

Festo_Positioning_Basic library – CNC Editor / G-Codes

Commissioning of a selected system with the Festo_Positioning_Basic library is explained step by step, so that it's successfully integrated into the user program.

FPosB

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1 CNC editor / G codes

CNC data can be imported and integrated into an existing Codesys project.

These CNCs need to be created by the user for the respective application. They can be created with external programs (DXF import) or using the CNC editor in Codesys.

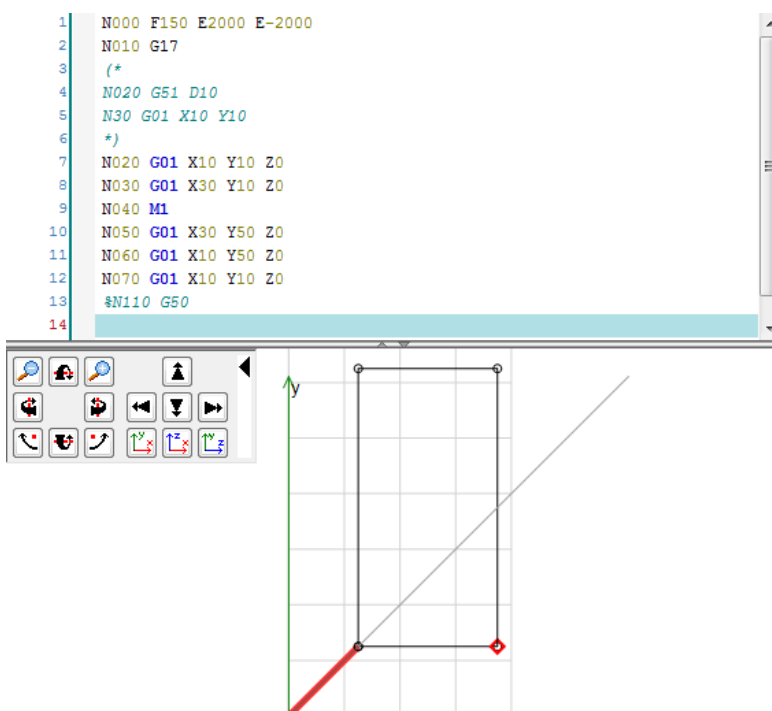
Supported commands and functions are listed in the Codesys online help function. Due to the fact that CNC programming is standardized, the most important information can be found by accessing the following file path in the online help:

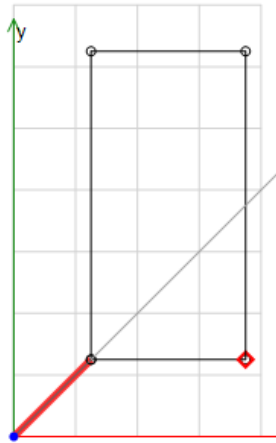
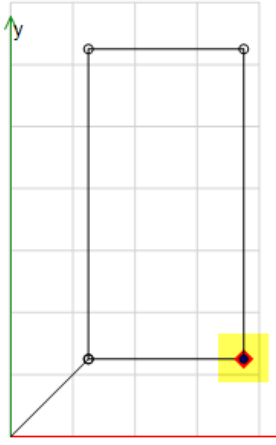
1.1 Soft motion > CNC editor > CNC language, DIN 66025

CNC Language DIN 66025

- Basics of DIN 66025
- Positioning
- Line
- Arc
- Delay Time
- Spline
- Parabola
- Ellipse
- 3D-mode
- Jump
- Changing variable values
- Preprocessor
- Coordinate Shift
- Smoothing Movement of Additional Axis over Several Objects
- Time synchronisation with interpolator
- Mode
- Switch point (H-function)
- M-function
- Usage of Variable
- Additional Splined Axes A, B, C

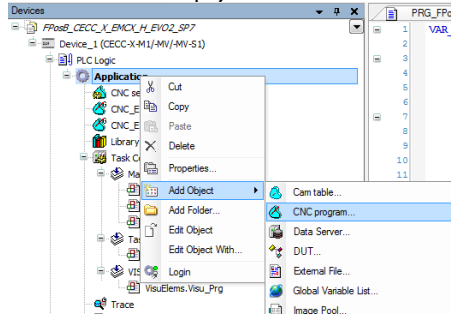
A simple example is used here to point out a few basic functions:



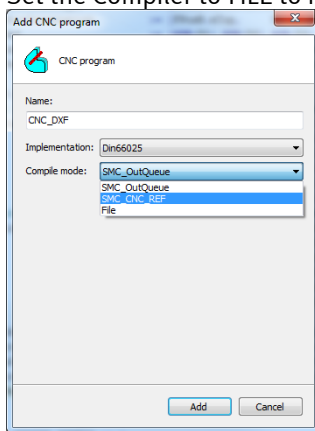
G code	Path	Significance
N000	-	The respective G code line is numbered with “N”.
F150 E2000 E-2000	-	Velocity is defined with “F”, and acceleration/deceleration with “E” – in both cases in soft motion units. Deceleration is specified by means of a negative value.
G17	-	Activation of the 3D function. This mode should always be active, as soon as there are more than 2 axes.
G01 X30 Y10 Z0		Linear interpolation to the corresponding coordinates in X, Y and Z. The CNC is further defined with each subsequent G01 command. The depicted rectangle results from the commands in figure above.
M1		The CNC stops at these functions and must be explicitly acknowledged by the user. G code processing does not continue until after acknowledgement.
(* N020 G51 D10 N30 G01 X10 Y10 *)	-	Comments are implemented block by block with “(...)”.
%N110 G50	-	Comments are implemented line by line with “%”.

1.2 DXF Import via CODESYS CNC Editor

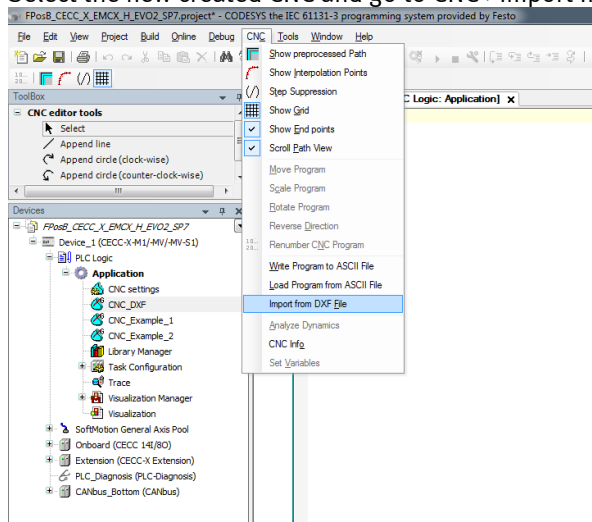
1. Create a new empty CNC in CODESYS



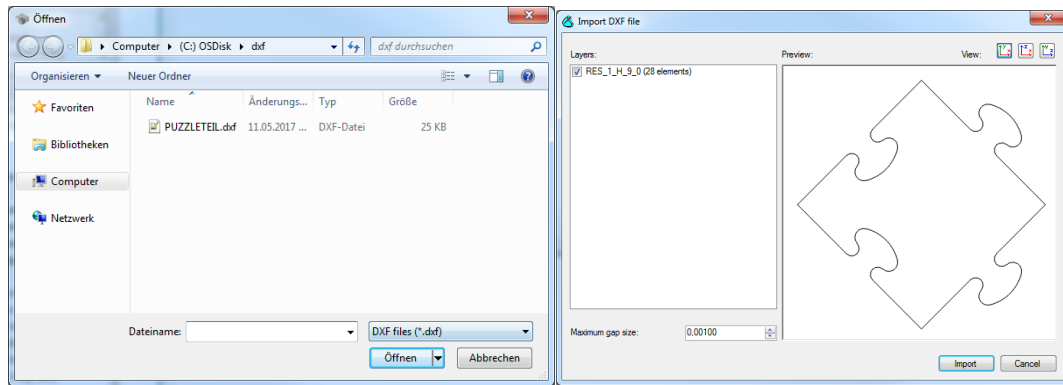
2. Set the compiler to SMC_CNC_REF to run it in Internal CNC Mode
Set the Compiler to FILE to run it in External CNC Mode.



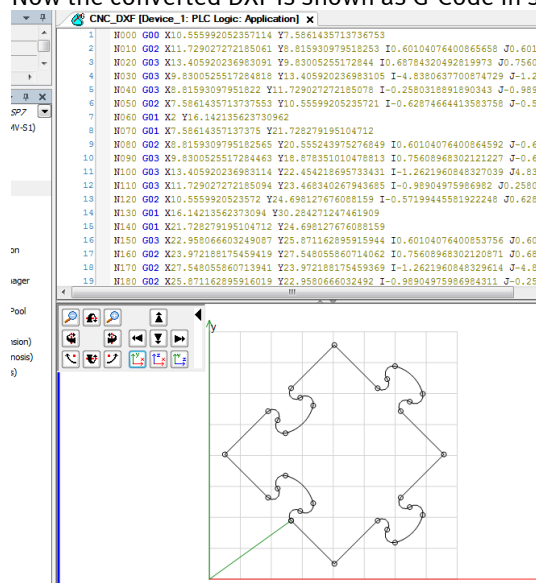
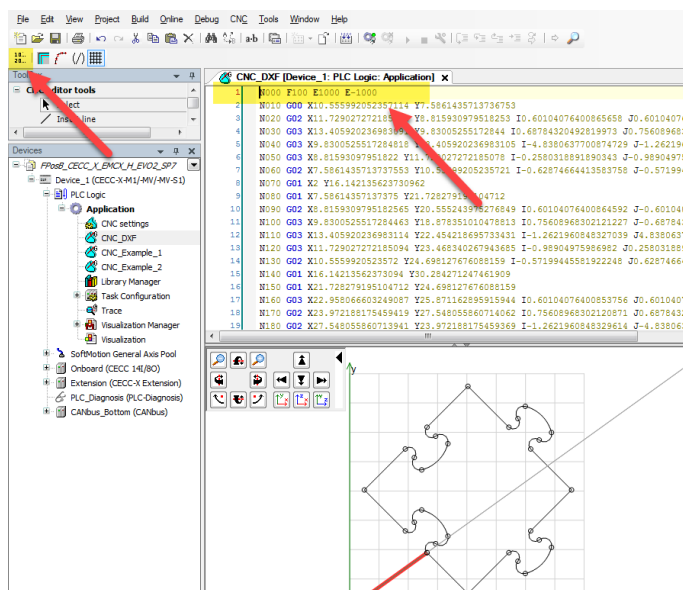
3. Select the new created CNC and go to CNC > Import from DXF FILE



4. Select the DXF file and press Import button



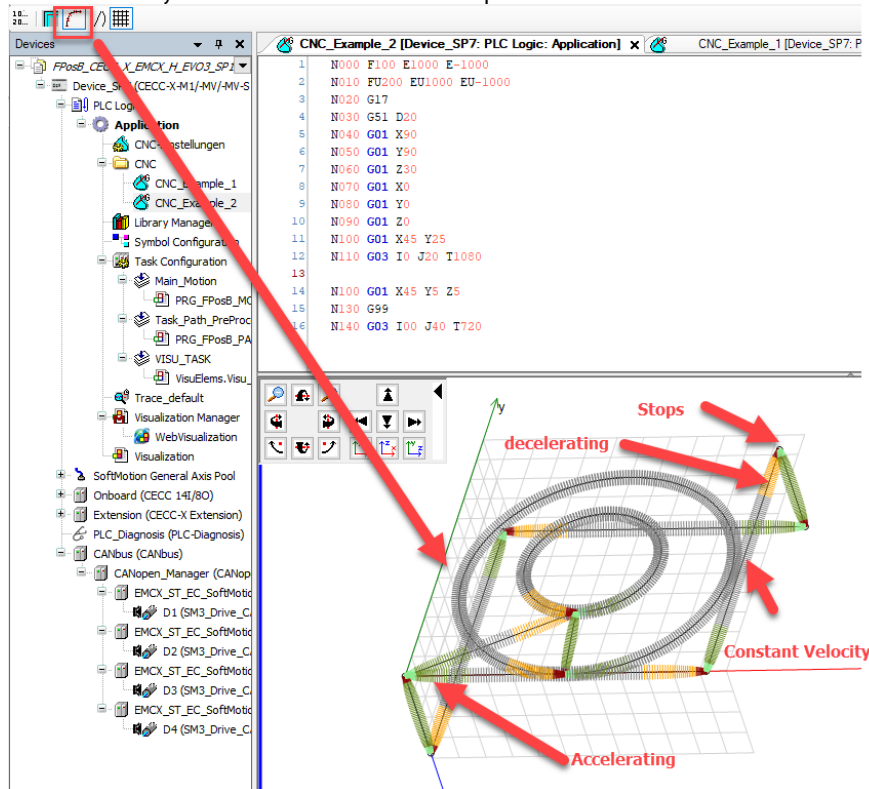
5. Now the converted DXF is shown as G-Code in selected CNC windows.

6. Please don't forget to add dynamic data to the g-Code at least in the 1st Line. Click on the upper left button to update the line number

1.3 Analyse CNC Dynamic

There are two options to analyse the CNC dynamic.

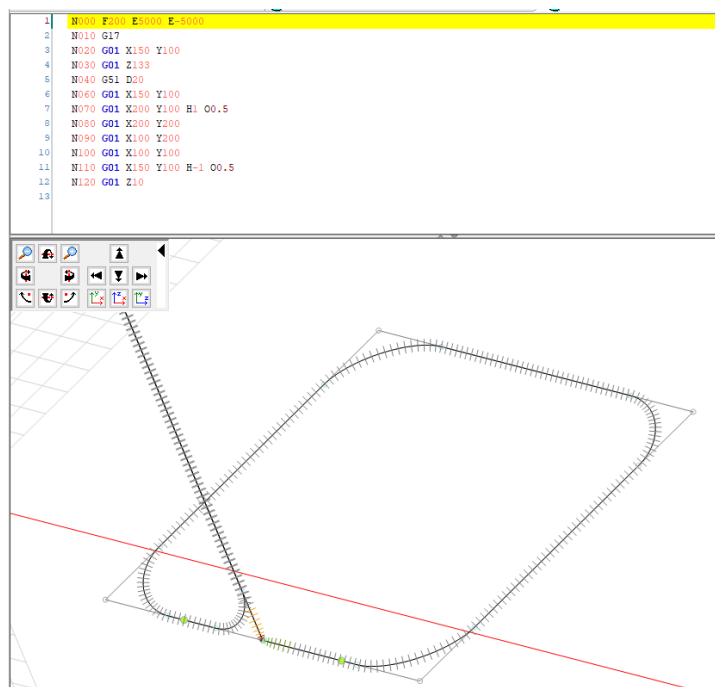
1. Activate the dynamic information on the top left corner.



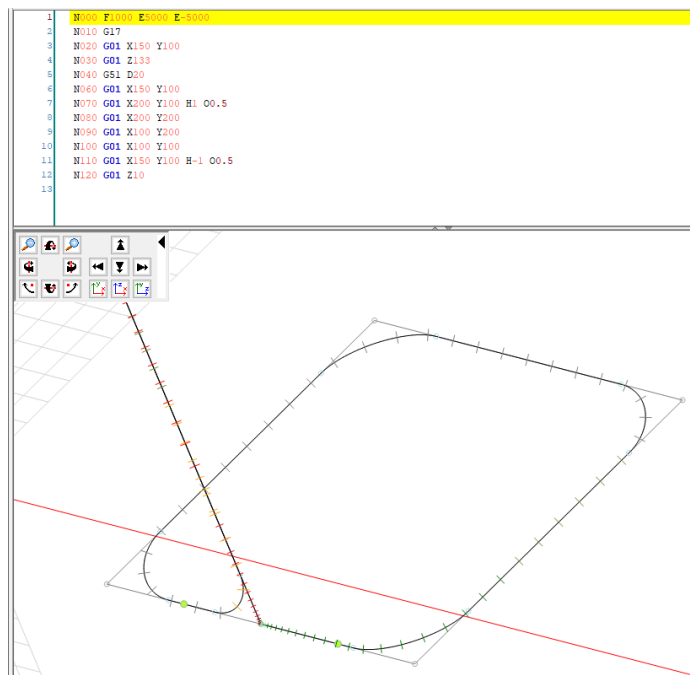
The different colours can already give a good overview, how the dynamics on the path will look like.

Another important information are the lines on the path. They represent the supporting points, which are created by the interpolator at different dynamics. The more points we have the smoother a movement is.

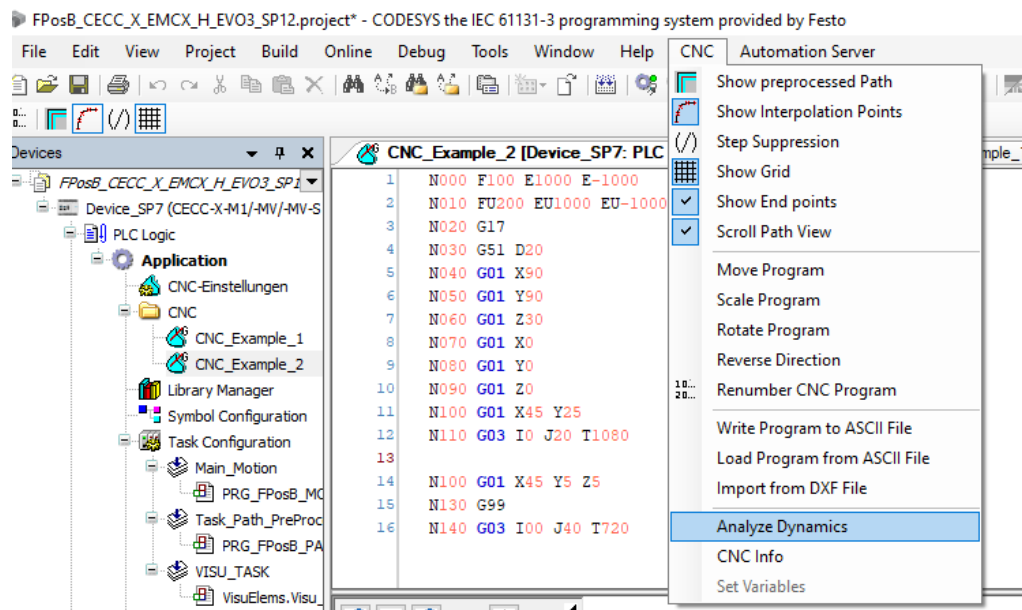
Example 1 (F200 E5000 E-5000): many supporting Points creates by Interpolator, leads to a smooth motion.

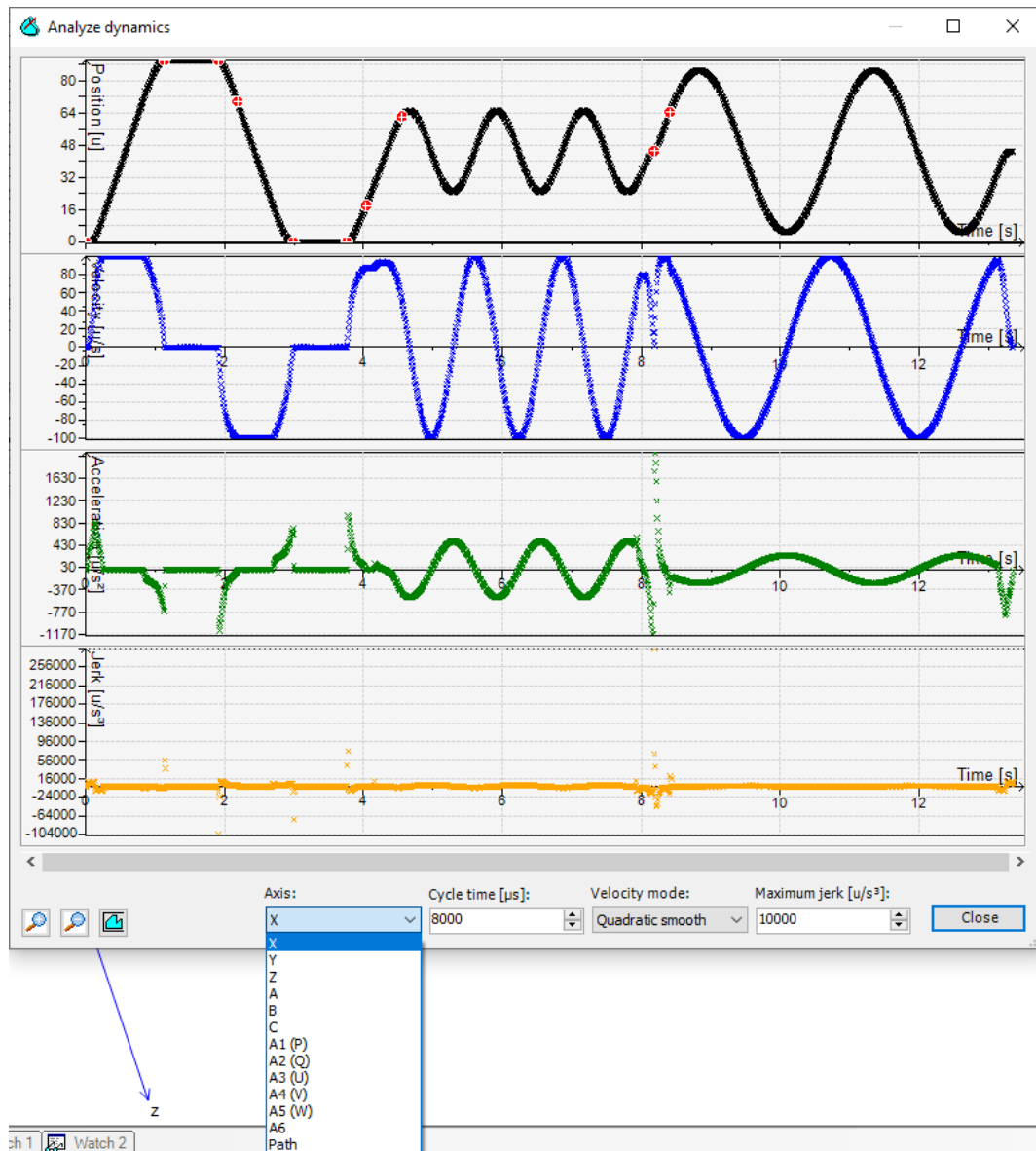


Example 2(F1000 E5000 E-5000): less supporting Points creates by Interpolator, leads to harsh motion



2. Open the **Analyze Dynamic** option in the CNC Menu





The dropdown list offers dynamic charts for different axes or the complete path.