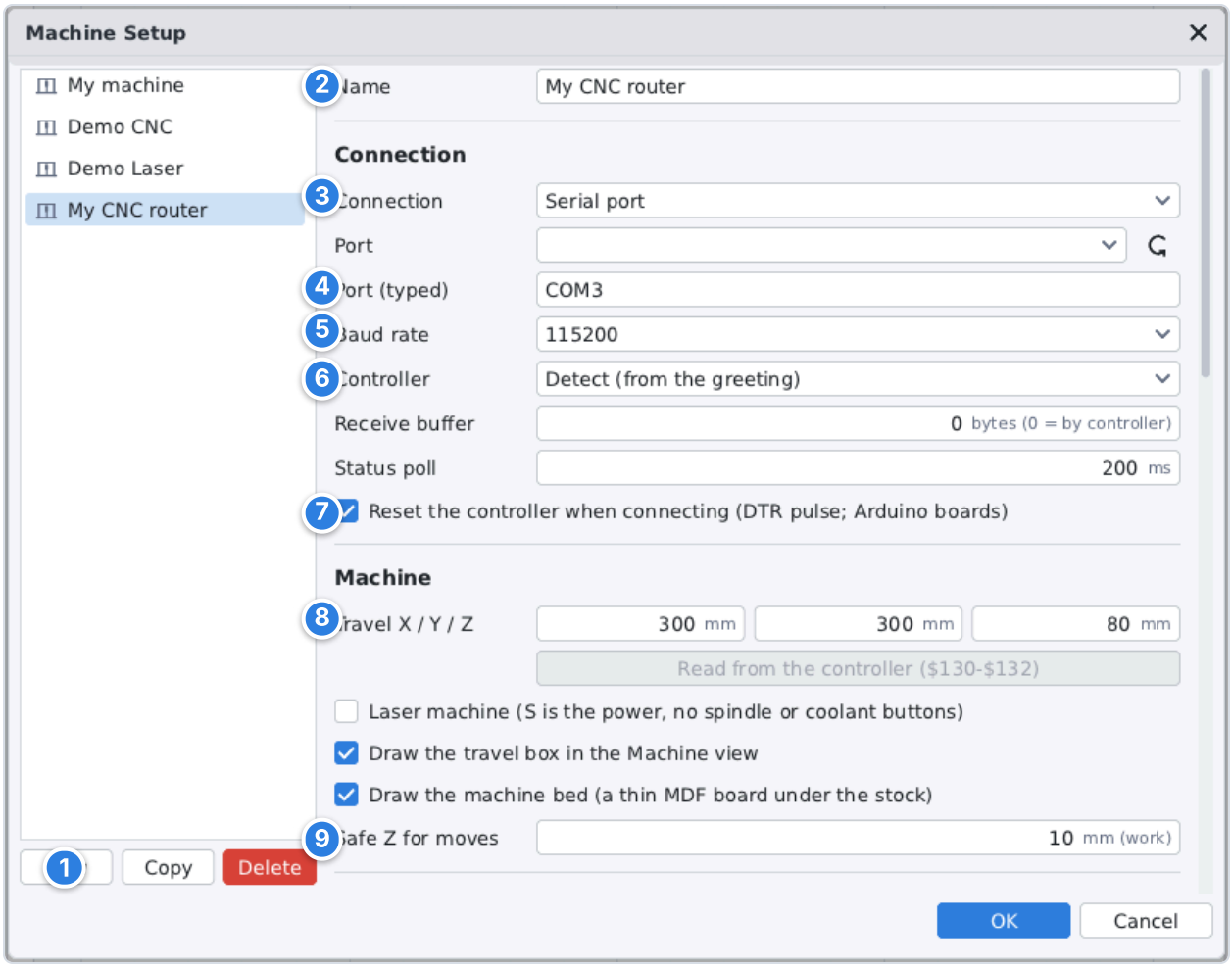
Computer	The port looks like	Where to check if it is not listed
Windows	`COM3`, `COM5`...	**Device Manager > Ports (COM & LPT)**. The entry says something like *USB-SERIAL CH340 (COM3)*. Unplug and plug the cable to see which one comes and goes.
macOS	`/dev/cu.usbserial-1420` or `/dev/cu.usbmodem...`	Some boards need the maker's driver (CH340 or CP210x). Install it, then unplug and plug the cable.
Linux	`/dev/ttyUSB0` or `/dev/ttyACM0`	Your user must be allowed to use serial ports: add it to the `dialout` group and log in again.

Close other senders first

Only one program can use the port at a time. If another sender program (or a serial monitor) is open and connected to the machine, Carvio cannot open the port. Close it before you connect from Carvio.

Make the machine profile

Choose **Machine > Machine Setup...**. The list on the left holds your machines; the two demo machines are already there. Click **New** to add yours and give it a name.



Machine Setup, top part: the connection and the size of the machine.

1. **New** adds a profile. **Copy** duplicates one, **Delete** removes it.
2. **Name**: anything you like, "My CNC router" is fine.
3. **Connection**: **Serial port** for a USB cable. **Network (TCP)** for a board on Ethernet or WiFi (then type its address under **Host** and leave the TCP port at 23 unless the board says otherwise).
4. **Port**: pick yours from the list. The round-arrow button looks again after you plug the cable in. If the list is empty, type the port's name in **Port (typed)**.
6. **Controller**: leave **Detect (from the greeting)**. Only force Grbl 1.1 or grblHAL if detection gets it wrong.
7. **Reset the controller when connecting**: leave it ticked. Arduino-based boards restart when the port opens and then greet Carvio. Untick it only if your board should keep running when you reconnect.
8. **Travel X / Y / Z**: how far each axis can move. Once you are connected, **Read from the controller ($130-$132)** fills them in from the controller's own settings.
9. **Safe Z for moves**: the height Carvio lifts to before its own moves (Go to zero, Frame job).

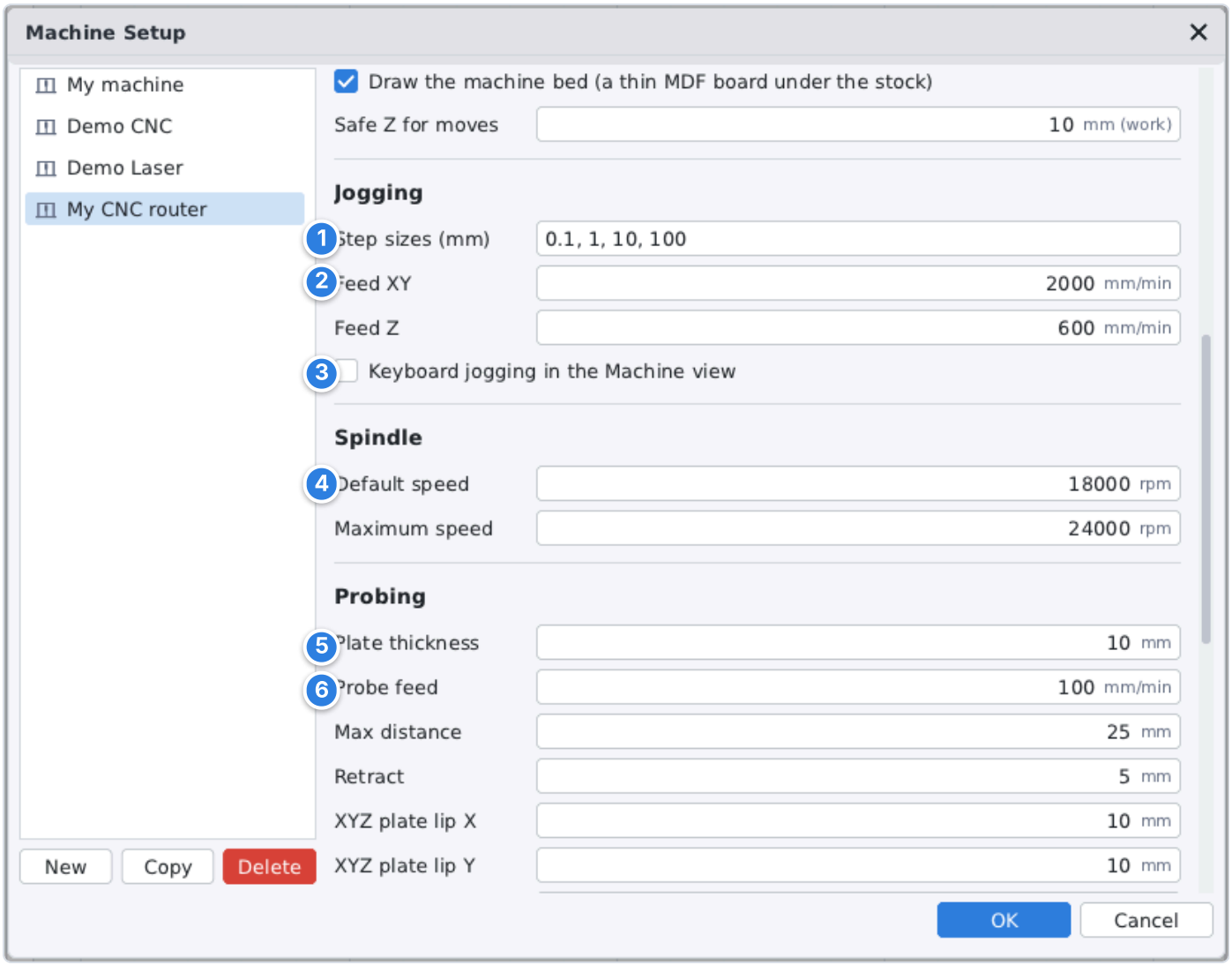
5 **Baud rate**: 115200. Every Grbl and grblHAL board uses it unless its manual says otherwise.

Set it higher than your clamps, 10 mm is a start. It is measured from your work Z zero, so it means "10 mm above the board" with Z zero on the top.

Leave **Receive buffer** at 0 and **Status poll** at 200 ms. Tick **Laser machine** only for a laser. The two "Draw..." boxes only change what the Machine view shows.

Jogging, spindle and probing

Scroll the dialog down for the next sections.



Machine Setup, middle part.

1 **Step sizes**: the jog steps the Machine tab offers. `0.1, 1, 10, 100` is right for mm. (In inches Carvio offers 0.001, 0.01, 0.1, 1.)

2 **Feed XY** and **Feed Z**: how fast jogging moves. 2000 mm/min sideways and 600 mm/min for Z are gentle starting values. Keep Z slow: you

4 **Default speed** is what the spindle buttons start with; **Maximum speed** is the spindle's top rpm from its label.

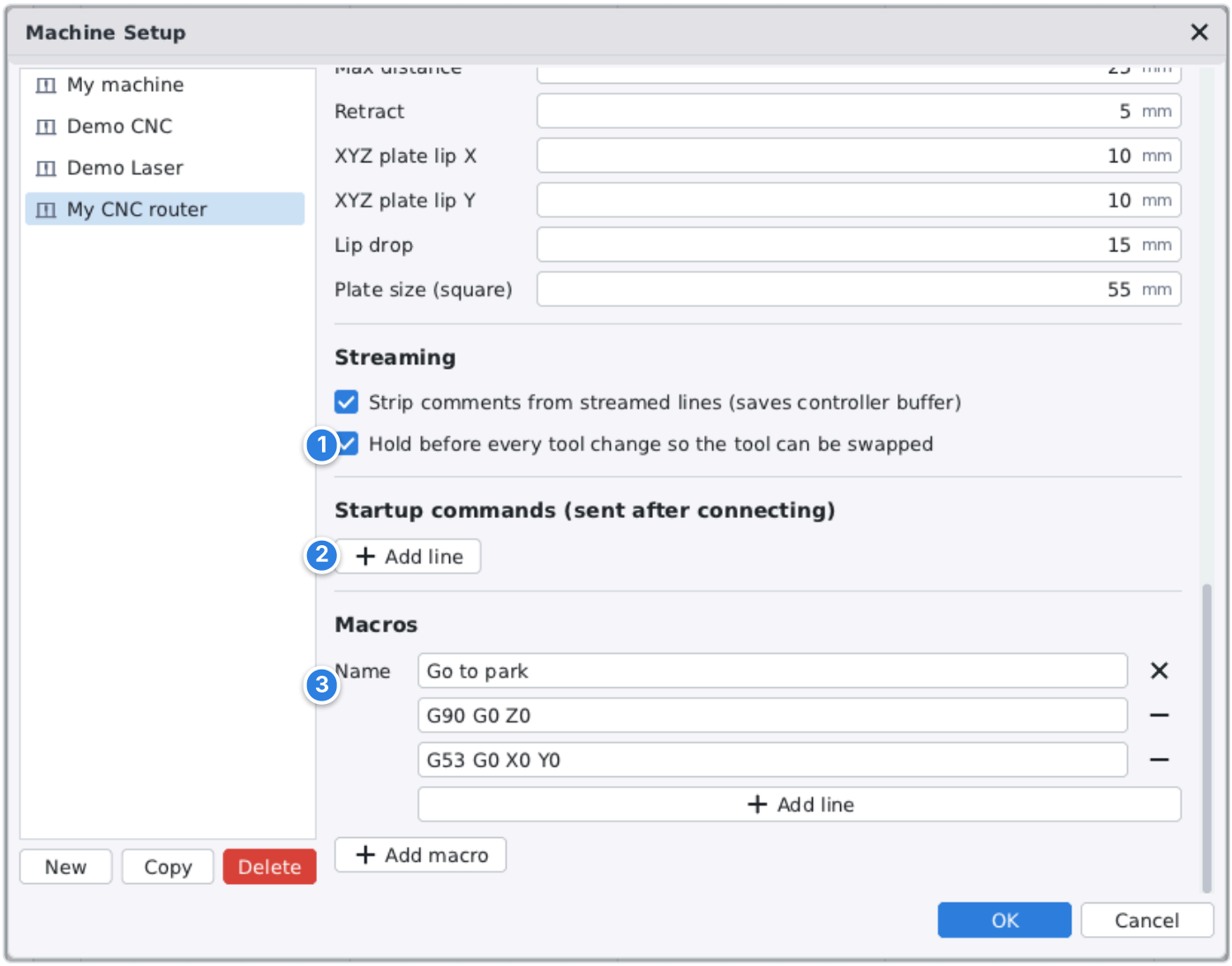
5 **Plate thickness**: your touch plate measured with calipers. An error here becomes the same error in every cut depth.

must be able to stop before the bit meets the board.

3. **Keyboard jogging**: leave it off until you are comfortable. A knocked key could move the machine.

6. **Probe feed** 100 mm/min, **Max distance** 25 mm, **Retract** 5 mm are good as they are. The **XYZ plate lip** and **Plate size** values only matter for a corner plate (Guide 5).

Streaming, startup commands and macros



Machine Setup, bottom part. **OK** saves the profile.

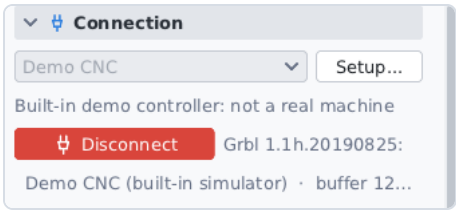
1. **Hold before every tool change so the tool can be swapped**: keep it ticked. Carvio pauses the job at every tool change so you can change the bit by hand. **Strip comments** stays ticked too.
2. **Startup commands**: G-code sent every time you connect. Leave it empty for now.
3. **Macros**: named groups of commands you can run with one click from the Machine tab. The ready-made **Go to park** raises Z and goes to the machine's home corner. Add your own later, for example a warm-up.

Click **OK**. Carvio saves the profiles in a file called `machines.json` in its settings folder (the bottom of the dialog says where), so they survive updates.

Where the profile is used

Open the **Machine** tab in the right-hand panel. The **Connection** section at the top shows the machine list: pick your profile, check the port, and the **Connect** button is ready. **Setup...** brings you back to this dialog any time.

That is all the setting up Carvio needs for the machine itself. **Guide 5** presses Connect, and **Guide 4** sets up your bits in the meantime.



The Connection section of the Machine tab (here connected to the demo machine).

> **Try the demo first**
>
> Pick **Demo CNC** in the same list and click **Connect**: everything in Guide 5 can be practised on it with no risk, then repeated on your own profile.

⚠ If something goes wrong

What you see	What to do
The port list is empty, or your port is not in it	Plug the cable in and click the round-arrow button next to Port. Try another USB cable: many are charge-only and carry no data. Install the board's USB driver (CH340, CP210x or FTDI, named in the machine's manual). On Linux, join the `dialout` group.
The port is listed but Carvio says it cannot open it	Another program has it open: close the other sender, serial monitor or the board maker's app. Then connect again.
Connect waits, then nothing happens	Wrong port or wrong baud rate. Check the port with Device Manager (unplug and plug to see it come and go), and set the baud rate to 115200. If the board does not restart when the port opens, tick **Reset the controller when connecting**.
Garbled text in the Console after connecting	Wrong baud rate. Set 115200, or the rate the board's manual gives.
The machine resets every time Carvio connects and loses its position	That is the DTR reset. Untick **Reset the controller when connecting**; then home again after connecting if the board asks for it.
"Grbl 1.1h" appears, then the Status says Alarm	Normal on a machine with homing switched on. Click **Home** (Guide 5). Without switches, click **Unlock $X**.
Carvio says the profile's port is missing	The computer gave the cable another name (COM4 instead of COM3, say). Pick the new one in the Connection section.
A network board does not answer	Check the address with the board's own web page or display, make sure the computer is on the same network, and that the TCP port (usually 23) is the one the board uses.

Next: Guide 4, Set Up Your Tools: your bits, their sizes and safe speeds.

The Carvio Beginner Guides: 1 Start Here · 2 Know Your Machine · 3 Set Up Your Machine in Carvio · 4 Set Up Your Tools · 5 Connect, Jog, Home and Set Zero · 6 Your First Job and Test Cuts