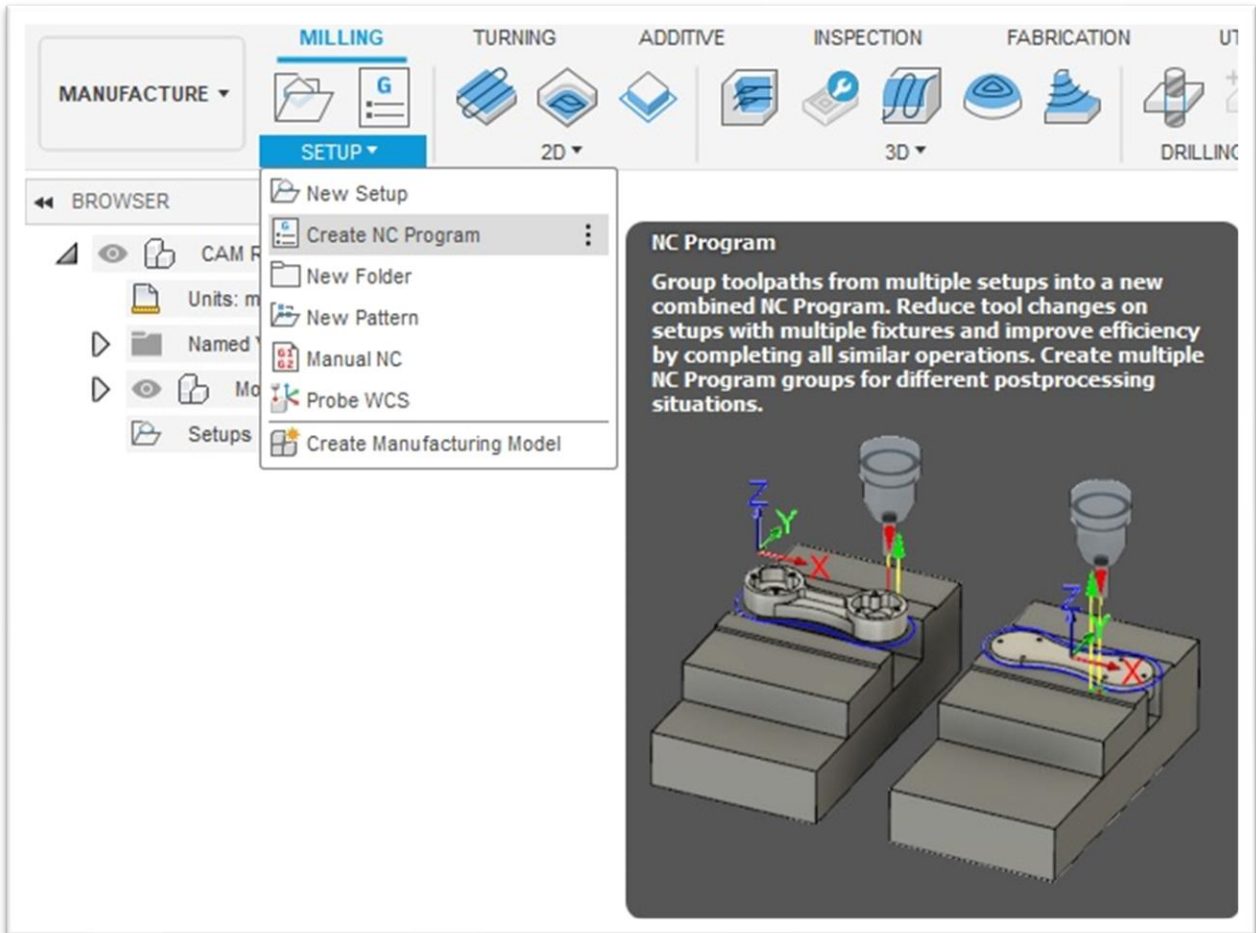


POSTPROCESSOR MANUAL



1. Create NC Program

NC Program can organize several Setups into a single NC program output, writing multiple toolpaths when needed:

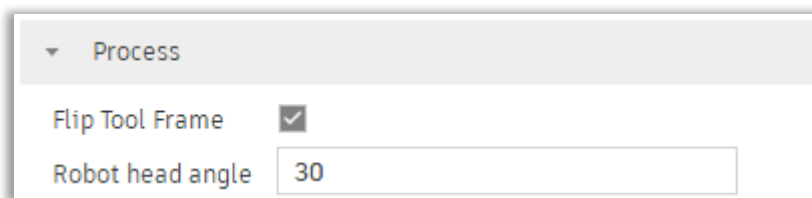
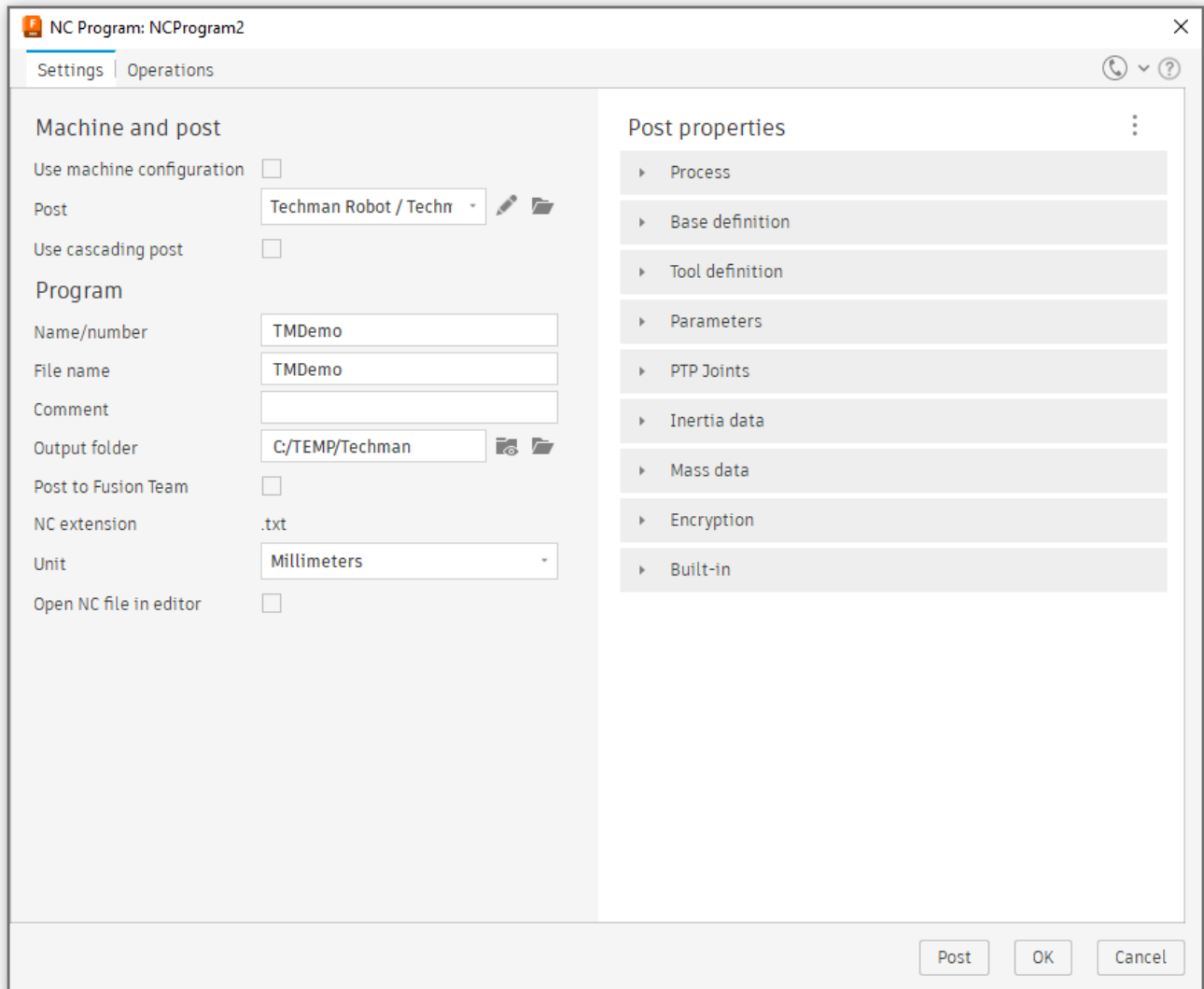


It's important to use NC Program for writing your nc codes.

The NC Program dialog has an ordered tab to manage all the properties you need for the TECHMAN nc code.

2. NC Program Settings properties

This is an overview of all the properties available for TECHMAN output:



▼ Base definition

Base X	<input type="text" value="0"/>
Base Y	<input type="text" value="0"/>
Base Z	<input type="text" value="0"/>
Base Rx	<input type="text" value="0"/>
Base Ry	<input type="text" value="0"/>
Base Rz	<input type="text" value="0"/>

▼ Tool definition

Tool X	<input type="text" value="0"/>
Tool Y	<input type="text" value="0"/>
Tool Z	<input type="text" value="0"/>
Tool Rx	<input type="text" value="0"/>
Tool Ry	<input type="text" value="0"/>
Tool Rz	<input type="text" value="0"/>

▼ Motion Parameters

Line ABS	<input type="text" value="ON"/>
LS Percentage	<input type="text" value="100"/>
LSA Velocity	<input type="text" value="100"/>
LSTTTS	<input type="text" value="100"/>
PLSA Velocity	<input type="text" value="100"/>
PLSTTTS	<input type="text" value="100"/>
PS Percentage	<input type="text" value="100"/>
PSTTTS	<input type="text" value="100"/>
PSTTTSOF	<input type="text" value="ON"/>
Robot blend value (mm)	<input type="text" value="1"/>
Robot configuration	<input type="text" value="0,2,4"/>

▼ PTP Joints

Joint A1	0
Joint A2	0
Joint A3	0
Joint A4	0
Joint A5	0
Joint A6	0

▼ Inertia data

Inertia X	0
Inertia Y	0
Inertia Z	0

▼ Mass data

Mass Center X	0
Mass Center Y	0
Mass Center Z	0
Mass Center U	0
Mass Center V	0
Mass Center W	0

▼ Encryption

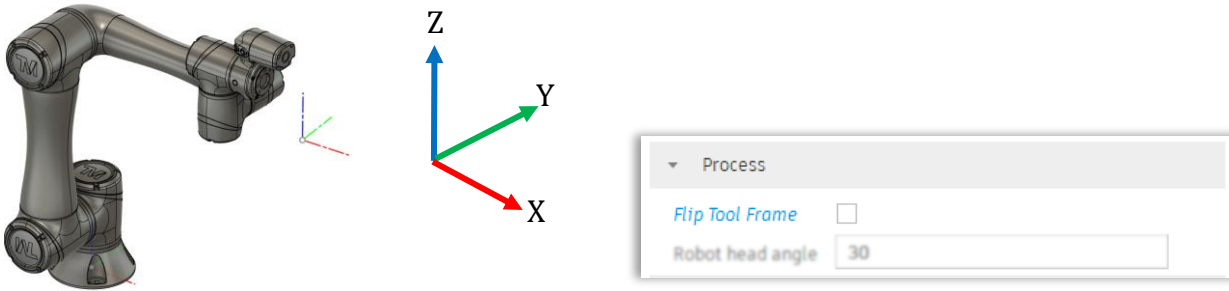
Encrypt output folder	<input type="checkbox"/>
Executable path	C:\Techman\TMExportZip.exe
Author	ADSK
Password	Tm000000

3- Confirm the tool orientation on the robot

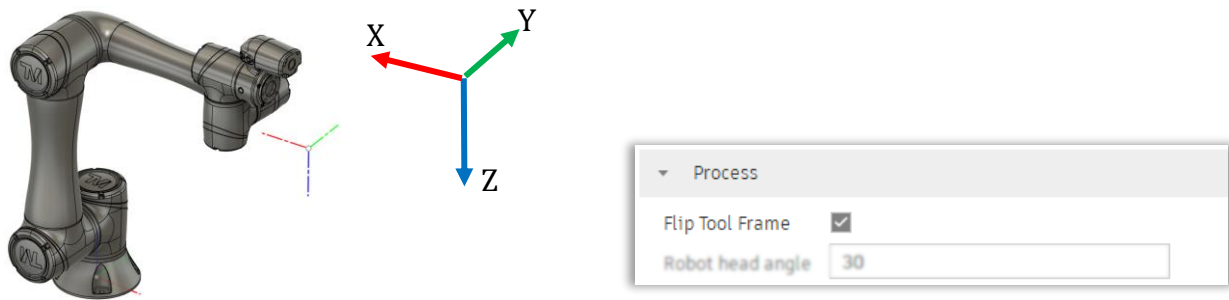
The robot can be driven manually along the tool coordinate system, this is one option to check the orientation of the tool workplane.

- Select the tool coordinate system
- Select the appropriate tool number to jog
- Use the teach pendant/enabling device to drive the robot along each axis individually
- This is a good way to check the orientation of X, Y and Z axis of the tool workplane.

If Z+ is pointing up along the tool axis and the X+ is pointing in front, **do not activate Flip** option:



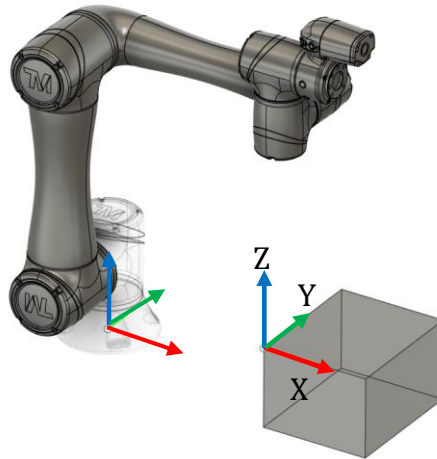
If Z+ is pointing down along the tool axis and X+ is pointing backwards, **use Flip** option:



Note: if the tool orientation is not one of the above, Autodesk CAM post will not support the application correctly.

4 - WCS setup (workplane)

On the TECHMAN robot it is possible to define a coordinate system on the part which is known as a **Base (Find it in Base Manager)**. The **Base**, located on the part/block, will be referenced from the zero of the robot, which is located at its base.

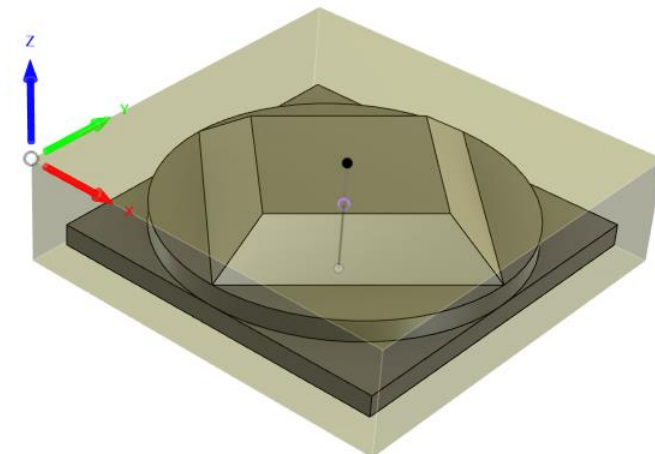
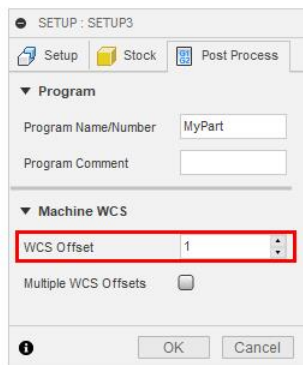


When a **Base** is defined on the part, the robot will have defined a:

- Number
- Name
- Position & Orientation

To run a toolpath successfully on the robot, users must ensure the robot Base and the WCS in Autodesk CAM are in the same location and orientation.

The WCS Offset number in Autodesk CAM defines the **Base** number, select the number defined on the robot.

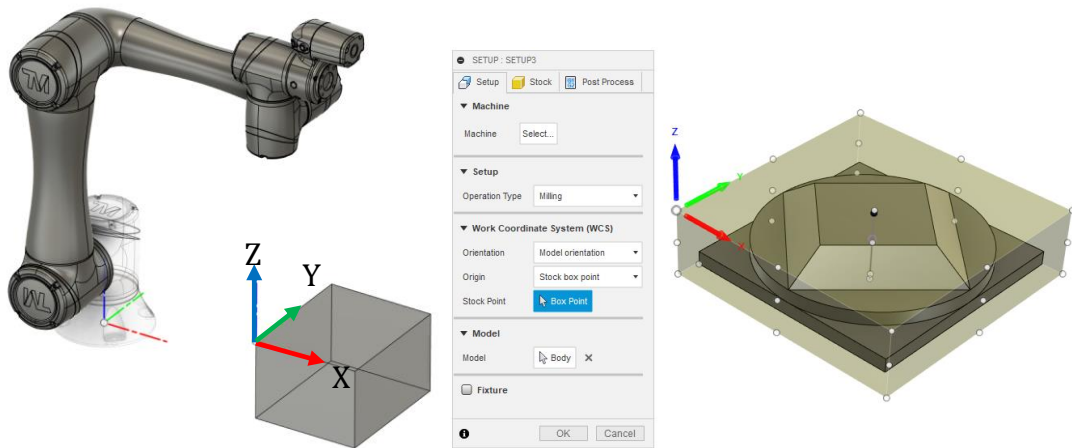


The Base will be declared in the .dat file, as displayed below.

```
<Base name="Base22" basedata="-207,-449,107,0,0,-144" type="C" number="22" />
```

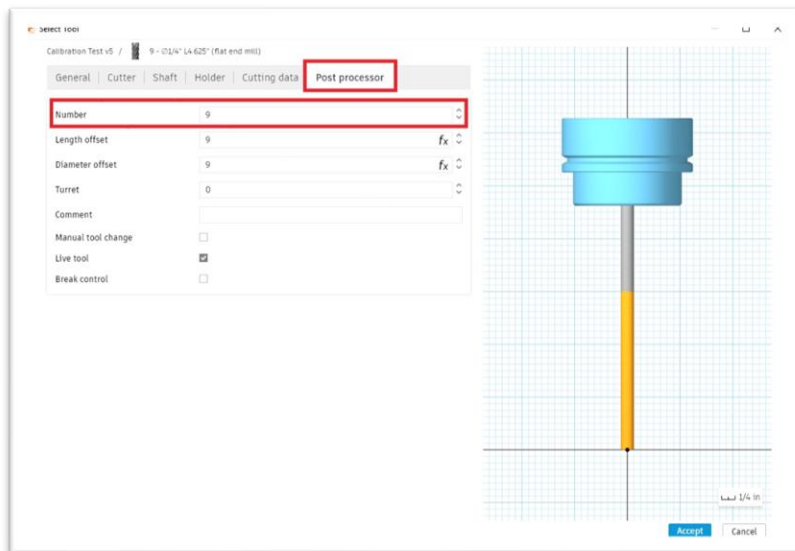
Note: WCS 0 cannot be use, if zero is selected an error will be raised while post processing and no output will be written.

Use the WCS setup menu to replicate the location and orientation of the **Base Data** on the part.



5 - Define Tool Number (replicate settings on the robot)

The tool number is defined via the Tool Post Processor menu.

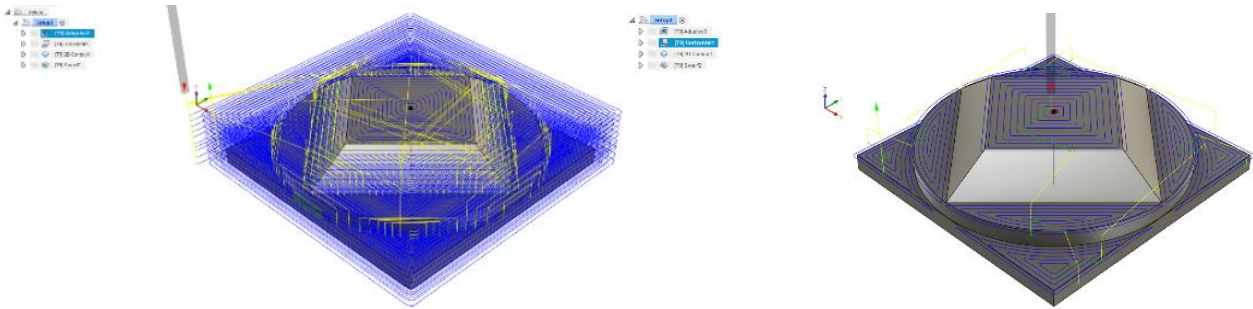


The tool will be declared in the ConfigData.xml, as displayed below.


```
<TCPConfig>  
<EndEffector order="1" default="true">  
  <Name>TOOL6</Name>  
  <Description />  
  <GPTFF>  
    <X>0</X>  
    <Y>0</Y>  
    <Z>200</Z>  
    <W>-180</W>  
    <V>0</V>  
    <U>90</U>  
  </GPTFF>  
</EndEffector>  
</TCPConfig>
```

6 - Create a toolpath

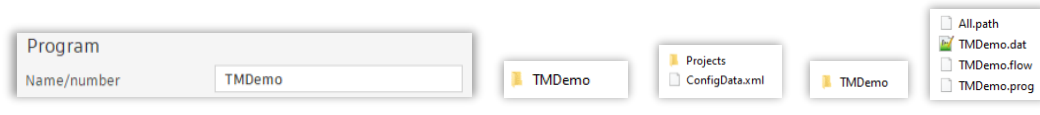
Follow the usual steps inside Autodesk CAM in order to generate one or more toolpaths in your setup.



7 - Post processing

Autodesk CAM post-processor generates a few files for Techman, these files are stored in a folder with the same name as the Program Name.

- A total of 5 files are created; a ConfigData.xml, and a .path, .dat, .flow and .prog files are generated.
- **Toolpath** files are named using the toolpath name given in Autodesk CAM.
File name should **NOT** start with a number and should not contain any special characters.
- The .path file is named after the toolpath name.
- All other files are named after the Program Name as displayed below.



Once ready to post process, some post-processor properties need to be defined before output files can be generated.

Note: this postprocessor does not support tool change, this means that the NC program created requires all programs to be using the same tool. An error message will be shown while post processing occurs if two different tools are present in the NC program.

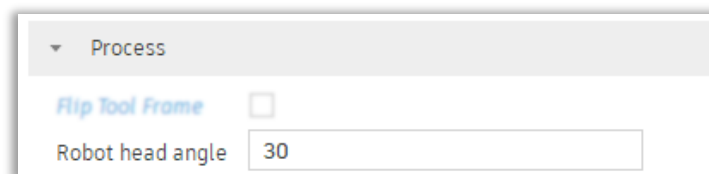
```

*** Status File - Not for use ***
Files are saved to: C:\Users\amiloa\AppData\Local\Fusion 360 CAM\nc\11212

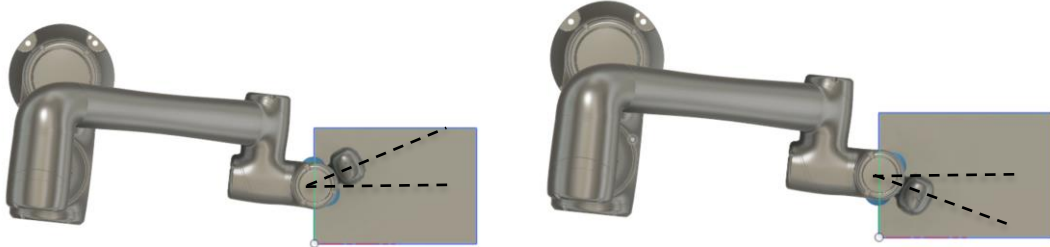
*** Please carefully check your output files ***
NC Program contains toolpaths calculated using different tools
Tool change is not available on Techman controller
*****
    
```

Process properties

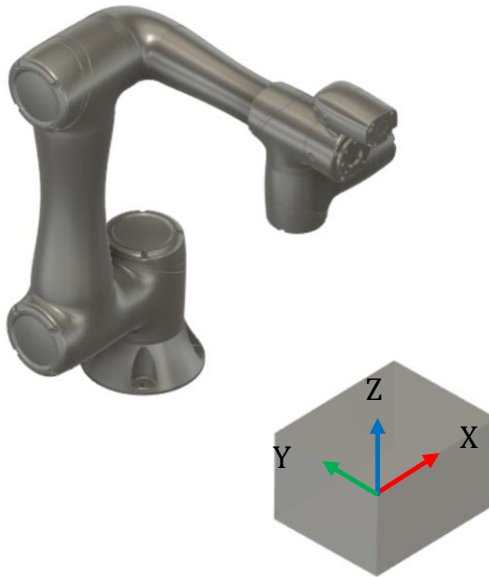
- Head angle: This allows the user to enter an angle of rotation around the tool axis, this will effectively rotate the spindle, the angle will be kept throughout the entire toolpath. This angle is relative to the X axis of the WCS defined on the part.
-



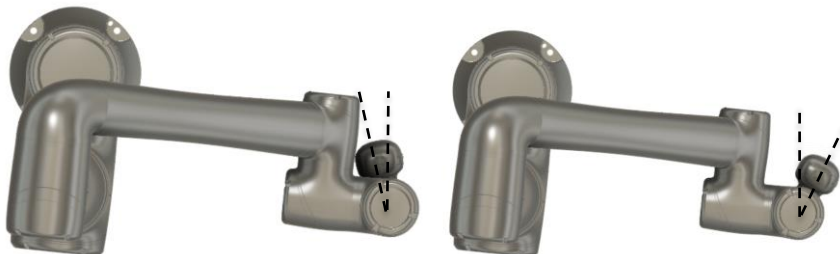
Below an example of a 30 degrees (left) and -30 degree (right) relative to the X axis, for a tool defined with Z+ going up the spindle.



If the X axis is defined on another orientation the spindle angle will be relative to this orientation.
Note: X axis on the **Base Data** is NOT pointing forward in this example



15 degree (left) and -15 degree (right)



- FlipTool Frame: This has been covered in point 3 above, read that section to configure this post property.

Base definition

This is where the part workplane definition will be set, the value will be set in the robot and visible in the **.path** file as displayed below.

Base X	-207
Base Y	-449
Base Z	107
Base Rx	0
Base Ry	0
Base Rz	-144

```
<Base>
  <Name>Base22</Name>
  <Data>0.0000,0.0000,0.0000,0.0000,0.0000,0.0000</Data>
  <Data>-207,-449,107,0,0,-144</Data>
  <Type />
```

Tool definition

This is where the Tool workplane definition will be set, the value will be set within the robot and visible in the **.path** file as displayed below.

Tool X	0
Tool Y	0
Tool Z	200
Tool Rx	-180
Tool Ry	0
Tool Rz	90

```
<Name>TOOL6</Name>
<Description />
<GPTFF>
  <X>0</X>
  <Y>0</Y>
  <Z>200</Z>
  <W>-180</W>
  <V>0</V>
  <U>90</U>
</GPTFF>
```

Motion Parameters

These parameters are responsible for the the motion on the Techman robot, to find our more read Techman robot owner manual.

Line ABS	ON
LS Percentage	100
LSA Velocity	100
LSTTTS	100
PLSA Velocity	100
PLSTTTS	100
PS Percentage	100
PSTTTS	100
PSTTTSOF	ON
Robot blend value (mm)	1
Robot configuration	0,2,4

LineABS	line setting, enable absolute velocity (ON,OFF)
LS Percentage	line setting, speed percentage (%)
LSA Velocity	line setting, absolute velocity value (%)
LSTTTS	line setting, time to top speed (%)
PLSA Velocity	PLine setting, absolute velocity value
PLSTTTS	PLine setting, time to top speed (s)
PS Percentage	PTP setting, speed percentage (%)
PSTTTS	PTP setting, time to top speed
PSTTTSOF	PTP setting, enable time to top speed : ON,OFF
BlendValue	blend value (mm)
Robot Configuration	Value to be read from Tm Flow while driving robot

PTP Joints Allows the user to set the angle (deg) for first move, so the move will be completed using robot joints. The joint values are defined in the form below.

PTP Joints	
Joint A1	-105
Joint A2	3
Joint A3	126
Joint A4	-40
Joint A5	90
Joint A6	-49

```
<Motion>PTP</Motion>
<coordinate>0.0,0.0,0.0,0.0,0.0,0.0</coordinate>
<joint_angle>-104.939,3.885,126.918,-40.803,90.000,-49.939</joint_angle>
```

Inertia Data Allows the user to set the Tool Inertia data if desired (this is easier to calculate on the robot).

Inertia data	
Inertia X	0
Inertia Y	0
Inertia Z	0

Mass Data Allows the user to set the Tool Inertia data if desired (this is easier to calculate on the robot).

Mass data	
Mass Center X	0
Mass Center Y	0
Mass Center Z	0
Mass Center U	0
Mass Center V	0
Mass Center W	0

Encryption This option if selected will create a zipped copy of the data set, as this is the format required to load the toolpath files directly into TM Flow software, this means the option must be selected in order to generate a .zip with the password as defined below. An unzipped version of the output is created by default for the user to check the contents of the file if needed.

Encryption	
Encrypt output folder	<input checked="" type="checkbox"/>
Executable path	C:\Techman\TMExportZip.exe
Author	ADSK
Password	Tm000000

General properties

A dummy file with standard information is created after posting. It contains the name of the directory where you can find your NC files.

It is called as the Program Name in NC Program form. This is a dummy file example:

This is a dummy file.
Your program files are located here: C:\Users\xyz\AppData\Local\Fusion 360 CAM\nc\1001

- Toolpath name max 30 chars: Default is to check each toolpath name length. An error will be raised when length is more than 30 char.

6 – General information

For more information get help or post your questions on the forum:

<https://forums.autodesk.com> Select "*Fusion 360*" and then "*Fusion 360 Manufacturing*"

In TECHMAN Robot Language, the default unit of speed is millimeters per second: **mm/sec**.

If the Autodesk CAM session is running in inches, the output file will still be written in mm as this is the unit system used on robots.

IMPORTANT: Please remember that program and toolpath names should not contain any symbol or special character.

Default is to write out all data in a sub folder.