

FOSUN 复星

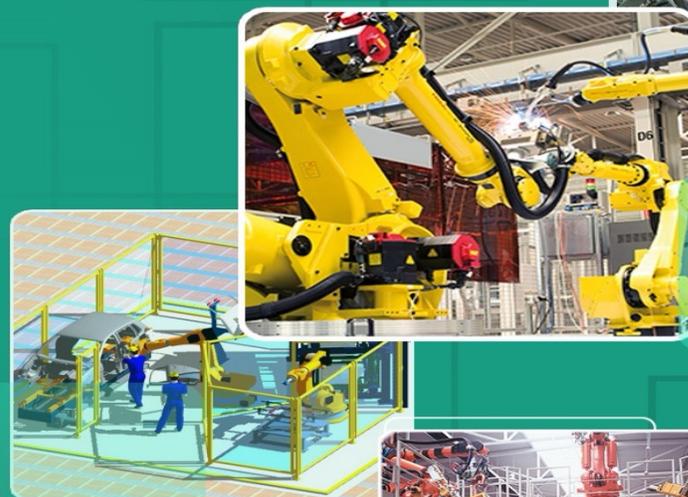


Your Turn-key Partner for Production Systems  
您的交钥匙生产系统的合作伙伴

Always One Step Ahead in Production Systems  
制造系统的卓越引领者

GetOperationJointAngles Plugin User Manual

Author: David Nie



# CONTENTS

## 目录

1 Usage Scenario 1

---

2 Usage Scenario 2

---

3 Q/A

---

4 Import the plugin

---

5 Video Demo

---

6 Contact us

---

# Designed for two Usage Scenario

OperationQueryForm

OperationHead: MB1\_ARG1

Name	Status
STA010R01_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model2_03_Spot_010JG02	NO ROBOT
STA010R01_Model1_03_Spot_010JG02	NO ROBOT
STA010R01_Model2_03_Spot_010JG02	NO ROBOT
STA010R02_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model2_03_Spot_010JG02	NO ROBOT
STA010R01_Model1_03_Spot_010JG02	NO ROBOT
STA010R01_Model2_03_Spot_010JG02	NO ROBOT
STA010R02_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model2_03_Spot_010JG02	NO ROBOT
MB020R01_F30_01_Glue_020JG01_L	NOK
MB020R01_cGun1_Service	NOK
MB020R02_F30_01_Glue_020JG01_R	NOK
MB020R02_cGun1_Service	OK
MB020R01_F30_01_Glue_020JG01_L	OK
MB020R01_F30_01_Glue_020JG01_R	NOK
GLUE_MB020JIG01_1_L_F30	NOK
GL_AUTOPURGE1	NOK
TR_GUN1	NOK
GLUE_MB020JIG01_1_R_F30	NOK
GL_AUTOPURGE1	OK
TR_GUN1	OK
GLUE_MB020JIG01_1_L_F30	NOK
GLUE_MB020JIG01_1_R_F30	NOK
GLUE_MB020JIG01_1_L_F30	NOK

Joint Limit Threshold Watcher: 10.00 Refresh

1. Obtain the list of operations under an “Operation Folder” under Operation Tree

Operation Name: MB020R02\_F30\_01\_Glue\_020JG01\_R

RobotName: MB020\_R02

### Joint Limits

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

### Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Name	J1	J2	J3	J4	J5	J6
P5	30	-49.85	5.35	0	-35.35	0
P10	36.58	6.94	-23.71	110.18	-88.65	228.19
Curve24_Is1	33.47	3.61	-23.97	111.5	-86.08	226.94
Curve24_Is2	33.77	3.11	-24.28	111.38	-86.45	226.75
Curve24_Is3	34.17	2.57	-24.64	111.23	-86.92	226.55
Curve24_Is4	34.48	2.17	-24.9	111.11	-87.27	226.41
P15	32.12	-0.38	-24.02	112.08	-84.96	226.43
Curve21_Is1	27.1	-4.7	-24.95	114.49	-81.13	223.75
Curve21_Is2	26.58	-3.63	-24.48	114.67	-80.5	223.99
Curve20_Is1	26.3	-3	-24.3	114.87	-80.28	225.83
Curve20_Is2	25.75	-3.71	-24.29	115.04	-79.74	223.84
Curve20_Is3	25.65	-3.43	-24.18	115.07	-79.61	223.91
Curve20_Is4	25.54	-3.1	-24.04	115.1	-79.46	223.99
P20	32.91	-11.98	-14.9	110.84	-82.3	235.25
P25	33.58	-3.8	-22.8	3.41	-69.35	125.15
Polyline1_Is1	31.47	-1.48	-22.87	3.5	-69.17	127.23
Polyline1_Is2	23.8	-9.58	-23.23	3.77	-68.36	154.76
Polyline1_Is3	25.41	-8.54	-23.48	3.73	-68.21	153.16
Polyline1_Is4	23.84	-9.51	-23.41	3.78	-68.18	154.71
Polyline1_Is5	23.75	-9.23	-24.51	3.81	-67.08	154.71

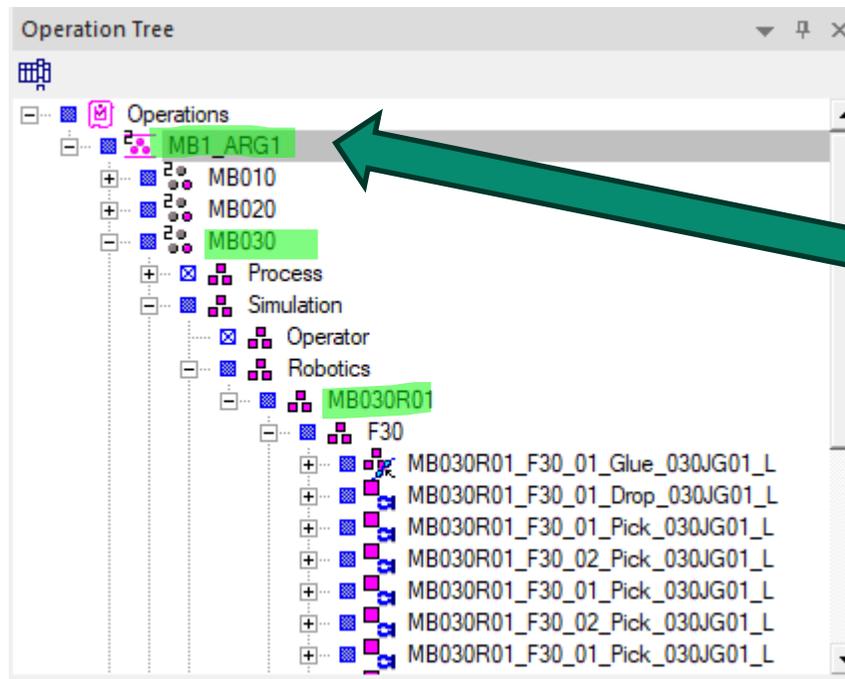
Robot Jog Add To Path Editor Refresh

Joint Limit Threshold Watcher: 10.00

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

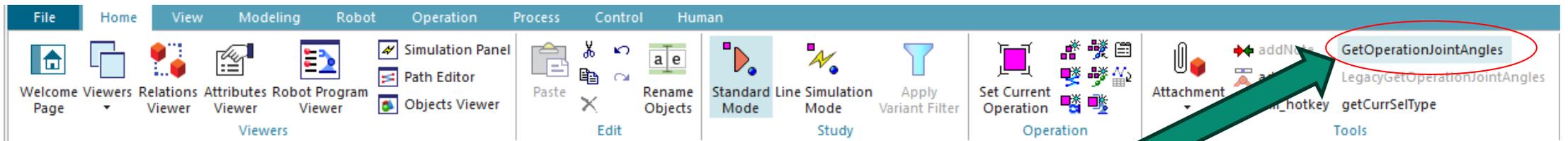
2. Obtain the list of viapoints Joint Configs in one operation

# 1. Scenario 1: Obtain the list of operations



Click on any of the “Operation folder”  
such as the ones highlighted in green





## Click on the Plugin

*(If the plugin is not selectable, there are two common reasons)*

- 1. An unsupported operation type is selected*
- 2. More than one operation is selected*

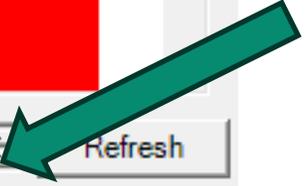
OperationHead: MB1\_ARG1

Name	Status
STA010R01_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model2_03_Spot_010JG02	NO ROBOT
STA010R01_Model1_03_Spot_010JG02	NO ROBOT
STA010R01_Model2_03_Spot_010JG02	NO ROBOT
STA010R02_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model2_03_Spot_010JG02	NO ROBOT
STA010R01_Model1_03_Spot_010JG02	NO ROBOT
STA010R01_Model2_03_Spot_010JG02	NO ROBOT
STA010R02_Model1_03_Spot_010JG02	NO ROBOT
STA010R02_Model2_03_Spot_010JG02	NO ROBOT
MB020R01_F30_01_Glue_020JG01_L	NOK
MB020R01_cGun1_Service	NOK
MB020R02_F30_01_Glue_020JG01_R	NOK
MB020R02_cGun1_Service	OK
MB020R01_F30_01_Glue_020JG01_L	OK
MB020R01_F30_01_Glue_020JG01_R	NOK
GLUE_MB020JIG01_1_L_F30	NOK
GL_AUTOPURGE1	NOK
TR_GUN1	NOK
GLUE_MB020JIG01_1_R_F30	NOK
GL_AUTOPURGE1	OK
TR_GUN1	OK
GLUE_MB020JIG01_1_L_F30	NOK
GLUE_MB020JIG01_1_R_F30	NOK
GLUE_MB020JIG01_1_L_F30	NOK

Joint Limit Threshold Watcher:  Refresh

Range for selection: 0-15

The form refresh automatically when one press Enter while the box is selected



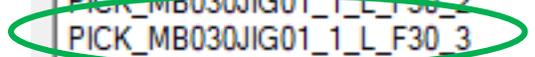
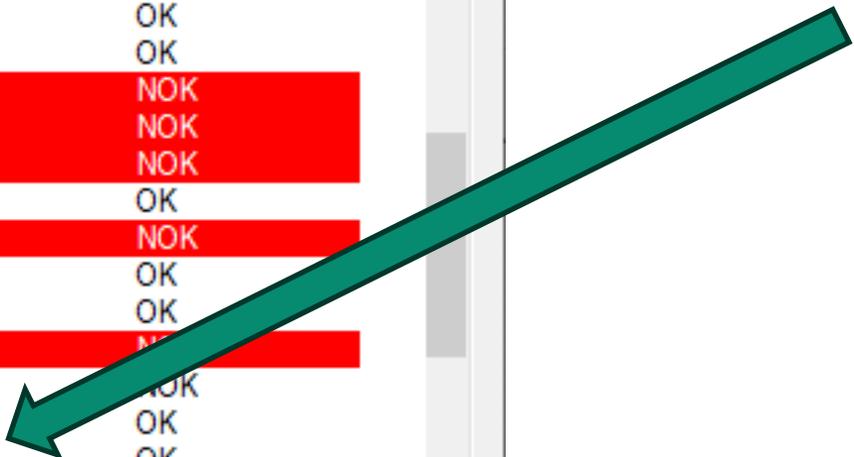
OperationQueryForm

OperationHead: MB1\_ARG1

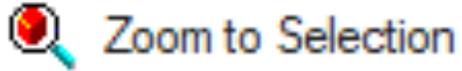
Name	Status
MB030R01_Gripper1_Tcp	OK
MB030R01_Gripper_Service	OK
MB030R01_F30_01_Pick_030JG01_L	OK
MB030R01_F30_02_Pick_030JG01_L	OK
MB030R01_F30_01_Glue_030JG01_L	OK
MB030R01_F30_01_Drop_030JG01_L	OK
MB040R01_F30_01_Pick_030JG01_L	OK
MB040R01_F30_01_Put_030JG01_L	OK
MB040R01_F30_02_Put_030JG01_L	NOK
MB040R02_F30_01_Pick_030JG01_R	NOK
MB040R02_F30_01_Put_030JG01_R	NOK
MB040R02_F30_02_Put_030JG01_R	OK
DROP_MB030JIG01_4_L_F30	NOK
PICK_MB030JIG01_1_L_F30	OK
PICK_MB030JIG01_2_L_F30	OK
GLUE_MB030JIG01_3_L_F30	NOK
PICK_MB030JIG01_2_L_F30_2	NOK
PICK_MB030JIG01_1_L_F30_2	OK
PICK_MB030JIG01_1_L_F30_3	OK
PICK_MB030JIG01_2_L_F30_4	OK
PICK_MB030JIG01_1_L_F30_4	OK
PICK_MB030JIG01_2_L_F30_3	OK
GLUESHOW_F30	OK
TR_GRIP1	OK
GLUE_MB030JIG01_3_L_F30	NOK
STA010R01_Model1_03_Spot_010JG02	NO ROBOT

Joint Limit Threshold Watcher: 10.00 Refresh

Click on a row



# Two events will get triggered



1. The viewer will zoom in to the robot in charge of the operation

2. The JointConfig Form will open



Operation Name: PICK\_MB030JIG01\_2\_L\_F30\_4  
RobotName: MB030\_R01

Name	J1	J2	J3	J4	J5	J6
P5	-0.12	-20	0.03	0	-90.03	-49.05
P10	-40.42	-15.72	13.01	0	-103.01	-8.75
P15	-128.56	-30.52	16.82	0	-106.82	79.39
P20	-128.56	-30.52	16.82	0	-106.82	-10.61
P25	-138.07	-39.58	-2.89	-92.63	-47.65	45.6
P30	-124.67	57.56	-1.79	-92.58	-34.71	43.97
P35	-124.67	66.03	-24.2	-120.66	-41.4	79.15
P35	-124.67	57.56	-1.79	-92.58	-34.71	43.97
P40	-138.07	-39.58	-2.89	-92.63	-47.65	45.6
P45	-128.56	-30.52	16.82	0	-106.82	-10.61
P50	-128.56	-30.52	16.82	0	-106.82	79.39
P55	-40.42	-15.72	13.01	0	-103.01	-8.75
P60	-0.12	-20	0.03	0	-90.03	-49.05

**Joint Limits**

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

**Text Color Coding And Identifier**

- Unreachable NOK
- Near Singularity # item #
- Close to Joint Limit \$ item \$

Robot Jog Add To Path Editor Refresh

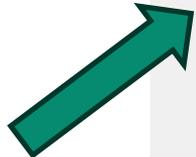
Joint Limit Threshold Watcher: 15.00

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

Operation Name: PICK\_MB030JIG01\_2\_L\_F30\_4

RobotName: MB030\_R01

Name	J1	J2	J3	J4	J5	J6	
P5	-0.12	-20	0.03	0	-90.03	-49.05	
P10	-40.42	-15.72	13.01	0	-103.01	-8.75	
P15	-128.56	-30.52	16.82	0	-106.82	79.39	
P20	-128.56	-30.52	16.82	0	-106.82	-10.61	
P25	-138.07	-39.58	-2.89	-92.63	-47.65	45.6	
P30	-124.67	57.56	-1.79	-92.58	-34.71	43.97	
pPickHHL4	-124.67	66.03	-24.2	-120.66	-41.4	79.15	
P35	-124.67	57.56	-1.79	-92.58	-34.71	43.97	
P40	-138.07	-39.58	-2.89	-92.63	\$ 111 \$	45.6	
P45	-128.56	-30.52	16.82	0	-106.82	-10.61	
P50	-128.56	-30.52	16.82	0	-106.82	79.39	
P55	-40.42	-15.72	13.01	0	-103.01	-8.75	
P60	-0.12	-20	0.03	0	-90.03	-49.05	



List of viapoints

### Joint Limits

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

### Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Robot Jog    Add To Path Editor    Refresh

Joint Limit Threshold Watcher: 15.00



The Threshold will match what's on the Operation List

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

Operation Name: PICK\_MB040EMS\_1\_L\_F30

RobotName: MB040\_R01

### Joint Limits

Name	J1	J2	J3	J4	J5	J6	
P5	-89.65	-29.9	0.33	0	-90.33	-179.77	
P10	-84.11	-16.9	17.01	-95.11	-82.67	-106.35	
P15	-62.44	-2.04	23.94	-85.28	-62.33	-113.4	
pPickEMS	-55.02	6.62	24.18	-81.64	-55.62	-114.59	
P20	-55.14	8.09	26.07	-80.44	-56.02	-116.82	
P25	-62.59	-0.7	25.66	-84.45	-62.61	-115.33	
P30	-84.11	-16.9	17.01	-95.11	-82.67	-106.35	
P35	-89.65	-29.9	0.33	0	-90.33	-179.77	

Name	LowerLimit	UpperLimit
j1	-180	180
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

### Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Robot Jog    Add To Path Editor    Refresh

Joint Limit Threshold Watcher: 10.00

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

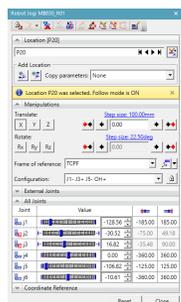
When a row is selected



\* Robot will jump to that viapoint where possible



\* Robot Jog will change to the config of the viapoint



Operation Name: PICK\_MB030JIG01\_2\_L\_F30\_4

RobotName: MB030\_R01

Name	J1	J2	J3	J4	J5	J6
P5	-0.12	-20	0.03	0	-90.03	-49.05
P10	-40.42	-15.72	13.01	0	-103.01	-8.75
P15	-128.56	-30.52	16.82	0	-106.82	79.39
P20	-128.56	-30.52	16.82	0	-106.82	-10.61
P25	-138.07	-39.58	-2.89	-92.63	-47.65	45.6
P30	-124.67	57.56	-1.79	-92.58	-34.71	43.97
pPickHHL4	-124.67	66.03	-24.2	-120.66	-41.4	79.15
P35	-124.67	57.56	-1.79	-92.58	34.71	43.97
P40	-138.07	-39.58	-2.89	-92.63	\$ 111 \$	45.6
P45	-128.56	-30.52	16.82	0	-106.82	-10.61
P50	-128.56	-30.52	16.82	0	-106.82	79.39
P55	-40.42	-15.72	13.01	0	-103.01	-8.75
P60	-0.12	-20	0.03	0	-90.03	-49.05

### Joint Limits

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

### Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

Close to Joint Limit

\$ 111 \$

The item in the row responsible for the error will be marked with the identifier

\$ item \$

Operation Name: DROP\_MB030JIG01\_4\_L\_F30

RobotName: MB030\_R01

Name	J1	J2	J3	J4	J5	J6
P5	-0.12	-20	0.03	0	-90.03	-49.05
P10	7.99	-25.93	17	42.4	-21.25	-88.48
P15	50.33	14.58	17.45	109.88	42.75	-165.39
pDropHHL	50.33	10.09	9.7	101.49	40.65	-154.17
P20	50.33	14.58	17.45	109.88	42.75	-165.39
P25	105.61	-7.14	13.34	50.46	-20.43	-277.79
pDropQHL	105.61	-10.3	6.67	67.42	-16.95	-295.68
P30	105.61	-7.14	13.34	50.46	-20.43	-277.79
<b>P35</b>	<b>41.29</b>	<b>-16.11</b>	<b>10.23</b>	<b>112.01</b>	<b># 2.93 #</b>	<b>-251.9</b>
P40	16.93	0.84	25.5	14.51	-87.27	-55.38
P45	-0.12	-20	0.03	0	-90.03	-49.05

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

**Text Color Coding And Identifier**

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Robot Jog    Add To Path Editor    Refresh

Joint Limit Threshold Watcher:

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

Near Singularity

# 2.93 #

The item in the row responsible for the error will be marked with the identifier # item #

## Singularity Check

- Wrist Singularity
  - $|J5| \leq 15 \text{ deg}$

Operation Name: MB040R02\_F30\_02\_Put\_030JG01\_R

RobotName: MB040\_R02

Name	J1	J2	J3	J4	J5	J6
P5	71.85	63.41	-24.35	-82.3	73.52	-115.46
P10	81.16	57.51	-27.67	-85.87	82.18	-117.96
P15	NOK	NOK	NOK	NOK	NOK	NOK
HOME_mirrored	NOK	NOK	NOK	NOK	NOK	NOK

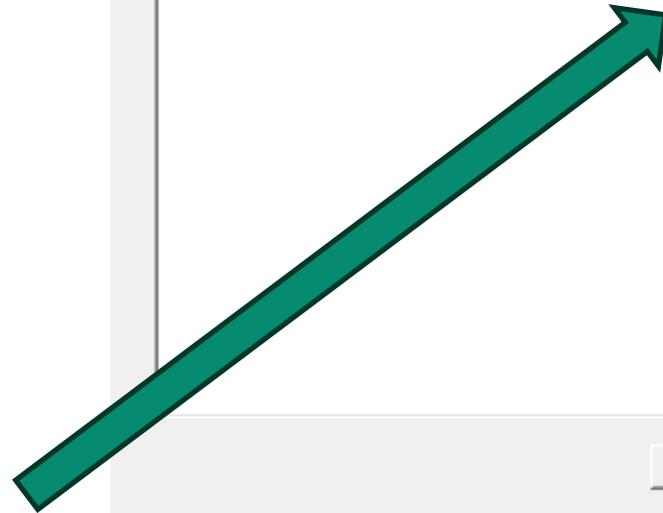
### Joint Limits

Name	LowerLimit	UpperLimit
j1	-180	180
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

### Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)



Unreachable Viapoint

Robot Jog    Add To Path Editor    Refresh

Joint Limit Threshold Watcher: 10.00

Operation Name: PICK\_MB030JIG01\_2\_L\_F30\_4

RobotName: MB030\_R01

### Joint Limits

Name	J1	J2	J3	J4	J5	J6
P5	-0.12	-20	0.03	0	-90.03	-49.05
P10	-40.42	-15.72	13.01	0	-103.01	-8.75
P15	-128.56	-30.52	16.82	0	-106.82	79.39
P20	-128.56	-30.52	16.82	0	-106.82	-10.61
P25	-138.07	-39.58	-2.89	-92.63	-47.65	45.6
P30	-124.67	57.56	-1.79	-92.58	-34.71	43.97
pPickHHL4	-124.67	66.03	-24.2	-120.66	-41.4	79.15
P35	-124.67	57.56	-1.79	-92.58	-34.71	43.97
P40	-138.07	-39.58	-2.89	-92.63	-111.1	45.6
P45	-128.56	-30.52	16.82	0	-106.82	-10.61
P50	-128.56	-30.52	16.82	0	-106.82	79.39
P55	-40.42	-15.72	13.01	0	-103.01	-8.75
P60	-0.12	-20	0.03	0	-90.03	-49.05

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

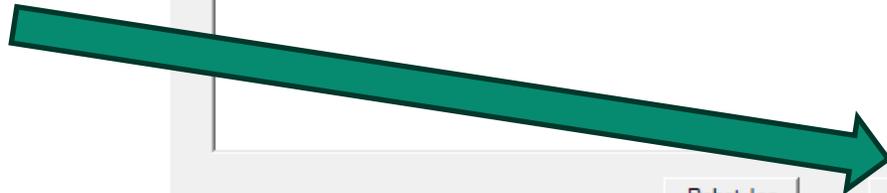
### Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

Robot Jog    Add To Path Editor    Refresh

Joint Limit Threshold Watcher: 15.00



Path Editor - MB030\_R01

Paths & Locations	Attachment	X	Y	Z	RX	RY	RZ	Duration	OLP Commands	Robot	Gun	Comment	Configuration	Es
PICK_MB030JIG0...								25.15		MB030_R01				
P5		-70249.89	83627.74	2278.47	-90.00	0.00	-90.00	1.84					✓	
P10		-69829.64	84727.38	2680.33	-90.00	0.00	-90.00	1.21					✓	
P15		-67654.64	84727.38	2680.33	-90.00	0.00	-90.00	3.17					✓	
P20		-68499.51	83900.49	2680.32	-90.00	0.00	-180.00	1.33					✓	
P25		-68308.67	85286.85	1887.18	-180.00	0.86	179.52	1.72					✓	
P30		-67691.58	86781.93	1674.10	180.00	0.00	180.00	2.63					✓	
pPickHHL4		-67691.58	86781.93	874.10	180.00	0.00	180.00	2.10	! Check MH PP On ; CALL			pPickHHL4	✓	
P35		-67691.58	86781.93	1674.10	-180.00	0.00	180.00	1.79	! Check MH PP On ; CALL				✓	
P40		-68179.51	83894.30	1877.57	-178.56	8.41	-21.03	1.92					✓	
P45		-68499.51	83900.49	2680.33	-90.00	0.00	-180.00	1.72					✓	

Robot Jog: MB030\_R01

Location [P20]  
P20

Add Location  
Copy parameters: None

Location P20 was selected. Follow mode is ON

Manipulations  
Translate: Step size: 100.00mm  
X Y Z 0.00  
Rotate: Step size: 22.50deg  
Rx Ry Rz 0.00  
Frame of reference: TCPF  
Configuration: J1- J3+ J5- OH+

External Joints

All Joints

Joint	Value	LowerLimit	UpperLimit
j1	-128.56	-185.00	185.00
j2	-30.52	-75.00	49.18
j3	16.82	-35.48	90.00
j4	0.00	-360.00	360.00
j5	-106.82	-125.00	125.00
j6	-10.61	-360.00	360.00

Coordinate Reference

Reset Close

Operation Name: PICK\_MB030JIG01\_2\_L\_F30\_4

RobotName: MB030\_R01

Name	J1	J2	J3	J4	J5	J6
P5	-0.12	-20	0.03	0	-90.03	-49.05
P10	-40.42	-15.72	13.01	0	-103.01	-8.75
P15	-128.56	-30.52	16.82	0	-106.82	79.39
P20	-128.56	-30.52	16.82	0	-106.82	-10.61
P25	-138.07	-39.58	-2.89	-92.63	-47.65	45.6
P30	-124.67	57.56	-1.79	-92.58	-34.71	43.97
pPickHHL4	-124.67	66.03	-24.2	-120.66	-41.4	79.15
P35	-124.67	57.56	-1.79	-92.58	-34.71	43.97
P40	-138.07	-39.58	-2.89	-92.63	111.1	45.6
P45	-128.56	-30.52	16.82	0	-106.82	-10.61
P50	-128.56	-30.52	16.82	0	-106.82	79.39
P55	-40.42	-15.72	13.01	0	-103.01	-8.75
P60	-0.12	-20	0.03	0	-90.03	-49.05

## Joint Limits

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

## Text Color Coding And Identifier

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Robot Jog Add To Path Editor Refresh

Joint Limit Threshold Watcher: 15.00

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

*Prerequisite: A row must be selected first*

Operation Name: MB040R02\_F30\_02\_Put\_030JG01\_R

RobotName: MB040\_R02

Name	J1	J2	J3	J4	J5	J6
P5	71.85	63.41	-24.35	-82.3	73.52	-115.46
P10	81.16	57.51	-27.67	-85.87	82.18	-117.96
P15	NOK	NOK	NOK	NOK	NOK	NOK
HOME_mirrored	NOK	NOK	NOK	NOK	NOK	NOK

### Joint Limits

Name	LowerLimit	UpperLimit
j1	-180	180
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

### Text Color Coding And Identification

Unreachable	NOK
Near Singularity	# item #
Close to Joint Limit	\$ item \$

Robot Jog

Add To Path Editor

Refresh

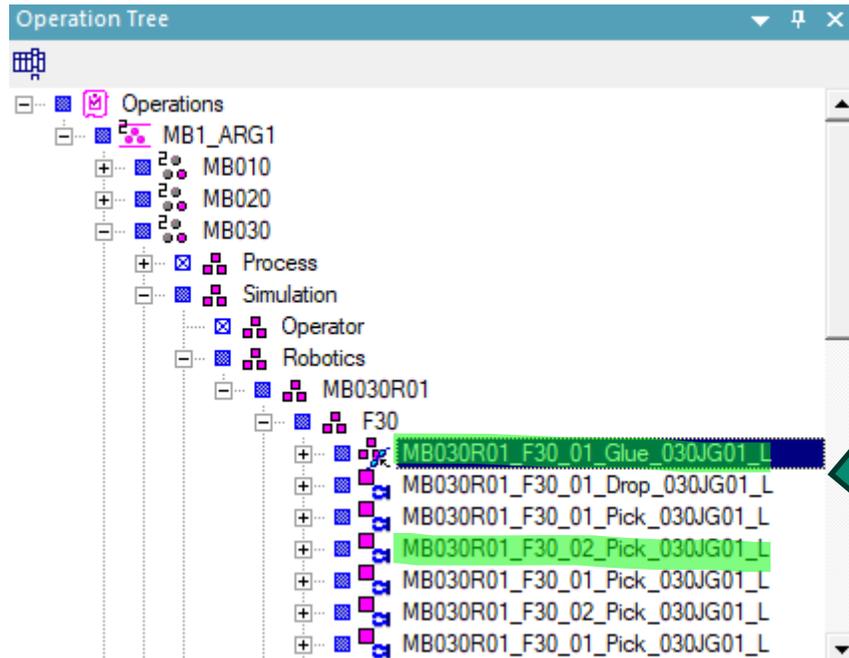
Joint Limit Threshold Watcher: 10.00

Written by David Nie for FFT Shanghai  
Special thanks to Lujun Wei  
on 28-12-2023  
(Tested using PS on eMs StandAlone Ver.15.1.2)

Note that Joint 2 & 3 will be neglected for **Close to Joint Limit** Check

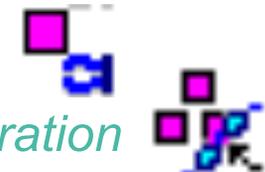
(For Joint 2 & 3 are controlled by the robot model, their joint angle correlated, and the joint limits change as the angle changes. Therefore, we assume that the 2 joints are always regulated, and that no abnormalities will incur.)

## 2. Scenario 2: Viapoint list for single operation



Click on an operation

Supported Type :  
1. WeldOperation  
2. ContinuousOperation



Operation Name: MB030R01\_F30\_01\_Pick\_030JG01\_L

RobotName: MB030\_R01

Name	J1	J2	J3	J4	J5	J6
P5	-0.12	-20	0.03	0	-90.03	-49.05
P10	-49.03	-25.53	-0.27	0	-89.73	90.73
P15	-46.1	-42.76	8.83	81.09	-45.07	54.21
P20	-64.7	41.21	-17.39	122.31	-30.38	4.59
pick_qianhengliang	-64.69	50.46	-30.64	137.15	-38.94	-13.35
P25	-64.7	39.47	-11.35	112.6	-27.58	15.67
P30	-46.1	-42.76	8.83	81.09	-45.07	54.21
P35	-49.03	-25.53	-0.27	0	-89.73	90.73
P40	-0.12	-20	0.03	0	-90.03	-49.05

Name	LowerLimit	UpperLimit
j1	-185	185
j2	NULL	NULL
j3	NULL	NULL
j4	-360	360
j5	-125	125
j6	-360	360

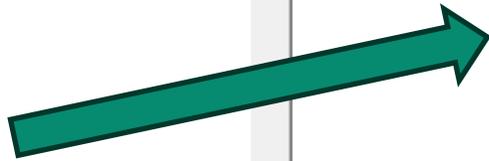
**Text Color Coding And Identifier**

- Unreachable NOK
- Near Singularity # item #
- Close to Joint Limit \$ item \$

Robot Jog    Add To Path Editor    Refresh

Joint Limit Threshold Watcher:

Written by David Nie for FFT Shanghai  
 Special thanks to Lujun Wei  
 on 28-12-2023  
 (Tested using PS on eMs StandAlone Ver.15.1.2)



## Obtaining the viapoint list directly

*The default value for the “Joint Limit Threshold Watcher” is 10.*

### 3. Q/A

**Q: The Plugin cannot be selected**

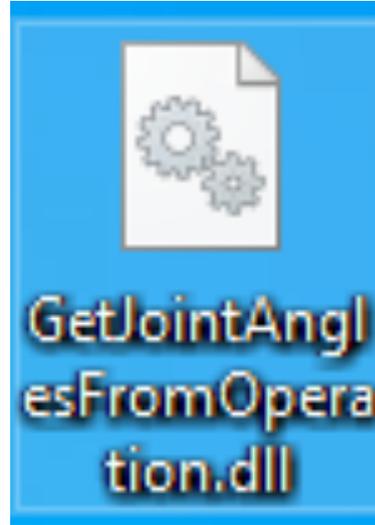
A: The operator needs to select a supported operation type

**Q: Robot Jog cannot be selected**

A: The operator needs to click on a row first, for the Robot Jog needs a target.

## 4. Import the plugin

- Step 1: Locate the library file (.dll)



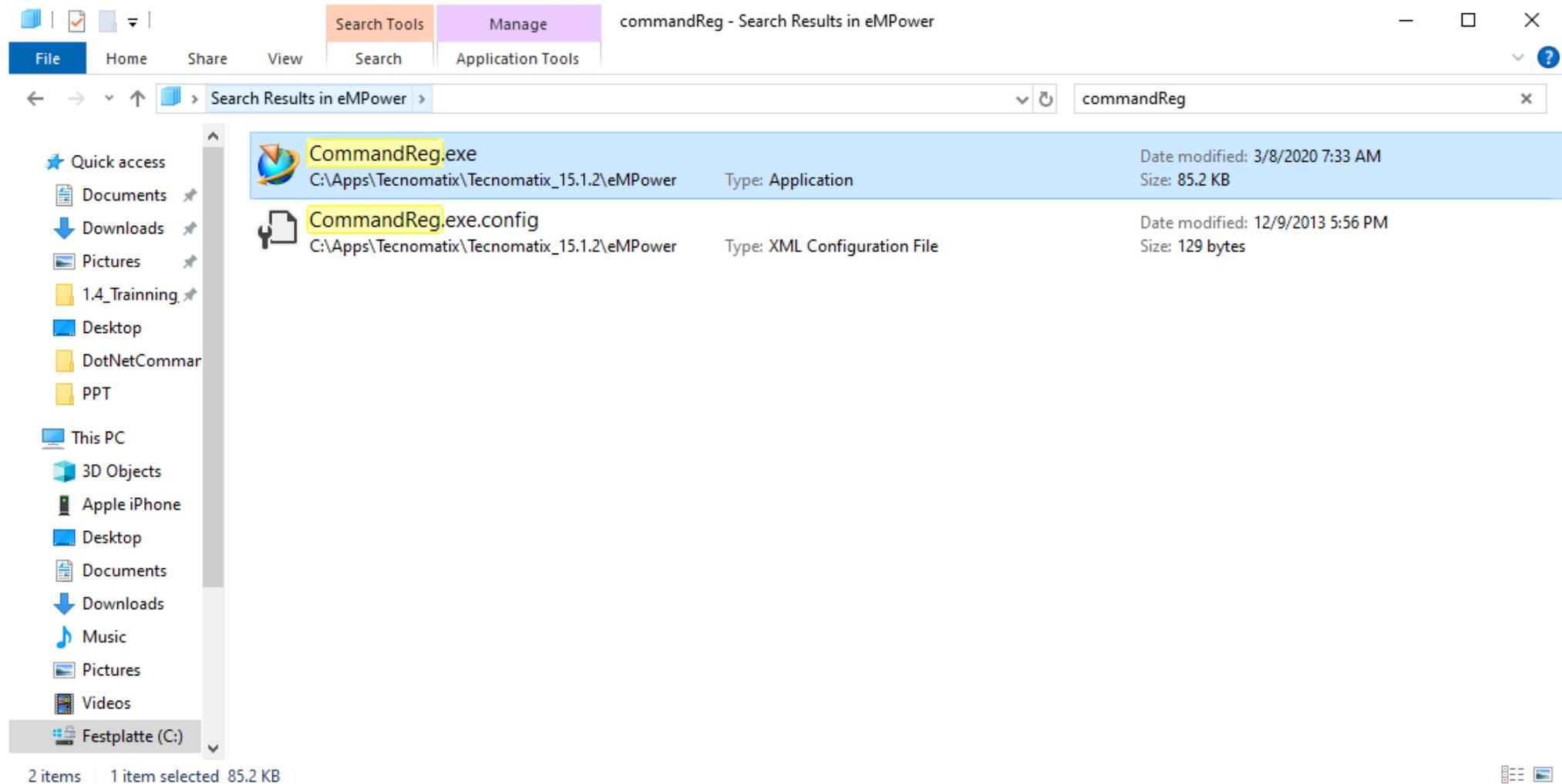
- Step 2: Place it under /DotNetCommands folder, as shown below

..\Tecnomatix\Tecnomatix\_15.1.2\eMPower\DotNetCommands

(Process Simulate is often installed under C:\Apps or C:\Program Files)

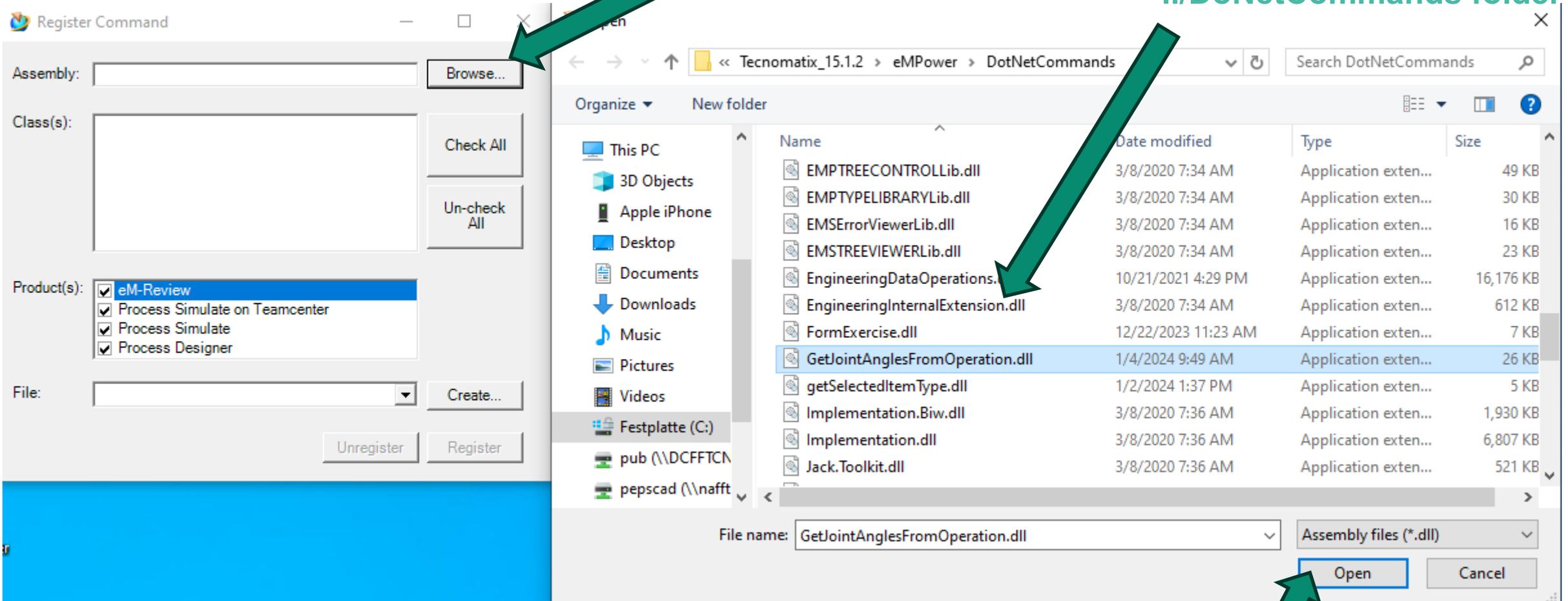
- Step 3: Register command

Search for CommandReg.exe under the Root of the software, open it

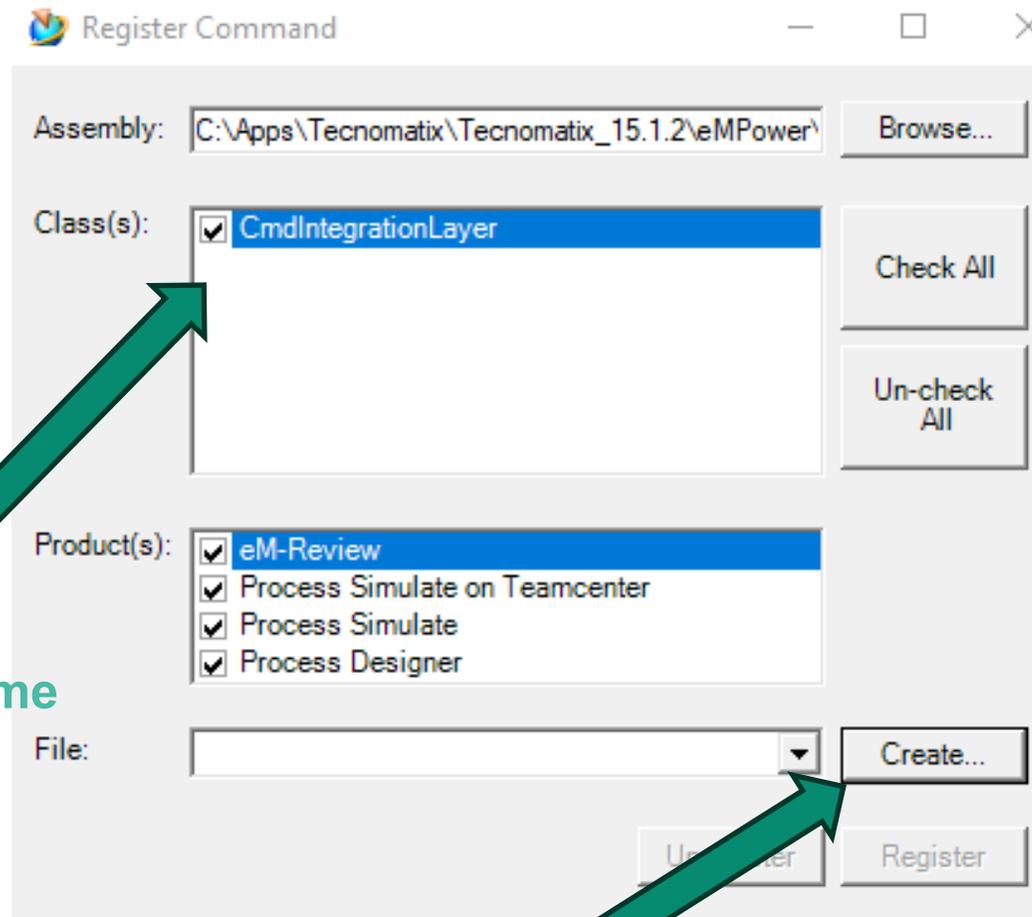


1. Click on Browse

2. Find the plugin under  
../DoNetCommands folder



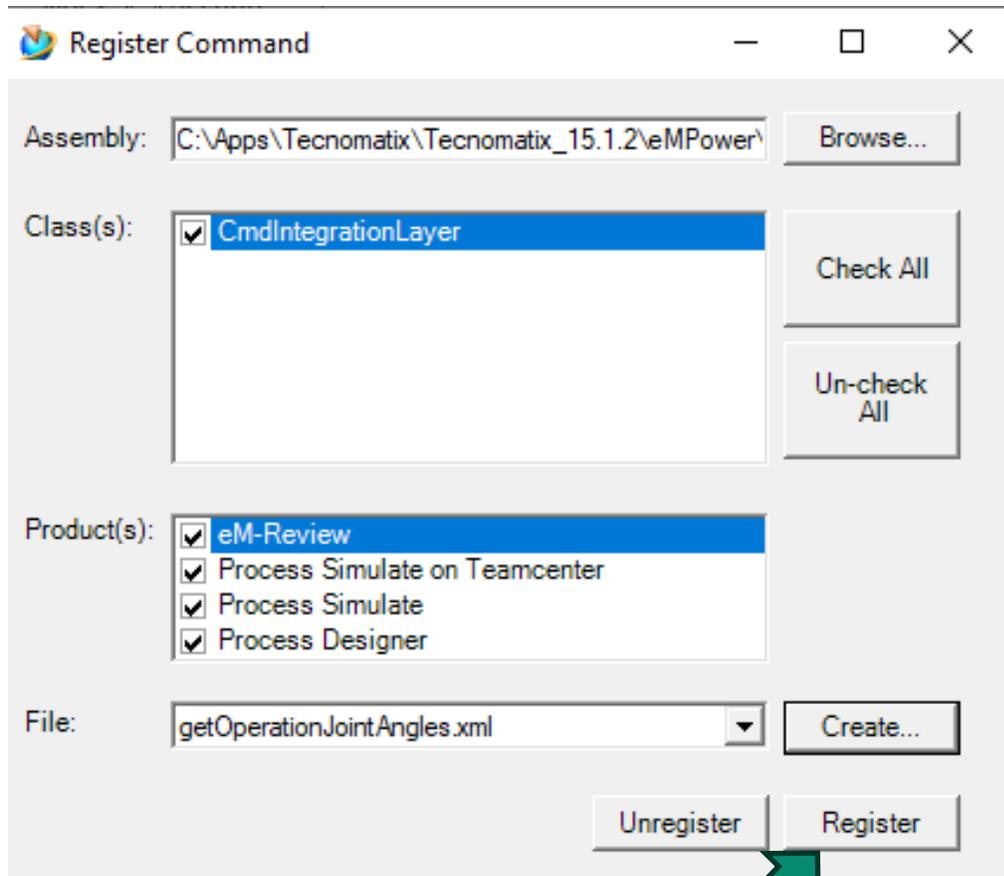
3. Click Open



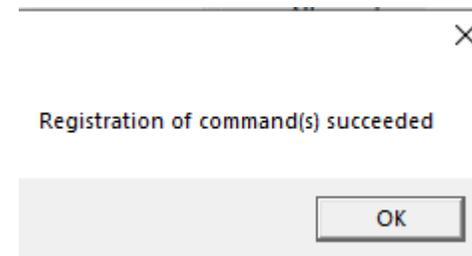
1. Double check the name

2. Click on Create

3. Enter the name for the (.xml) file  
(The name of the file doesn't matter, it's for  
storing temporary data)  
e.g. getOperationJointAnglesDB



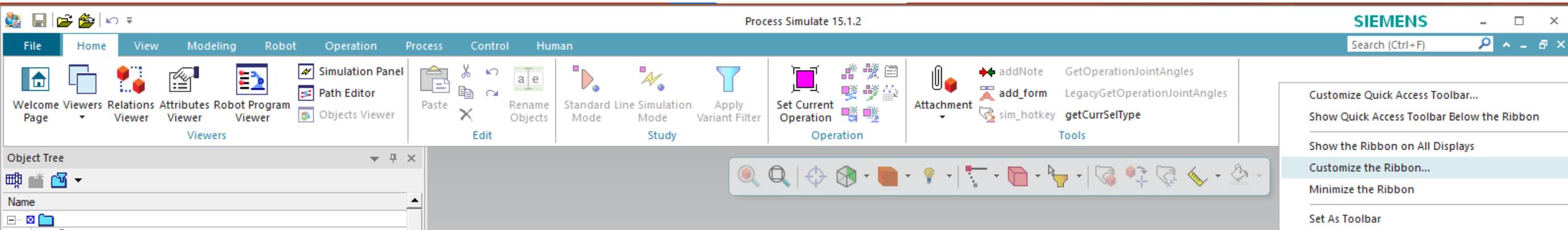
1. Click on Register



2. and... DONE!!!

- Step 4: Import the plugin in PS

- Open PS
- Right Click in the ribbon area, select Customize the Ribbon

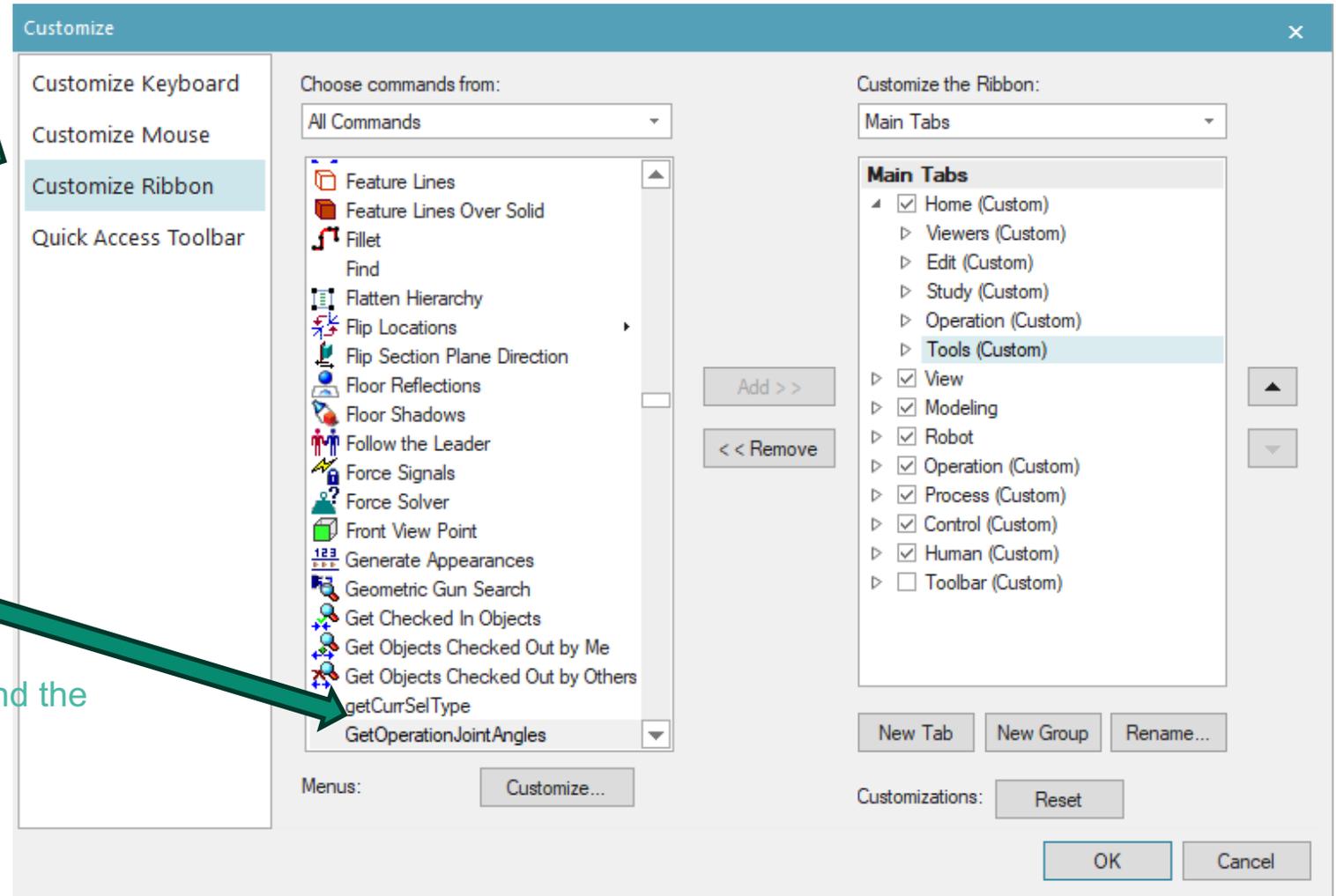


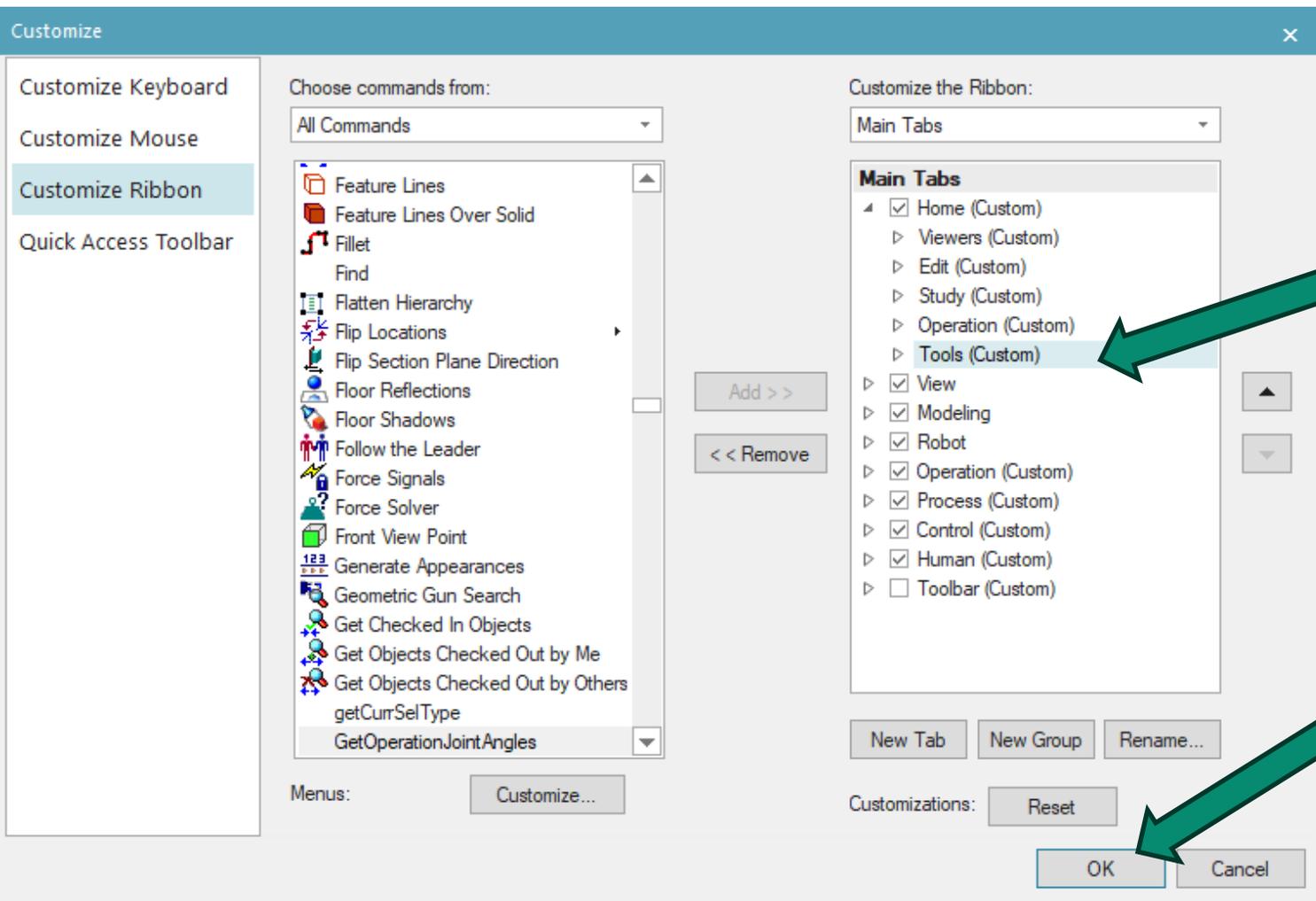
## 1. Select Customize Ribbon



## 2. Find the plugin under the name GetOperationJointAngles

(ProTip: For max efficiency, click on an item in the command menu, then type “geto”, the system will find the first command with the corresponding prefix)



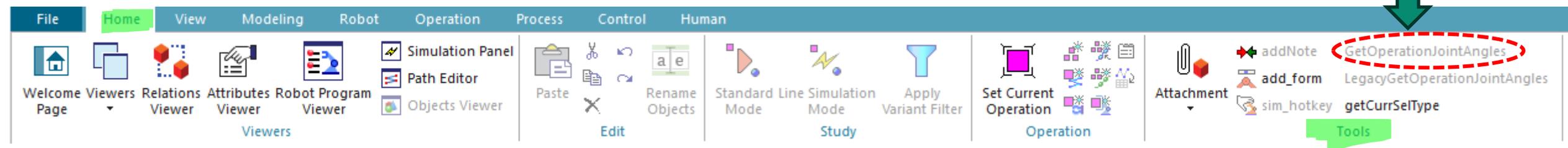


1. Select the location you want the plugin to be placed

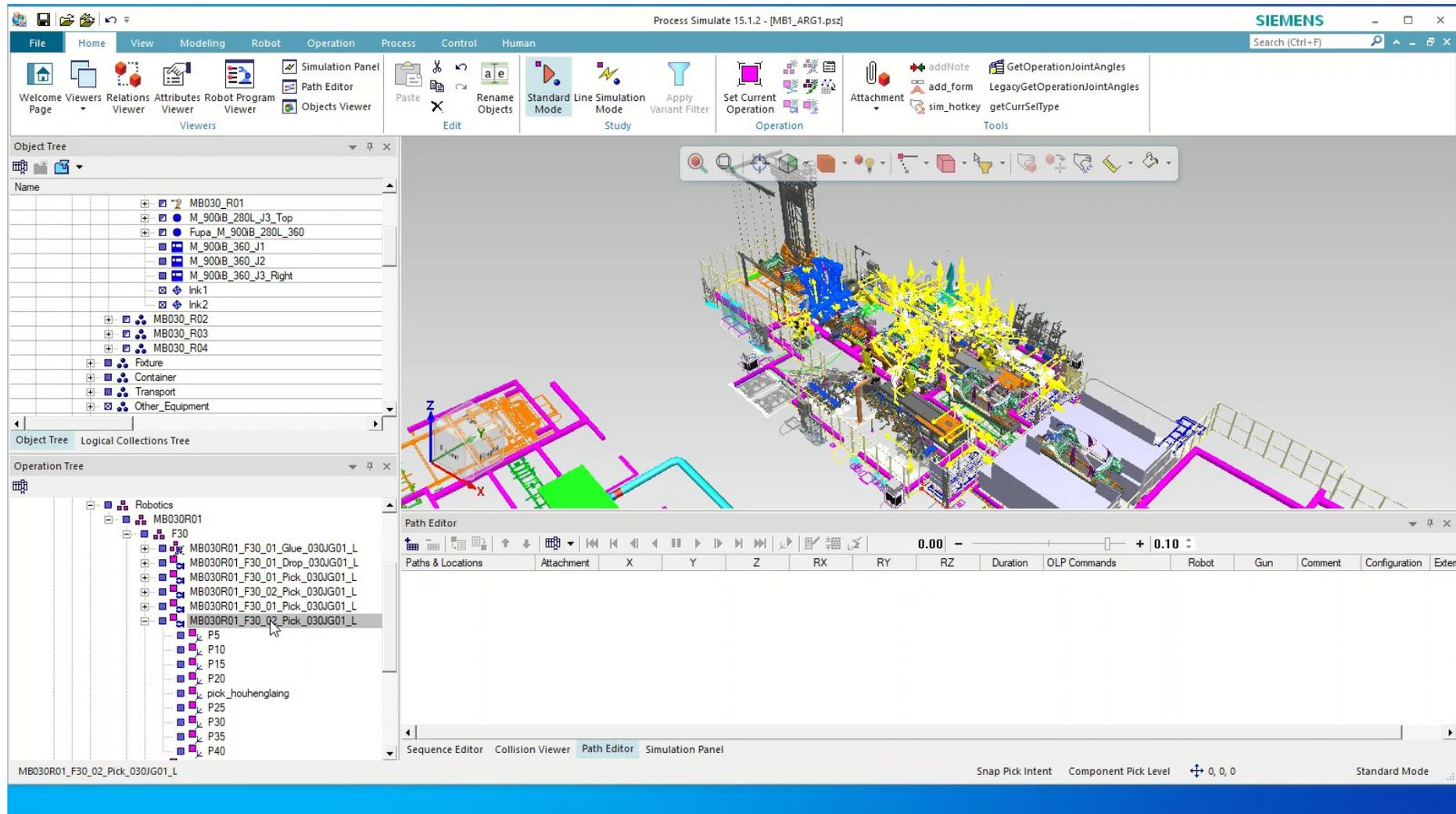
(For example, if we place it under Home -> Tools, it will be in the location shown in the image below.)

2. Click OK

The plugin!



# 5. Video Demo



## Contact



### Software Version used for testing:

Process Simulate 15.1.2

### Special Thanks to: Lujun Wei

Since the plugin is relatively young, if you found any bug, issue within the functionalities, have any suggestions or feedback in general

Please send an email to:

[davidnie0418@gmail.com](mailto:davidnie0418@gmail.com)

&

[lujun.wei@cn-fft.com](mailto:lujun.wei@cn-fft.com)

Please attach any screenshots, error messages you can gather, and a description of the issue.

Happy PS-ing!!!~~~

## Contact



### FFT Production Systems (Shanghai) Co., Ltd. 爱孚迪（上海）制造系统工程有限公司



No. 388 Yuanda Rd., Anting, Jiading District, 201805, Shanghai,  
P.R.China 上海市嘉定区安亭镇园大路388号



David Nie



+86 (21) 69169555



Engineering 技术部



davidnie0418@gmail.com



www.cn-fft.com

