

1000 Series Plasma Operation Manual



Introduction

Control Startup

To open the control software double-click on the Plasma profile icon on the desktop or open the Mach4 Loader and choose a profile from the list.



Control Icons

Overview

This manual gives the process for basic operation of a plasma using the MachMotion control screen.



Standard Control Screen Overview

For a quick reference, the description of each zone is located below.

1. The tool path window shows the path the tool will take when a G-Code file is loaded. G-Code line number display (can also show percentage complete with setting change) and part counter display.
2. Unlock the screen to access certain features/settings such as fixture offsets and homing. Use DRO mode to measure or run in manual mode. DRO mode has no effect on fixture offsets.
3. The axis DROs show the current location and homing state (Green DROs indicate part coordinates, brown DROs indicate machine coordinates. The axis label LEDs turn green when the axis is homed).
4. Feed rate control and status
5. Plasma process parameters. Change between tabs for OxyFuel and other tools.
6. The Control section is used to Enable/Disable system, Start and Stop programs, and Feed Hold. Reset will rewind the program and return to the default state of GCode modals.
7. Part file control and MDI
8. View current/last status message. Click [History] to view status messages and clear status line.
9. Displays current G-Code modals and the state of the control.

Homing

Homing should only need to be done whenever software is started up. Once the machine has been homed, then it knows where it is at and can continue without homing until the software has been restarted (control powered off/on).

To home the machine, begin by enabling the system. Click [UnLocked] button. To home all axes press the [Home All]

button. Each axis can also be homed using the individual axis home buttons. Once an axis has been homed, the axis LED display will be green. This green indicates it HAS been homed and knows the location, it does NOT indicate that it is currently at home position.

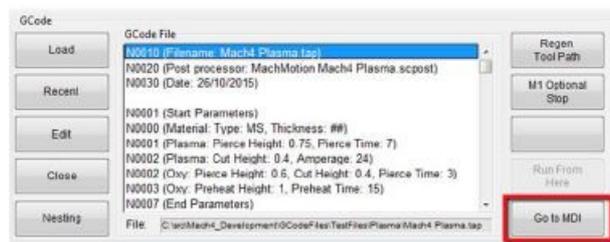


Plasma Homing

Programmed Movement

MDI

To command a movement using the MDI feature, press the [Go to MDI] button.



MDI Tab Selection

Enter the desired G-Code command into the field and press [Cycle Start] to execute the command(s).

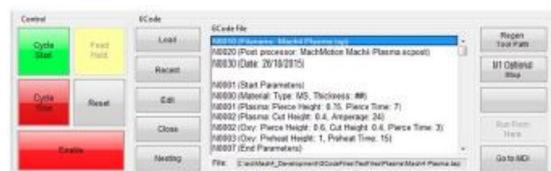


Example MDI Command

G-Code

The primary method of commanding motion is using G-Code files. G-Code files will be generated by a CAM software and loaded. If using a MachMotion integrated CAM simply press [Nesting] to start creating a layout.

G-Code File Controls



G-Code Controls

1. Cycle Start – Starts a loaded G-Code file
2. Feed Hold – Should not be used for plasma
3. Cycle Stop – Stops a running G-Code file or other commanded movement
4. Reset – Rewinds a loaded G-Code file to the beginning and resets G-Code modals to default configuration
5. Load – Opens a file browser to select an existing G-Code file
6. Recent – Opens a selection window with the ten most recent run G-Code files
7. Edit – Opens a loaded G-Code file to allow easy editing
8. Close – Closes the loaded G-Code file
9. Nesting – Opens the integrated MachMotion CAM software
10. Regen Tool Path – Recalculates the current tool path with current zero point
11. M1 Optional Stop – Stops program with M1 command
12. Go To MDI – Allows for Manual Data Input to command simple motion or modals

Running a G-Code File Example

1. Press the [Load] button then select a G-Code file and press [Open]

2. Jog the machine to the work piece zero point (see Using Laser Alignment section if applicable)
3. Zero the axes by selecting [UnLocked] and then [Zero All]
4. Before running G-Code, it is good practice to go back to [Locked] mode. All offsets are saved when [Locked] is pressed.
5. Press [Cycle Start] to run the program
6. If it is necessary to stop in the middle of a program to inspect the part press [Cycle Stop]



Zero the Axes

Tool Path Screen

Below are the controls to manipulate the tool path screen:

1. Zoom - Use scroll wheel of mouse or right click with the mouse and move mouse up/down
2. Rotate - left click with the mouse and rotate the part by moving the mouse
3. Pan - press Ctrl on the keyboard and left click with the mouse, then pan by moving the mouse (one-hand control option is to use left and right mouse click and move the mouse. No Ctrl press needed)

Using Laser Alignment

If your system is equipped with a laser for aligning, it can be used to help accuracy and efficiency in setting part zero.

To use the laser, navigate to the "Unlocked" tab and press the **Laser** button.



Use the laser to line up your "Part 0", then press **Zero All**. The part 0 is now set. You can also use the trace feature with the laser on to help simulate a cut. Press the laser button again when finished to turn the laser pointer off.

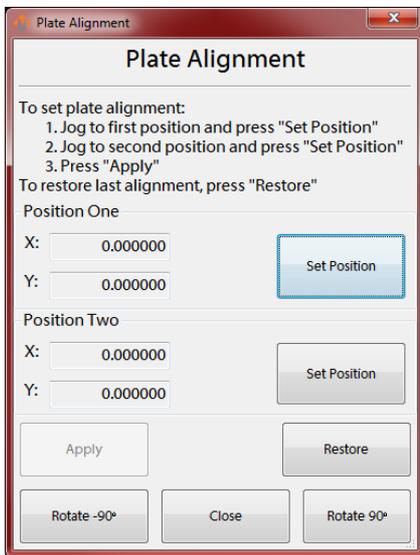
See the [Laser Offset Setup guide](#) for information on laser setup.

Using Plate Alignment

Plate alignment is used to compensate for a sheet of metal that is not "square" to the table. To use plate alignment navigate to the "Unlocked" Tab and press the **Plate Alignment** button.



Next, follow the directions in the **Plate Alignment** dialog window:



Both positions referenced in the dialog will be on the edge of the material. Line the torch/laser pointer up with the corner of the material, set to the first position. Then, jog the machine to the other end of the material and repeat. This will calculate for any crookedness in the work piece allowing for accurate full sheet cuts.

When plate alignment is active, the G54 DRO's will be *italicized* as shown below.



Part Recovery

During the cutting operation the process may be interrupted for multiple reasons. This section will outline some of the recovery methods and features that will allow you to resume cutting operations.

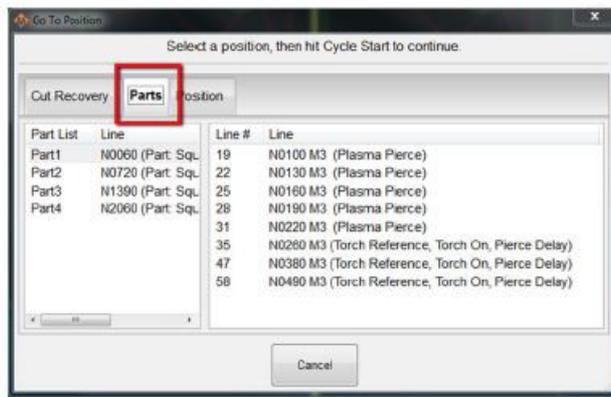
GoTo Positions

GoTo Positions give you the ability to send the machine to several defined locations. Note: If the GoTo Position button is not visible, select the "Locked" button to change screen options.



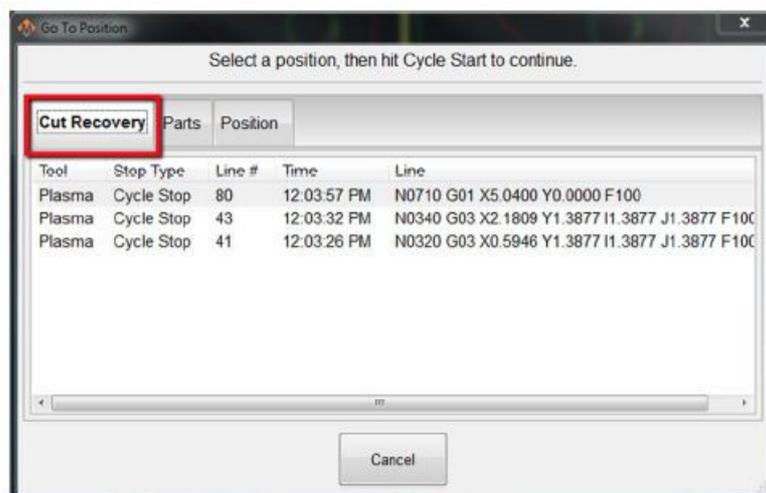
Start at any Pierce

The [Parts] tab will show you each part and each pierce point within that part. To start at a pierce point of a part simply select the part that you want in the left window and then the pierce point in the right window. At this point press [Cycle Start] to move the machine to the location that the pierce would start and then [Cycle Start] again to start the program.



Resume from Stop Point

If you ever press [Cycle Stop] or if the plasma detects a lost arc it will record the exact position of all axis for future use. To continue from the most recent lost arc or stop point simply press [Cycle Start]. If you want to go back to one of the past lost arc or stop points select it from the [Cut Recovery] tab and press [Cycle Start] once to go to that position and then again to start the program.



Example scenario:

1. Machine is cutting along and loses arc in the middle of a part.
2. Operator jogs machine to serviceable location
3. Operator replaces consumables
4. Operator presses [Cycle Start] to send machine to lost arc point
5. Operator presses [Cycle Start] to start program

Trace

At any point in time you can use the [Trace] buttons on the operator panel to trace forward or backwards along the cut path. This can be useful for checking clearances and verifying material or can be used to go back to a section for recut. From anywhere the machine is if you press one of the [Trace] buttons it will find the closest cut path, snap on path, begin simulated motion from there. Once you're on the desired tool path, cycle start will start the program from that position, allowing for precise and visual cut recovery.

Pierce Off Path





To avoid leaving an ugly pierce point when doing a cut recovery you can use pierce of path to place your pierce point off the part profile and in the waste. Once at start point with Trace or GoTo Position function press [Pierce Off Path] and jog the machine just slightly off the part path to where you want to pierce. Now press [Cycle Start]



Under the plasma tab you have control of the process parameters for plasma pierce and height control.

AVC: Arc Voltage Control. This enables a delay at arc before the sampled voltage is taken to allow for voltage to regulate.

Target/Sampled Voltage:

Sampled is the preferred cutting mode. In this mode, torch moves to the Cut Height after touch off and then samples the voltage for use in height control.

Target goes to the Cut Height and then uses the set voltage **SP**) for height control. Target mode requires user to set the voltage. Once the torch fires and starts cutting the part, the control will adjust the torch height to sustain that voltage setpoint.

Reset IHS: Initial height sense can be configured to only sense if beyond a given distance from last pierce point. Reset IHS will make the next pierce do a touch off height sense regardless of last point.

Warranty Information

MachMotion warranty policy is subject to change. Updated information is available at our website:
<https://machmotion.com/warranty>

The MachMotion Team
<http://www.machmotion.com>
 14518 County Road 7240, Newburg, MO 65550
 (573) 368-7399 • Fax (573) 341-2672

