

# Tangential Knife Setup

The following manual is designed to aid the user with the basic setup of a tangential knife system using myCNC software.

The main settings for the tangential knife/creasing wheel/etc can be found in **Config > Technology > Tangential Knife** on the following screen:

SYS

PLC

Info

Support

Camera

Cutchart

Config

SAVE

CNC Settings

▶ Axes/Motors

▶ Inputs/Outputs/Sensors

▶ Network

▶ Motion

▶ PLC

▶ G-codes settings

▶ DXF import settings

▶ Macro List

▶ Macro Wizard

▶ Probing Wizard

▶ Preferences

▶ Screen

▶ Work Offsets

▶ Parking Coordinates

▶ Technology

▶ Plasma Cutting

▶ Gas/Oxyfuel

▶ Cutcharts

▶ THC

▶ Mill/Lathe

▶ Multi Head

▶ Laser control

Tangential Knife

▶ Special Purpose

▶ Camera

▶ 5 axes RTCP

▶ Panel/Pendant

▶ Hardware

▶ Advanced

Knife Enabled

☒

Knife Min Angle, degree

3

Knife Min Angle (2), degree

10

Knife Up programming

absolute

Knife Initial Angle (Angle after Homing), degree

0

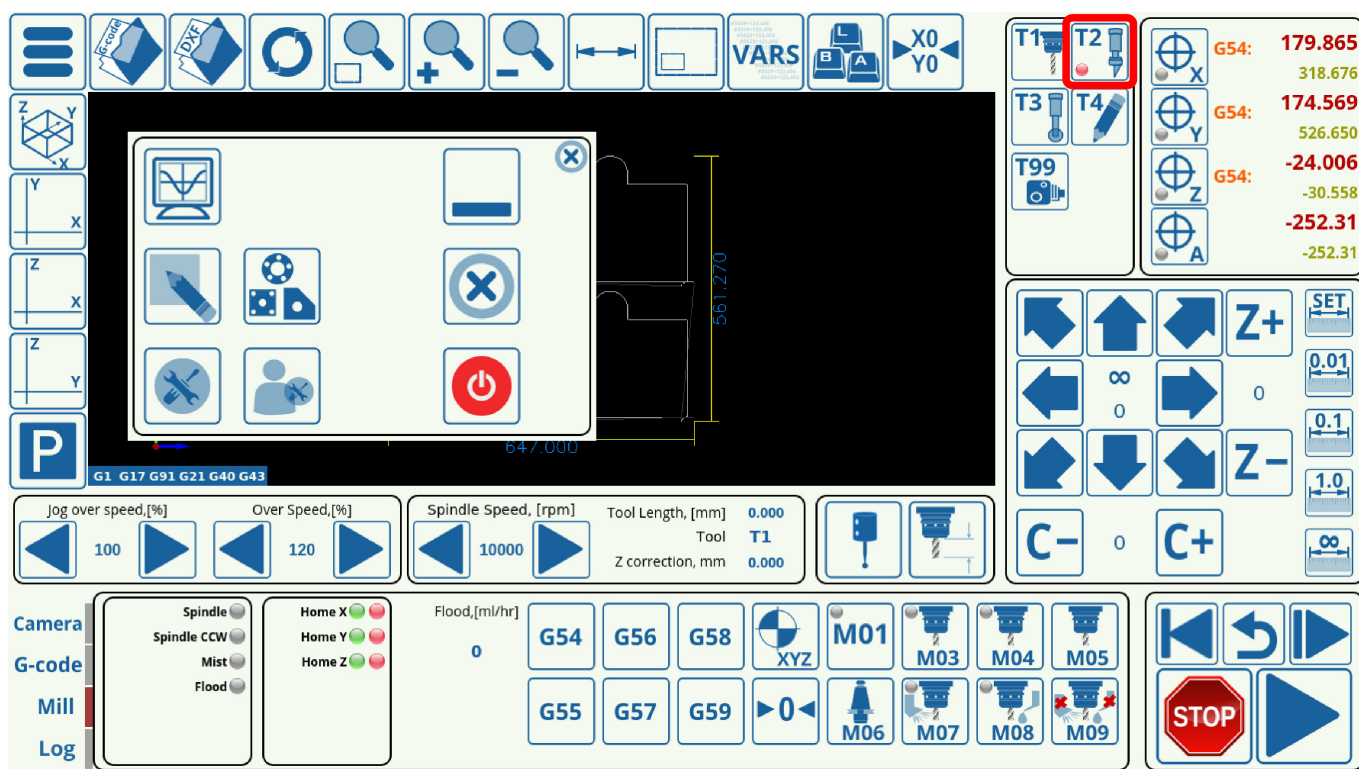
Glass Cutting extention

☒

Lift Height

10

In order to enable the system, change the flag in the **Knife Enabled** line to ON (green). If you later navigate to the main screen of myCNC software, the indicator on the tangential knife icon will show whether the system is on or off, without having to go to the settings (red for ON, grey for OFF).



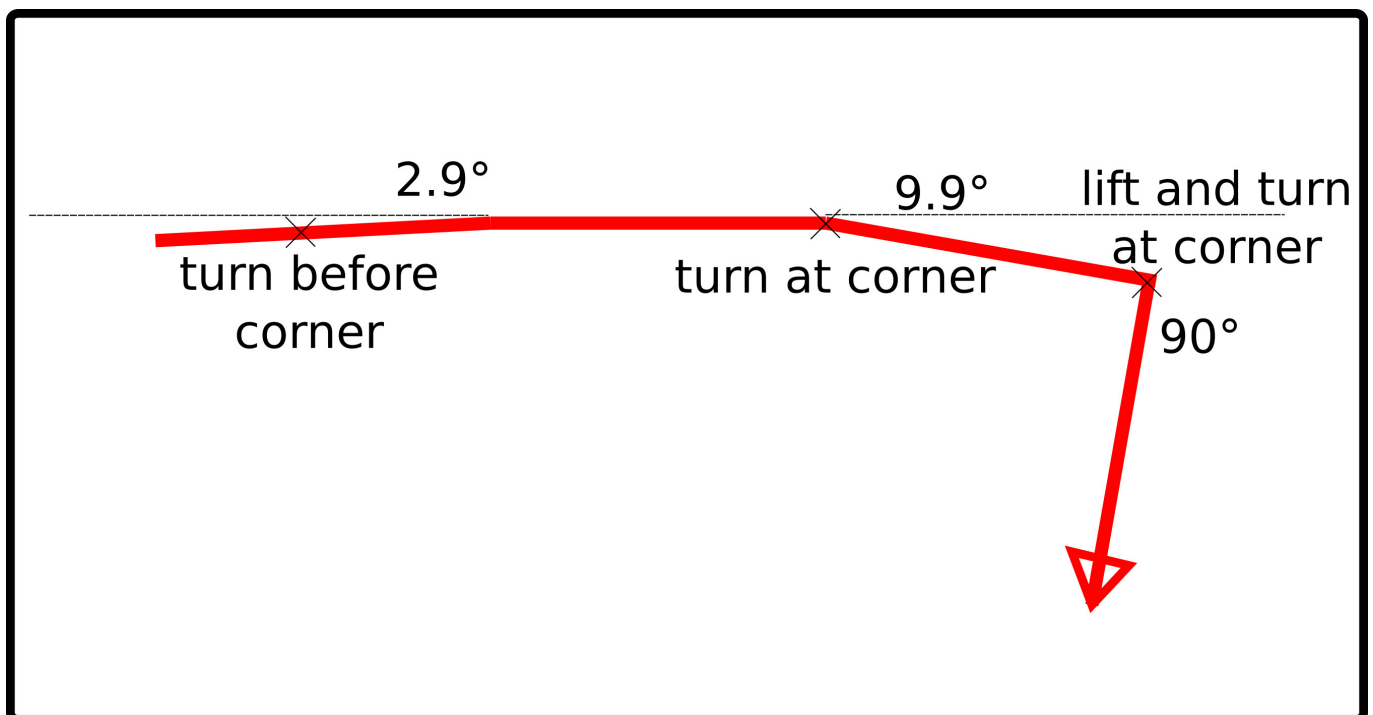
**Knife Min Angle** values signify the largest angles at which the machine will still be turning the knife without lifting it. The first Knife Min Angle value signifies the maximum angle of such a turn as to allow the machine to begin rotating the knife before reaching the corner of the turn itself. This is useful when working with pliable materials which allow for some bending, in order to achieve a cleaner overall cut.

The second Knife Min Angle (2) signifies the maximum angle of a turn such that the machine can rotate the knife right at the corner without lifting the knife up. This is usually a higher value than the first Min Angle.

The screenshot shows the 'Config' tab in the CNC Settings software. The left sidebar lists various settings categories, with 'Tangential Knife' selected under the 'Technology' section. The main panel displays the 'Knife Enabled' settings, which are highlighted with a red box. The settings include:

Setting	Value
Knife Min Angle, degree	3
Knife Min Angle (2), degree	10
Knife Up programming	absolute
Knife Initial Angle (Angle after Homing), degree	0
Glass Cutting extension	<input checked="" type="checkbox"/>
Lift Height	10

A value that is higher than Knife Min Values (meaning a sharper turn) will make the machine reach the corner and lift the knife up to its programmed lift height.



As can be seen in the example above, our Min Angle values were 3 and 10 degrees respectively. Thus, the machine will start turning the knife before reaching the 2.9 degree corner, then will continue to travel up until the 10 degree corner at which it will turn the knife again (all of that without lifting). At the 90 degree corner, however, it will lift the knife first before turning it, as the turn is too sharp for the knife to be rotated while still embedded in the cutting material.

The **Knife Up programming** field specifies the behaviour of the knife during the lifting phase, which can be set to *absolute* and *incremental*. Absolute takes the value of the Lift Height and lifts the knife to that point in the z-axis regardless of its previous position, while the incremental mode adds the Lift

Height value to its original cutting position and lifts it to that height. Both methods have their merits, and can be switched between depending on the operator's needs.

The screenshot shows the myCNC configuration interface. At the top, there is a navigation bar with icons for SYS, PLC, Info, Support, Camera, Cutchart, and Config. A 'SAVE' button with a download icon is on the right. The left sidebar contains a tree view of settings categories: CNC Settings, Work Offsets, Parking Coordinates, Technology (Plasma Cutting, Gas/Oxyfuel, Cutcharts, THC, Mill/Lathe, Multi Head, Laser control), Tangential Knife (highlighted), Special Purpose (Flatbed Correction, Height Map, 3D Printer, Multi-Device, MaxLaser, Circular Saw, PWM PIDs, Modbus servo, Exhaust/Extraction control), Camera, 5 axes RTCP, Panel/Pendant (Wireless Pendant/XHC, Operator Panel, Gamepad, Hotkeys, Hardkeys), and Hardware (Common Hardware Settings, Encoders). The main panel displays the 'Tangential Knife' settings. A red box highlights the 'Knife Up programming' dropdown menu, which is set to 'absolute'. Other settings include 'Knife Enabled' (checked), 'Knife Min Angle, degree' (3), 'Knife Min Angle (2), degree' (10), 'Knife Initial Angle (Angle after Homing), degree' (0), 'Glass Cutting extension' (disabled with a red X), and 'Lift Height' (10).

Setting	Value
Knife Enabled	<input checked="" type="checkbox"/>
Knife Min Angle, degree	3
Knife Min Angle (2), degree	10
Knife Up programming	absolute
Knife Initial Angle (Angle after Homing), degree	0
Glass Cutting extension	<input checked="" type="checkbox"/>
Lift Height	10

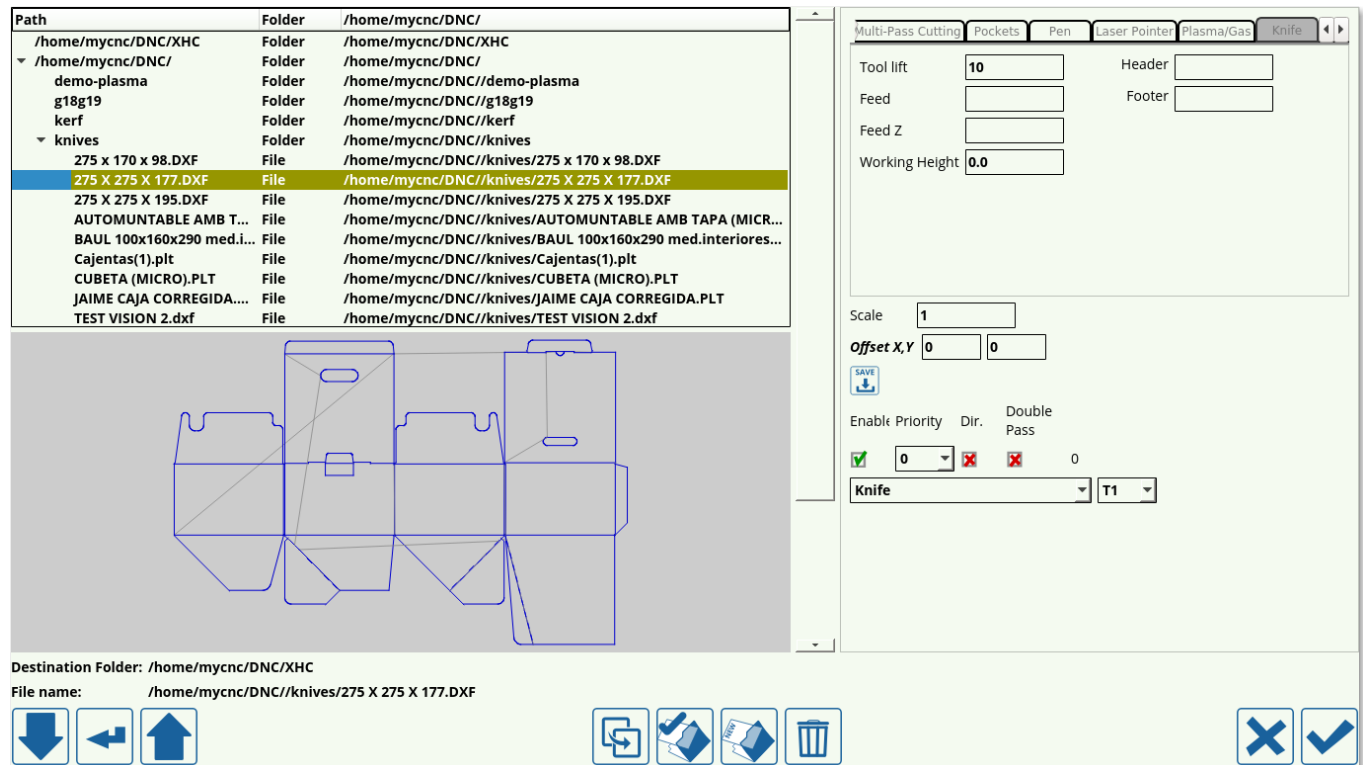
The **Angle after Homing degree** is usually left to be at zero, however that can be altered depending on the needs of the operator and the specific configuration of the machine.

The **Glass Cutting extension** can be toggled to be ON or OFF, depending on the specifics of the machine.

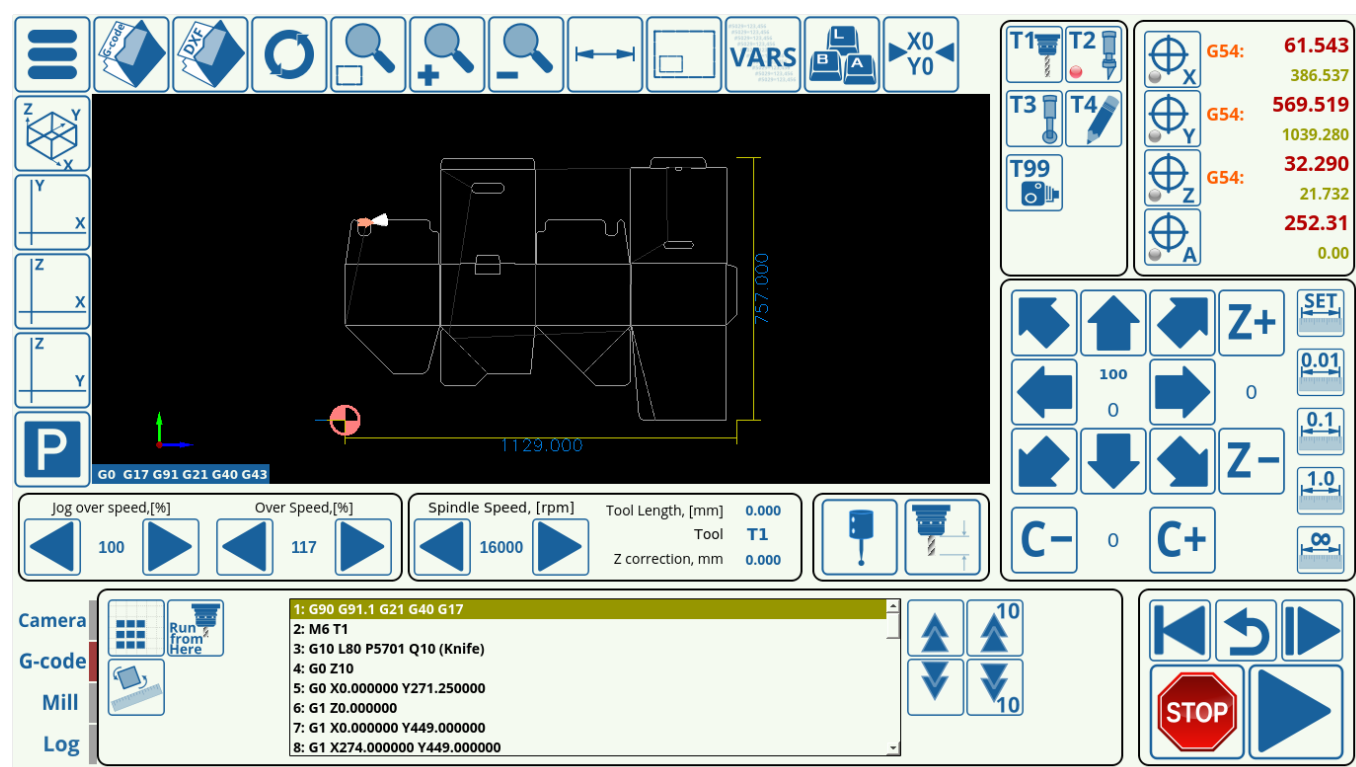
**Lift Height** specifies the height for the lifting procedure, as described in the **Knife Up Programming**. This value is set to be in millimeters.

## Importing DXF files into myCNC

Upon pressing the **Open DXF** file and navigating to the particular file you would like to open, the following window is shown:



- Select your tool in the top section (Knife in this particular configuration, Half-Knife, Creasing Wheel and Camera can also be used).
- Select your Tool Lift. This height will specify how high the knife will be lifted as it travels between parts.
- Select your Working Height (usually left at 0)
- Insert any necessary commands into the Header/Footer fields. These are usually left blank, unless it is necessary to add some particular command to the G-code generated from the DXF file after the Tool Change.
- Choose your X-Y offset
- If using multiple tools, such as a knife/creasing wheel combo, set up the priorities for the tools which correspond to the DXF file layers (so as to assign a correct tool to each layer). Press Save.
- Press the check mark in the bottom right section of the screen to load the DXF file into myCNC. The file should now be loaded and displayed on your main screen:



The DXF import procedure automatically generates the knife turn/knife lift G-codes which are inserted into the program, and which correspond with the settings listed in Config > Technology > Tangential Knife. This allows for easy set up provided the DXF file has been correctly modelled.

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Last update: 2019/07/02 13:35

