

NX Post Configurator 012 – Multichain I

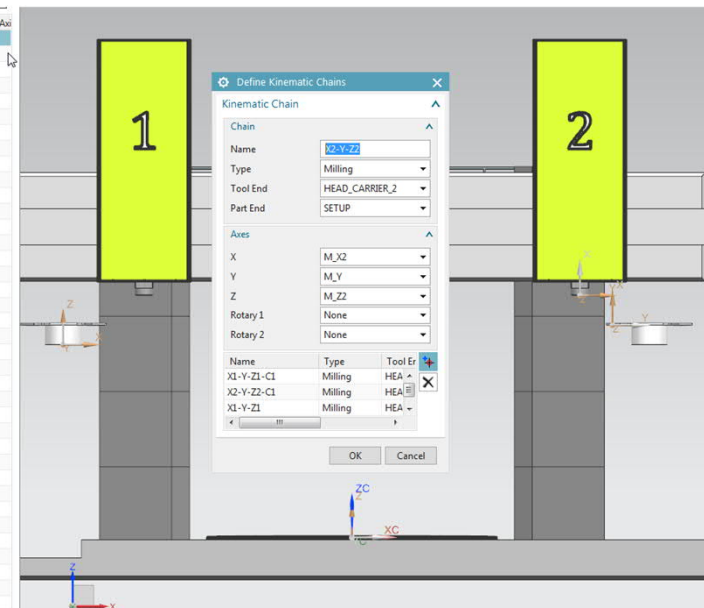
How to set up Chains

- Kinematic chains are defined in the MTB in NX
- Use of a kinematic model to create a post with Post Configurator is recommended
- Information of the kinematic model is automatically transferred into the created post

Benefits:

- one location to define the kinematics for post & simulation

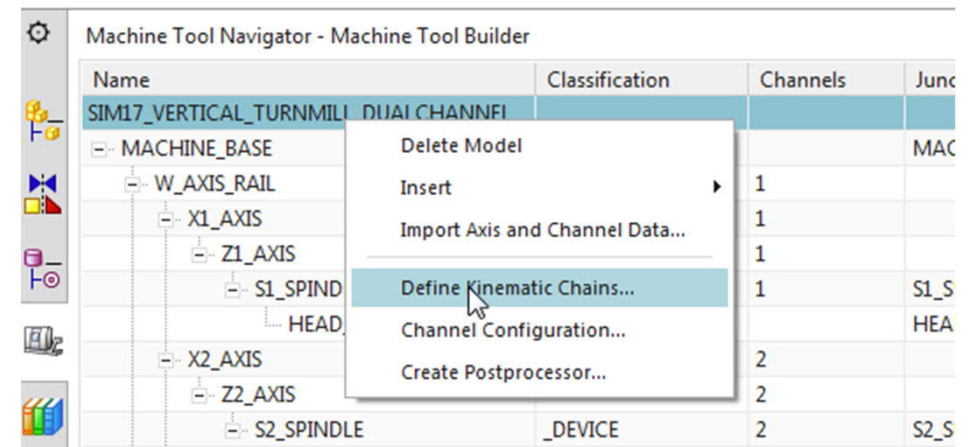
Name	Classification	Channels	Junctions	Axis...	Axis Number	Initial Value	NC Axis
SIM17_VERTICAL_TURNMILL_DUALCHANNEL							
- MACHINE_BASE	MACHINE_BASE		MACHINE_ZERO_JUNCTION*				
- W_AXIS_RAIL		1		M_W	7	5000	✓
- X1_AXIS		1		M_X1	1	-5763	✓
- Z1_AXIS		1		M_Z1	3	1716	✓
- S1_SPINDLE	DEVICE	1	S1_SPINDLE_JCT	M_S...	5	0	
- HEAD_CARRIER_1	DYNAMIC_HOLDER		HEAD_CARRIER_JCT_1				
- X2_AXIS		2		M_X2	2	6319	✓
- Z2_AXIS		2		M_Z2	4	1716	✓
- S2_SPINDLE	DEVICE	2	S2_SPINDLE_JCT	M_S...	6	0	
- HEAD_CARRIER_2	DYNAMIC_HOLDER		HEAD_CARRIER_JCT_2				
- HEAD_MAGAZIN_HOUSING							
- HEAD_MAGAZIN_1	DEVICE	1	HEAD_MAGAZIN_ROT_JCT	Q1	15	0	
- HEAD_POCKET_11	STATIC_HOLDER		HEAD_POCKET_10_JCT				
- HEAD_POCKET_12	STATIC_HOLDER		HEAD_POCKET_11_JCT				
- HEAD_POCKET_13	STATIC_HOLDER		HEAD_POCKET_12_JCT				
- HEAD_POCKET_14	STATIC_HOLDER		HEAD_POCKET_13_JCT				
- HEAD_POCKET_15	STATIC_HOLDER		HEAD_POCKET_14_JCT				
- HEAD_POCKET_16	STATIC_HOLDER		HEAD_POCKET_15_JCT				
- HEAD_MAGAZIN_2	DEVICE	2	HEAD_MAGAZIN_2_ROT_JCT	Q2	16	0	
- HEAD_POCKET_21	STATIC_HOLDER		HEAD_POCKET_20_JCT				
- HEAD_POCKET_22	STATIC_HOLDER		HEAD_POCKET_21_JCT				
- HEAD_POCKET_23	STATIC_HOLDER		HEAD_POCKET_22_JCT				
- HEAD_POCKET_24	STATIC_HOLDER		HEAD_POCKET_23_JCT				
- HEAD_POCKET_25	STATIC_HOLDER		HEAD_POCKET_24_JCT				
- HEAD_POCKET_26	STATIC_HOLDER		HEAD_POCKET_25_JCT				
- Y_AXIS		1		M_Y	10	0	✓
- C_BASE	LATHE_SPINDLE	1	C_AXIS_WORKPLANE	M_C1	11	0	✓
- C_ROTARY							
- SETUP	SETUP_ELEMENT		PART_MOUNT_JCT				
- BLANK	WORKPIECE_SET...						
- PART	PART_SETUP_ELE...						
- FIXTURE	SETUP_ELEMENT						
- Y_DUMMY		2		M_Y2	8	0	✓



Set up NX Chains 1/2



- Open the kinematic assembly from sim17 machine
(installed_machines\sim17_vertical_turnmill_dualchanne
\graphics\sim17_vertical_turnmill_dualchannel.prt
- If not in in MTB switch application
- Right click on the root name and choose Define
kinematic chain



Set up NX Chains 2/2

- 4 chains are defined in the sim17 sample machine
- In general you can create multiple chains here, no limitations
- The name of the chain is used in Post Configurator so this should be unique and understandable
- Dependent on the Tool End and Part End assign the axes to the chain

Define Kinematic Chains

Kinematic Chain

Chain

Name: X2-Y-Z2

Type: Milling

Tool End: HEAD_CARRIER_2

Part End: SETUP

Axes

X: M_X2

Y: M_Y

Z: M_Z2

Rotary 1: None

Rotary 2: None

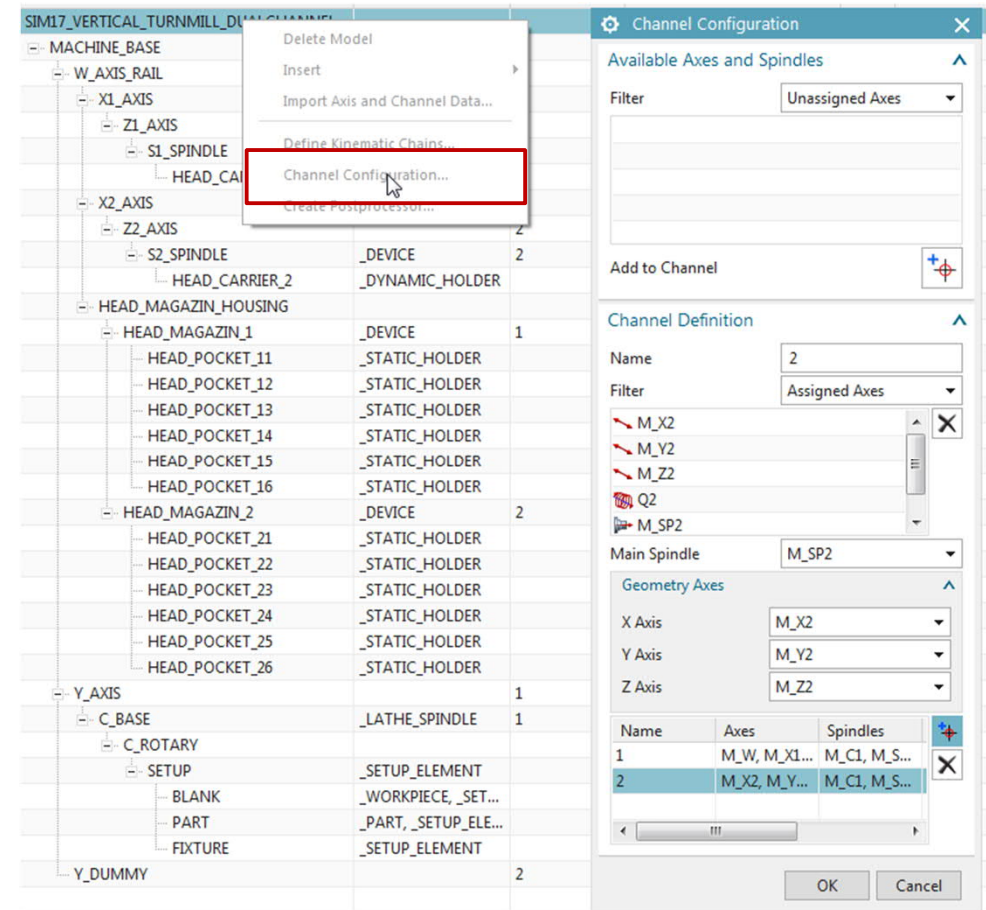
Name	Type	Tool End
X2-Y-Z2-C1	Milling	HEA
X1-Y-Z1	Milling	HEA
X2-Y-Z2	Milling	HEA

OK Cancel

Channel Configuration

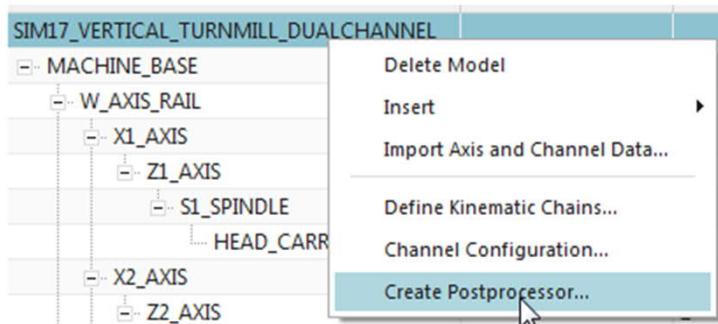


- Channel configuration is mainly needed for simulation
- All axes and spindles should be assigned to a channel
- Post Configurator not use information from here when create the post
- For postprocessing it's needed if use the sync manager

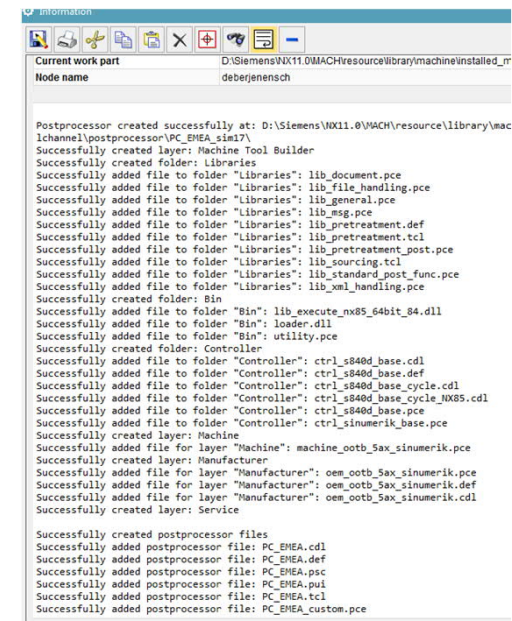
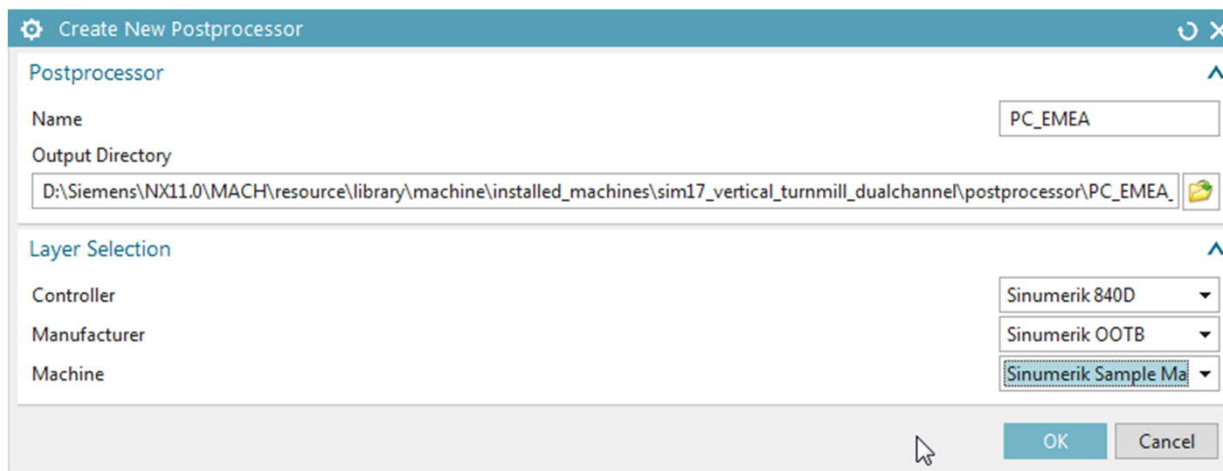


Create the post based on MTB

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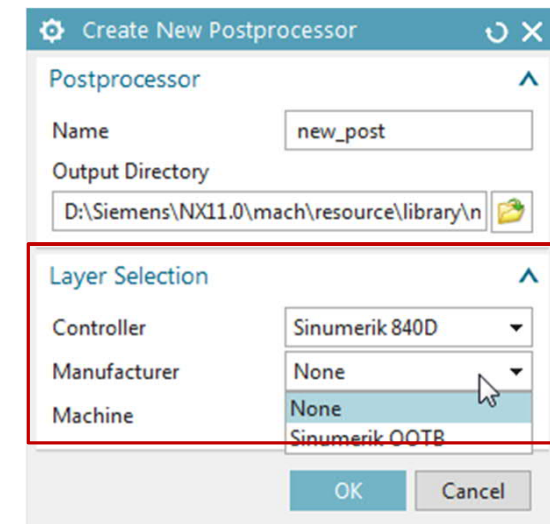
- RBM to create a new post based on MTB
- Create a new folder (e.g. in the sim17 machine folder) and a unique name for the post
- Use the OOTB Manufacturer and Machine level



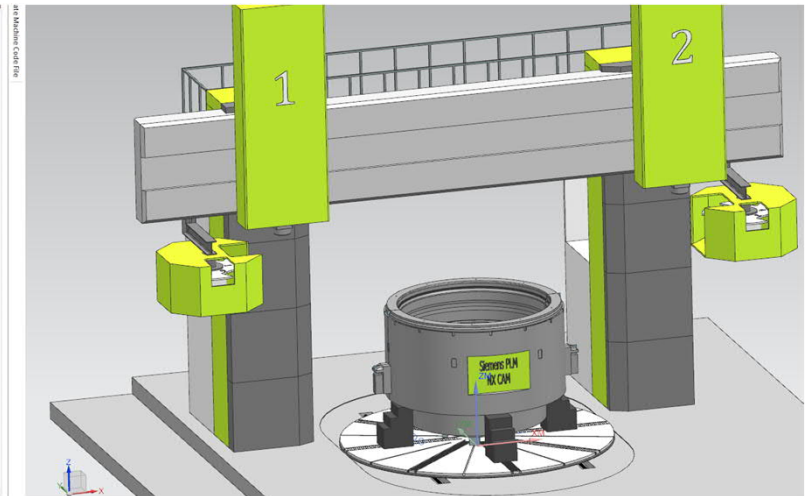
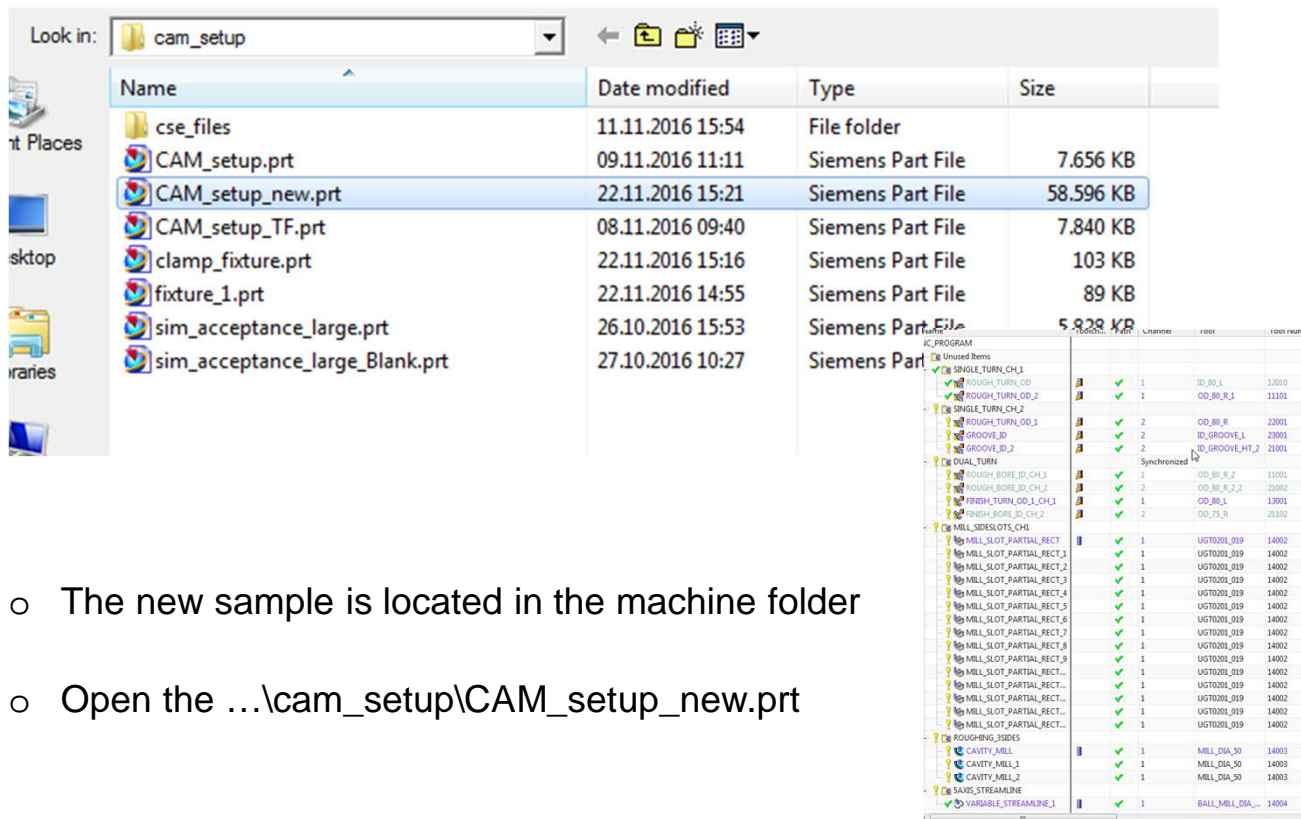
Post Creation with OOTB Layer/ without



- The OOTB layer are optimized for the OOTB samples
- Recommendation is to use this for quick demos
- For complex machines or general new machines create the post without these layers or use your own
- In OOTB layer Manufacturer LIB_Entrys are used and Standard definitions like Header information for Sinumerik 840D
- In OOTB layer Machine normally only machine mode is set





Open the new sample sim17



- The new sample is located in the machine folder
- Open the ...\\cam_setup\\CAM_setup_new.prt

Connect the generated post with machine

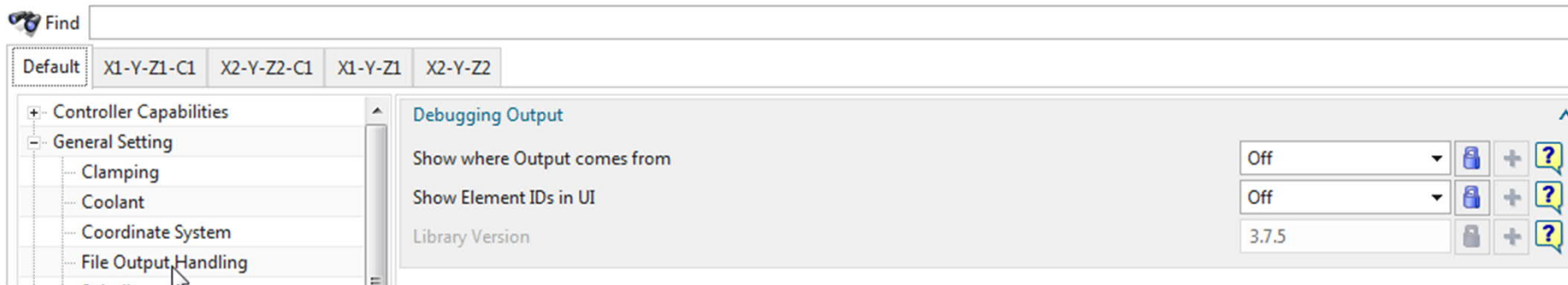


	Add_to_machine_database.txt	20.07.2016 17:04	Text Document	1 KB
	sim17_vertical_turnmill_dualchannel.dat	03.11.2016 13:08	DAT File	1 KB

```
k\sim17_turnmill_sinumerik.tcl,${UGII_CAM_LIBRARY_INSTALLED_MACHINES_DIR}\sim17_vertical_turnmill_dualchannel\postprocessor\sinumerik\sim17_turnmill_sinumerik.def
```

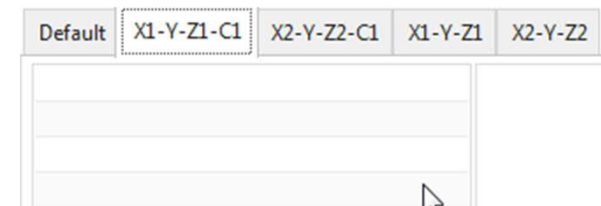
- Open sim17_vertical_turnmill_dualchannel.dat
- Replace the entry for the post with the new one

Automatically generated Chains post overview



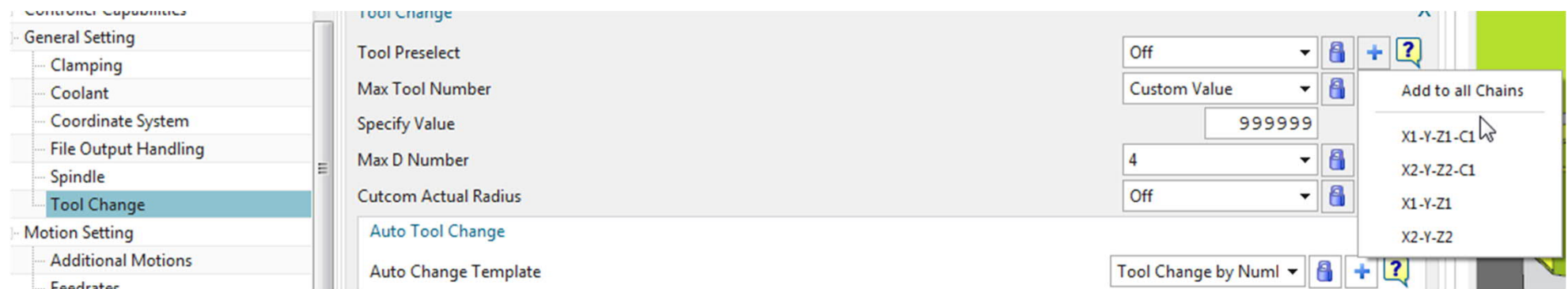
- The chains are added through the mtb Layer which was generated when create the post
- After creation the default chain contains all propertyts
- All created chains are empty and propertyts can now assigned to these chains

PC_EMEA_custom.pce	23.11.2016 07:50	PCE File	1 KB
PC_EMEA_mtb.pce	23.11.2016 07:50	PCE File	3 KB
PC_EMEA_service_s840d.tcl	23.11.2016 07:50	TCL File	13 KB

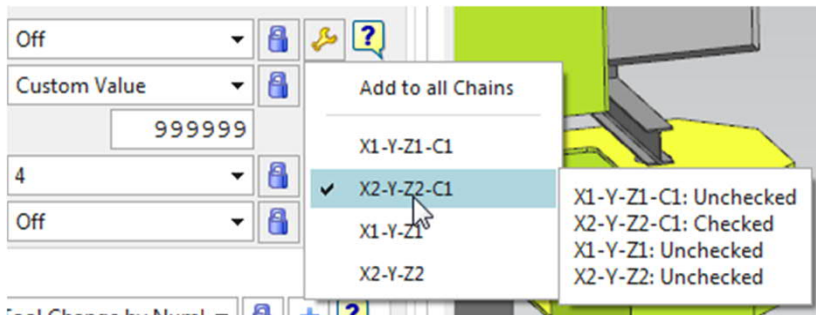


Add the property to chains 1/2 general

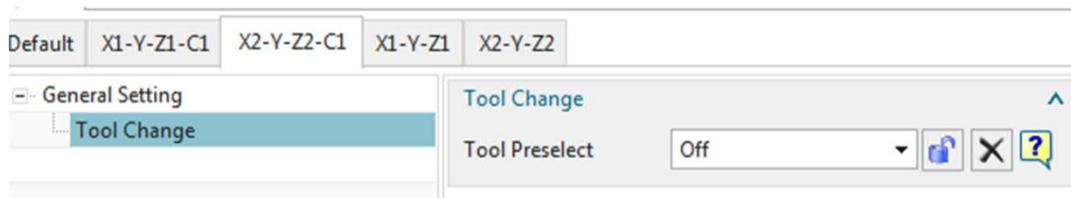
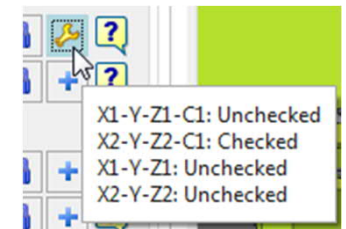
- Properties which can be chain specific can add to single chains or to all chains
- Click on the + sign between the inherited lock and help sign and context menu will open
- User make decision which chains this property contains or add it to all chains
- Property which can not assigned to chains are greyed



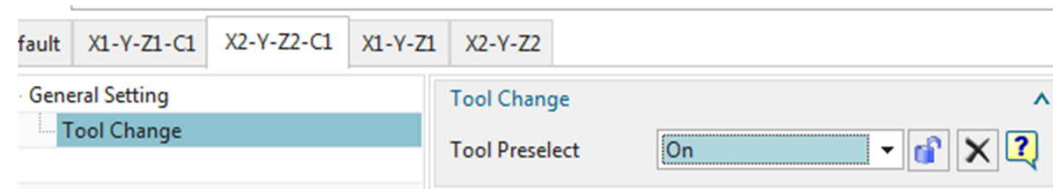
Add the property to chains 2/2 general



- When added to a chain the chain is marked and the + symbol is converted into a wrench
- in UI it's fast to see which property is in chains
- When mouse is over the wrench a tooltip open in which chains this property is used



- When switching the chain in the tab the property which was added is in navigation tree with the origin group of setting
- Now value can be changed for this property



Define Chain conditions for automatic switching

The screenshot shows the 'Chain Mapping' configuration window. On the left is a tree view with the following items: Chain Selection, Chain Mapping (highlighted), Controller Capabilities, Controller Version, Output Settings, General Setting, Advanced settings, Clamping, Coolant, Coordinate System, File Output Handling, Spindle, Tool Change, and Motion Setting. The main area is titled 'Chain Mapping' and contains four sections: 'Chain Mapping Condition 1', 'Chain Mapping Condition 2', 'Chain Mapping Condition 3', and 'Chain Mapping Condition 4'. The first section is expanded, showing five rows: 'Prio 1 Condition Value (\$mom_carrier_name)', 'Prio 2 Condition Value (\$mom_main_mcs)', 'Prio 3 Condition Value (\$mom_machine_mode)', 'Prio 4 Condition Value (\$mom_channel_id)', and 'Assigned Chain'. Each row has a text input field, a lock icon, a plus icon, and a help icon. The 'Assigned Chain' row has a dropdown arrow in the input field. The other three condition sections are collapsed.

- New property for Chain mapping

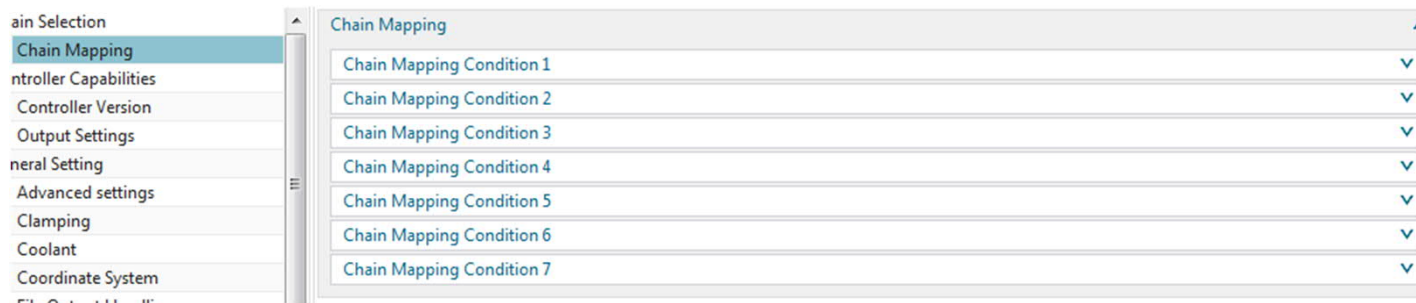
Workflow:

- Assign chain condition
- Possibilities to use standard values for chain mapping e.g. mom_carrier_name for machines with head devices

Chain conditions expert settings

- If more conditions needed in UI, because chains added manual with Tcl you can use the followed command in service layer:

LIB_GE_generate_chain_selection_condition_vars 7



- To reorder priority set the index of the variable `lib_ge_chain_selection_priority`

set lib_ge_chain_selection_priority(3) mom_channel_id

set lib_ge_chain_selection_priority(1) mom_main_mcs

set lib_ge_chain_selection_priority(2) mom_machine_mode

set lib_ge_chain_selection_priority(0) mom_carrier_name

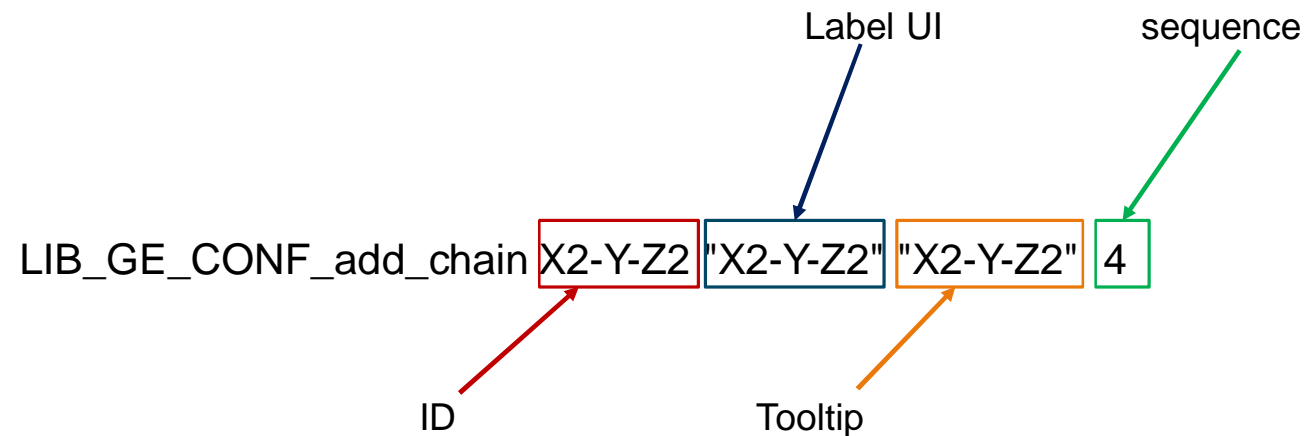
Preset chain selection condition



```
# This array is to preset a chain selection condition from any  
TCL layer of the postprocessor  
  
set lib_ge_chain_condition(0,mom_channel_id) Main  
set lib_ge_chain_condition(0,mom_main_mcs) MCS_MAIN  
set lib_ge_chain_condition(0,mom_machine_mode) MILL  
set lib_ge_chain_condition(0,mom_carrier_name) ""  
set lib_ge_chain_selection(0) "test-chain-1"
```

Add Chain manual

- It's possible to add chains by hand through tcl
- Siemens PLM recommend to create the chain in MTB and then create the post
- But if necessary the chain can setup in the layer file, because e.g. new head device for machine or a Retrofit of a machine and so post must updated



Allow Chains property

```
LIB_GE_CREATE_obj custom_int {} {  
    LIB_GE_property_ui_name      "Name"  
    LIB_GE_property_ui_tooltip   "Tooltip"  
  
    set id "custom_prop"  
    set $id 0  
    set options($id)             {1|2|3}  
    set options_ids($id)         {0|1|2}  
    set datatype($id)            "INT"  
    set access($id)              222  
    set dialog($id)              {{Int Property}}  
    set descr($id)               {{A numeric Property}}  
    set ui_parent($id)           "custom_group"  
    set ui_sequence($id)         -1  
    set allow_chain($id) 0  
}
```

- Defines that the property can be added to other chains
 - 0 – cannot add to other chains
 - 1 – can add to other chains, also it's possible not to define the value because in standard it's allowed by default

Q&A

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