

Asean-factori

Lab Siemens (Following3.) IHM Implementation

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[Asean-Factori \(grenoble-inp.fr\)](http://asean-factori.grenoble-inp.fr)

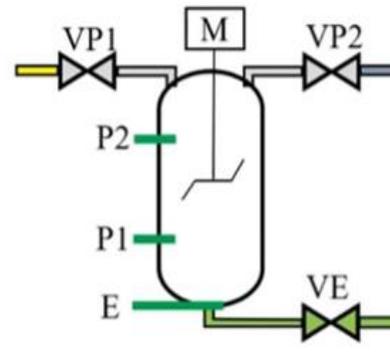


<http://www.gipsa-lab.grenoble-inp.fr/~jean-marc.thiriet/asean/asean.html>

- In the following slides we will show you how to create an IHM for the following tank problem

HMI system (Human Machine Interface).

- Is the interface between the human (operator) and the process (machine/plant).
- The actual control of the process is provided by the control system.
- There is therefore an interface between the operator and WinCC (on the operator panel) and an interface between WinCC and the controller.



Séquence

- T0: E↓, VP1↑
- T1: P1↑, VP1↓, VP2↑
- T2: P2↑, VP2↓, M1↑
- T3: M1↓, VE↑
- T4: P2↓
- T5: P1↓
- T6: VE↓



HMI

SIMATIC HMI Comfort Panels are seamlessly integrated in the TIA Portal via WinCC .
This innovative engineering framework represents the key to the full performance capacity of
Totally Integrated Automation



User management

Management of process and
machine data in recipes

Documentation of process
values and alarms



Process representation with a
clear view structure

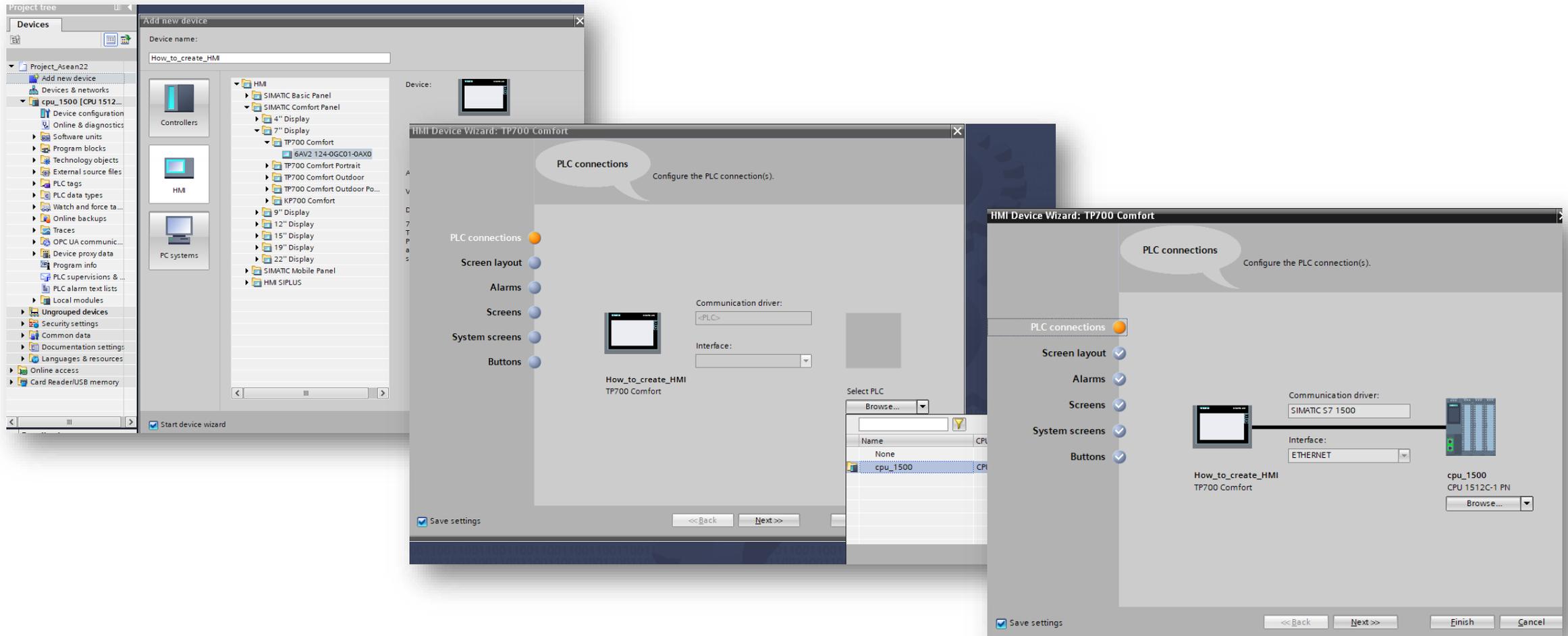
Process control

Alarm display

Archiving of process values and alarms

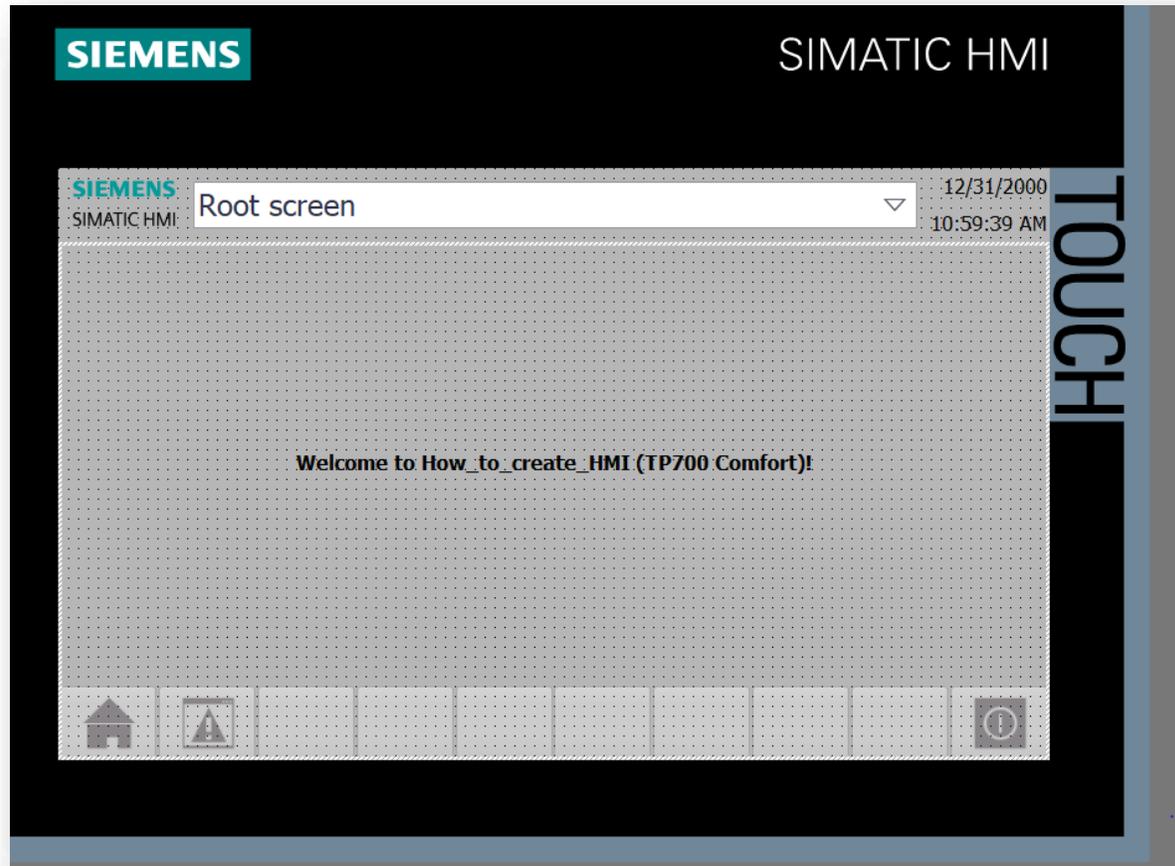
HMI Creation Steps

In the same created project you need to add a new device as follows;



HMI Creation Steps

The following screen is opened as soon as you add your device correctly;



HMI Configuration connexion Steps

-> After adding the device -> Set IP @ -> Then check the connexion

For more details steps : [Siemens: HMI + Hands on the control problem \(notion.site\)](#)

The screenshot illustrates the configuration process in Siemens SIMATIC Manager. It shows the HMI device (HMI_1) connected to the PLC (S7_1500). The 'Connections' table is as follows:

Name	Communication driver	HMI time synchronization mode	Station	Partner
HMI_Connection_1	SIMATIC S7 1500	None	S71500/ET200MP s...	S7_1500
<Add new>				

The 'Parameter' window for the HMI shows the following configuration:

- Interface: ETHERNET
- Station: (Visualized in the Station window)

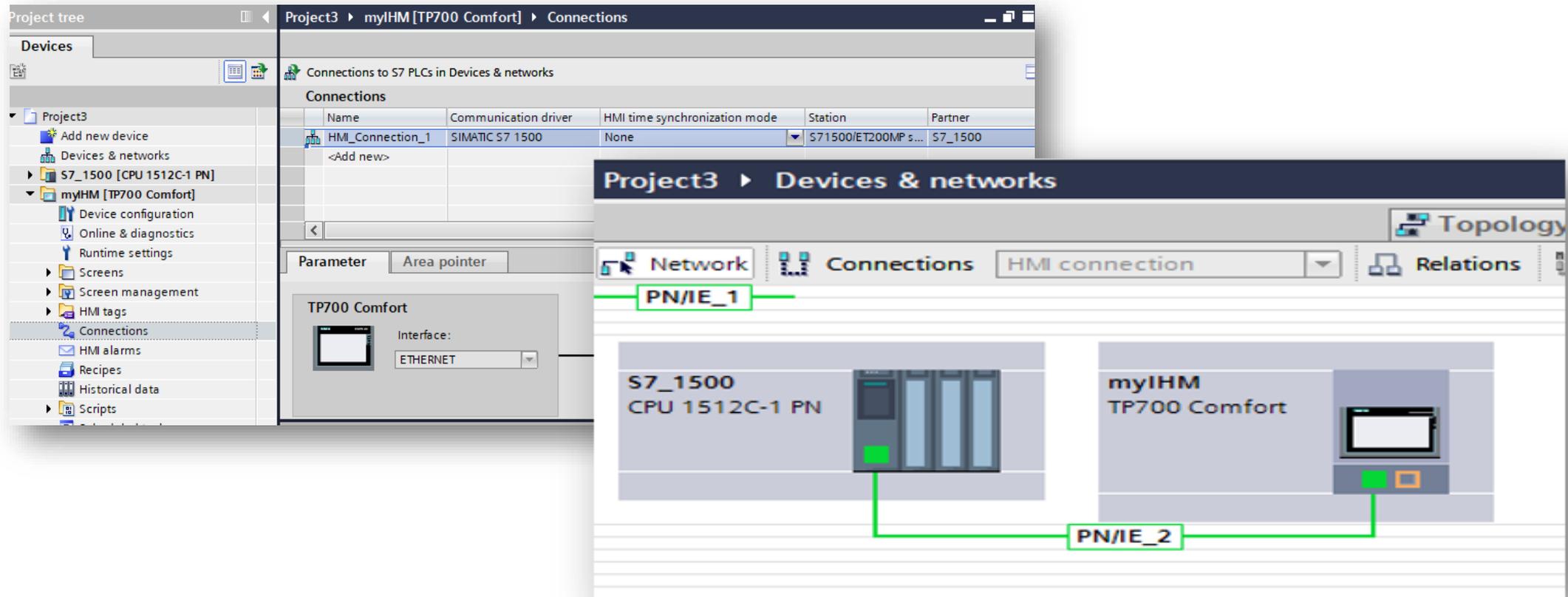
The 'IP protocol' configuration is set to 'Set IP address in the project' with the following values:

- IP address: 10 . 10 . 4 . 25
- Subnet mask: 255 . 255 . 0 . 0
- Use router:
- Router address: 10 . 10 . 255 . 254

HMI Configuration connexion Steps

-> After adding the device -> Set IP @ -> Then check the connexion

For more details steps : [Siemens: HMI + Hands on the control problem \(notion.site\)](#)



Connecting tags between the PLC and the HMI

->Next step to be done is to connect the tags of the two devices.

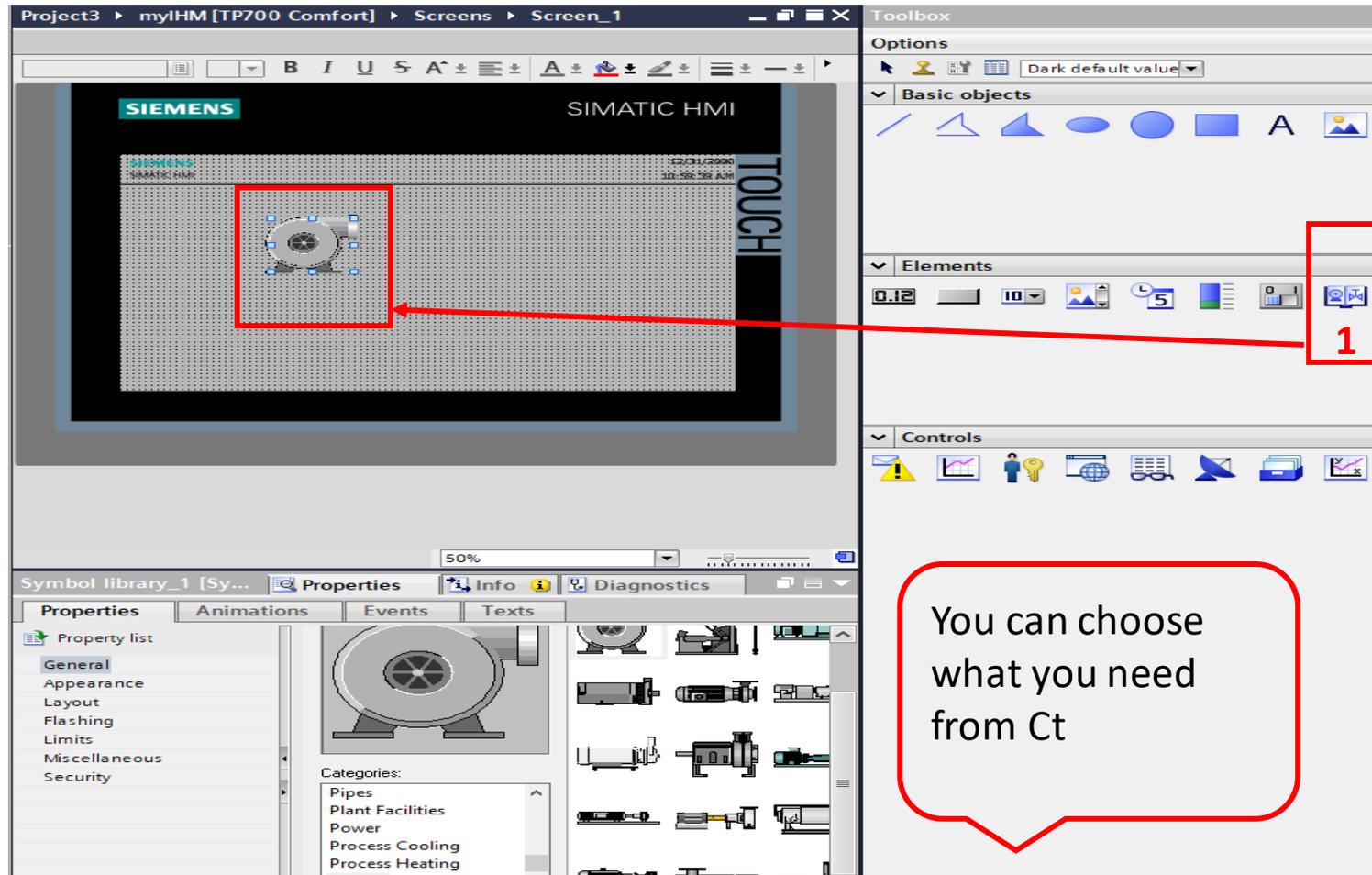
For more details steps : [Siemens: HMI + Hands on the control problem \(notion.site\)](#)

Example:

HMI_tank_tag table							
Name ▲	Data type	Connection	PLC name	PLC tag	Address	Access mode	Acquisition cycle
IEC_Timer_0_DB_ET	Time	HMI_Conne...	S7_1500	IEC_Timer_0_DB.ET		<symbolic access>	1 s
IEC_Timer_0_DB_PT	Time	HMI_Conne...	S7_1500	IEC_Timer_0_DB.PT		<symbolic access>	1 s
IHM_button_Mixing	Bool	HMI_Conne...	S7_1500	mixing		<symbolic access>	1 s
IHM_E	Bool	HMI_Conne...	S7_1500	E		<symbolic access>	1 s
IHM_M	Bool	HMI_Conne...	S7_1500	*m(1)*		<symbolic access>	1 s
IHM_P1	Bool	HMI_Conne...	S7_1500	P1		<symbolic access>	1 s
IHM_P2	Bool	HMI_Conne...	S7_1500	P2		<symbolic access>	1 s
IHM_VE	Bool	HMI_Conne...	S7_1500	*ve(1)*		<symbolic access>	1 s
IHM_VP1	Bool	HMI_Conne...	S7_1500	*vp1(1)*		<symbolic access>	1 s
IHM_VP2	Bool	HMI_Conne...	S7_1500	*vp2(1)*		<symbolic access>	1 s
Tag_ScreenNumber	Bool	<Internal tag>		<Undefined>			1 s

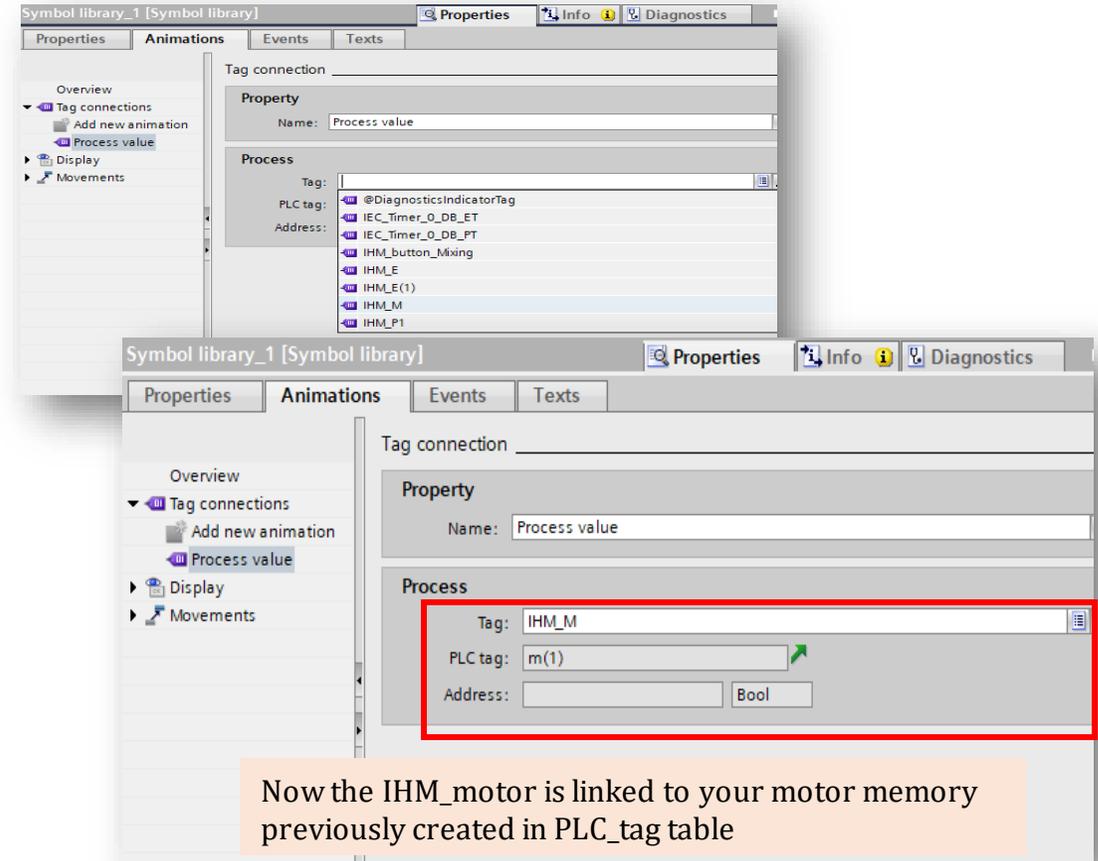
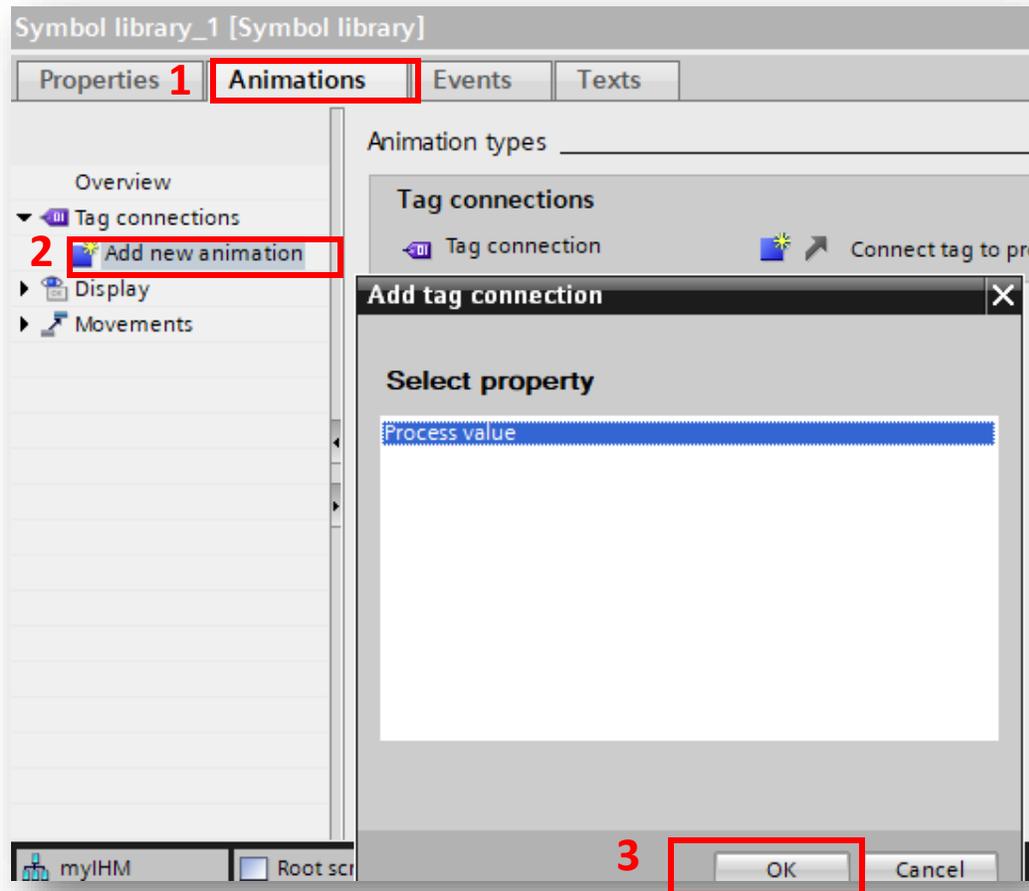
HMI Steps

-> Back to your root screen -> Start creating your Program model by adding the blocks needed as follows;



HMI Steps

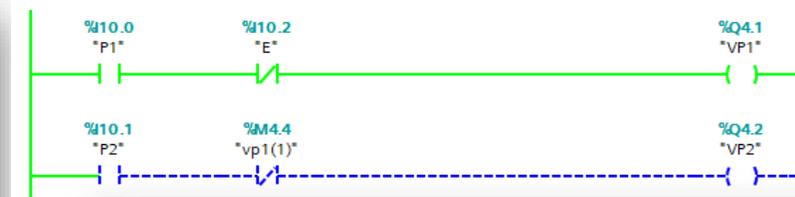
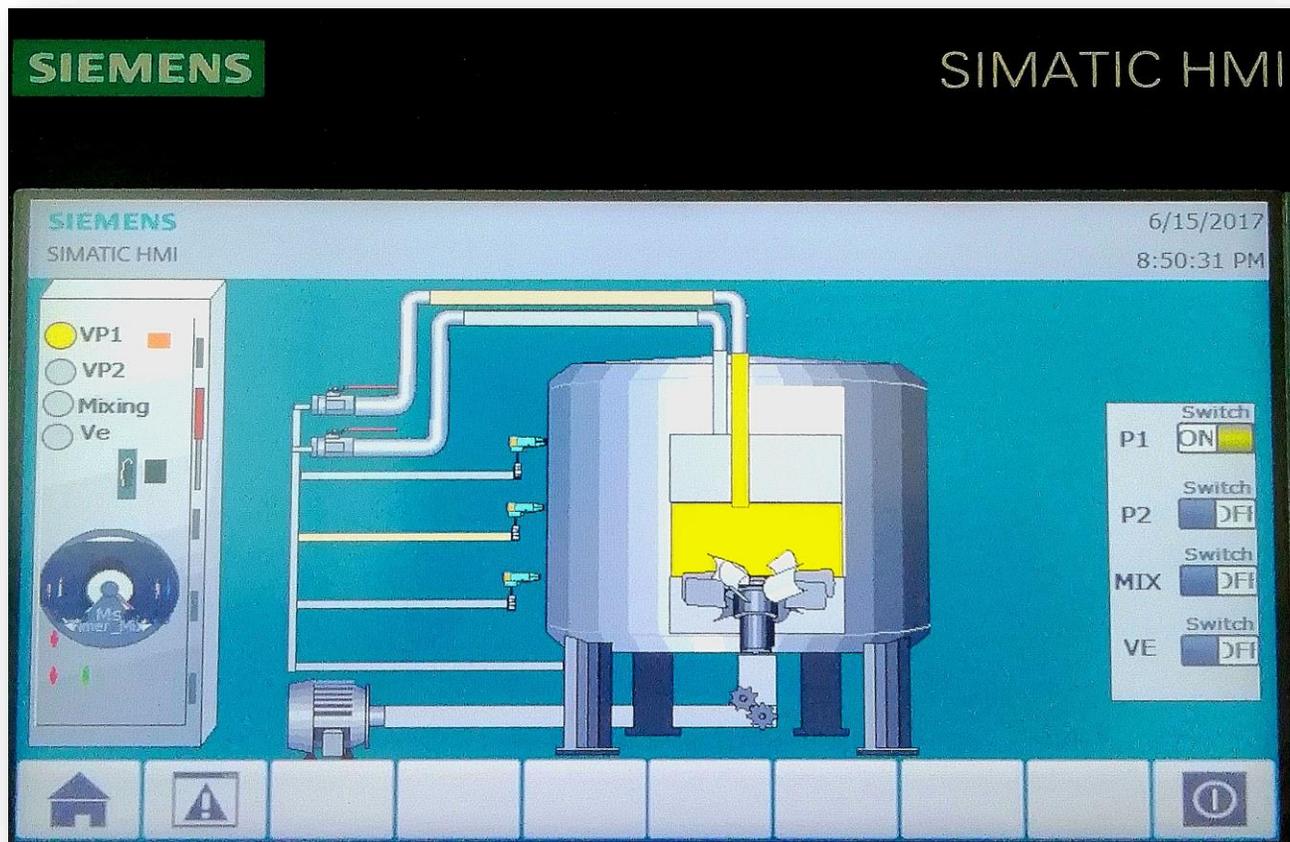
-> For example we can add a motor to the screen from categories-> Then you can add new animation -> Then you need to add tag connection as follows;



TEST_HMI (GICS-tester)

-> Test for the final problem Tank model with GICS-Tester

✓ Open valve 1 (filling yellow product)



GICS Tester

Target IP: 10.10.100.114 Port: 2015

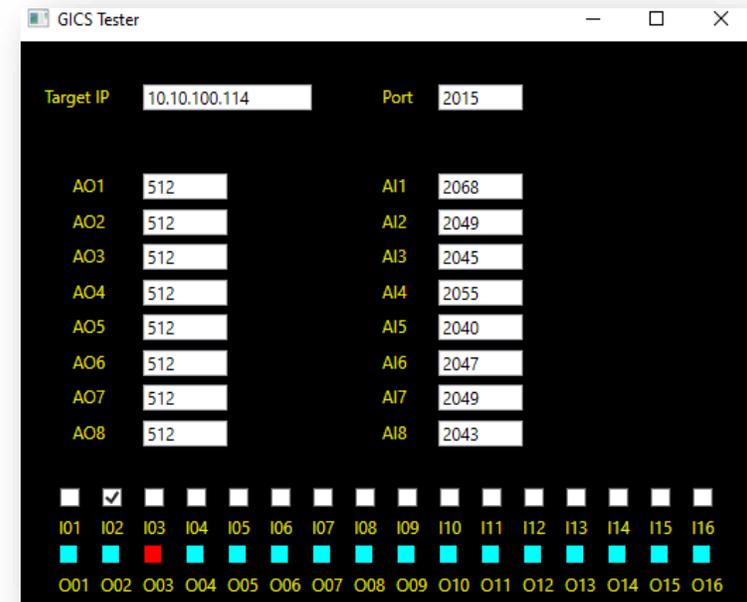
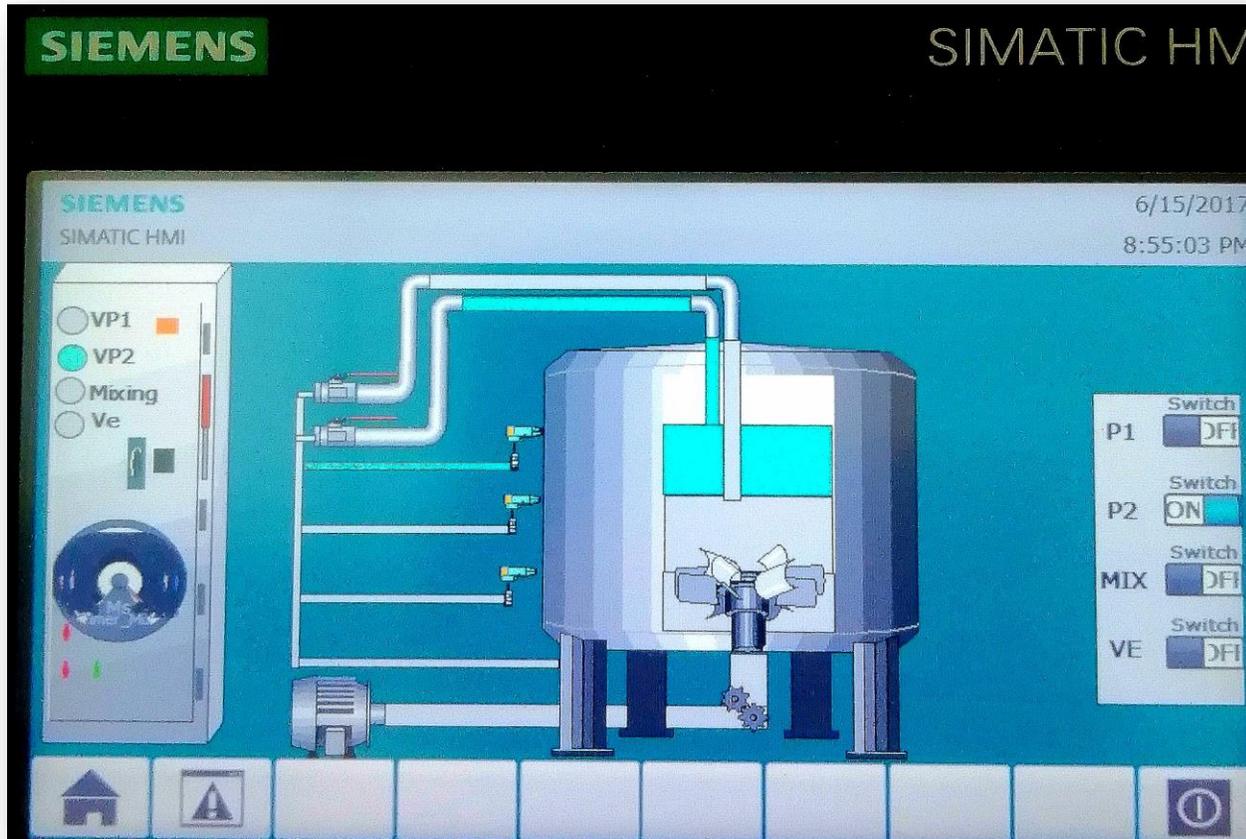
AO1	512	AI1	2031
AO2	512	AI2	2052
AO3	512	AI3	2047
AO4	512	AI4	2047
AO5	512	AI5	2046
AO6	512	AI6	2047
AO7	512	AI7	2049
AO8	512	AI8	2048

I01 I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I14 I15 I16
 O01 O02 O03 O04 O05 O06 O07 O08 O09 O10 O11 O12 O13 O14 O15 O16

TEST_HMI (GICS-tester)

-> Test for the final problem Tank model with GICS-Tester

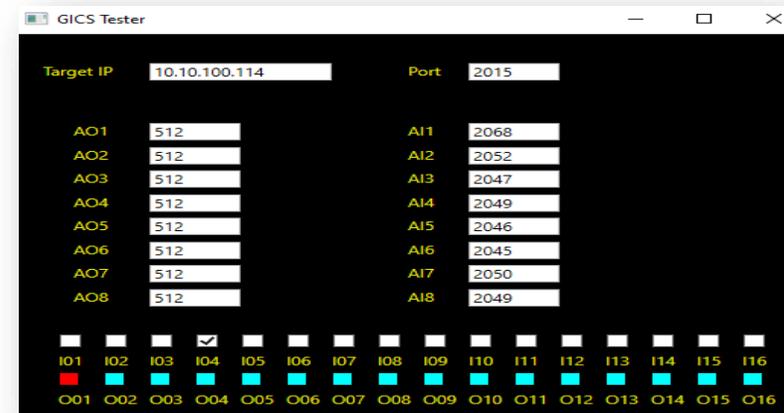
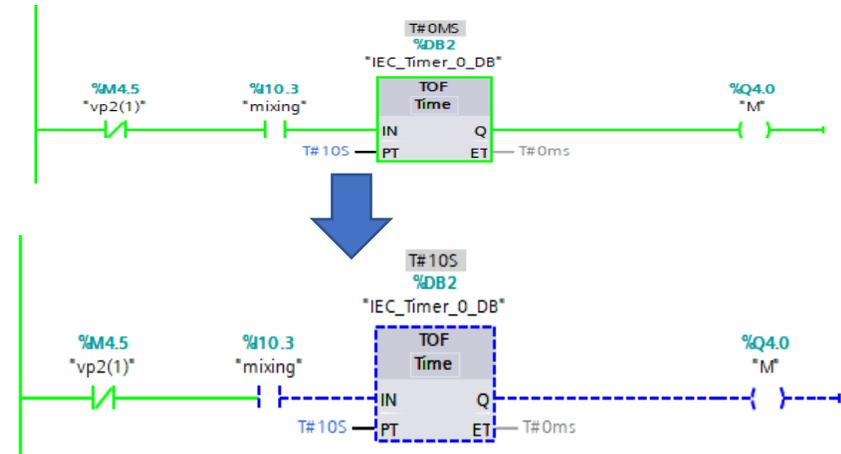
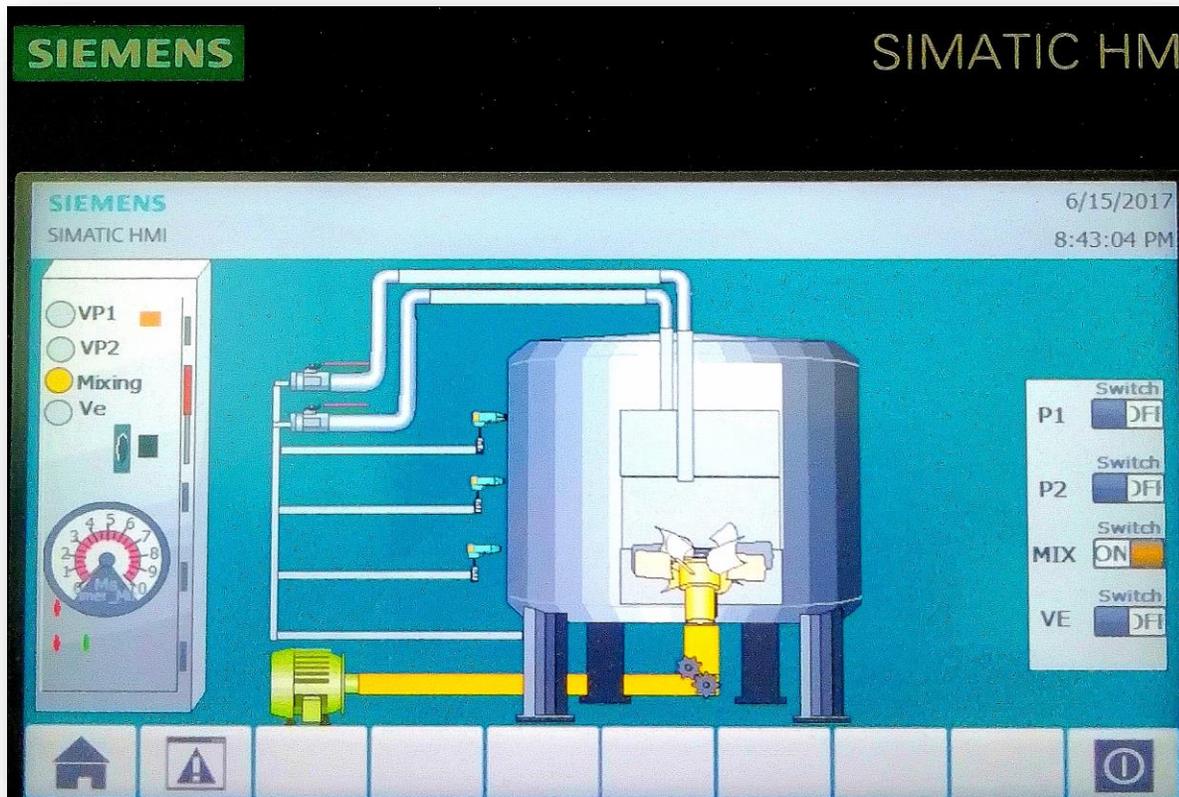
✓ Open valve 2 (filling Blue product)



TEST_HMI (GICS-tester)

-> Test for the final problem Tank model with GICS-Tester

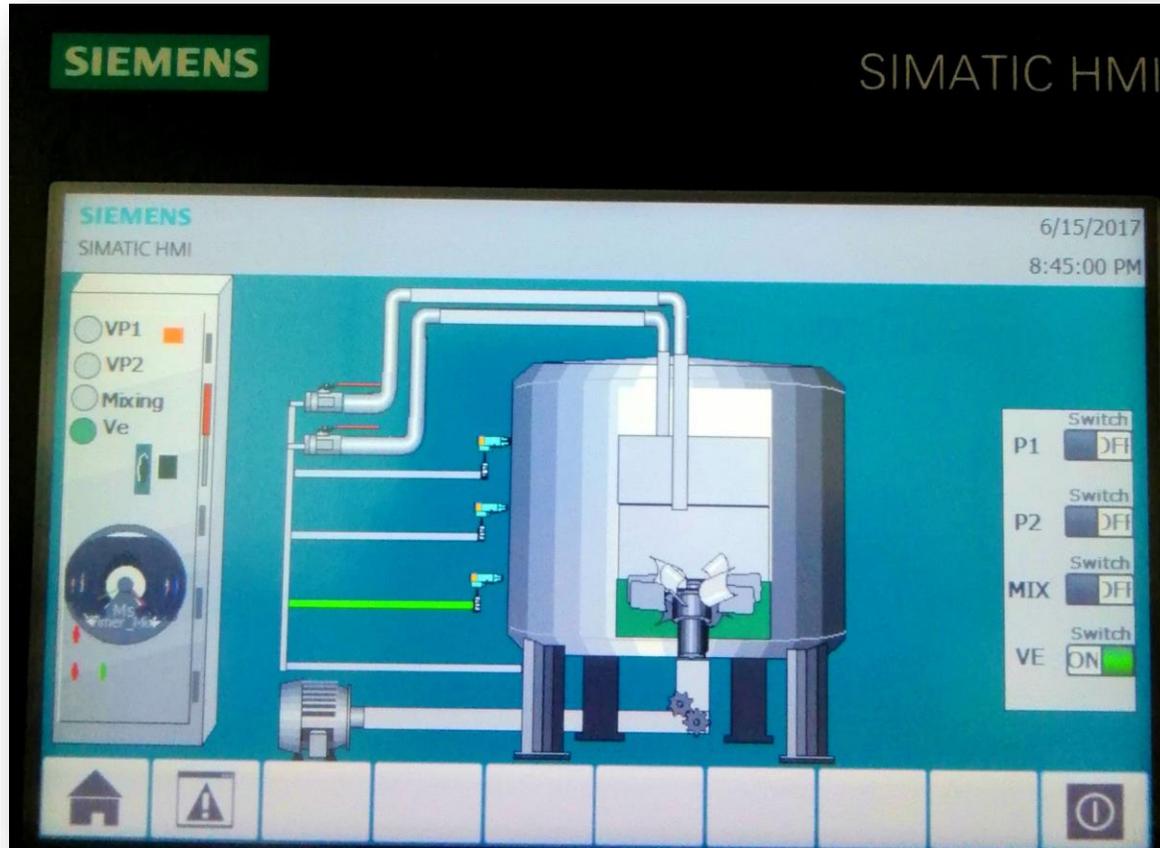
- ✓ Timer is activated with switching ON/OFF button_mixing
- ✓ Motor off after 10s



TEST_HMI (GICS-tester)

-> Test for the final problem Tank model with GICS-Tester

- ✓ Open valve E (For draining green product)



GICS Tester

Target IP: 10.10.100.114 Port: 2015

AO1	512	AI1	2046
AO2	512	AI2	2049
AO3	512	AI3	2046
AO4	512	AI4	2049
AO5	512	AI5	2046
AO6	512	AI6	2048
AO7	512	AI7	2050
AO8	512	AI8	2045

I01 I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I14 I15 I16
 O01 O02 O03 O04 O05 O06 O07 O08 O09 O10 O11 O12 O13 O14 O15 O16

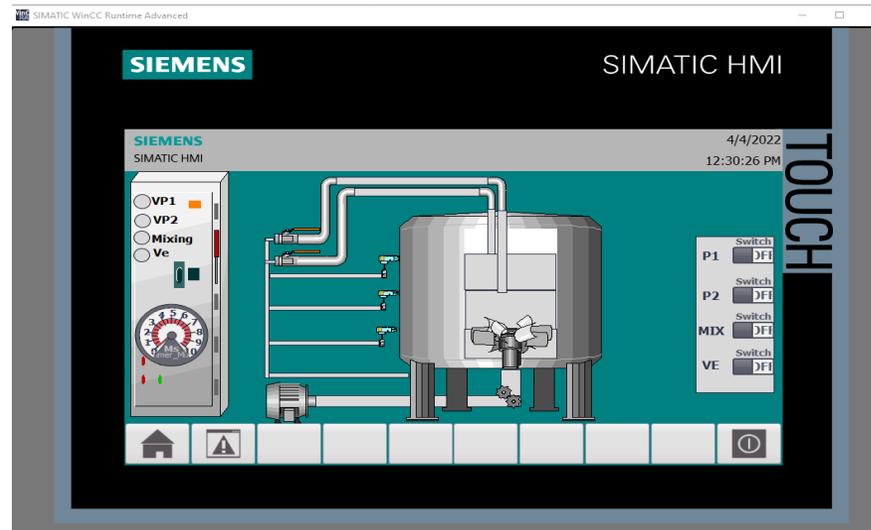
TEST_HMI (WINCC)

-> Test for the final problem Tank model with Virtual_simulator WinCC

- -> Click on your PLC device then launch simulator (PLSIM) of your program



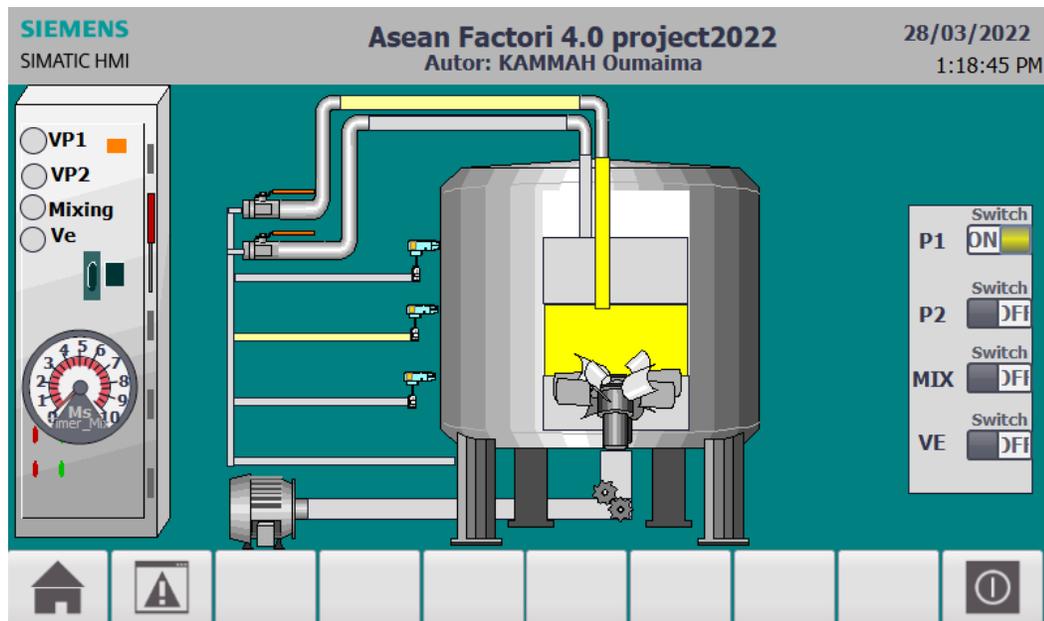
- -> Back to your HMI and launch simulator (SIMATIC WinCC runtime Advanced)



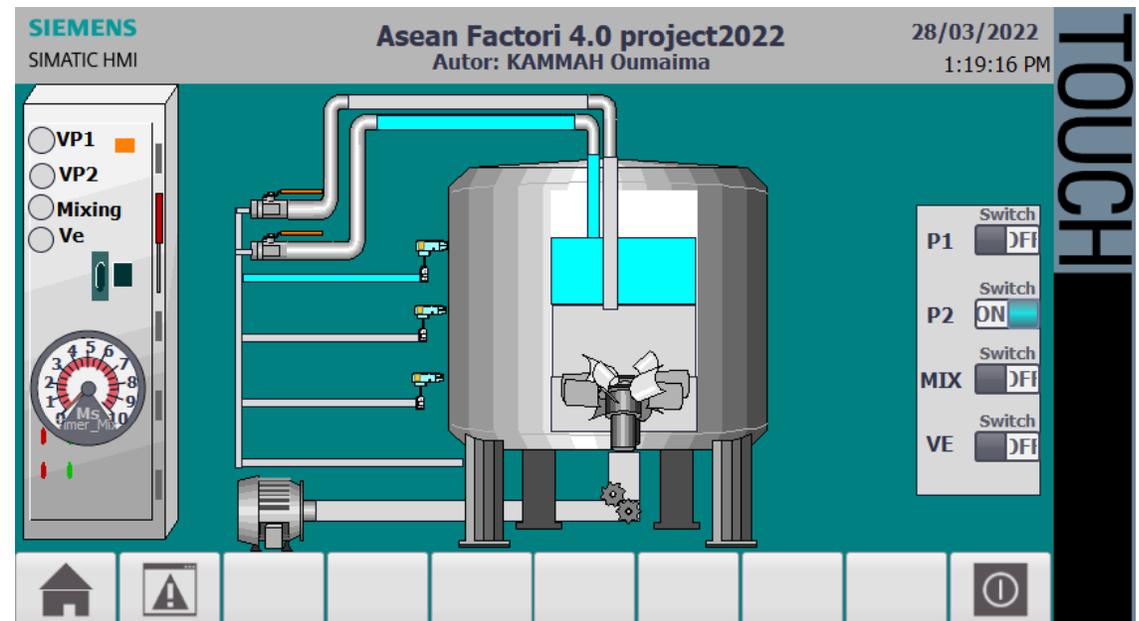
TEST_HMI (WINCC)

-> Test for the final problem Tank model with Virtual_simulator WinCC

✓ Open valve1 (filling yellow product)



✓ Open valve2 (filling blue product)

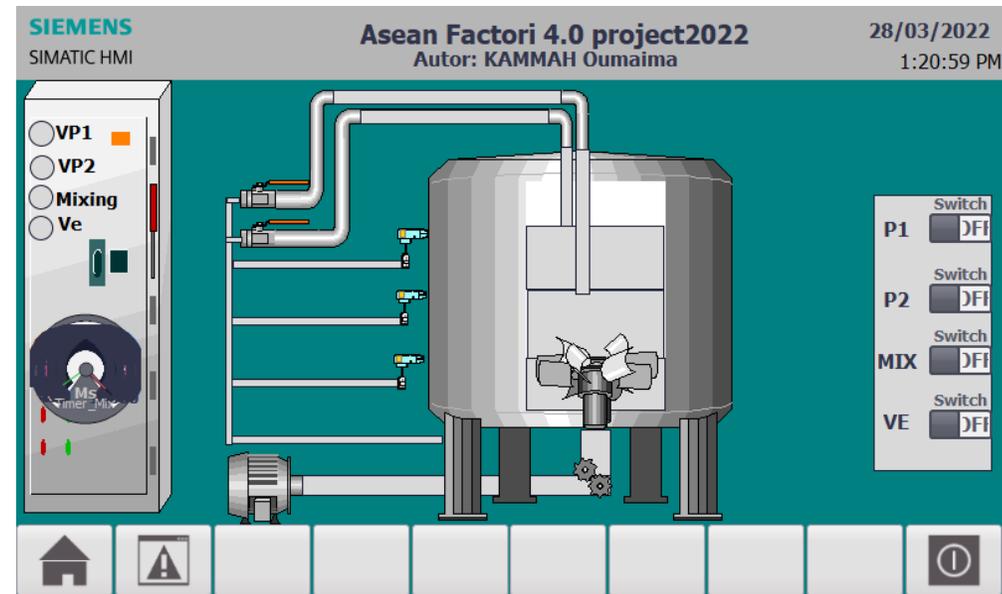


TEST_HMI (WINCC)

-> Test for the final problem Tank model with Virtual_simulator WinCC

✓ Timer is activated with switching ON/OFF button
_mixing

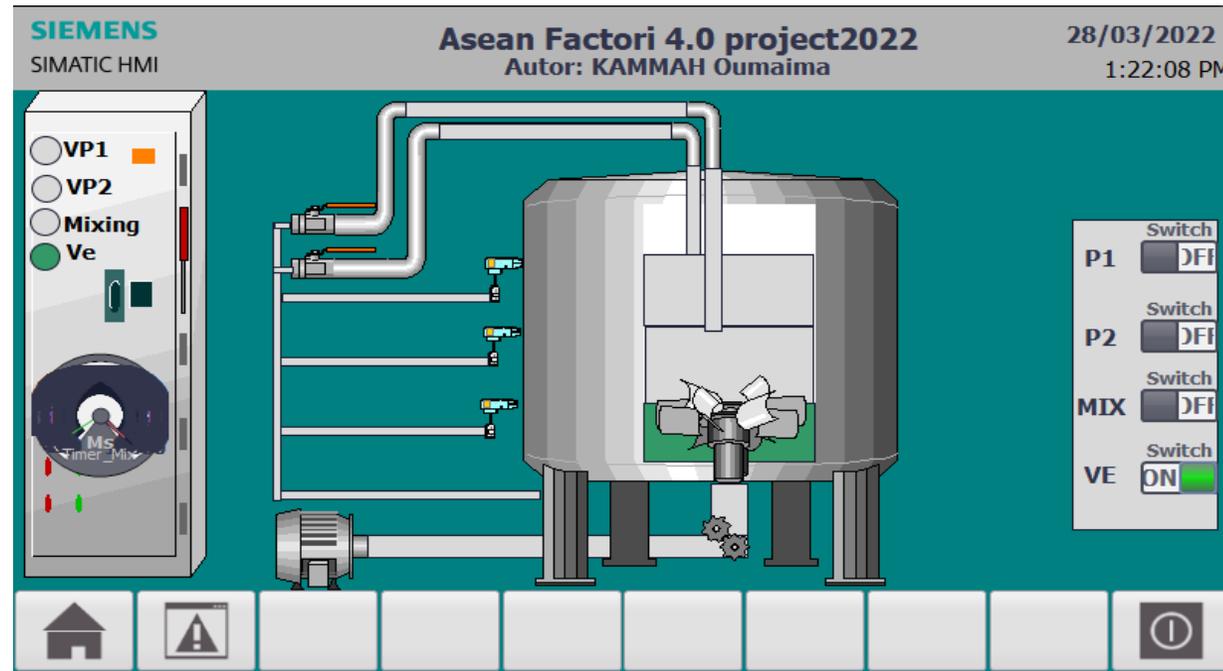
✓ Motor off after 10s



TEST_HMI (WINCC)

-> Test for the final problem Tank model with Virtual_simulator WinCC

✓ Open valve E (For draining green product)



References

- <https://tharotk-phd.notion.site/Siemens-HMI-Hands-on-the-control-problem-740fc5f5d2a148f481224876d76fa3cc>
- [041-101-wincc-baisc-ktp700-1200-r1709-fr.docx \(siemens.com\)](#)

Thank you