

Festo_Positioning_Basic library – Internal and External CNC List

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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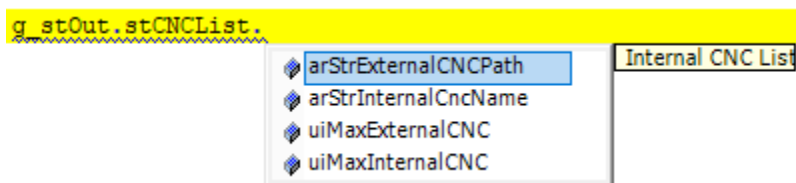
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1 CNC List

FPosB can list or scan the Internal and External CNCs automatically and store it in the output structure `stCNCList`. Both, the Internal and External CNC, can be found in an dedicated array of string.

For the Internal CNC, this array contains the CNC Name.

For the External CNC, this array contains the CNC Name including the storage path of the CNC-File.



1.1 Internal CNC Mode List

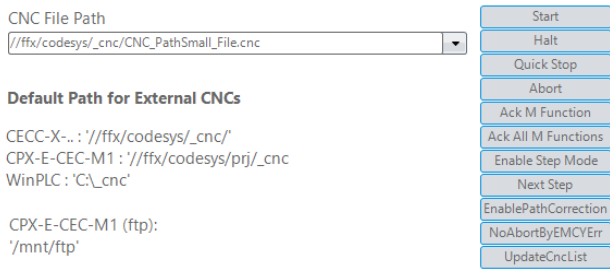
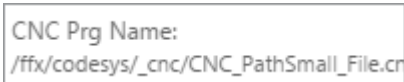
Visualization	Codesys
1 Auto listing/scanning of Internal CNCs. The CNCs will be listed in the <code>g_stOut.stCNCList.arStrInternalCncName</code>, the Visualization on the left side has the same order like the Codesys Project. Except the 3rd CNC, the reason for that will be explained later. In general the auto scan process list the CNCs in the same order like the Codesys-Project. Internal CNC No 1 CNC_1 CNC_1 CNC_2 FB_PICK_AND_PLACE_CYCLIC CNC_3 CNC_4 CNC_Example_1 CNC_Example_2 CNC_Example_3 CNC_Example_4 CNC_Path_1 CNC_Path_2 CNC_Path_3 CNC_Path_4 Start Halt Quick Stop Abort Ack M Function Ack All M Functions Enable Step Mode Next Step EnablePathCorrection NoAbortByEMCYErr UpdateCncList PLC Logic Application CNC-Einstellungen CNC CNC_1 CNC_2 CNC_3 CNC_4 CNC_Example_1 CNC_Example_2 CNC_Example_3 CNC_Example_4 CNC_Path_1 CNC_Path_2 CNC_Path_3 CNC_Path_4	
2 Manual List of the Internal CNCs Method 1 If there is a need for individual order of the CNC List, this can be done by manual declaration of the CNCs into the CNC list in <code>g_stIn</code>. This can be found in the <code>GVL_Motion_INOUT</code>. e.g CNC_Example_1 and CNC_Example_2 is now listed in the first and second place in the list instead of CNC_1 and CNC_2 compare to the example above. The scan procedure will automatically recognize the occupied space from the user in the list and will automatically list the remaining CNCs into the free space. It will also recognize the CNC which is already set by user and will not double list it into the Array.	

Visualization	Codesys
Internal CNC No 1 CNC_Example_1 CNC_Example_1 CNC_Example_2 FB_PICK_AND_PLACE_CYCLIC CNC_1 CNC_2 CNC_3 CNC_4 CNC_Example_3 CNC_Example_4 CNC_Path_1 CNC_Path_2 CNC_Path_3 CNC_Path_4 Start Halt Quick Stop Abort Ack M Function Ack All M Functions Enable Step Mode Next Step EnablePathCorrection NoAbortByEMCYErr UpdateCncList	<pre> ('FPB_INPUT_DATA') g_stIn : FPosB.FPB_INPUT_DATA := (eMOP := FPosB.eNoMode, //stCW := gstCW, eSelCS := FPosB.eMOC tRampInDelay := T#8MS, stCNCVarList := (wNumberVars := 16, psvVarList stDefaultDynCNC := (lrVel:=10, lrAcc:= 1000, lrDec: stDefaultDynFFCNCGO := (lrVel:=10, lrAcc:= 1000, lrDec: parCNCUser := [(ADR(CNC_Example_1)), (ADR(CNC_Example_2))] // Max.256 CNC_Example_1); </pre>
3 Manual List of the Internal CNCs Method 2 The CNC order can also be changed in the code.	
Internal CNC No 1 CNC_Example_1 CNC_Example_1 CNC_Example_2 FB_PICK_AND_PLACE_CYCLIC CNC_1 CNC_2 CNC_3 CNC_4 CNC_Example_3 CNC_Example_4 CNC_Path_1 CNC_Path_2 CNC_Path_3 CNC_Path_4 Start Halt Quick Stop Abort Ack M Function Ack All M Functions Enable Step Mode Next Step EnablePathCorrection NoAbortByEMCYErr UpdateCncList	POUs FPosB_CECC_X_EMCK_H_EVO3_SP12 Main_Motion 00_GVLs GVL_CNC GVL_CONFIG GVL_Motion_FB GVL_Motion_INOUT 00_Main_Motion PRG_FPosB_MOTION (PRG) ACT_MotionControl ACT_PICK_AND_PLACE PRG_FB_PATH (PRG) GlobalTextList PRG_FPosB_MOTION.ACT_PICK_AND_PLACE x GVL_Motion <pre> 1 fbPick_n_Place_EV03(2 xGotoParkPos := , 3 pstDynamic := ADR(gstDynPnP), 4 pstDynamicAddAxes := ADR(gstDynPnP_AddAxes), 5 xRepeat := , 6 xAlreadyPicked := , 7 pstPickPos := ADR(gstPickPos), 8 pstPlacePos := ADR(gstPlacePos), 9 pstParkPos := ADR(gstParkPos), 10 xTeachPickPos := , 11 xTeachPlacePos := , 12 xTeachParkPos := , 13 xAckPickOrPlace := , 14 lrUpPosZ := , 15 lrRadius := , 16 udiPickTimer := , 17 udiPlaceTimer := , 18 xPickPosReady := , 19 xPlacePosReady := , 20 pCNC => g_stIn.parCNCUser[3], 21 xPick => , 22 xPlace => , 23 iPickCounter => , 24 iPlaceCounter => , 25 udiCycle => , 26 udiCycleTime => , 27 tCycleTimePickPlace := , 28 stKineDataRef := gstGantryDataRef; 29 30 OR 31 g_stIn.parCNCUser[3] := fbPick_n_Place_EV03.pCNC; 32 33 </pre>
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1.2 External CNC List

The External CNC Mode operates with CNC files which are located in the flash memory of the PLC or MicroSD Card. The scan procedure will, depends on the operating PLC, scan the specific CNC folders and list up all CNC Files in the folder. The whole file list will be written after the scan into the following Array of String:

g_stOut.stCNCList.arStrExternalCncName

	Visualization	Codesys
1	You can put your CNC files in a specific folder on the PLC. For CECC-X Internal flash storage: '//ffx/codesys/_cnc' Or '_cnc' For CECC-X MicroSd Card: '/mnt/sdcard/_cnc' For CECC-X USB Memory Stick: '/mnt/usb/_cnc' For CPX-E-CEC-M1-... Internal flash storage: '//ffx/codesys/prj/_cnc' For CPX-E-CEC-M1-... USB Memory Stick: '/mnt/usb/_cnc' For CPX-E-CEC-M1-... ftp: '/mnt/ftp/_cnc' Soft_PLC: 'C:_cnc' "_cnc" Folder should always be located in the root of the MicroSD-Card or USB-Storage. All CNC files in the above folders will be automatically scanned and added to the CNC list. Please take care of '/' and '\' because of SoftPLC (Windows) and PLC (Linux) The CNC file path can also directly written into g_stIn.sCNCFilePath like g_stIn.sCNCFilePath := '/_cnc/CNC_PathSmall_File.cnc';, if for example you are using another folder to save the CNC File.	
		g_stIn.sCNCFilePath := '/specific folder/CNC_PathSmall_File.cnc'; or Standard Path of the PLC: g_stIn.sCNCFilePath := '/_cnc/CNC_PathSmall_File.cnc';
2	The selected CNC can be checked as a name in text format.	
		g_stOut.stActiveCncSource.sCNCName = '/ffx/codesys/_cnc/CNC_PathSmall_File.cnc';

1.3 Manual restart of the scan procedure

	Visualization	Codesys
1	The Internal and External CNC will be scanned once at start of the Codesys project (reset cold or Power cycle) This can also be manually triggered, when new files are added to the PLC or the SD Card. CNC File Path //ffx/codesys/_cnc/CNC_PathSmall_File.cnc Default Path for External CNCs CECC-X-.. : '//ffx/codesys/_cnc/' CPX-E-CEC-M1 : '//ffx/codesys/prj/_cnc' WinPLC : 'C:_cnc' CPX-E-CEC-M1 (ftp): '/mnt/ftp' Start Halt Quick Stop Abort Ack M Function Ack All M Functions Enable Step Mode Next Step EnablePathCorrection NoAbortByEMCVErr UpdateCncList 	rising edge: g_stIn.stcw.xUpdateCncList := True;
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