



Swifty CNC cutter

Instruction manual



Copyright

This document is copyright of Swift-Cut Automation Ltd. 2017. All rights reserved. It is supplied under the terms of an agreement with UCAS, and may not be used except as permitted by Swift-Cut Automation Ltd.

Swift-Cut logos are trademarks of Swift-Cut Automation Ltd. Other products and company names herein may be the trademarks of their respective owners.

Document information

Version control

Revision No	Date	Description	Author
1.3	06/02/2017	Release 1.0	Swift-Cut Technical Authoring Team

Document purpose

The purpose of the user guide is to assist users of **Swifty** CNC to operate the system on a day to day basis.

Contents

1.	Introduction.....	5
2.	Environmental, Health and Safety Considerations.....	6
	Environmental	6
	Water treatment.....	6
	Disposal of water.....	6
	Waste material.....	6
	Fumes 6	
	Galvanised material	6
	Health 6	
	Lifting instructions	6
	Ventilation.....	7
	Recommended PPE.....	7
	Material handling	7
	Safety 7	
	Materials you can cut	7
	Table base	7
	Emergency Stop	7
3.	Getting Started.....	8
	Kit Contents	8
	Machine Specification	9
	Machine Layout.....	9
	Minimum Specification for PC	10
	Air Supply.....	10
4.	Assembly and Set-Up.....	11
	Machine Assembly	11
	Software Installation and Licencing	16
	Installing SwiftyCAM	16
	Installing SwiftyCNC.....	23
	Licensing SwiftyCNC	25
	Setting Up the Network Connection.....	29
	Switching On.....	32
	Testing (making your first cut)	33
5.	Swifty-CAM	34
6.	Swifty-CNC	35
	Machine Information	35
	Program Run Basic	36
	Work coordinates	36
	Jog control	37
	G-Code control.....	37
	Machine control	38
	Machine enable/disable	38
	Plasma torch information.....	38
	Cut path display.....	39

Program Run Advanced	40
G-Code and manual data input (MDI)	40
Work coordinates	41
Machine coordinates.....	41
Machine control	41
Feed Rate.....	41
Feed Rate Override (FRO)	41
Jog Control.....	42
Cut path42	
Diagnostics Screen	43
Output Signals.....	43
Input Signals	43
Plasma torch control.....	44
Default page	44
Sheet Trim Screen	45
2 points mode	45
3 points mode	45
7. Using Your Machine.....	47
Cutting a Part – Step by Step	47
Swift-CNC Advanced Features	52
Remember Position and Return to Position.....	52
Manual Data Input (MDI).....	52
Feed Rate Override.....	52
Restarting an Interrupted Cutting Operation	52
8. Maintenance	53
Machine Diagrams and Part Numbers.....	53
General Maintenance	53
9. Troubleshooting	54
Machine will not turn on	54
Cannot connect to machine	54
E-Stop condition in SwiftCNC.....	54
No movement.....	54
Plasma not cutting through material.....	54
Online Support.....	55
10. Warranty and Terms & Conditions	56
Warranty.....	56

1. Introduction

Thank you for purchasing our Swifty CNC machine. We have no doubt that your Swifty will be a tremendous help to you in your workshop from the day it is installed. We hope it will exceed your expectations in every way.

Swifty is a versatile bench-top CNC plasma cutting machine that offers great value for schools, artists and smaller workshops.

The complete package includes a Swifty CNC table, operating software and online support.

The CNC table works in conjunction with a range of plasma cutters. It is portable and easy to use, with a variety of cutting capabilities. All that is required to operate it is a plasma power source, an air compressor and a PC, giving the user freedom to work wherever they wish.

Swifty is easy to install, set up and use, but if you experience any problems, please check the support section of our website, swiftycnc.com.

Before commencing installation of your Swifty please register at :

<http://swiftycnc.com/product-registration>

and review the installation videos.

2. Environmental, Health and Safety Considerations

Environmental

Water treatment

We recommend the use of water treatments to prevent the build-up of bacteria and also to inhibit corrosion. Please see our website for recommended treatment.

Disposal of water

Please contact your local environmental health office as requirements differ from country to country.

Waste material

Ferrous and non-ferrous material must be disposed of into metal recycling bins.

Fumes

Water tables filled to the correct level will take out 90% of all fumes. However, if the material being cut is contaminated with items such as paint and oil, the cutting process will create more fumes, some of which may not be caught by the water. For this reason, we recommend that this table is only used in well-ventilated areas.

If you find the cutting process creating too much fume then you will need to slow down the cutting process by upto 50% depending on material and contamination.

Galvanised material

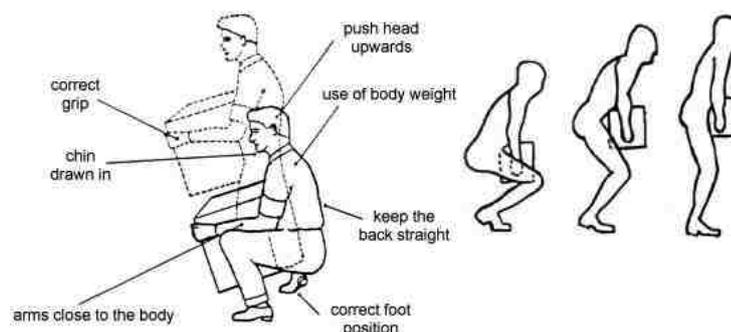
When cutting galvanised material, carcinogenic fumes are created. If galvanised materials need to be cut, we recommend the use of filtered breathing apparatus or filtered extraction over the table bed.

When cutting contaminated material, such as mild steels with an oil finish or plastic-coated steel, use in a well ventilated area.

Health

Lifting instructions

Please observe the correct manual handling instructions when lifting the table or plate.



The CNC table alone weighs 75Kg, so we recommend a three-man lift. Always lift the table from the ends. (see video 1.1 unpacking Swifty).

Ventilation

Open any windows or doors and never use in a confined space.

Recommended PPE

We recommend the following Personal Protective Equipment (PPE):

- Eye protection – shade 5 safety glasses (According to ANSI Z49.1:2005)
- Safety gloves
- Safety shoes
- Breathing apparatus if cutting galvanised material

Material handling

We recommend wearing gloves to prevent burns and lacerations.
Ensure appropriate weight-lifting methods and aids are used, as illustrated above.

Safety

The following warnings should be observed when using your Swifty CNC machine:



Voltage warning: risk of injury through electrical shock .

Note: The control is supplied either 110v/230v, and the table is supplied with 24v DC. This excludes the plasma source.



Moving machinery: risk of trapped fingers etc.



Do not run the machine with safety covers removed



Do not use near any flammable material due to danger of fires or explosions

Materials you can cut

You can cut mild steel, stainless steel, aluminium, brass, copper and any ferrous and non-ferrous materials.

Note that results may differ depending on the material used.

Table base

The table should be placed on a base that is sturdy and capable of supporting 110Kg.

Emergency Stop

The emergency stop button is located on the control box, please keep this box in arms reach at all times whilst using the table.

3. Getting Started

Kit Contents

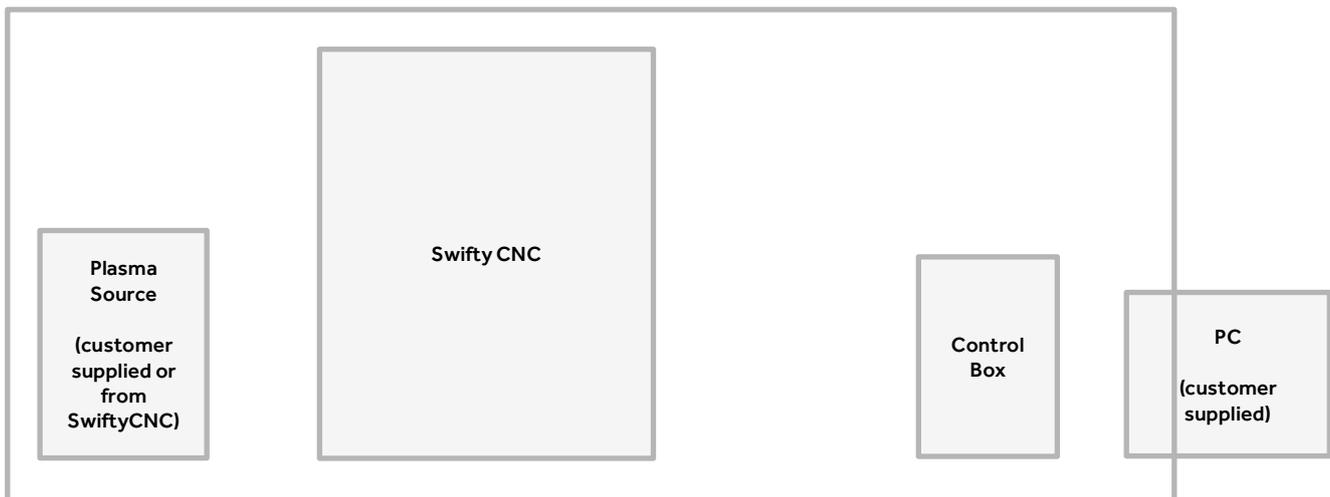
Description	Quantity	
Safety glasses	1	
Gloves	1	
Ethernet cable 3m	1	
Swift machine	1	
Control box	1	
Power lead	2 (UK & European)	
Cable support pole	1	
Cable support pole bolts (found in rear support beam)	2	
Cable support hook	1	
Material clamps short	4	
Material clamps long	2	
Cut height spacers	4	
USB stick	1	

Purple USB License dongle	1	
Work lead clamp bracket	1	

Machine Specification

Table dimensions	1130 x 980 x 460mm
Table mass	75Kg
Cutting area	620 x 620mm
Water volume	30 litres
Power requirement -	7amp, 230 volt (±15%) or
-	10 amp, 110 volt (±15%)

Machine Layout



Please make sure emergency stop is within arm's length at all times while machine is in use.

Minimum Specification for PC

Operating system	Windows 7, Windows 8, Windows 10 32 and 64 bit systems
Memory (RAM)	4GB
Graphics	256 MB graphics card
Processor	I5 and above
Ports	Ethernet port and 2 x USB

Air Supply

For the recommended air supply, see the manual for the plasma source.

It is recommend that you use a filtering system for the air supply to ISO 8573-1 class 1.2.2 for any plasma source chosen, please see SwiftyCNC.com for more details.

4. Assembly and Set-Up

Machine Assembly

Tip: watch the assembly video 1-2 on our website.

The following tools are required for the assembly process:

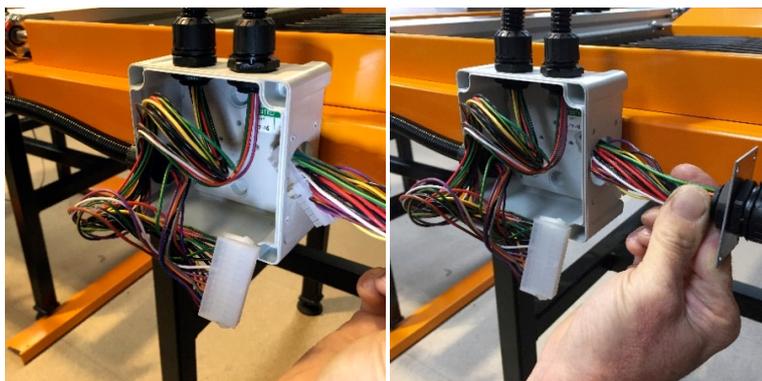
- Phillips-head screwdriver (supplied)
- Allen keys, 2.5mm 4mm and 5mm (supplied)
- 10mm spanner.

To assemble the machine:

1. At the back of the machine, remove the connector box lid using a Phillips-head screwdriver.



2. Pass the connector from the control box through the hole and connect it to the cables inside.

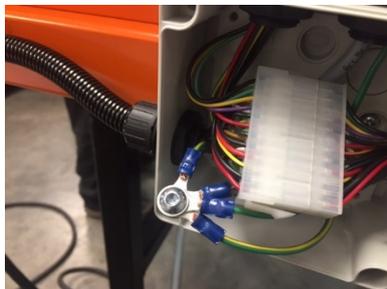




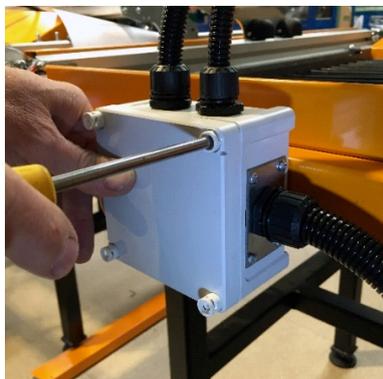
3. Attach the cover plate to the side of the connector box using the four self-tapping screws provided.



4. Then secure all 4 earth cables using the bolt/nut supplied.



5. Replace the connector box lid.



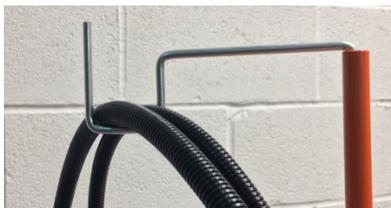
6. Attach the cable support pole to the back of the machine using the supplied bolts.



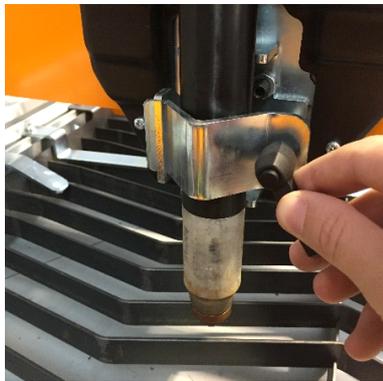
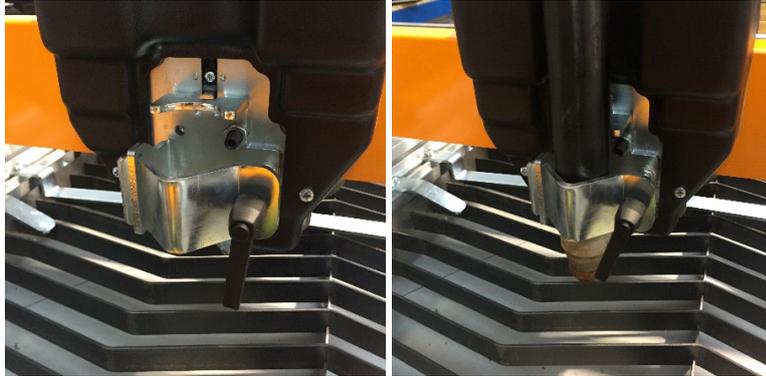
7. Slide the cable support hook into the top of the cable support pole.



8. Place the plasma torch hose and conduit onto the cable support pole. The plasma torch hose and conduit can be cable-tied to the support hook for additional security. Ensure there is enough slack to allow the plasma torch to reach the front of the table.



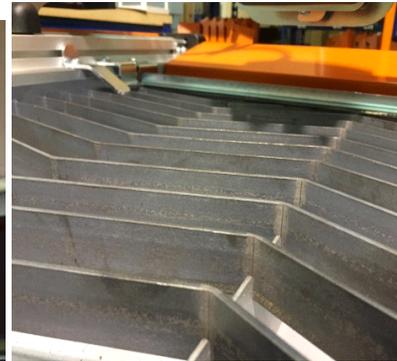
- Loosen the hand clamp and slide the plasma torch into the plasma torch holder. Tighten the clamp to secure it in place. The plasma torch height will be adjusted later.



- Connect the CNC interface lead into the back of the plasma unit. Push the plug into the CNC interface socket, taking note of the locating points, and then tighten the locking ring to secure it in place. (Thermacut option shown)



11. Check that the tap is off at the back of the table. Fill the table with water, to 10mm below the top of the cutting bed slats.



12. Mount the ground cable bracket to the rear of the table, then clip the ground clamp on to the bracket.



Software Installation and Licencing

If you register your machine at swifcnc.com you will find online videos to guide you through this process.

To complete this task you will need a PC or laptop to the recommended specification, an internet connection, the Swifty USB stick, SwiftyCAM dongle and Swifty information sheet with access codes.

Swifty is supplied with two pieces of software:

- SwiftyCAM (software for creating the machine code)
- SwiftyCNC (software for running the CNC)

Each of these must be installed.

If installing on a laptop, we recommend it is powered by the mains adaptor. Please make sure you have an internet connection throughout the installation.

If a FIREWALL is installed you may need to disable it during the installation process.

You will need 2 USB ports on your PC to complete this process. If you only have one USB port copy the software from the USB memory to your hard disk and run from that location.

Installing SwiftyCAM

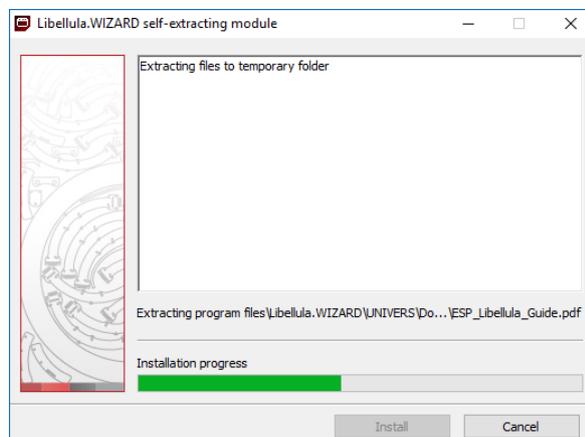
See video 2-1.

Make sure you have an internet connection before trying to install the software.

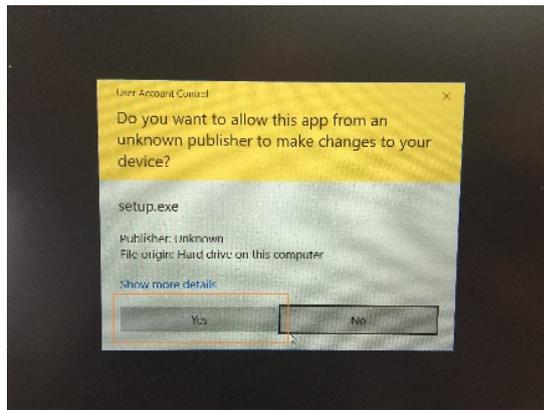
1. Insert the USB memory stick supplied with Swifty.



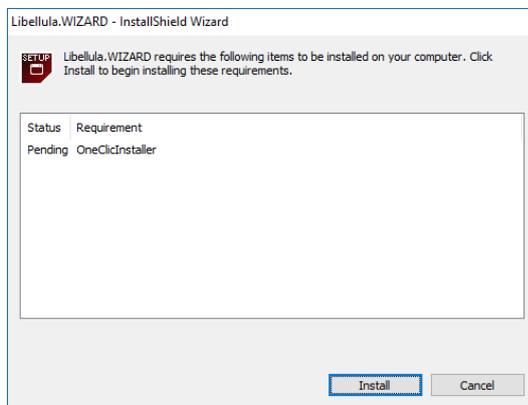
2. Locate the SwiftyCAM.exe file on the USB stick
3. Run the setup package, SwiftyCAM.exe.



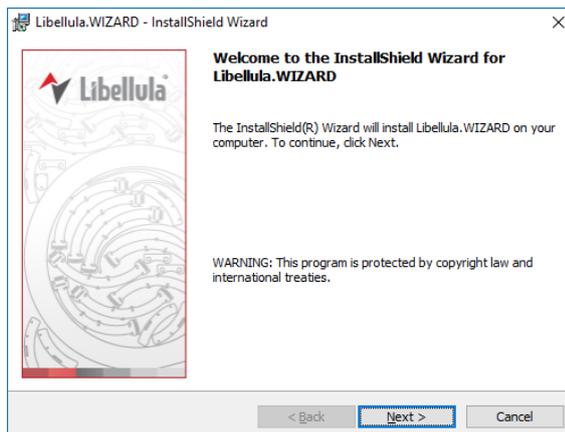
This window or similar may pop up. Click yes to proceed.



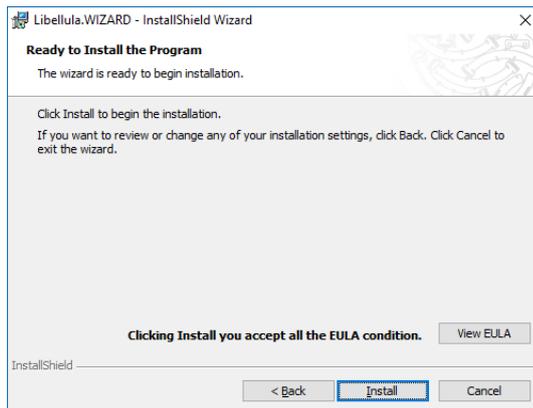
4. Click Install



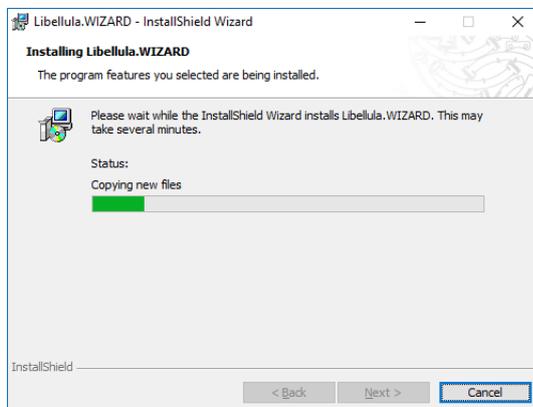
5. The Welcome page is displayed. Click on Next.



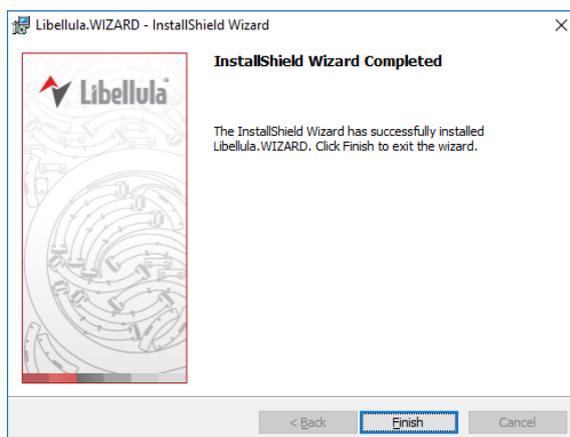
6. Accept the End User License Agreement by clicking on Install.



7. The files are copied onto the PC.



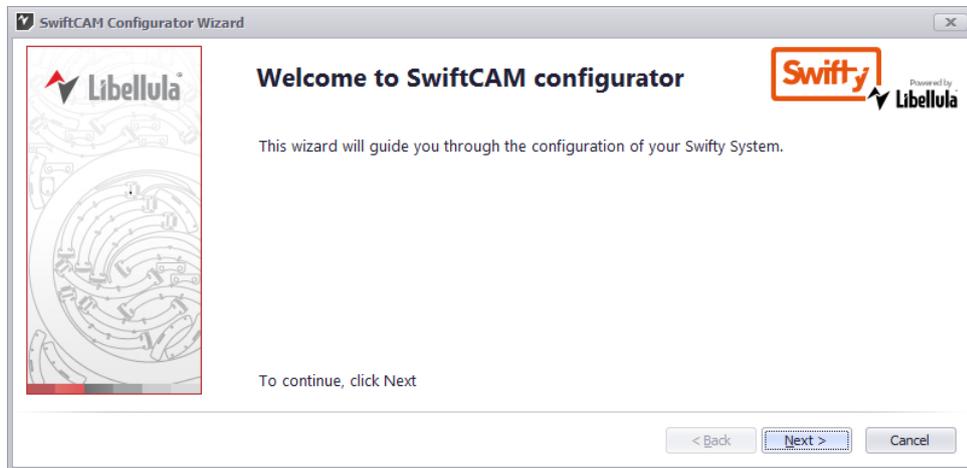
8. When setup is complete, click on Finish. This will take you to the SwiftyCAM configurator.



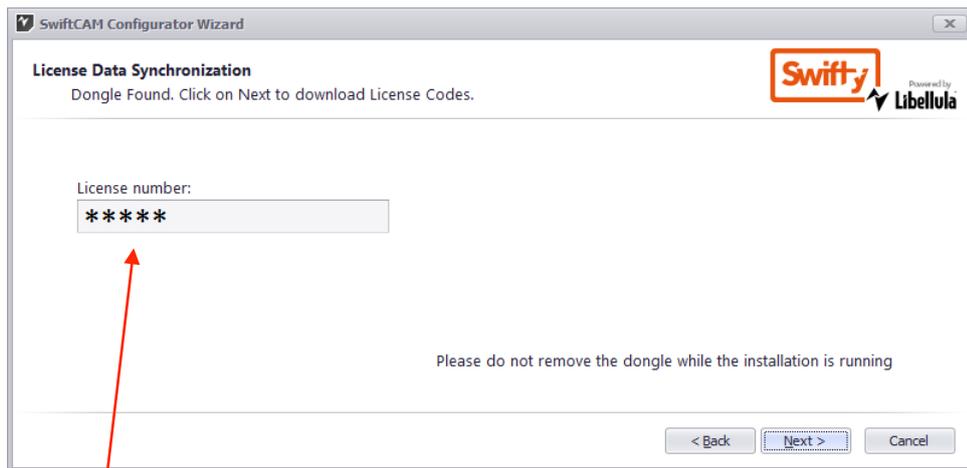
9. The next part of the installation configures your system. Insert your purple USB license dongle. Do not remove USB memory stick.



10. Click Next
(This screen may be hidden behind other open windows)

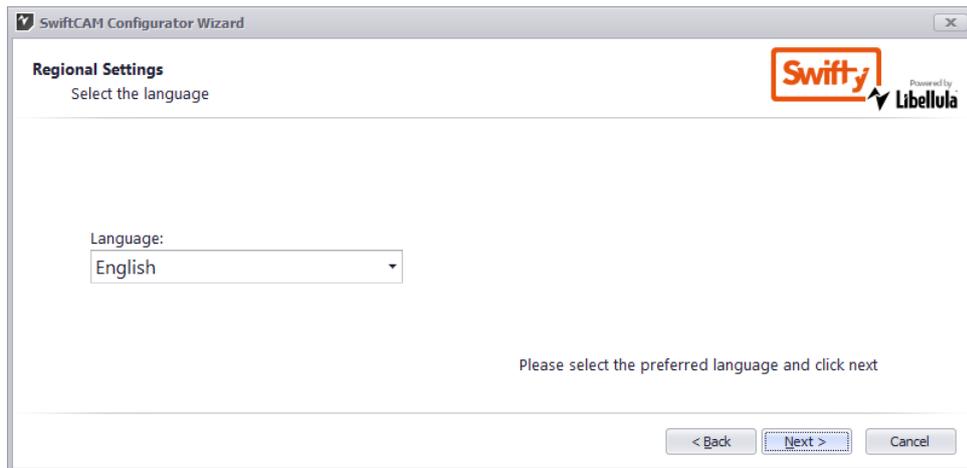


11. The next screen confirms that the dongle has been found. Click on Next.

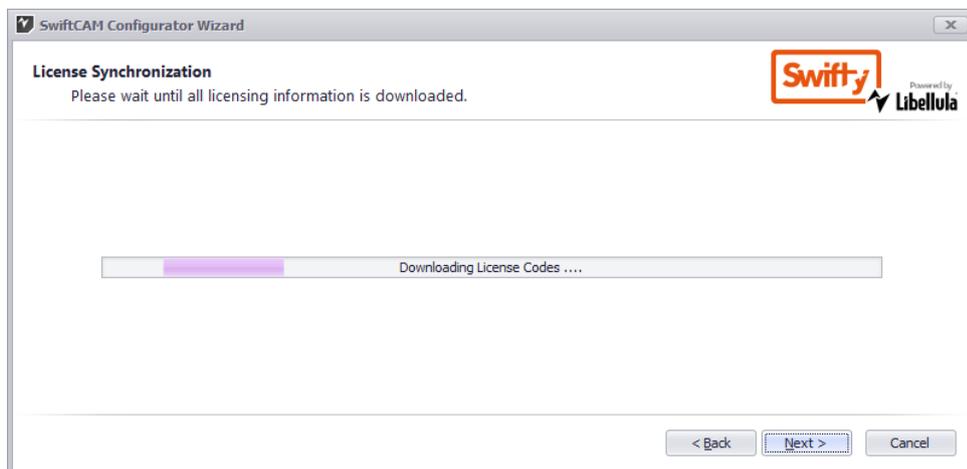


This is the number on the dongle.

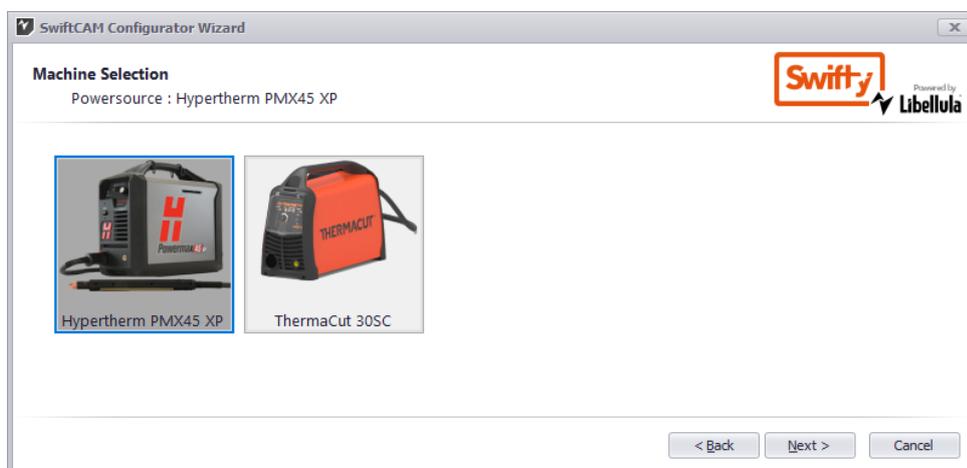
12. Select your preferred language and click on Next.



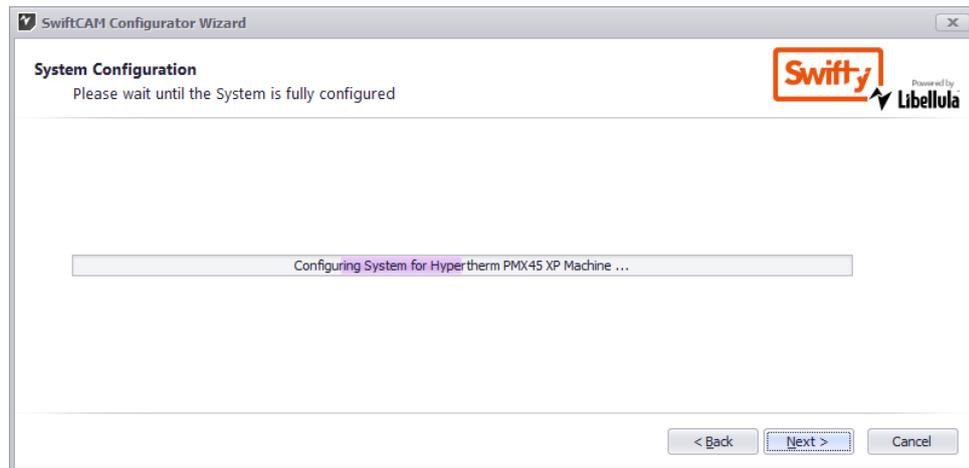
13. The license is downloaded.



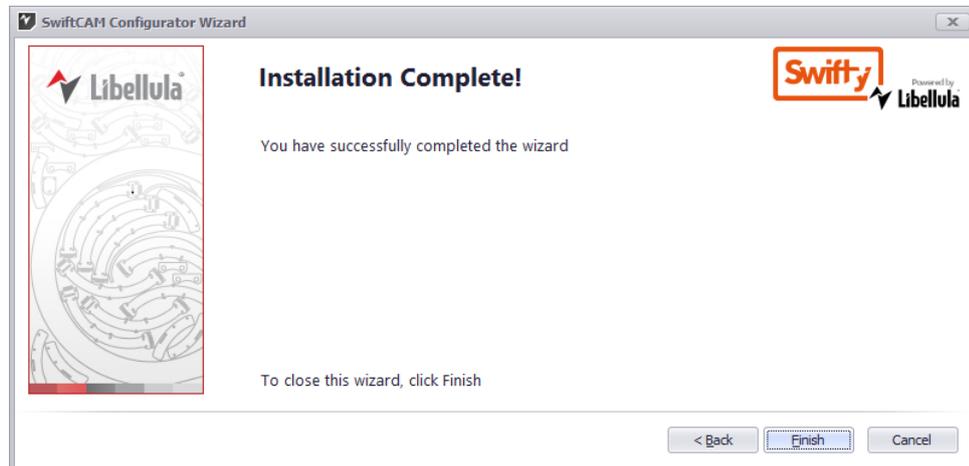
14. Select your power source by clicking on it, then click on Next.



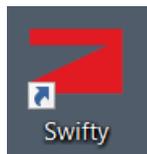
15. Wait while the system is configured.



16. When installation is complete, click on Finish.

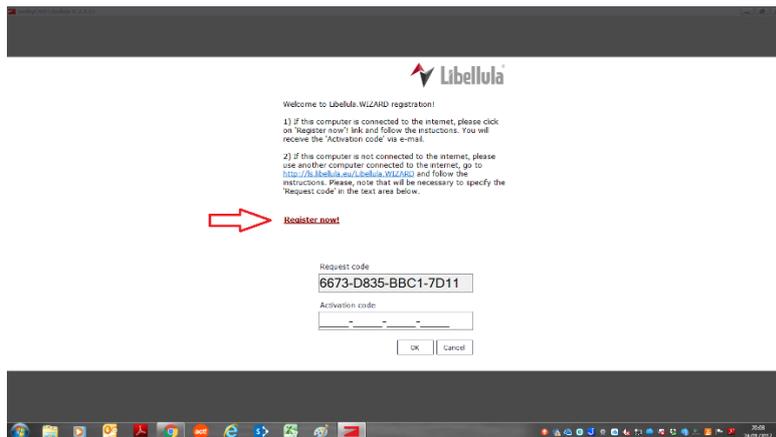


The SwiftCAM icon should now be on your desktop.

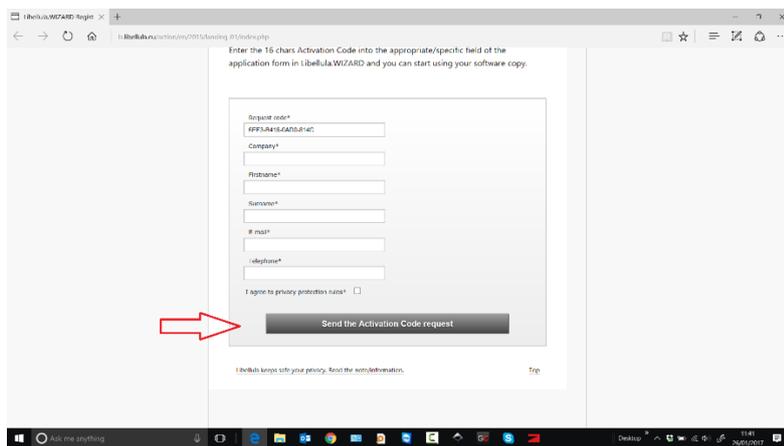


We now need to register this software.
Double click on the above icon to proceed.

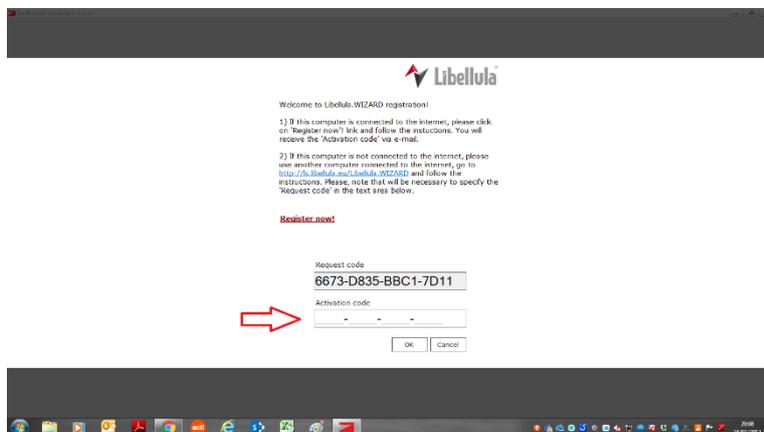
17. To receive an Activation code click on Register now.



18. Fill in your details and click on Send application code request. A file will be emailed to you with the Activation code. note: Check your Junk folder if not received. Close this screen when finished.



19. Enter your Activation code here



**Your SwiftyCAM software is now registered and ready to use.
We suggest you now close the program before moving onto the next stage.**

Installing SwiftyCNC

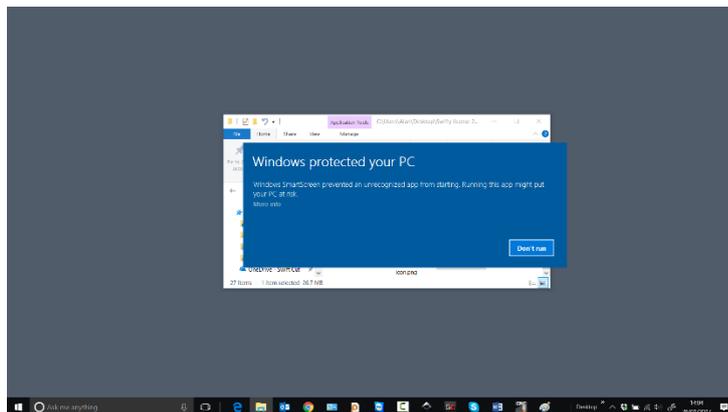
See video 2-2.

The next stage is to install the SwiftyCNC software. To install this you will need the USB memory stick. You can temporarily remove the purple dongle if necessary.

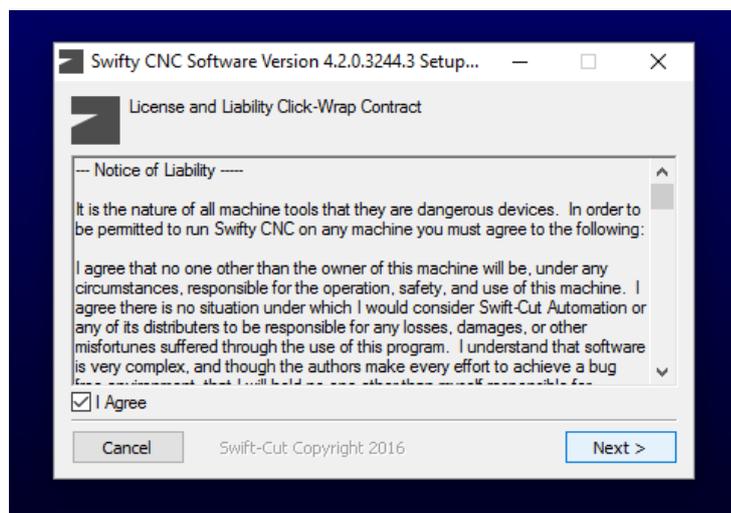
1. Insert the USB memory stick



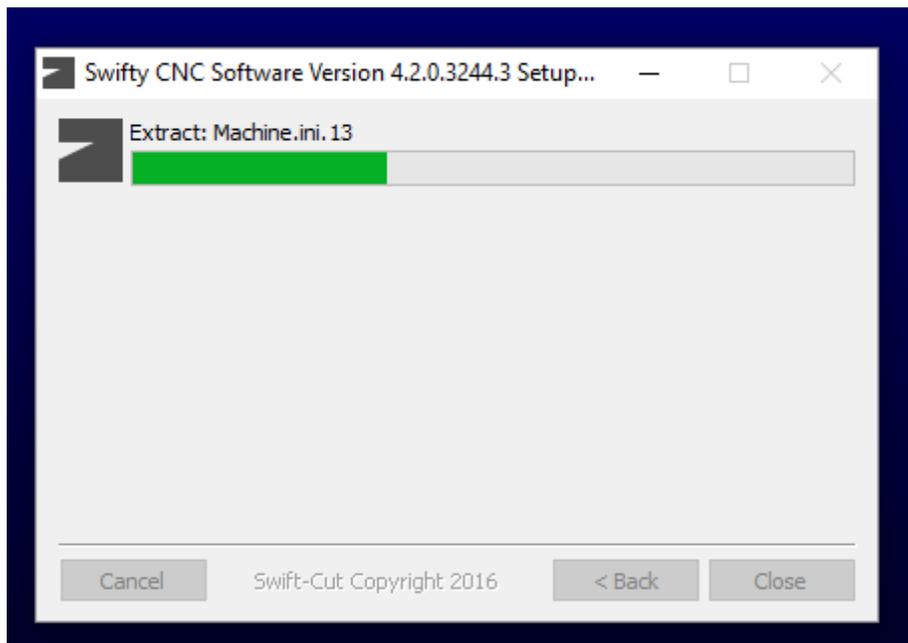
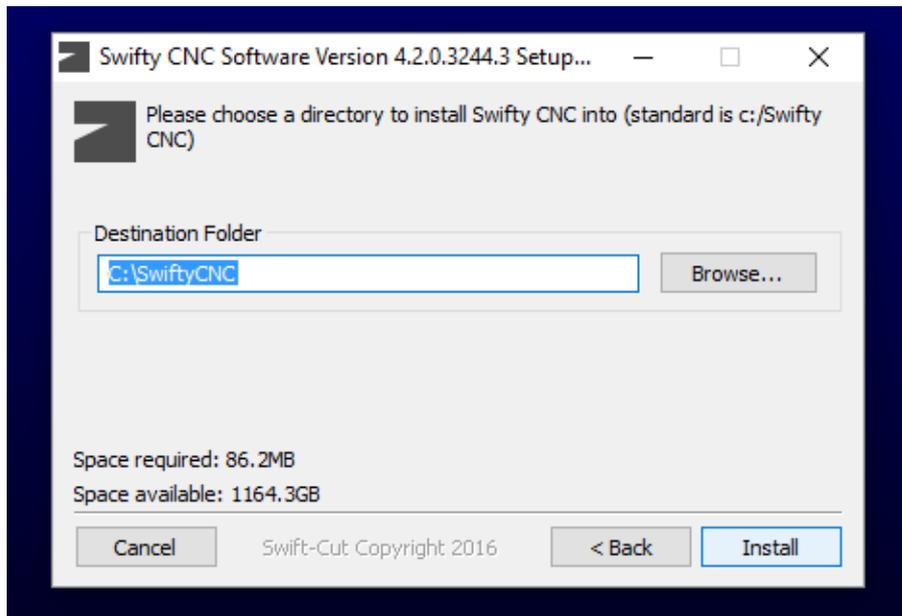
2. Locate the SwiftyCNC.exe file on the USB.
3. Run the setup package, SwiftyCNC.exe.
If a screen similar to this appears click on **more info** and **run anyway**.



4. Click on **I Agree** and **Next**



5. Accept the default destination folder and click **Install**

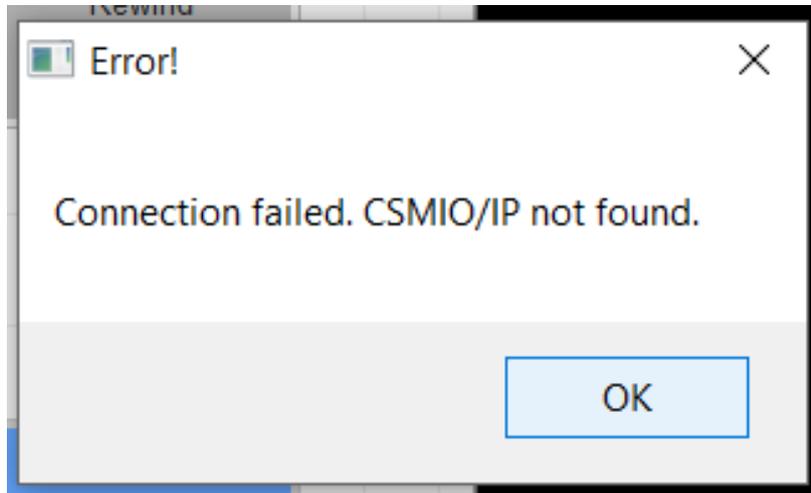


6. When the Install has finished you will have the SwiftyCNC icon on your desktop. Double click on the icon to open the CNC software.

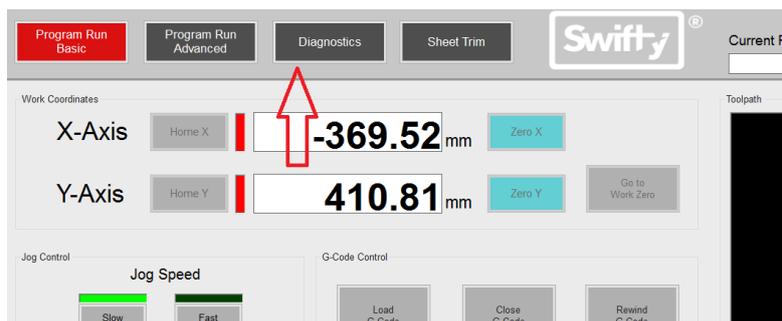


Licensing SwiftyCNC

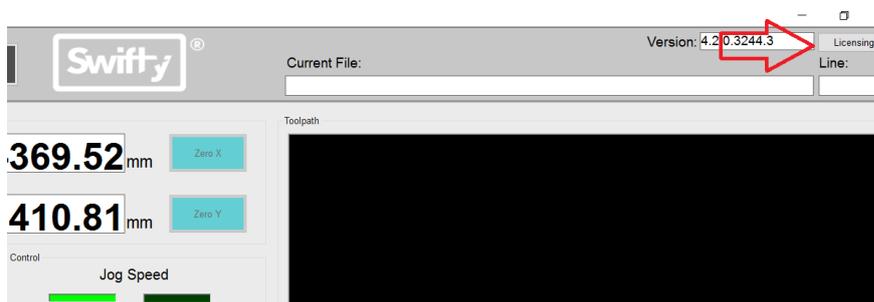
1. After opening SwiftyCNC software, the following message will appear if the Swifty machine is not connected to the PC. Click OK to bypass.



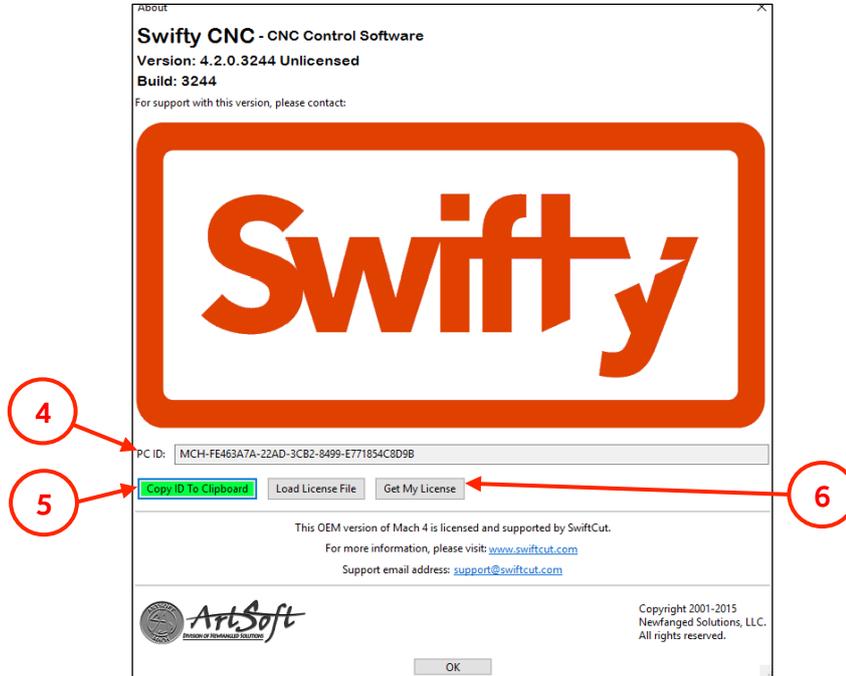
2. Click on the Diagnostics tab at the top of the screen



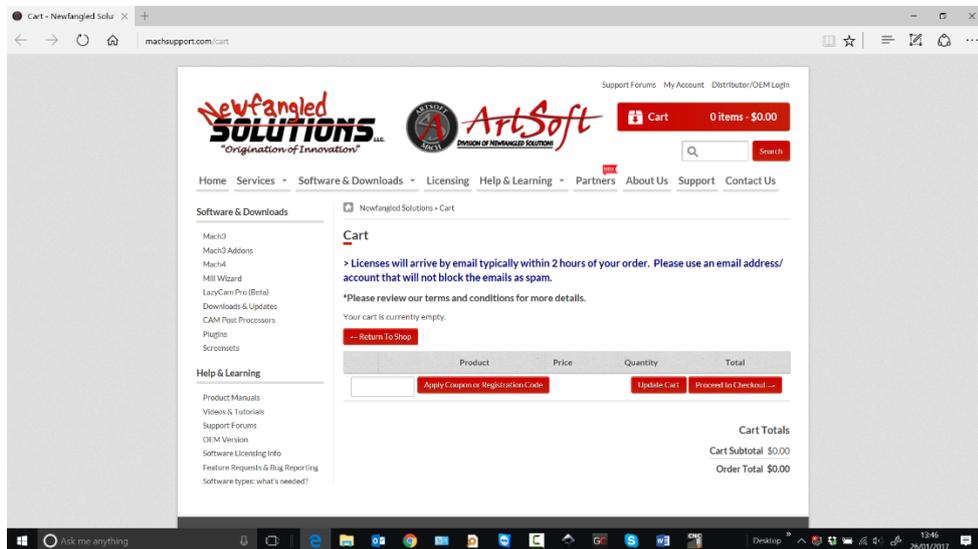
3. Click on the Licensing button at the top right hand corner.



4. To obtain your license file your PC-ID must be sent to our license server. After which the license file will be emailed to you. Your PC-ID is displayed underneath the Swifty logo.
5. Click on **Copy ID to Clipboard**. (this copys your PCID for later use).
6. Click on **Get My License**. This step requires an internet connection.



7. The Mach support webpage will be displayed.



8. Locate the software coupon code on the Swifty information sheet



The image shows a Swifty information sheet for a CNC cutter. It includes the Swifty logo, a photo of the machine, and instructions on how to unlock the online user guide. A red circle with the number '8' highlights the software coupon code 'gus6nj' in the 'Your unique access codes' section.

Swifty

Swifty information sheet
Keep this sheet safe

How to unlock your online user guide.
Congratulations - you're now the proud owner of a Swifty CNC cutter!
That means you can access our extensive online resources, for all the help you need to get the best from your Swifty machine.

What to do next:
Register your table at swiftycnc.com to gain access to the full range of Swifty resources, including:

- Detailed instruction manuals
- Video tutorials
- FAQs
- Self diagnostic tool
- Online support

Your unique access codes:

Swifty serial number: 0197 Use this number to register your table online and gain access to our resources.

Software coupon code: **gus6nj** You'll be asked for this code when you download your software.

8

Don't forget to register your table at swiftycnc.com

9. This is a 3 stage process.

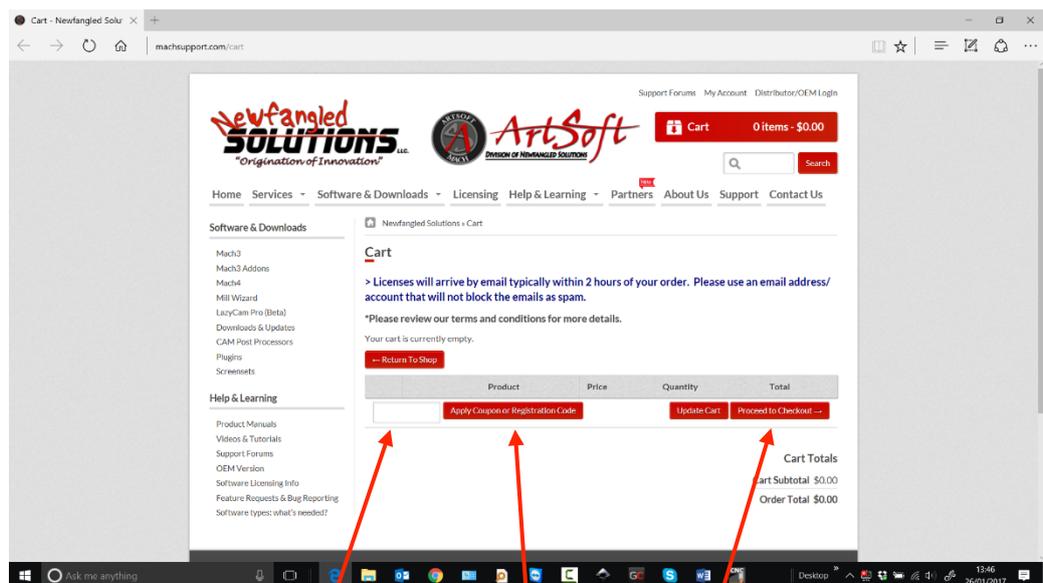
9.1 Enter the **Software coupon code** from the **Swifty information sheet**.

9.2 Click **Apply Coupon or Registration Code**.

This will automatically load the product into the cart.

9.3 Click **Proceed to Checkout**

Note: no payment is required.



The screenshot shows the 'Cart' page on the Newfangled Solutions website. The page is titled 'Cart - Newfangled Solu' and shows a shopping cart with 0 items for \$0.00. The page includes a navigation menu, a search bar, and a sidebar with links to 'Software & Downloads' and 'Help & Learning'. The main content area shows the cart details and a table with columns for Product, Price, Quantity, and Total. The table is currently empty. Below the table are buttons for 'Apply Coupon or Registration Code', 'Update Cart', and 'Proceed to Checkout ...'. Red arrows point to these buttons, labeled 9.1, 9.2, and 9.3 respectively.

Cart - Newfangled Solu

machsupport.com/cart

Newfangled SOLUTIONS "Origination of Innovation"

ArtSoft DIVISION OF NEWFANGLED SOLUTIONS

Support Forums My Account Distributor/OEM Login

Home Services Software & Downloads Licensing Help & Learning Partners About Us Support Contact Us

Software & Downloads

- Mach3
- Mach3 Addons
- Mach4
- Mill Wizard
- LazyCam Pro (Beta)
- Downloads & Updates
- CAM Post Processors
- Plugins
- Screensets

Help & Learning

- Product Manuals
- Videos & Tutorials
- Support Forums
- OEM Version
- Software Licensing Info
- Feature Requests & Bug Reporting
- Software types: what's needed?

Cart

> Licenses will arrive by email typically within 2 hours of your order. Please use an email address/account that will not block the emails as spam.

*Please review our terms and conditions for more details.

Your cart is currently empty.

Return To Shop

Product	Price	Quantity	Total
---------	-------	----------	-------

Apply Coupon or Registration Code Update Cart Proceed to Checkout ...

Cart Totals

Cart Subtotal \$0.00

Order Total \$0.00

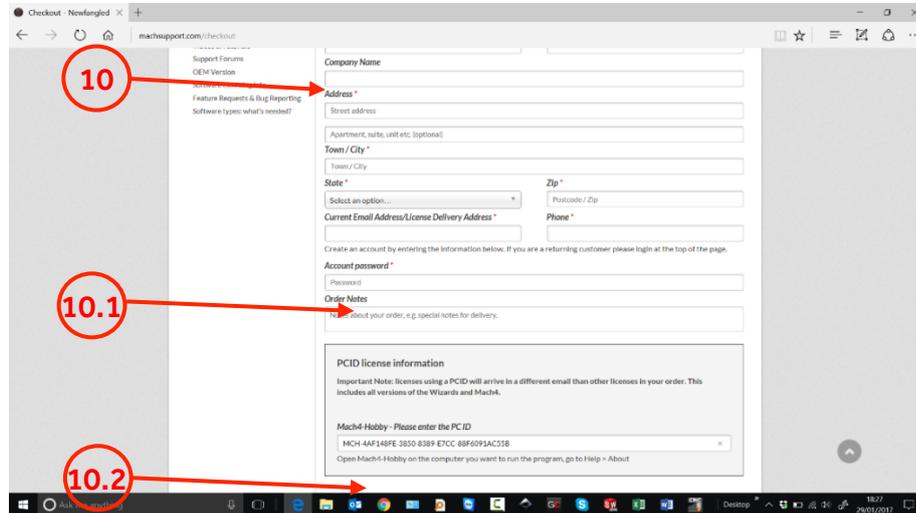
13:46 26/01/2017

10. Fill in your details on the Checkout page to create an account.

10.1 Choose a password for your account.

10.2 Enter your PC-ID by right clicking in the box and selecting Paste.

Note: Refer to page 27 step 4 to obtain your PC-ID if it does not paste.

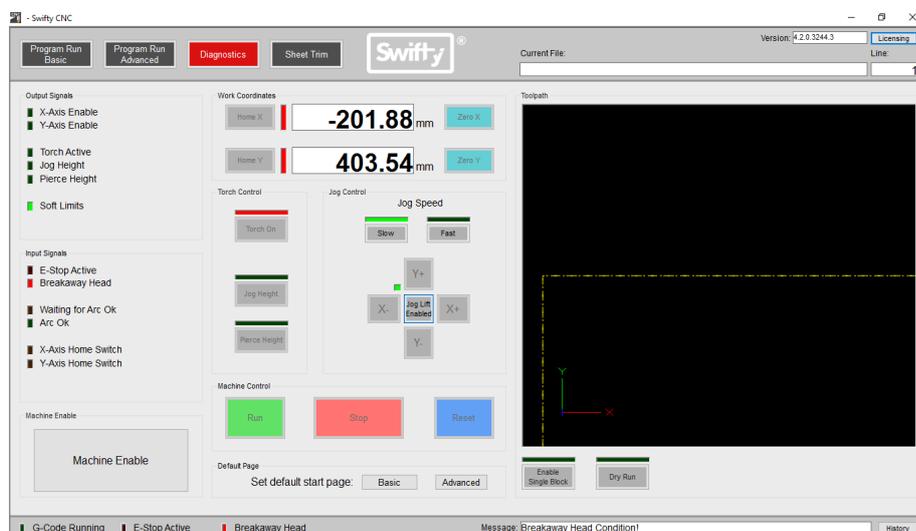


11. When the order is completed, a license file with your unique PC-ID will be created and **emailed to the email address you provided**. Please check your **Junk folder** if it does not appear in your Inbox. If not received within 2 hours we suggest you try a different email address if you have one. For help contact support@machsupport.com **Note** : 2 files are sent confirming your order and a further file is sent containing your license.

12. A confirmation screen appears at the end of this procedure.

13. When you receive the .zip file, download it onto your desktop. Right click the .zip file and select Extract. Extract the licence file to a known location as you will need this file in the next step.

14. To load the license file open SwiftyCNC using the icon on the Desktop. Click on the **Diagnostics** tab and click on the **Licensing** button.



15. On the popup that displays the PC ID under Diagnostics/Licensing, click on the **Load License File** button and direct it to the license file previously extracted, then click on **Open**.



16. A popup message says 'License loaded successfully'. Your SwiftyCNC software is now licensed.

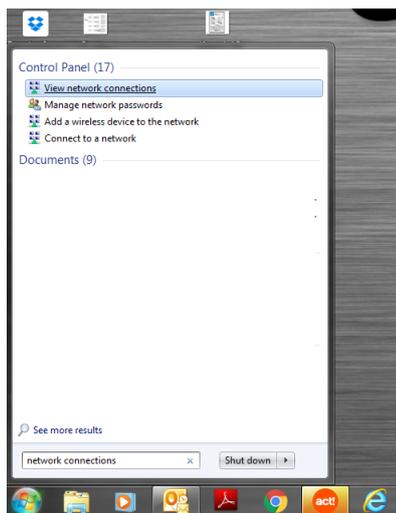
Setting Up the Network Connection

The next stage is to set up a network connection for the software.

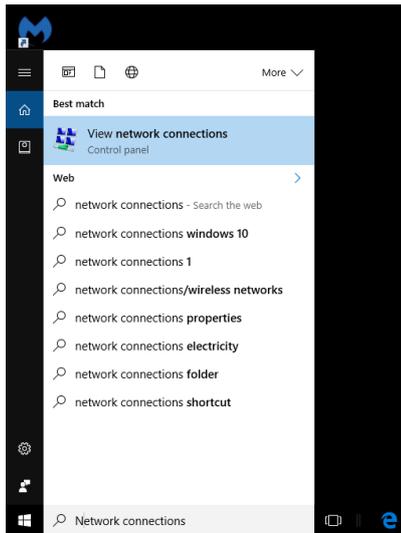
Close the SwiftyCNC software before starting.

1. On the Windows search bar, type 'network connections' and press Enter. This will open up the network connections.

Depending on your windows version it will look similar to this.

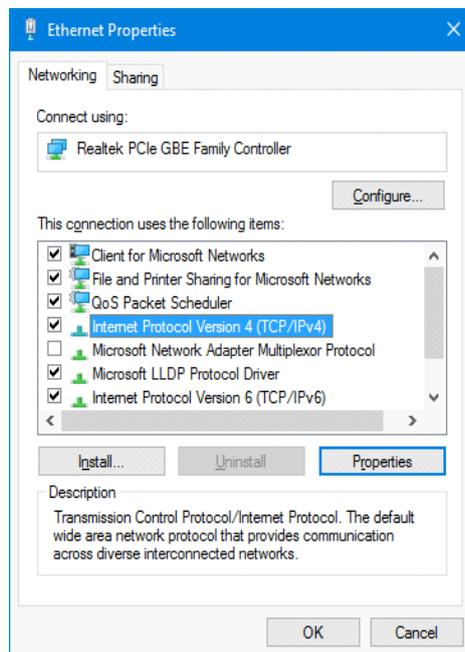


Windows 7 version.



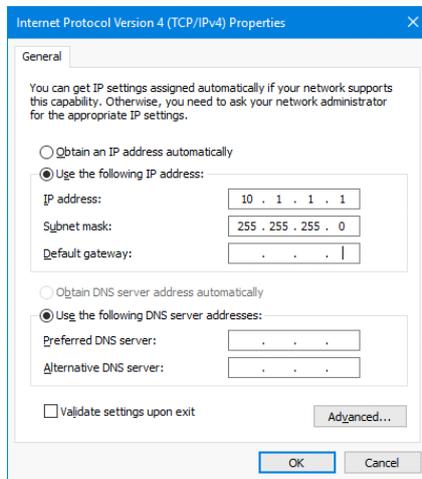
Windows 10 version

2. Once open, right-click on the 'Ethernet port' (local area connection) option, then left click on Properties. This opens a box containing a list of possible connections.
3. Double left click 'Internet Protocol Version 4 (TCP/IPv4)' and make sure the box to the left of this is ticked. This allows you to click on Properties, which appears below the box.



4. A new dialog opens. Select the option to 'Use the following IP address' and type in the following:

IP address: 10.1.1.1 Subnet mask: 255.255.255.0



5. Click on OK. You should now be able to connect your machine.
6. The process is complete.

Switching On

To switch the machine on:

1. Connect the Ethernet cable from your PC to the front of the control box.



2. Connect power into the back of the control box.



3. Turn on the plasma unit using the switch on the back, and follow any safety instructions relating to the plasma unit.
4. Set the cutting amps on the plasma unit to the maximum (See plasma user manual).
5. Turn Swift-y on using the switch on the back of the control box.

Testing (making your first cut)

Before cutting make sure the table is completely level, failure to do so can cause damage to the machine

We suggest you watch the videos **Swifty basics 3-1** and **First cut video 3-2** before proceeding.

A 2mm sheet of mild steel has been supplied to test the machine. (see swifcnc.com for the first cut tutorial video)

1. Ensure the machine, air compressor and plasma source are switched on.
2. Open the SwiftyCNC software. Open the Program Run Basic screen.
3. Enable the machine using the Machine Enable button in the bottom left-hand corner of the screen.
4. Home the X and Y axes by selecting Home in each case. This will cause the machine's axes to move to the home position. The Home LEDs will turn green, indicating that the axes have been homed.
5. With the axes at the home position, load and secure the supplied material onto the cutting bed using the material clamps.
6. Select "Load G-Code" and navigate to C:/CNCfiles, then open the file named in the first cut video tutorial *****.tap G-Code file. The cut path that the machine will follow is displayed.
7. Use the jog controls on the left side of the screen to move the machine to the lower left-hand corner of the material.
8. Position the plasma torch height spacer for 2mm material underneath the plasma torch. Loosen the clamp and lower the plasma torch onto the spacer. Tighten the clamp and then remove the spacer.
9. Zero the X and Y axes using the Zero X and Zero Y buttons.
10. Run G-Code.

5. Swifty-CAM

SwiftyCAM is CAD/CAM application software developed to allow ease of use for any of Swift-Cut cutting table, including Swifty.

SwiftyCAM guides the user to production through a simple path and minimises the time normally set aside for programme preparation.

An easy-to-learn product, SwiftyCAM allows you to verify the recently-created production cycle via 2D simulation in a realistic environment to test its functionality.

The benefits of SwiftyCAM are:

- Simple and easy to learn and use, with zero training requirements
- Allows you to import and nest a part simply, saving on time and costs
- Easy, fast loading procedure
- Correct programming of machines without any investment efforts required to learn a new system
- Offers a wide library of parametric patterns

Full details of the software are available at www.swifcnc.com.

6. Swifty-CNC

SwiftyCNC is a CNC control application used to operate your Swifty plasma cutting machine.

Machine Information

The main screen contains a set of status information along the bottom of the screen.

G-Code running LED

Indicates when G-Code is running.

E-Stop active LED

Flashes red when the emergency stop button on the control box is engaged.

Breakaway head LED

Flashes red when the head breaks away.

Message

Displays important information and error messages.

Current file

Displays the file path and name of the loaded G-Code file.

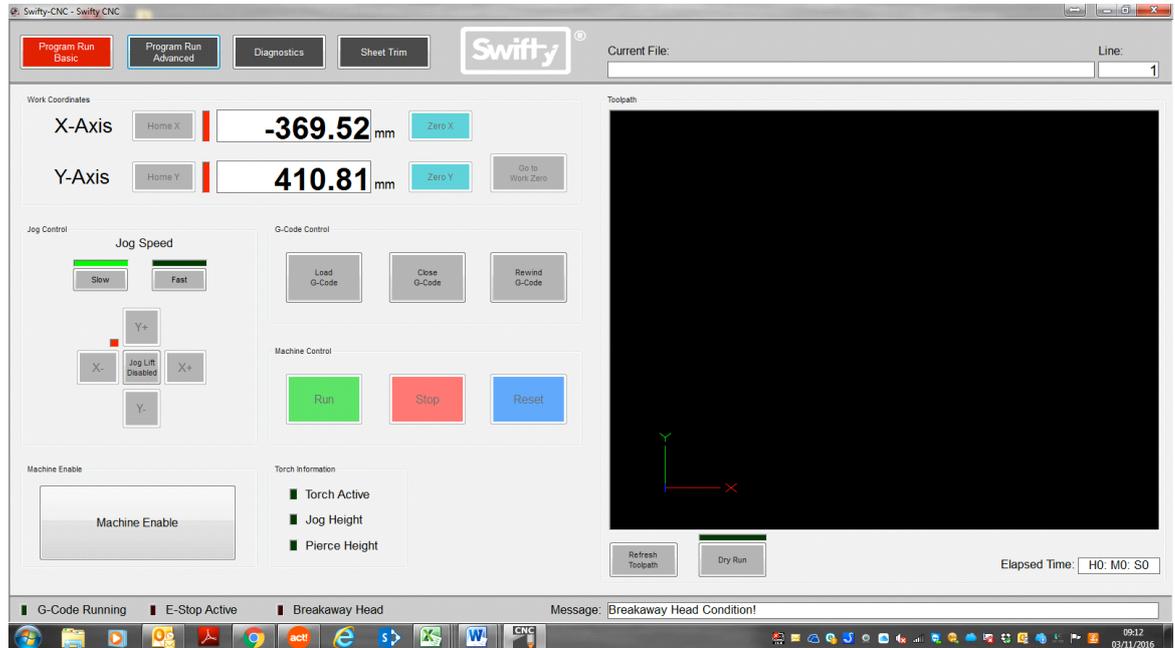
Line number

Displays the line number of the G-Code file being run, or the line selected when the machine is idle.

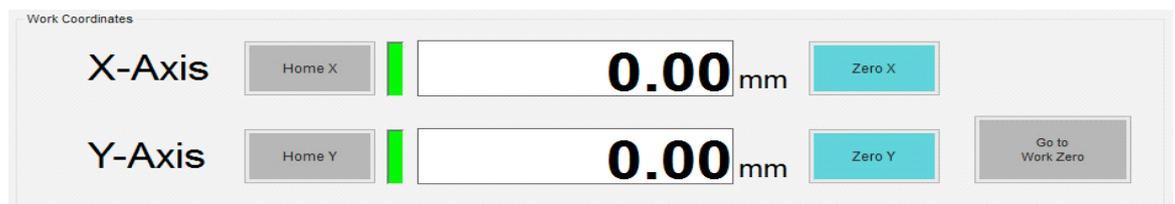
Program Run Basic

By default, the program starts with the Program Run Basic screen displayed. This screen can be displayed at any time by clicking on the Program Run Basic button in the top left-hand corner of the screen.

Each section of the Program Run Basic screen is described below.



Work coordinates



Home X and Home Y

Sends the axis towards the machine origin to determine its position. Must be performed after every start-up, when the axes become dereferenced or when the emergency stop (E-Stop) is pressed.

Home X and Home Y LEDs

Indicates home status of each axis.

X-Axis and Y-Axis digital read-out (DRO)

Shows the position of the plasma torch with respect to the current work piece origin.

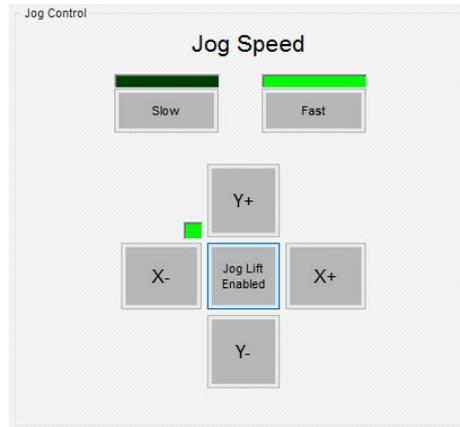
Zero X and Zero Y

Sets the current work position of the plasma torch to 0 for each axis.

Go to Work zero

Sends the plasma torch to the work origin.

Jog control



Y+/Y-/X+/X-

Provides jog control using the PC mouse.

Jog lift enabled/disabled

Enables or disables lifting of the plasma torch during machine axes jogging in continuous jog mode.

Slow

Selects slow jog speed.

Fast

Selects fast jog speed.

G-Code control



Load G-Code

Opens the Explorer window to allow the G-Code .tap file to be selected.

Close G-Code

Closes the current G-Code .tap file.

Rewind G-Code

Rewinds the G-Code to the first line.

Machine control



Run

Runs the loaded G-Code .tap program.

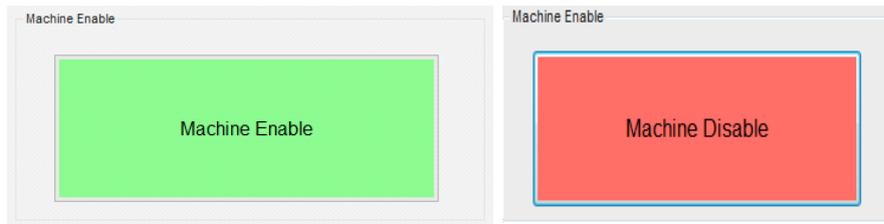
Stop

Stops the current operation.

Reset

Resets the controller, rewinds the current G-Code file and clears any messages.

Machine enable/disable



Machine enable

Machine is currently disabled. To enable it, press the green Machine Enable button (make sure E-Stop is not active and the breakaway head is located).

Machine disable

Machine is currently enabled. To disable it press the red Machine Disable button (make sure to re-home first).

Plasma torch information



Torch On LED

Indicates that the plasma torch is switched on.

Jog Height LED

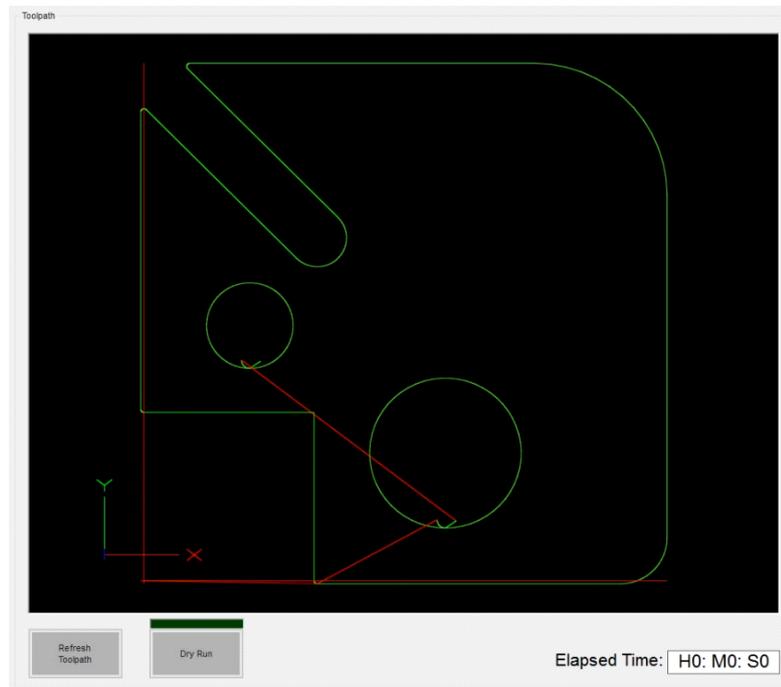
Indicates that the plasma torch is at the height required for moving it.

Pierce Height LED

Indicates that the plasma torch is at the height required for making the first cut in the material.

Cut path display

This part of the screen displays the programmed cut path for the currently loaded G-Code file.



Dry run

Runs the cut path without the plasma torch being on.

Refresh cut path

Refreshes the cut path display. When pressed, the cut path will be regenerated with any changes.

Enable/disable dry run

Prevents the plasma torch from firing while running a G-Code program. Used for checking G-Code.

Elapsed time

Shows the time since the machine started cutting.

Key for cut path line colour

The colours on the displayed cut path are as follows:

- Rapid movement colour – red
- Radius colour – dark green
- Axis colour – red
- Linear colour – light green
- Machine limits colour – yellow

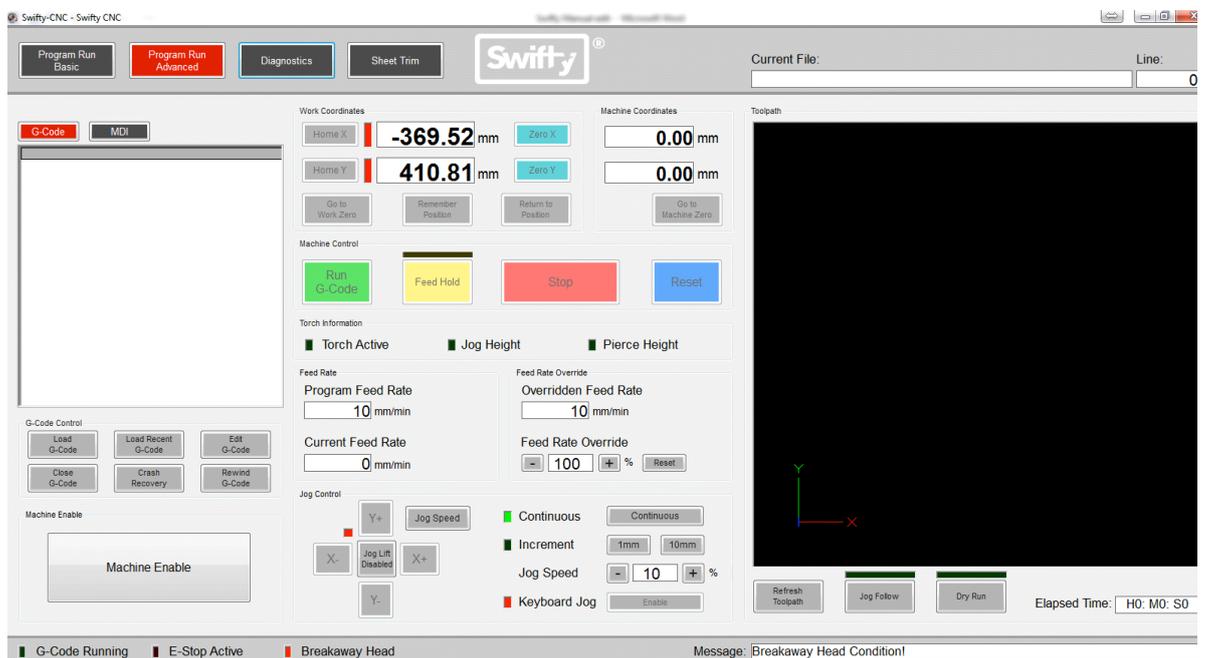
Mouse commands for cut path graphic display

The following mouse commands can be used:

- Rotate – left-click and drag
- Zoom in/out – scroll wheel forwards/backwards, or right-click and drag forwards/backwards
- Pan – right- and left-click and drag
- Reset view – double left-click

Program Run Advanced

Clicking on the Program Run Advanced button displays advanced options.



G-Code and manual data input (MDI)

MDI

Lets you enter commands manually to control the machine.

G-Code display

Displays the currently loaded G-Code file. Double-click to show line number.

Load recent G-Code

Displays the most recently loaded G-Code files. A file can be selected to be loaded into Swifty-CNC.

Edit G-Code

Opens the G-Code editing window for the currently loaded G-Code file. This allows the operator to edit the program. When the editor is closed, the edited G-Code file is loaded into Swifty-CNC.

Crash recovery

Rewinds the G-Code file to the beginning of the current cutting operation. Used when the machine is stopped or interrupted partway through a cut.

Work coordinates

Remember position

Remembers the current position of the axes.

Return to position

Returns the axes to the remembered position.

Machine coordinates

X and Y-axis DRO

Shows the position of the axes with respect to the home position.

Go to machine zero

Sends the axes to the machine's home position.

Machine control

Run G-Code

Displayed when the G-Code tab is open. Runs the loaded G-Code program.

Run MDI

Displayed when the MDI tab is open. Runs the code within the MDI window.

Feed hold

Pauses the current operation. This is only allowed when the plasma torch is at jog height.

Feed hold LED

Flashes yellow when an operation is paused.

Feed Rate

Program feed rate DRO

Displays the programmed feed rate specified within the G-Code file for the current operation.

Current feed rate DRO

Displays the instantaneous feed rate of the machine.

Feed Rate Override (FRO)

Overridden feed rate

Program feed rate based upon FRO.

Feed rate override +/-

Increases or decreases the FRO by 10%.

Override percentage DRO

Displays the FRO percentage.

Feed rate override reset

Resets the FRO to 100% of the program feed rate.

Jog Control**Jog speed toggle**

Toggles between fast and slow jog speed.

Jog mode LEDs

Indicates the currently selected jog mode.

Continuous

Sets the jog mode to continuous jog.

1mm

Sets the jog mode to increment in 1mm steps.

10mm

Sets the jog mode to increment in 10mm steps.

Jog Speed +/-

Increases or decrease the jog rate percentage.

Slow Jog speed DRO

Displays the current jog rate percentage.

Keyboard disable/enable

Enables or disables keyboard inputs. Enabling this option will allow jog control using the keyboard's directional arrows, but will lock the keyboard function to Swifty-CNC, preventing the keyboard arrows from being used in other open programs. Disable this option to restore keyboard function to other programs.

When using the keyboard to jog the machine's axes, hold the Shift key to override the jog rate set in the jog control area. For incremental jog using the keyboard, enable keyboard jog and, while holding the Ctrl key, use the keyboard's directional arrows.

Cut path**Jog follow**

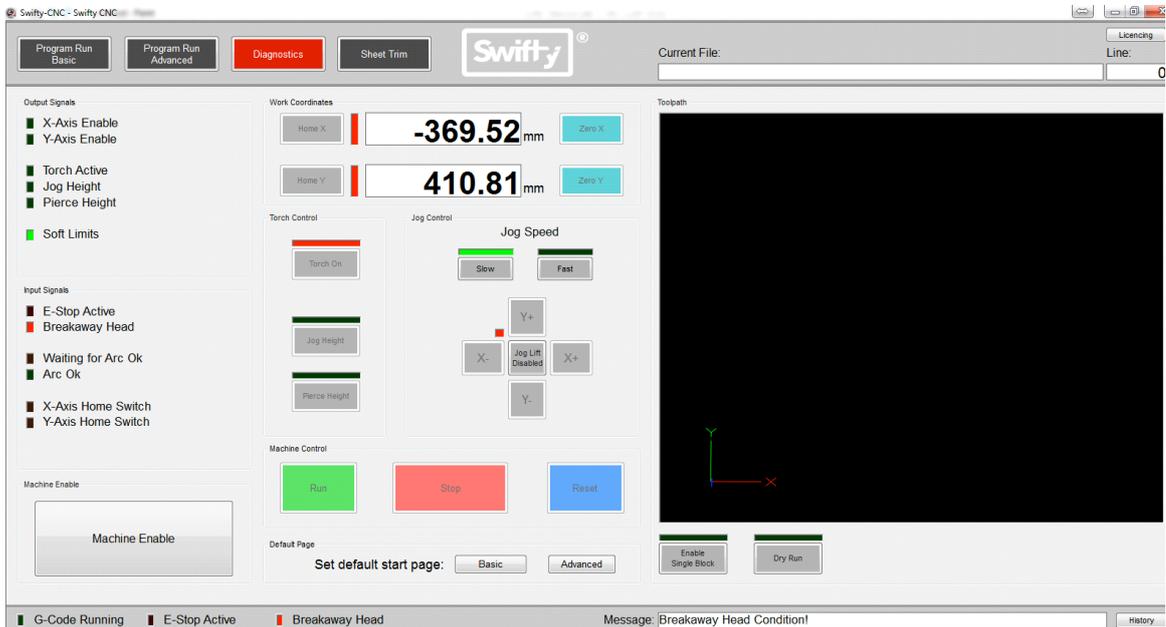
Centres the axes' crosshairs on the cut path display.

Jog follow LED

Indicates status of the jog follow function.

Diagnostics Screen

The diagnostics screen displays the status of the machine's input and output signals, which can be used to diagnose potential problems.



Output Signals

X-axis enable

Indicates the current state of the X-axis.

Y-axis enable

Indicates the current state of the Y-axis.

Plasma torch active

Indicates the current status of the plasma torch.

Jog height active

Indicates that the torch is at jog height active.

Pierce height active

Indicates that the torch is at pierce height.

Soft limits

Indicates the status of the soft limits (the physical limits of the table – 625mm).

Input Signals

E-stop

Emergency stop active.

Breakaway head

Breakaway head connection broken.

Waiting for arc ok

Indicates the machine is waiting for an arc to be established between the plasma torch and the cutting material.

Arc ok

Indicates status of the plasma torch's arc.

X-Axis home

X-axis home switch active.

Y-Axis home

Y-Axis home switch active.

Plasma torch control**Plasma torch on/off**

Toggles the plasma torch on and off.

Jog height

Toggles the jog height plasma torch position.

Pierce height

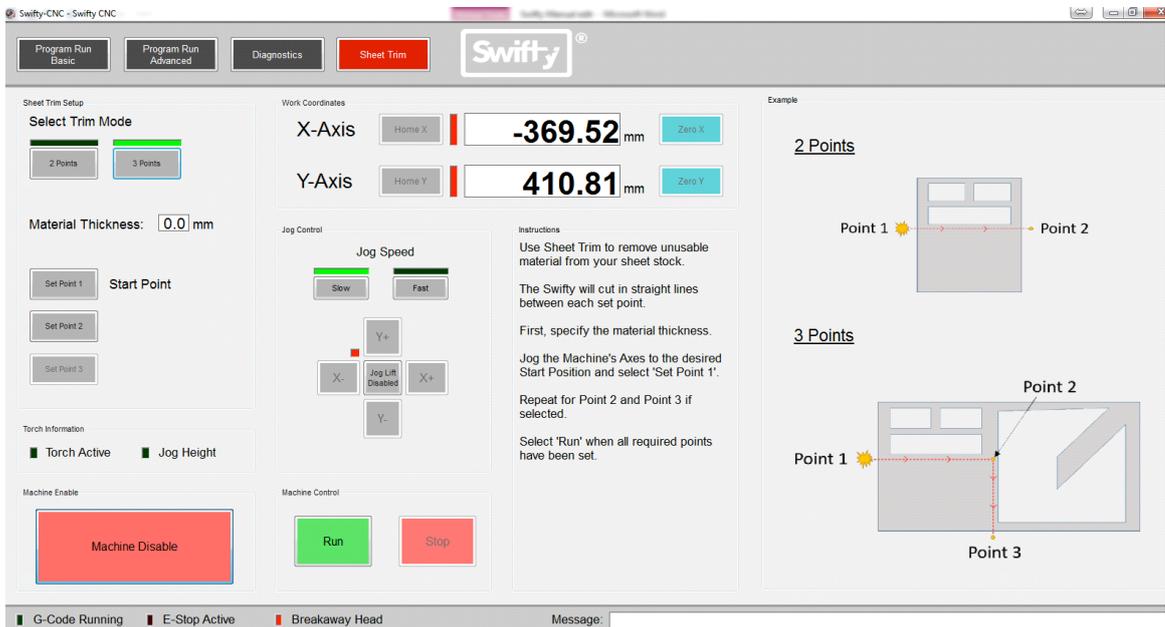
Toggles the pierce height plasma torch position.

Default page

Sets the default page that Swifty-CNC opens with (initially Program Run Basic).

Sheet Trim Screen

Sheet trim provides an easy method to remove unusable material from your sheet stock.



2 points mode

Allows material to be cut in a straight line.

Set point 1

Jog the machine to the co-ordinates at which you wish to start cutting (the 'start position') and select Set Point 1.

Set point 2

Jog the machine to the point at which you wish to end the straight line.

Enter the material thickness

Shown on the DRO.

Run

Select Run and the machine will cut the material in a straight line.

Note that in 2-point mode, the Set Point 3 button is not visible.

3 points mode

Allows material to be cut in an L shape.

Set point 1

Jog the machine to the co-ordinates at which you wish to start cutting (the 'start position') and select Set Point 1.

Set point 2

Jog the machine to the point where the horizontal and vertical lines meet (this is where the bend for the material will be) and select Set Point 2.

Set point 3

Jog the machine to where the cutting will end and select Set Point 3.

Run

Select Run and the machine will produce an L-shaped cutting.

7. Using Your Machine

To cut a part, a .dxf/dwg file has to be created. This file contains the geometry of the part to be cut. The geometry is typically created in a 2D or 3D drawing software package, from which a .dxf/dwg file can be produced. For details of software options please go to www.swiflycnc.com.

SwiftyCAM processes the geometry within the .dxf/dwg file and generates a G-Code file that the machine can read.

The G-Code file contains certain instructions, such as where the machine should move to and when to fire the plasma torch.

Cutting a Part – Step by Step

Creation of 2D Geometry

Geometry can be created within a 2D or 3D CAD (Computer Aided Design) software package. For 2D and 3D models, a drawing must be created in 1:1 scale showing only the part to be cut. The drawing must be saved as a .dxf/dwg file.

Starting a New Job

Open SwiftyCAM using the shortcut on your desktop and select Work to create a new job.

The job information screen will be presented. Fill in the required information, taking care to specify the correct material type and thickness from which the part will be cut. Click OK.

Adding a Part to the Current Job

The work library displays all parts associated with the current job. There are three ways to add parts to the current job: importing a .dxf/dwg, adding a part from the parametric library or adding a previously imported part.

Importing a .DXF/ DWG

A new .dxf/dwg file can be imported using the Import button at the bottom of the screen.

Navigate to the file location and select Next to display the Operations page.

Parametric Shape Library

SwiftyCAM includes a parametric shape library, featuring 80 pre-made parts that can be modified and adapted.

Select Parametric at the bottom of the screen to display the library. Double-click or drag and drop a part into the work library to add it to the current job. This will display the parameters that can be adjusted for that specific part.

Operations must now be applied to the profiles.

Using an Existing Part

To view previously added parts within the library, select Part at the bottom of the screen. Parts can be double-clicked or dragged and dropped into the work library to add them to the current job. For each part added, the quantity to be cut must be specified.

Applying and Modifying Operations

After importing a new .dxf/dwg file or adding a part from the parametric shape library, operations must be applied to the profiles.

On the Operations screen, select an operation from the list, and then select the profile(s) to which it should be applied. Alternatively, an operation can be applied to multiple profiles by checking Selection by Box and dragging around the profiles.

Click on Next to see a preview of the part. Once satisfied, click on Next to enter the quantity to be cut. The part will now be displayed within the work library.

To modify the operations of a part, select the part from the work library and click on Modify below the work library.

Part Nesting

Once all parts to be cut have been added to the work library, select Next or click Nesting in the top menu.

The nesting screen displays the sheet size specified when starting the job. The yellow border indicates the boundary of the sheet. The bottom left-hand corner of the sheet is the work piece origin, which corresponds to where the machine's axes are zeroed.

The work library is displayed on the right-hand side of the screen. It shows the previously selected parts, along with quantity required, and quantity currently placed on the sheet.

Select the part to be placed and then select Place at the bottom of the work library. The part will be positioned automatically on the sheet. Subsequent parts can be added and positioned on the sheet.

When positioning parts, always place them on the sheet starting at the bottom left-hand corner where the origin is located.

Parts can be rotated, mirrored and arrayed using the controls at the top, and moved by selecting and then dragging the part. Parts can also be accurately positioned using the directional arrows on the keyboard.

Once all parts have been nested, click Next or select Technology in the top menu.

Defining Lead-ins and Lead-outs (Technology)

Lead-ins and lead-outs are how the plasma torch begins and finishes the cutting operation.

Select Manual Cut Profile. On the right-hand side of the screen, the type of lead-in and lead-out can be selected. The properties of the selected lead-in and lead-out can be adjusted using the controls.

Next, select the position of the lead-in and lead-out starting with internal and then external profiles. Swifty will cut the parts in the order that the lead-ins and lead-outs are defined.

The Repeat button can be used when more than one of the same part is being cut. This copies the lead-ins and lead-outs of the selected part onto duplicates of that part.

If a lead-in is overlapping a nested part, it will be highlighted with a red circle. The lead-in can be moved using Lead-in Modify at the top of the screen, or the part can be dragged away from the lead-in.

When all lead-in and lead-outs have been defined select Next to finish. SwiftyCAM produces a .tap file which contains the G-Code.

Enabling the Machine and Homing the Axes

Open SwiftyCNC using the shortcut on the desktop.

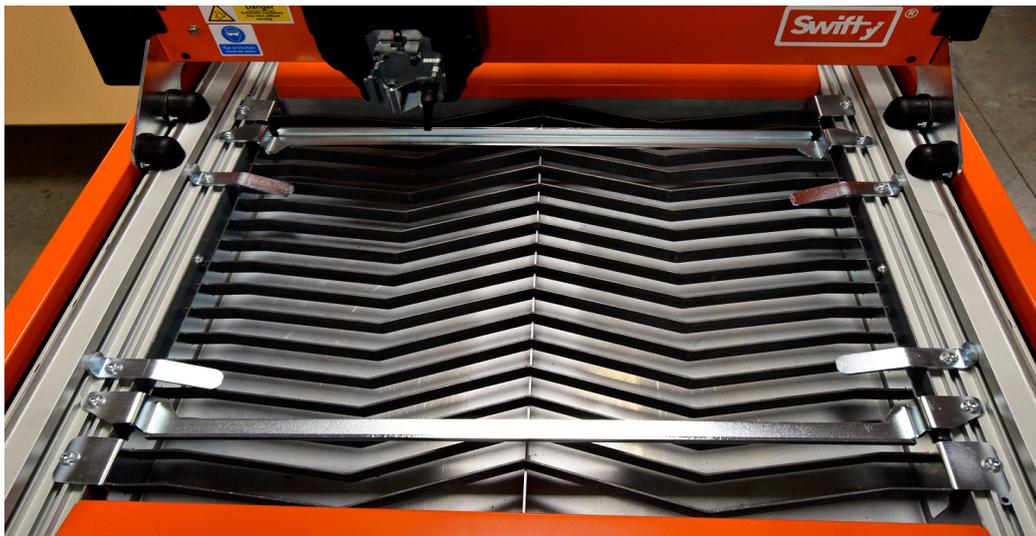
The Program Basic Run screen will be displayed. In its default state, the machine will be disabled, meaning that functions relating to the movement of the machine are unavailable. To enable the machine, click the flashing green Machine Enabled button in the lower left-hand corner.

For Swifty-CNC to know where the machine's axes are, they must be 'homed' against a known position. This position is known as the *machine origin* or *home position*.

Start the homing operation by selecting the Home button for each axis. The X and Y axis will move towards the home position and stop when the home switch for each axis is activated. The home LEDs will turn green, indicating that the machine's axes are now homed. Make sure the path is clear of obstructions.

Loading and Securing the Material

While the machine is in the home position, load the material onto the cutting bed.



Swiftly is supplied with material clamps to secure the material during a cutting operation:

- Smaller clamps for large material
- Larger clamps for small material

A maximum sheet size of 610 x 610mm can be loaded onto Swiftly's cutting bed. Make sure the material is flat and clean.

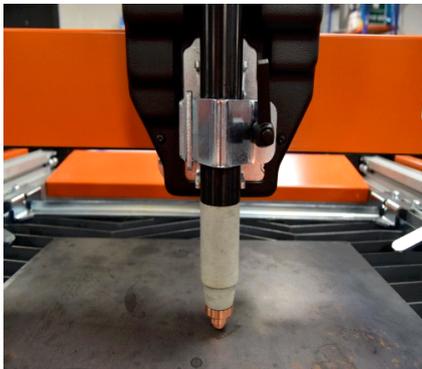
Jogging the Machine

If switching from thin to thick material, raise the plasma torch within its holder before jogging the machine over the material. This will prevent the plasma torch hitting the material and damaging the consumables.

Using the Y+/Y-/X+/X- buttons within the jog control box, jog the machine's axes over the material.

Setting the Plasma Torch Height

The plasma torch height must be set each time a different thickness of material is being cut.



To set the height:

1. With the plasma torch positioned over the material, place the plasma torch height spacer on top of the material, directly underneath the plasma torch.
2. Loosen the clamp and lower the plasma torch onto the spacer.
3. Tighten the clamp and remove the spacer.

The plasma torch is now set at the correct cut height. For correct height see the plasma torch manual.

Loading G-Code into SwiftyCNC

Load the G-Code file into SwiftyCNC by selecting the Load G-Code button in the G-Code control box. Navigate to the job folder and open the .tap file created by SwiftyCAM.

The cut path will be shown on the cut path display.

Zero the X and Y Axis

The position of the work piece origin must now be defined by zeroing the X and Y axis work coordinates at the desired location. This position corresponds to the origin displayed in Swifty-CAM when nesting the parts on the sheet. Bring the torch down to the cut position and the cut path will now run towards the top right from this position.

Jog the machine's axes to the front left corner of the material. Select the Zero X and Zero Y buttons. The work co-ordinate DROs will be set to 0 and the cut path display will refresh, showing the machine's axes are at the work piece origin.

Making the Cut

Ensure that the emergency stop button is within reach. Wear appropriate PPE (see Section 2).

Press the Run button to begin program execution.

Emergency Situation

Swiftycnc features an emergency stop, located on the control box. Hitting this button will stop the machine at its current position and disable all outputs including the plasma torch.

Breakaway Head Situation

If a breakaway head condition occurs, in which the plasma torch collides with an object and triggers the breakaway head sensor, the machine will stop at its current location. Swiftycnc will be disabled and the breakaway head sensor LED will be illuminated.



Normal operation



Breakaway head condition

Swiftycnc can be re-enabled and the machine's axes jogged away from the object if required. The head can then be reattached ensuring the locating pins are seated correctly. This will clear any errors presented within the Swiftycnc software and the breakaway head sensor LED will no longer be illuminated.

Swiftly-CNC Advanced Features

This section covers the advanced features found on the Program Run Advanced screen.

Remember Position and Return to Position

The Remember Position and Return to Position functions can be used to position the machine at the same co-ordinates repeatedly. Axes' positions are remembered even when the machine is turned off.

Note that the machine must be homed before selecting these options.

Manual Data Input (MDI)

The MDI is an advanced feature and should only be used by those familiar with the G-Code machine language.

The MDI can be used to manually enter G-Code to control Swiftly. The following commands are available:

- G00 – Rapid movement
- G01 – Straight line
- G02 – Clockwise arc
- G03 – Anticlockwise arc
- G04 – Dwell
- M03 – Plasma torch on
- M05 – Plasma torch off
- M07 – Jog height on
- M08 – Pierce height on
- M09 – Cut height (jog/pierce height off)

Feed Rate Override

The feed rate override controls can be used to override the programmed feed rate. They can be used to either increase or decrease an incorrect feed rate during a cutting operation.

Restarting an Interrupted Cutting Operation

If a cutting operation is interrupted by a breakaway head condition or if the operation is stopped, the Crash Recovery button can be used to repeat the current operation and then continue to finish the part.

Ensuring the currently selected G-Code line is where the operation was interrupted, click on the Crash Recovery button. The G-Code will be rewound to the start of the current cut. The Run G-Code button can now be selected to start the operation.

8. Maintenance

Machine Diagrams and Part Numbers

For machine diagrams and part numbers, see the Swifty website, www.swiftycnc.com.

General Maintenance

The following maintenance operations should be carried out on a regular basis:

- Wipe debris off the V-rails.
- Remove dross build-up off the cutting bed slats.
- Empty the water table and clear it of debris.

For other maintenance tasks, see the training videos on the the Swifty website, www.swiftycnc.com.

9. Troubleshooting

This section describes some common problems and their solutions. For all other support issues, refer to the Swifty website, www.swifcnc.com.

Machine will not turn on

- Check power lead into control box.
- Check power switch is on at the interface box
- Check fuse at the rear of the interface box.

Cannot connect to machine

Carry out the following checks:

- Check machine power.
- Check Ethernet cable.
- Check the network settings.

If the problem has not been resolved, restart Swifty-CNC.

E-Stop condition in SwiftyCNC

An E-stop condition can occur when the E-Stop button has been pressed. Release the E-stop by rotating the red button in the direction of the arrows shown on it.

Alternatively, an E-stop condition is shown when the PC has not made a connection to the machine (see above).

No movement

Lack of movement may be caused by the following conditions:

- E-stop condition
- A breakaway head
- The torch has reached the soft limits (625mm)
- Trying to jog using keyboard with keyboard input disabled
- Machine not homed

Plasma not cutting through material

Poor cutting may be due to the following conditions:

- The incorrect material thickness has been chosen.
- The plasma torch height is incorrect.
- Plasma cut speeds are too high
- Plasma amperage too low
- Consumables worn or incorrect

Online Support

Please visit the website, www.swiftcnc.com, for a complete troubleshooter, user help forums and knowledge centre.

10. Warranty and Terms & Conditions

Warranty

In order to be able to claim under the warranty for Swifty, it must be installed in accordance with the instructions in this user guide. The warranty does not cover damage resulting from improper setup, installation, use, cleaning, use of cleaning chemicals, servicing or repair.

The warranty is for 1yr from delivery.

The warranty is for only items supplied by Swift-Cut Automation Ltd

Please contact your local supplier for more information or refer to our website:
www.swifcnc.com.