SIEMENS

NX Mechatronics Concept Designer

External Communication – SHM

Revision History

Rev. #	Date of change	Name of person making change	Description of Change
1.0	09/20/2018	MCD team	Initial Version
2.0	0715/2021	MCD team	Update the software version
3.0			

1 Introduction

1.1 Overview

The following documentation describes the structure, machine model generation and commissioning of the soft-in-the-loop solution for SHM communication protocol. The following diagram shows the overview of the communication.



Note It is assumed that readers have knowledge about SIMIT setup and configuration, and operating Mechatronics Concept Designer.

1.2 Principle of operation

The following figure shows the operating principle of the application example. The SIMIT and MCD must to be executed on a same computer or virtual machine (VM).



1.3 Components used

This application example was created with the following software components:

Component	Quantity	Note
SIMIT V10.0 or higher	1	
Mechatronics Concept Designer V953 or higher	1	

This application example comprises the following components:

Component	File name	Note
Documentation	Case_SHM.docx	
SIMIT project	CirclePicker.simarc	
MCD part	CirclePicker_SHM.zip	

3 Commissioning and coupling

3.1 Configuration in SIMIT

- a) Start SIMIT SP Demo
- b) Retrieve SIMIT project: Start -> Retrieve project -> Archivename, select "CirclePicker.simarc", -> Retrieve

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Star	t	1			Retriev	ve project		
_					3		2	_
	Coup	olings 🗧		Open existing project Create new project	5	Archivename		15
	Simu	lation model		Retrieve project		raiger folder of a		10
	Sint			Retrieve sample project			Retije	eve
pen	h th	e project view						
	-	Couplings		Add coupling				
		Simulation model	3	Add chart				
	⇒	Automatic model creation	⋙	Generate charts automatically				
	4	Project view		Open the project view				

d) In Project navigation, select "Chart", right click, Open



e) In toolbar, Click Start to start simulation



3.2 Configuration in NX MCD

a) Start NX MCD

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- b) Open file "__Top_System_Portal_Final.prt"
- c) Open External Signal Configuration dialog: Home -> Automation -> External Signal Configuration



- In SHM page, click Add SHMs
- Input SHM Name: SIMITShared Memory, press Enter

OPC DA	OPCUA	SHM	Matlab	PLCS	IM Adv	ICP	UDP	Profine
SHMs								/
			Refresh	SHMs	Status			
SHM	Name	Endian	Stat	us	Owner P	art		*
SIMIT	SIMITShared M Lit		n Exist	Exist _		Top_System_Portal_Final		
CLIM	Data							
SELIVI	Data							~
Inp	ut							^
N	ame	Data Ty	pe ۱	Value	Mess	age		
Lig	LightSensor_1		f	false				
Lig	htSensor_2	bool	f	alse				
Lig	htSensor_3	bool	f	alse				
Out	put							^
N	ame	Data Ty	pe ۱	Value	Mess	age		
Ax	is_X_Position	double	. 0	.000000)	-		
Ax	is_Y_Position	double	0	.000000)			
Ax	is_Z_Position	double	0	.000000)			
Co	nveyor_Spee	d double	0	.000000)			
Ge	tCircle	bool	f	alse				
Re	leaseCircle	bool	f	alse				
Ne	xtCircle	bool	f	alse				

- Click OK
- d) Open signal mapping dialog:
 - Type: SHM
 - SHM Names: SIMITShared Memory
 - Click **Do Auto Mapping**, then signal mapping will be list under **Mapped Signals** list.

MCD Signal Name	Direction	External Signal Name	Owner Component
			^
Axis_X_Position	←	Axis_X_Position	
Axis_Y_Position	←	Axis_Y_Position	
Axis_Z_Position	←	Axis_Z_Position	
Conveyor_Speed	←	Conveyor_Speed	
GetCircle	←	GetCircle	
ReleaseCircle	←	ReleaseCircle	
LightSensor_1	→	LightSensor_1	
LightSensor_2	→	LightSensor_2	
11.110 0		12.106	×
	MCD Signal Name Axis_X_Position Axis_Y_Position Axis_Z_Position Conveyor_Speed GetCircle ReleaseCircle LightSensor_1 LightSensor_2	MCD Signal Name Direction	MCD Signal Name Direction External Signal Name Axis_X_Position ← Axis_X_Position Axis_Y_Position ← Axis_Y_Position Axis_Z_Position ← Axis_Z_Position Conveyor_Speed ← Conveyor_Speed GetCircle ← GetCircle ReleaseCircle ← ReleaseCircle LightSensor_1 → LightSensor_2

- Click OK.

3.3.4 Start MCD simulation

a) Start MCD simulation by click Play.



3.3.5 Commissioning

- a) Do operation in SIMIT
 - Click Start button in chart page in SIMIT to control transport surface.
 - Drag slider to move components along X, Y, Z
 - Click button "Get Circle", "Release Circle" and "Next Circle" to "grab circle part", "release circle part" and "generate next part".
 - See detail operations in "CirclePicker.mp4"