

# MTP (Module Type Package) Interface for Tempered Mixed Device with Machine Proxy for Industrial Edge

Machine Proxy for Industrial Edge V1.1

<https://support.industry.siemens.com/cs/ww/en/view/109824432>

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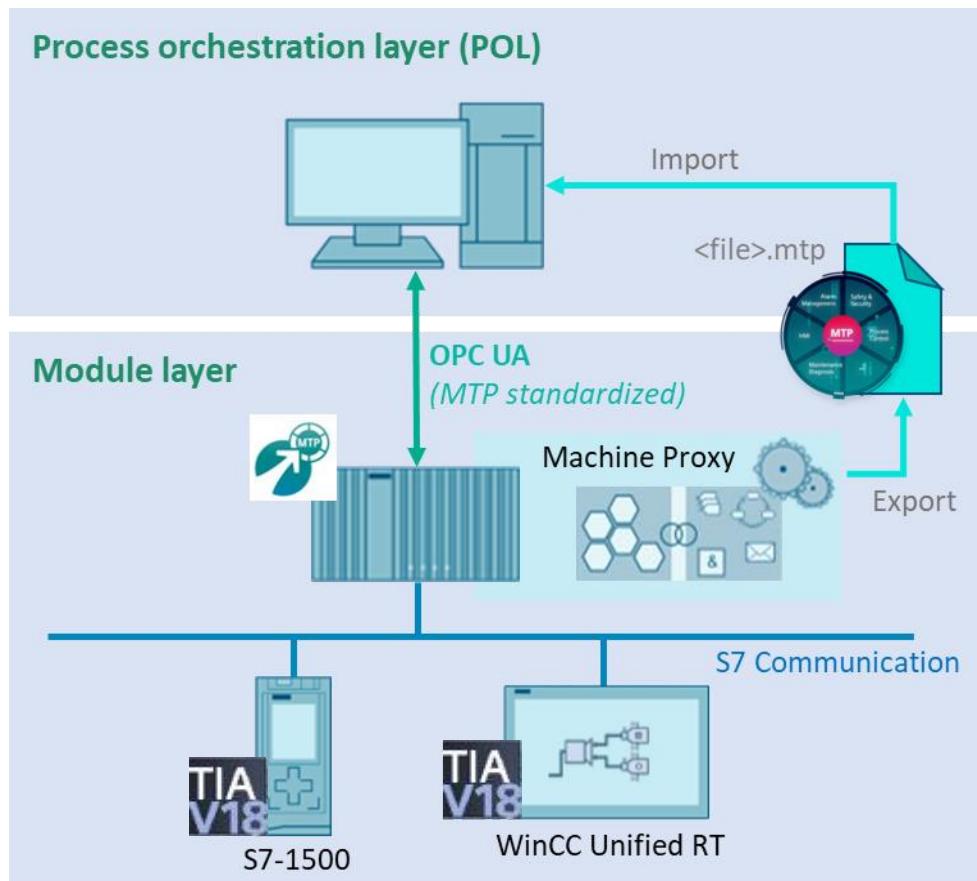
# 1 Introduction

Module Type Package (MTP) according to standard series VDI/VDE/NAMUR 2658 provides solution for modular production and effortless commissioning of new modules into process lines. Siemens provides several solutions to make your machine/equipment MTP compliant. If it is possible to re-engineer PLC, then usage of MTP compliant Libraries (SIMATIC CFL or SIMATIC PFL) in combination with SIMATIC MTP Creator could be right solution. However, if it is not possible to natively implement MTP compliant components on the PLC level you can use Industrial Edge Device with Machine Proxy App to provide the OPC UA server based MTP interface of non-MTP compliant machine.

## 1.1 Overview

Application example project demonstrates the practical usage of Machine Proxy App Providing MTP interface for non-MTP Mixer unit. The unit is controlled by SIMATIC S7-1500 PLC and has WinCC Unified HMI. This PLC can be connected to the Industrial Edge Device, where the mapping and MTP interface engineering is done to elevate the machine to be MTP compliant. The Application example provides besides TIA Portal project file also S7-connector configuration file as well as Machine Proxy App project file, therefore the working environment can be easily established by the user.

Figure 1-1



## 1.2 Components used

This application example has been created with the following hard- and software components:

Table 1-1

Component	Version	Description
Microsoft Windows 10 Enterprise	10.0.19045	Operation system of PC station
Totally Integrated Automation Portal	V18 Update 2	Engineering tool
WinCC Advanced / Unified PC V18	V18 Update 2	HMI Engineering tool and RT
S7-PLCSIM Advanced	V5.0 Update 2	PLC-Simulation software
Industrial Edge Management System	1.14.10	Platform
Industrial Edge Device OS	ievd-1.16.1-1-a	Virtual device OS
Industrial Edge Runtime	1.12.0-3	Virtual device RT
SIMATIC S7 Connector	V 2.0.0-1	Industrial Edge App
SIMATIC S7 Import Converter	V 2.1.0-2	Industrial Edge App
Registry Service	V1.9.0-0	Industrial Edge App
Databus	V 2.3.1-2	Industrial Edge App
Machine Proxy App	V 1.1.1	Industrial Edge App

You can purchase the Siemens components from the [Siemens Industry Mall](#).

This application example consists of the following components:

Table 1-2

Component	File name	Note
Documentation	109824432_MachineProxyApp_DOC_V11_en.pdf	This document
TIA Portal project	109824432_MachineProxyApp_PROJ_V11.zip	-
Databus Configuration	109824432_MachineProxyApp_DbConf_V11.zip	(Password: <b>Siemens123!</b> )
Project for Machine Proxy App	109824432_MachineProxyApp_MPADemo_V11.zip	-
PLC instance persistence file	109824432_MachineProxyApp_PLC_MPA_V11.zip	-
MTP file of Tempered mixer module	109824432_MachineProxyApp_MTP_V11.zip	-

## 1.3 System prerequisites

To make an application example running in the runtime, following conditions must be fulfilled:

1. Real or virtual PLC, WinCC Unified PC station, and Industrial Edge device are on the same network.
2. Users have access to the Edge Management System where the used Edge device is deployed.
3. There is Databus, SIMATIC S7 Connector, SIMATIC S7 Import Converter, Registry Service and Machine Proxy installed and running on Edge Device.
4. Users have access to Edge device.

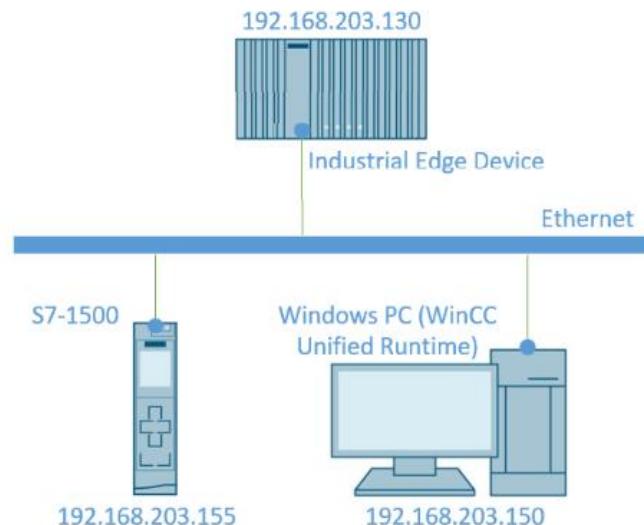
## 2 Description of the project

The application example covers complete module MTP compliancy elevation engineering workflow. The Application example provides TIA Portal project including SIMATIC S7-1500 PLC (PLC\_MPA), WinCC Unified PC RT. The package also contains S7-Connector configuration file and Machine Proxy App Project to be implemented in Industrial Edge Device with necessary applications installed.

Table 2-1

Device name	Platform	Description	Preset IP address
localhost	WinCC Unified RT	TIA Portal project including the SIMATIC S7-1500 PLC (Firmware V2.8) and WinCC Unified device	192.168.203.150
EID_MPA	Virtual Edge Device	Configuration of S7 connector	192.168.203.130
PLC_MPA	S7-1500 Virtual PLC	Virtual SIMATIC S7-1500 PLC instance in S7-PLCSIM Advanced	192.168.203.155

Figure 2-1



All the devices communicate using S7 protocol. The Industrial Edge device then provides MTP compliant OPC UA server to communicate with POL.

The Application Example package includes following components:

Table 2-2

File	Platform	Description
MPADemo.zap18	TIA Portal	TIA Portal project including the S7-1500 PLC (Firmware V2.8) and WinCC Unified device
DbConfig.json	Industrial Edge	Configuration of Databus (Password: Siemens123!)
Tempered Mixer Demonstrator.mpa.yaml	Industrial Edge	Project for Machine Proxy App
PLC_MPA.zip	PLCSIM Advanced	PLC instance persistence file
TempMixer.mtp	POL (SIMATIC PCS neo)	Slightly modified MTP file of the Tempered mixer module obtained from Machine Proxy

The "TempMixer.mtp" can be then used to integrate the Tempered Mixer module into Process Orchestration Layer (POL), i.e., SIMATIC PCS neo. User can also generate his own MTP file from Machine Proxy project as described in chapter 3.6 of this document.

## 2.1 PEA description

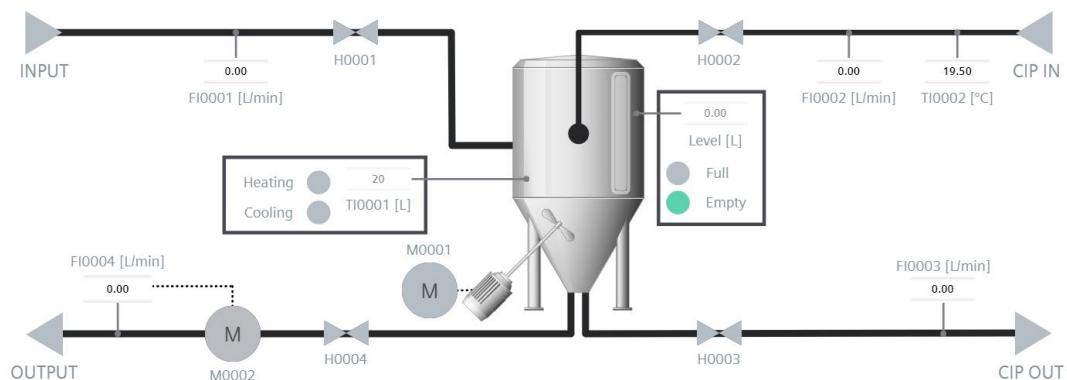
The Application example presents the implementation of Tempered mixer as Process equipment assembly (PEA) to be elevated into MTP compliancy. The module offers 3 automated programs: Rinse, Production, and Disinfection. It can be controlled from WinCC Unified RT and the TIA Portal project implements also process values simulation, therefore it can be run and operated as a demonstrator without any additional simulation software.

The Tempered Mixer consists of control modules listed in the following table.

Table 2-3

Name	FB(FC)	Instance DB	Description
H0001	FB3, FB1	DB10, DB2	Valve for product inflow
H0002	FB3, FB1	DB11, DB3	Valve from CIP medium inflow
H0003	FB3, FB1	DB12, DB4	Valve for CIP medium outflow
H0004	FB3, FB1	DB13, DB5	Valve for product outflow
M0001	FB4, FB2	DB14, DB6	Motor for mixer
M0002	FB4, FB2	DB15, DB7	Pump for product outflow
FI0001	FC1	DB1	Flowrate meter for product inflow
FI0002	FC1	DB1	Flowrate meter for CIP medium inflow
FI0003	FC1	DB1	Flowrate meter for CIP medium outflow
FI0004	FC1	DB1	Flowrate meter for product outflow
TI0001	FC1	DB1	Temperature meter in the mixer
TI0002	-	DB19	Temperature meter for CIP medium inflow
HeaterOn	FC1	DB1	Heating indication
CoolerOn	FC1	DB1	Cooling indication
Level	FC1	DB1	Level in the mixer
IndicatorFull	FC1	DB1	Full mixer indicator
IndicatorEmpty	FC1	DB1	Empty mixer indicator

Figure 2-2



## 2.2 PLC program structure

Coding of the ISA88 State machine model states and commands can be found in "DefaultTagTable".

Figure 2-3

DefaultTagTable			
	Name	Data type	Value
1	STATE_STOPPED	UDInt	16
2	STATE_IDLE	UDInt	1
3	STATE_EXECUTE	UDInt	3
4	STATE_STOPPING	UDInt	15
5	STATE_ABORTING	UDInt	17
6	STATE_ABORTED	UDInt	18
7	STATE_HOLDING	UDInt	12
8	STATE_HELD	UDInt	13

The PLC program is structured into four groups.

### 2.2.1 01\_Main

The main [OB1] block calls all the Control Modules (valves and motors) as well as Procedures (Rinse, Production, Disinfection) and State simulation. The State simulation is done in BuildStateMonitors [FC1], therefore the process control can be demonstrated without any additional SW or HW. States [DB1] contains the actual values of the process parameters and states indicators (FI0001, TI0001, Heating On, Level, etc.). HMICommands [DB9] serves mostly as an interface to the HMI. Configuration [DB19] contains setpoints of the machine (maximal temperature, maximal level, temperature of the CIP medium).

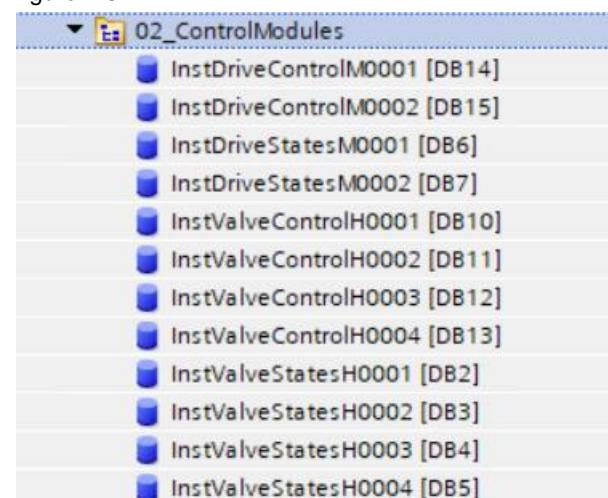
Figure 2-4



### 2.2.2 02\_Control modules

In the 02\_Control modules group, the instances of the States and Control FBs are located. This represents the instantiation of the custom library, where each Control Modules needs to have 2 instances to operate correctly.

Figure 2-5

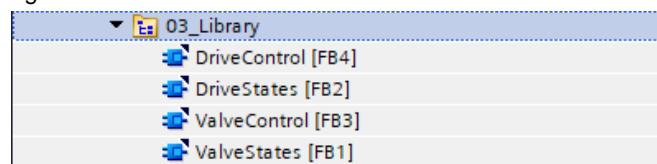


## 2 Description of the project

### 2.2.3 03\_Library

The 03\_Library group contains copied FBs from the Project (custom) library.

Figure 2-6



### 2.2.4 04\_Procedures

04\_Procedures includes FBs and their instances for the 3 programs available on the module. These FBs implement the ISA88 State machine model and contain the logic of the sequential operations.

Figure 2-7



## 2.3 HMI Screen

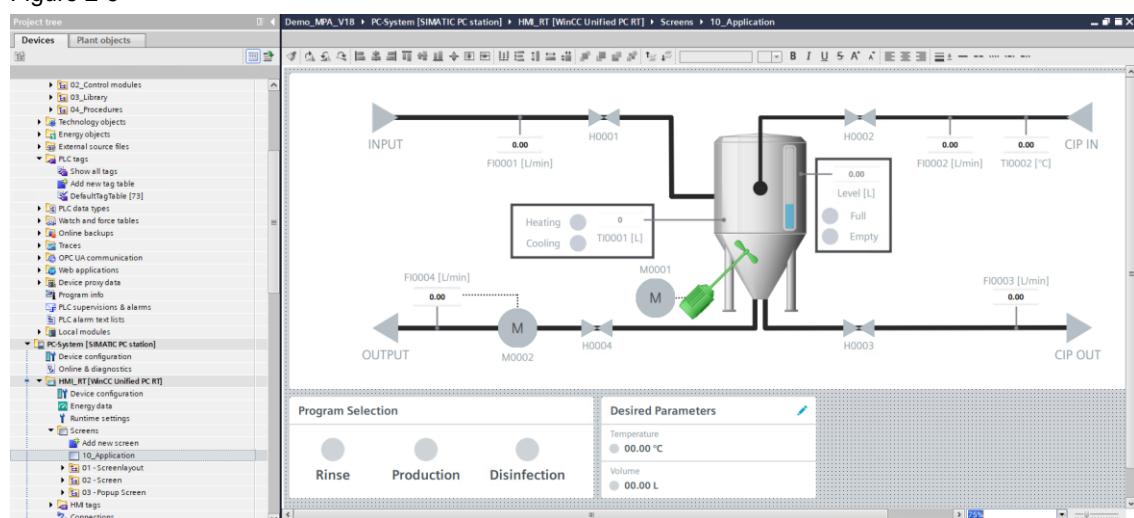
All connections to PLC instances are defined in the HMI Tag table "MPA\_Tags". There are all the variables from all the DBs in the PLC Program blocks. There is one Connection established between "HMI\_RT" and "PLC\_MPA" called "HMI\_Connection\_1".

Figure 2-8

Connections						
Name	Communication driver	Station	Partner	Node	Online	
HMI_Connection_1	SIMATIC S7 1200/1500	S7-1500/ET200MP ...	PLC_MPA	CPU 1511-1 PN, PR...	<input checked="" type="checkbox"/>	

All the visual elements important for the monitoring and control of the tempered mixer unit are implemented in screen "10\_Application". The additional screens in "01 – Screenlayout", "02-Screen", and "03 - Popup Screen" are partial implementation of the WinCC Unified Template Suite style guide.

Figure 2-9



## 2 Description of the project

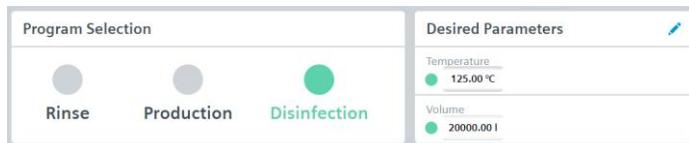
### 2.3.1 Operating WinCC Unified HMI

The valves and drives can be controlled by clicking on their symbols. Cooling and heating cannot be controlled from the HMI screen.

The Automatic programs can be operated in the bottom section of the screen. In "PROGRAM SELECTION" area, user can select which program should be executed by clicking on the circular icon. Change in the desired program can be done only when the active program is in "Idle" state.

"DESIRERES PARAMETERS" allows user to monitor and edit parameters of the procedures like temperature which will be achieved during heating or volume of the batch.

Figure 2-10



States of the machine can be monitored and observed by clicking on "Current State" icon in the top left corner.

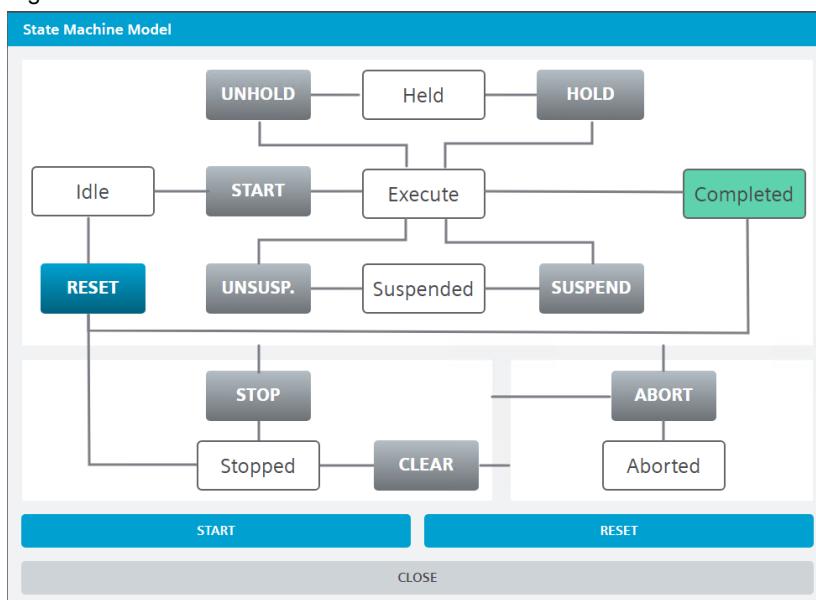
Figure 2-11



## 2.4 State machine

The complete control and monitoring of the ISA 88 state machine can be done on the machine level in WinCC Unified runtime by opening the state machine view window.

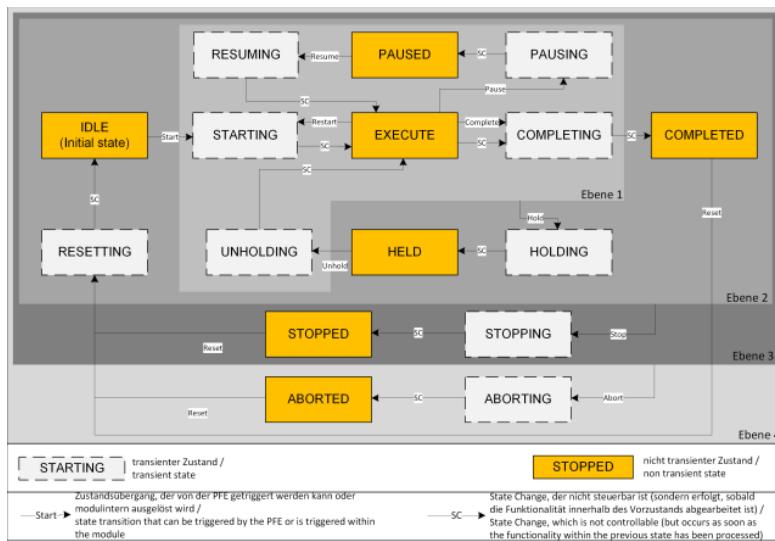
Figure 2-12



State machine defined in **VDI/VDE/NAMUR 2658-4** slightly differs from its ISA 88 counterpart.

## 2 Description of the project

Figure 2-13



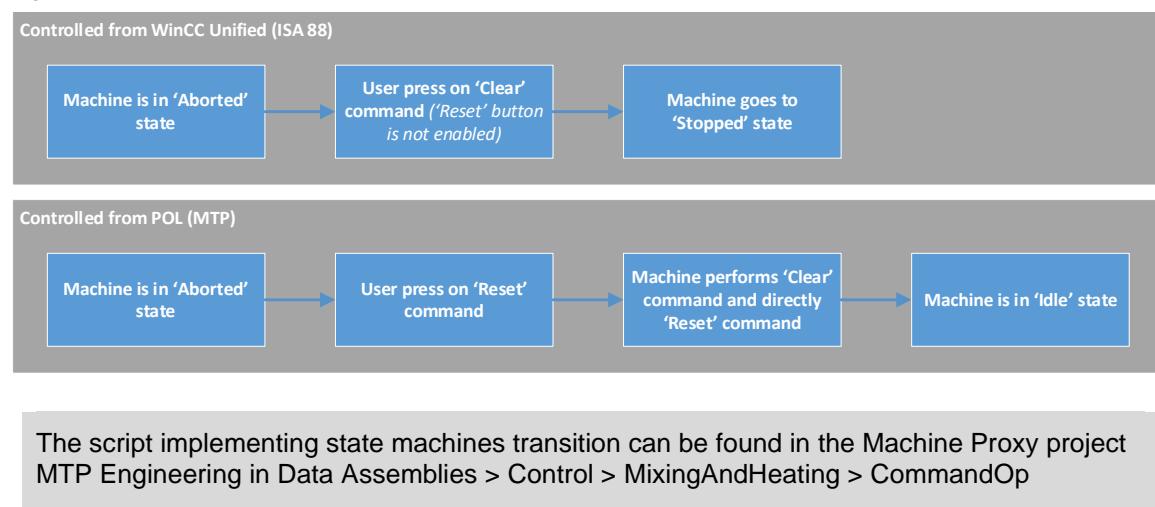
Following table summarizes how the translation between the two state machine models has been done.

Table 2-4

Commands ISA 88	Commands MTP
Start	Start
Hold	Hold
Unhold	Unhold
Suspend	Pause
Unsuspend	Resume
Abort	Abort
Stop	Stop
Clear & Reset	Reset

Only noticeable difference is lack of "Clear" command and "Clearing" state in the MTP state machine model. This has lead to the small difference in module behavior when it is controlled from POL via MTP interface, or on machine level via WinCC Unified HMI.

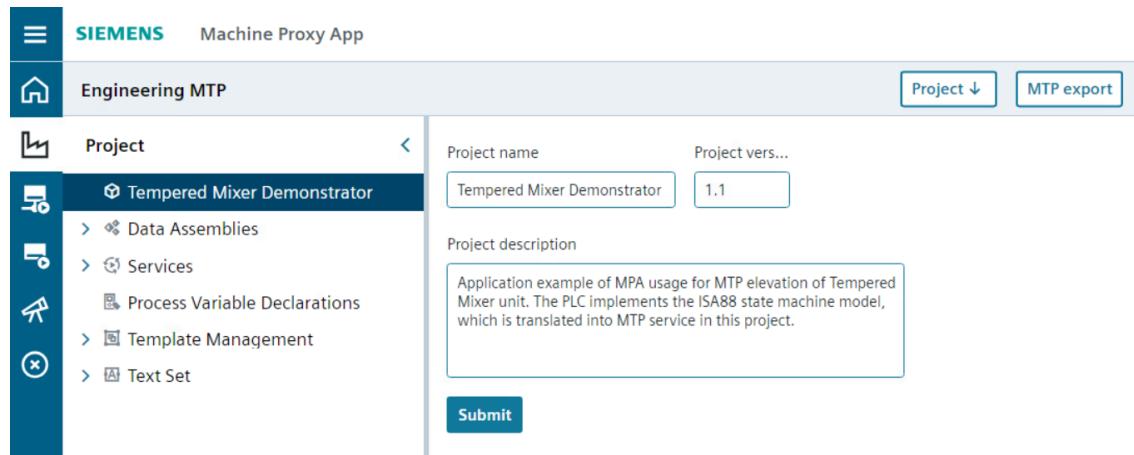
Figure 2-14



## 2.5 Project in Machine Proxy for Industrial Edge

The project in Machine Proxy is called "Tempered Mixer Demonstrator" and can be directly used to start OPC UA runtime translating non-MTP interface on the PLC level into MTP compliant OPC UA server interface. The MTP file can be also exported from the project.

Figure 2-15



### 2.5.1 Data assemblies

The project implements all the Data Assemblies interfaces which are necessary to monitor and control modules listed in [Table 2-2](#) are created in the project. Some additional Data Assemblies implementing MTP-compliant Service with 3 procedures can be found in the project. The service-related Data Assemblies are listed in the table below.

Table 2-5

Name	Type	Description
MixingAndHeating	ServiceControl	Main Data Assembly for service control
RinseVolumeToUse	AnaServParam	Volume to use during rinse procedure
ProductionVolumeToUse	AnaServParam	Volume to use during production procedure
ProductionTempToUse	AnaServParam	Temperature to achieve during production procedure
DisinfectionVolumeToUse	AnaServParam	Volume to use during disinfection procedure
DisinfectionTempToUse	AnaServParam	Temperature to achieve during disinfection procedure
ProcRinse	ProcedureHealthView	Worse quality code of the procedure (not used in this demo)
ProcProduction	ProcedureHealthView	Worse quality code of the procedure (not used in this demo)
ProcDisinfection	ProcedureHealthView	Worse quality code of the procedure (not used in this demo)

## 2.6 Automatic programs description

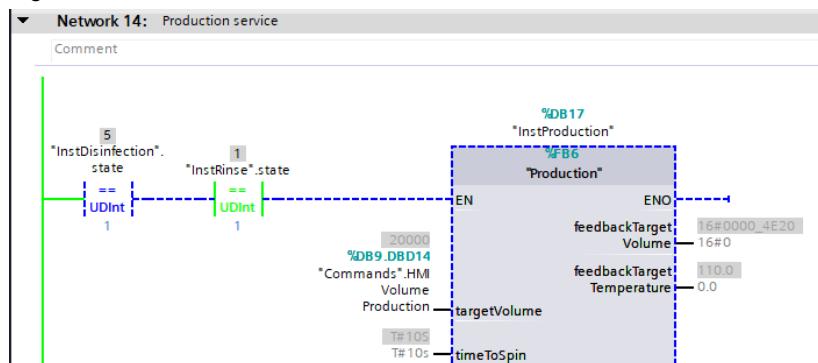
The complete automatic program can be found in the program blocks of "PLC\_MPA". There are three separated FBs and their instances. The interface is basically the same for Production and Disinfection, only Rinse does not include "targetTemperature" in Input section. The "InOut" section contains connectors to all the actuators (valves, drives).

Figure 2-16

InstDisinfection									
	Name	start value	Retain	Accessible f...	Writ...	Visible in ...	Setpoint	Supervision	Comment
1	Input								
2	targetVolume	0000		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				desired volume to be filled into mixer
3	timeSpin	0			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			desired time for mixing from HMI (sec)
4	targetTemperature	8000.0		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				desired temperature in the mixer
5	Output								
6	timeToSpin	#10s		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				desired time for mixing
7	feedbackTargetVolume			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				current target volume
8	feedbackTargetTemper...	0		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				current target temperature
9	InOut								
10	state				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			current state message
11	step				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			current step message
12	command				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			command message/signal
13	instValveControlH0001								ressource valve control
14	instValveControlH0002								water valve control
15	instValveControlH0003								waste valve control
16	instValveControlH0004								product valve control
17	instDriveControlM0001								motor mixer control
18	instDriveControlM0002								pump product control
19	stateStopped	6							machine state stopped
20	stateIdle								machine state idle
21	stateExecute								machine state execute
22	stateStopping	5							machine state stopping
23	stateAborting	7							machine state aborting
24	stateAborted	8							machine state aborted

The disable mechanism implemented in the networks 13, 14, and 15 ensures that only one procedure can be active at one time.

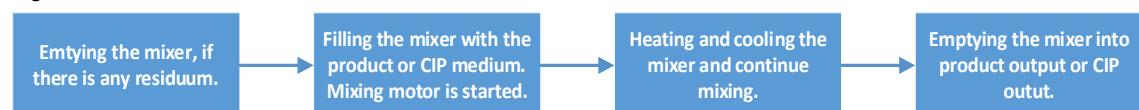
Figure 2-17



The code in the procedure FBs is divided into 4 regions. The State machine model including the actual program logic can be found in "STATE MACHINE" region. All of the control logic and sequence is implemented in "Starting" and "Execute" States of the state machine.

The sequence of the program can be understood from the following diagram.

Figure 2-18



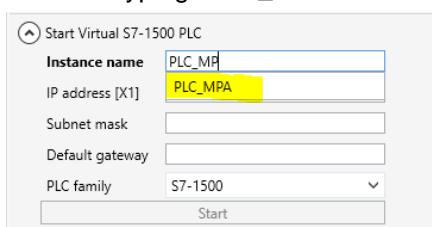
## 3 Initiating project runtime simulation

### 3.1 PLC simulation

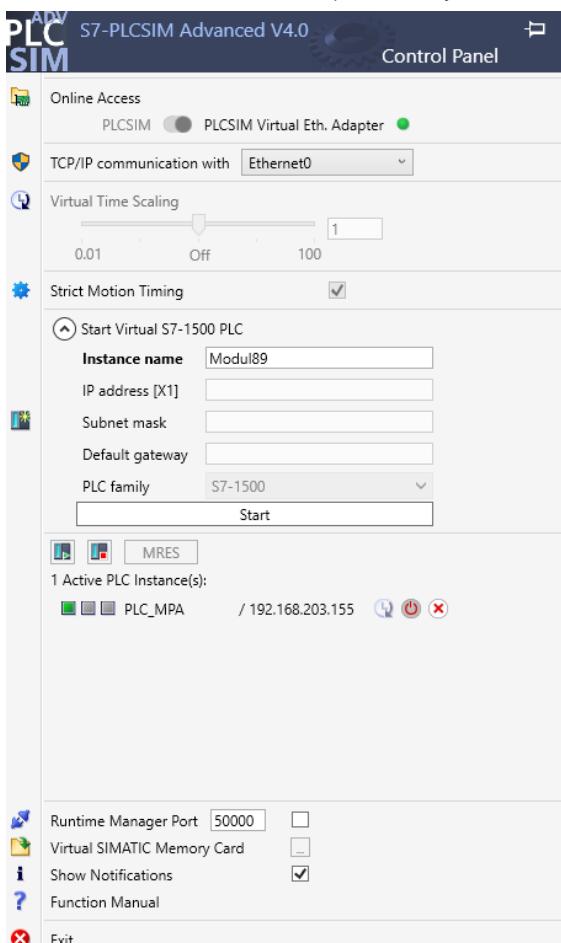
This application example can run on a simulated PLCSIM Advanced instance. It is also possible to use real SIMATIC S7-1500 PLC eventually for running the project.

#### 3.1.1 Start PLCSIM Advanced instance

1. Start PLCSIM Adv.
2. Change "Online Access" to PLCSIM Virtual Eth. Adapter.
3. Click on the folder icon  and unzip 109824432\_MachineProxyApp\_PLC\_MPA\_V11.zip into the opened folder.
4. Start typing "PLC\_MPA" into "Instance name" field.

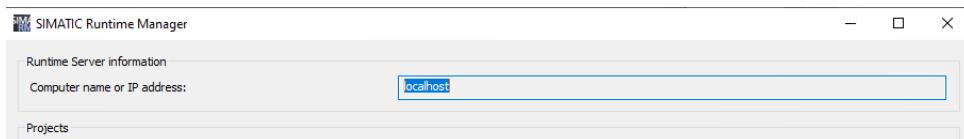


5. Select "PLC\_MPA"
6. Start the PLC instance (eventually click on PLC start button 

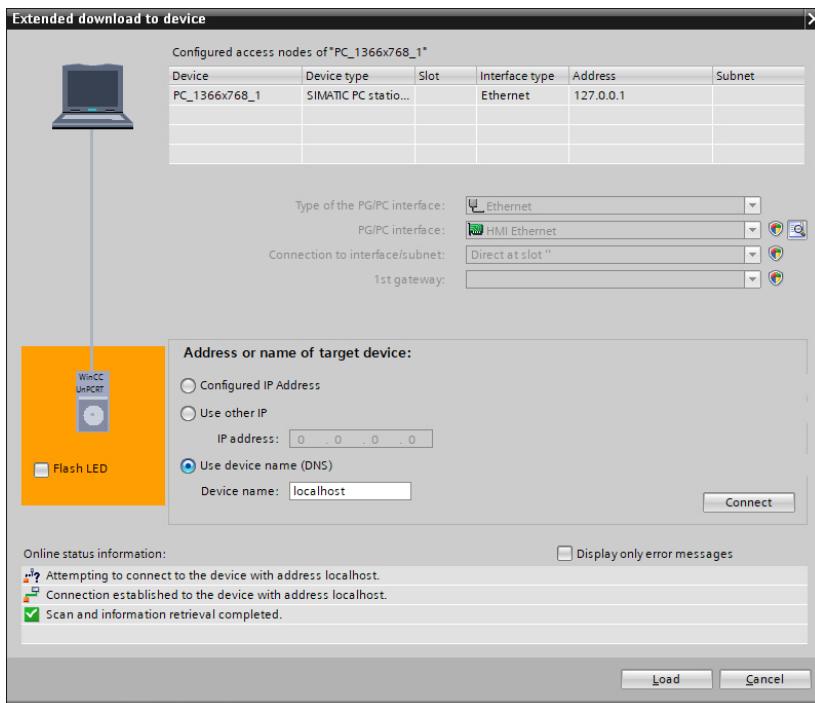


## 3.2 WinCC Unified Runtime

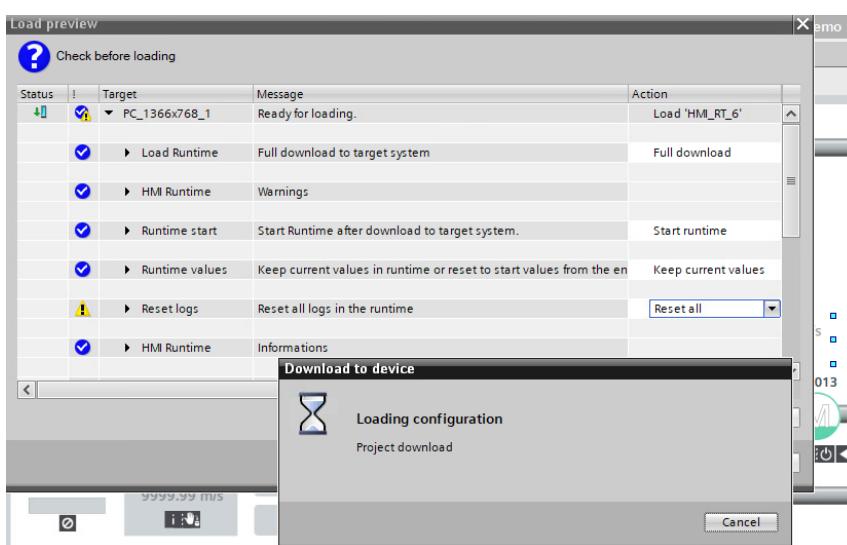
1. Open the SIMATIC Runtime Manager and notice the computer name.



2. Select PC\_System in the project tree and click on the Download button.
3. Select "Use device name (DNS)" and enter the computer name.

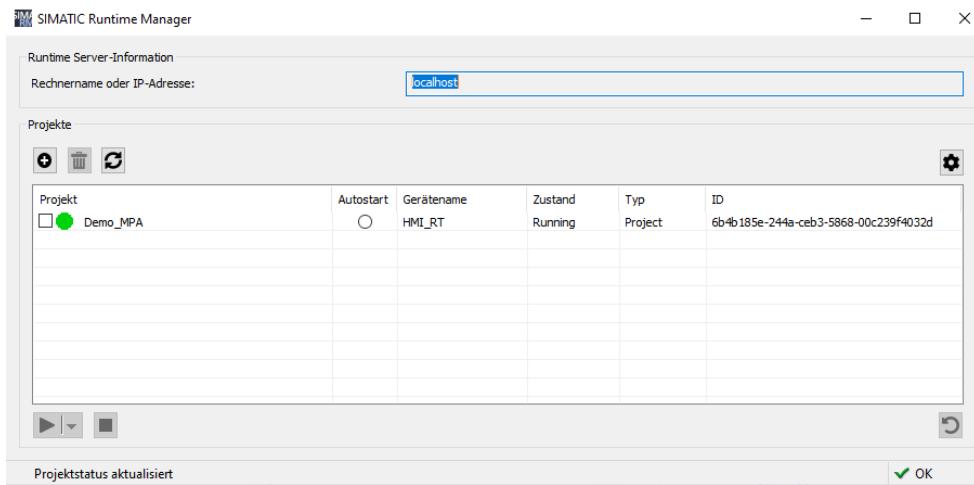


4. Click on the "Load" button.
5. In the load preview, select "Full download", "Start runtime:", and "Reset all" and click on "Load" button.



#### 3.2.1 Start the project on Runtime server

1. Open SIMATIC Runtime Manager and check the status of the project (if you do not see any entry click on refresh button).



2. Once Project is running, open the browser and enter "https://<Computer name>".

https://localhost

3. Click on the WinCC Unified RT and use the credentials stated in Table 3-1:

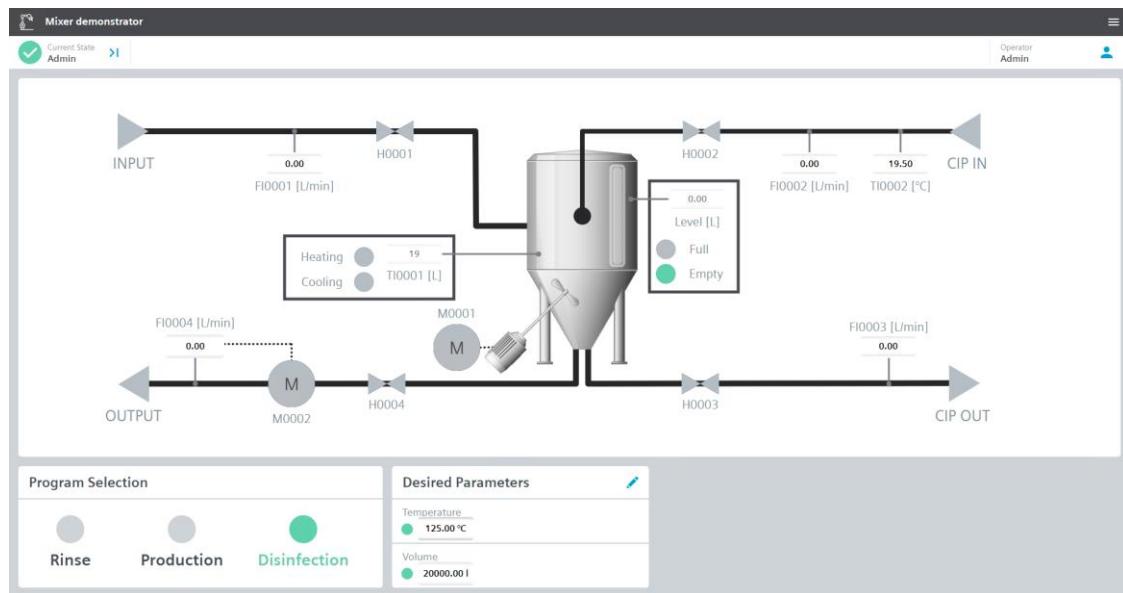
Table 3-1

User	Password
Admin	Siemens123!
User	Siemens123



### 3 Initiating project runtime simulation

4. You should be redirected directly to the main application screen.



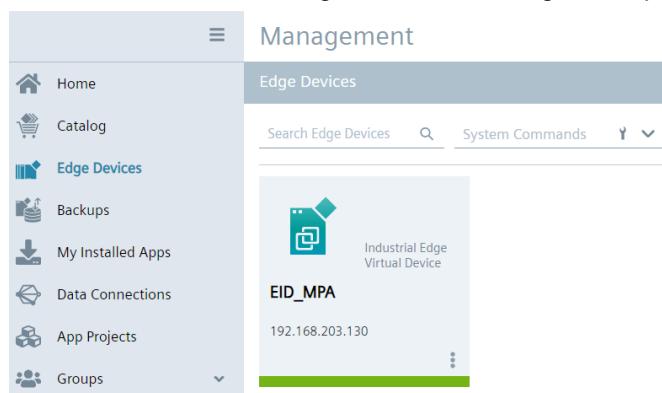
## 3.3 PLC – Industrial Edge communication

1. To establish PLC – Industrial Edge communication, make sure that all the prerequisites listed in chapter 1.3 have been fulfilled.
2. Make sure that the PLC has name "PLC\_MPA" and IP address 192.168.203.155.

#### NOTE

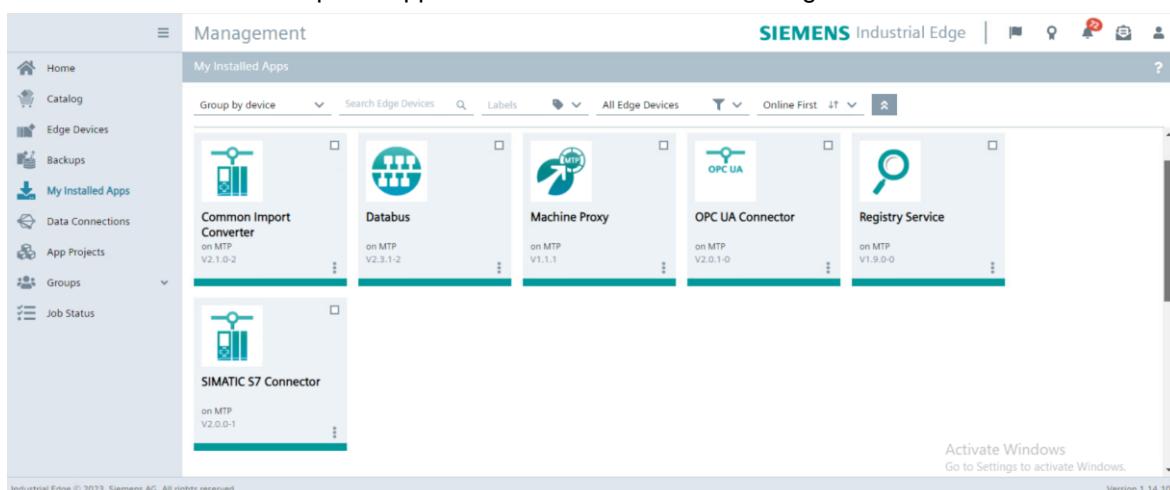
The SIMATIC S7 Connector file attached to this application example is configured to the IP addresses listed in chapter 2. If you need to change IP of the PLC, the SIMATIC S7 Connector configuration must be done manually.

3. Make sure that the Edge device is running and deployed in the management system.



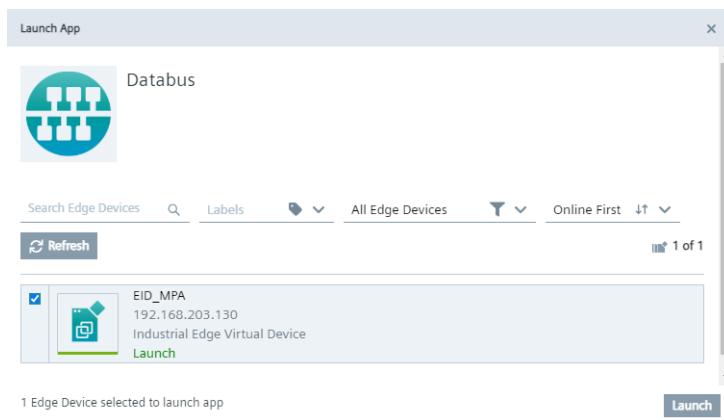
### 3 Initiating project runtime simulation

4. Make sure that the required applications are installed on the Edge device.

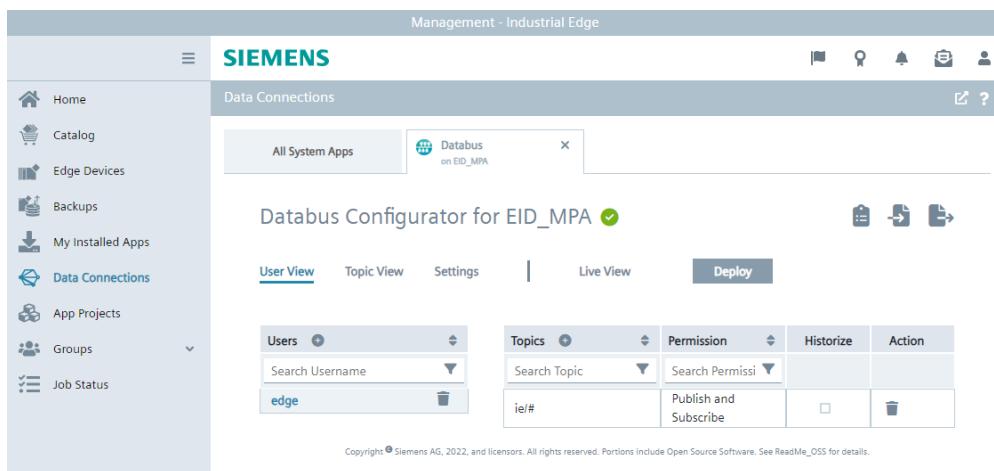


#### 3.3.1 Databus settings

1. In Edge Management system go to "Data Connections" and launch the Databus application on the EID\_MPA device.



2. Import "DbConfig.json" into Databus.
3. Enter password: Siemens123!
4. Deploy the configuration.



5. The successful deployment should be confirmed by green checkmark indication.



Read me

### Databus User Documentation

<https://support.industry.siemens.com/cs/ww/en/view/109954707>

#### 3.3.2 SIMATIC S7 Connector

1. In the Edge Management system go to "Data Connections" and launch the SIMATIC S7 Connector application on the EID\_MPA device.

2. Click on "Settings" icon

3. Enter following credentials:

- Databus ServiceName: ie-databus
- UserName: edge
- Password: edge
- Payload Version: 1.5
- Browse Timeout: 2 minutes
- Bulk Publish:

4. Save the settings.

5. Click on "Add Data Source"

6. Fill in following credentials:

- Data Source Type: Optimized S7-Protocol (S7-1200/1500)
- Name: PLC\_MPA
- PLC Type: S71500
- IP Address: 192.168.203.155
- Leave the rest default.

7. Add the data source.

8. Browse the tags of the PLC.

9. Add all the found tags with "Read & Write" Access Mode.

The screenshot shows the 'Browsed Tags - PLC\_MPA' window. At the top, there are 'Browse Filters' for 'Tag Filter' and 'Datablock Filter'. Below that are dropdowns for 'Acquisition Cycle' (set to '1 second'), 'Acquisition Mode' (set to 'CyclicOnChange'), and 'Access Mode' (set to 'Read & Write'). The main area displays a table of tags, with one row selected. The selected row shows a green status indicator and the name 'PLC\_MPA'.

10. Deploy the configuration.

11. Start the project.

12. If the communication was established, you should see green indicators.

The screenshot shows the 'Add Data Source' interface. At the top, there are buttons for 'Add Data Source' (disabled), 'Delete', and 'Bus Adaptor' (with a green checkmark). Below is a table with columns for Status, Name, and Comments. A single row is selected, showing a green status indicator and the name 'PLC\_MPA'.

### 3 Initiating project runtime simulation

**NOTE**

If you are using physical SIMATIC S7-1200 PLC, you can select different PLC type. However, do not forget to change hardware settings in the TIA Portal Project before downloading the program to PLC.

**NOTE**

You can use a different IP Address if you are not following addressing as defined in chapter 2. However, do not forget to change the IP addresses of PLC and WinCC Unified runtime in TIA Portal projects hardware setting before downloading.



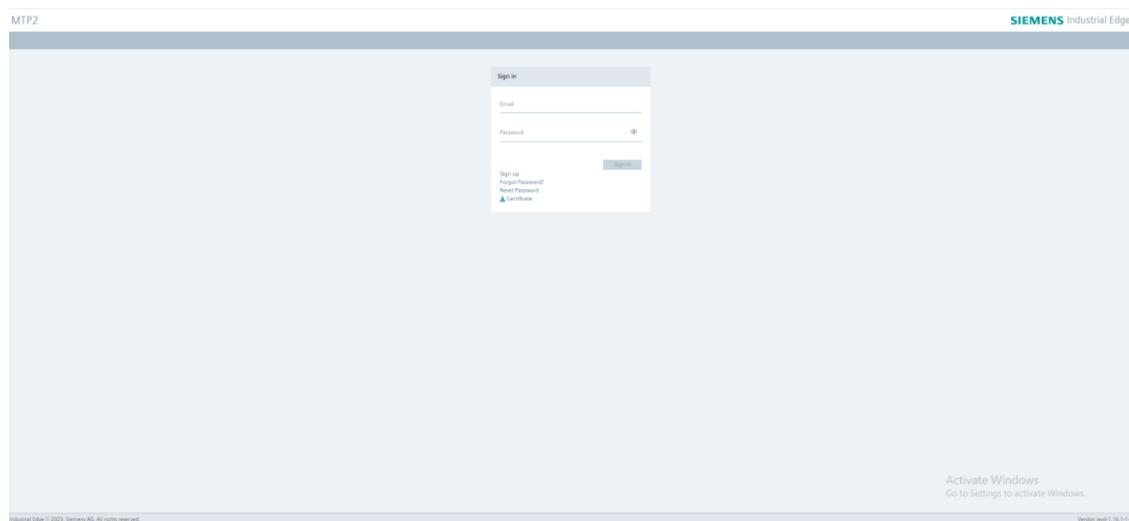
Read me

#### S7 Connector User Documentation

<https://support.industry.siemens.com/cs/ww/en/view/109955268>

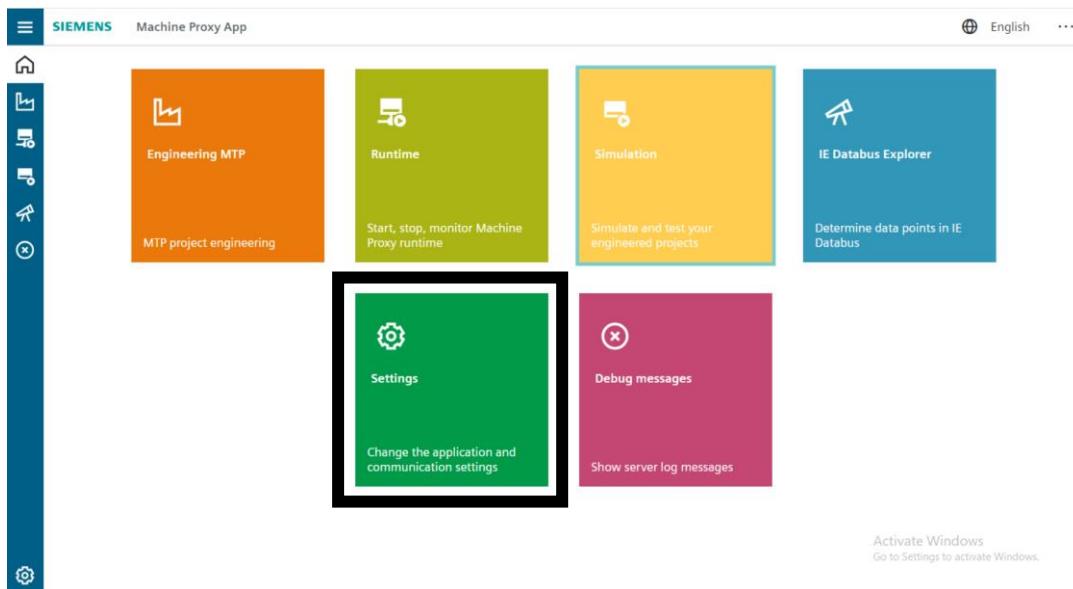
#### 3.3.3 Machine Proxy – Databus explorer

1. Log into "EID\_MPA" industrial edge device



2. Open Machine Proxy application.
3. Go to the "Settings" by clicking on its icon.

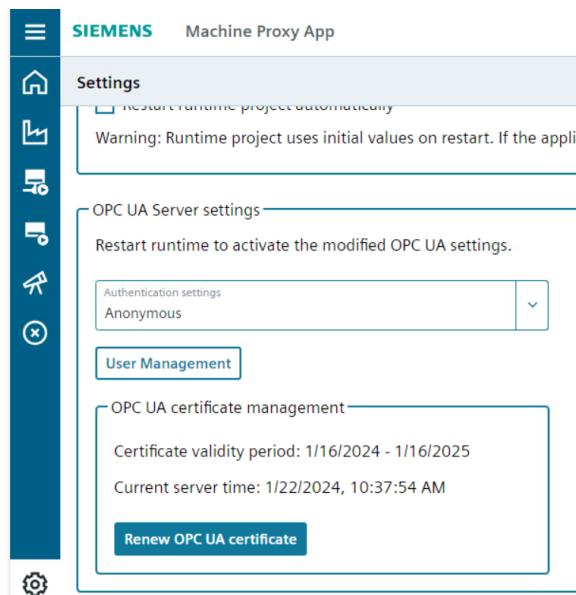
### 3 Initiating project runtime simulation



4. Enter following credentials in IE Databus configuration:

- Server: ie-databus
- Port: 1883
- User: edge
- Password: edge
- Connector: S7 Connector

5. Select "Anonymous" Authentication settings in OPC UA Server settings section.



6. Go to "Databus explorer" and click to green bottom "Connect".

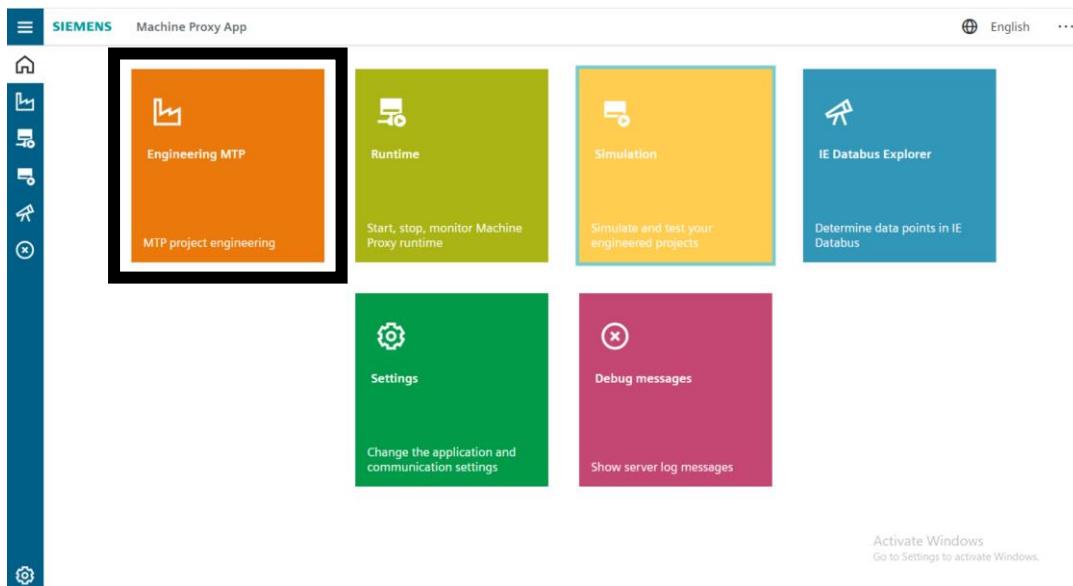
7. You should be able to see all the tags received from PLC with green square indication next to it. "Connection status: good" should be displayed in the top ribbon.

### 3 Initiating project runtime simulation

Name	Type	Value
AI_CJ_H0_StatusInitialization1	UDInt	1000
AI_CJ_H0_StatusInitialization2	UDInt	0
AI_CJ_H0_StatusInitialization3	UDInt	0
AI_CJ_H0_StatusInitialization4	UDInt	0
AI_CJ_H0_StatusInitOk	UDInt	1000
AI_CJ_H0_StatusInitErr	Bool	0
AI_CJ_H0_StatusSyncMode	Bool	1448021720886205
AI_CJ_H0_StatusNeverOn	Bool	0
AI_CJ_H0_StatusCloseOn	Bool	0
AI_CJ_H0_Instantaneous0001_mainMode	Bool	0
AI_CJ_H0_Instantaneous0001_stopMode	Bool	1
AI_CJ_H0_Instantaneous0001_command	Bool	1
AI_CJ_H0_Instantaneous0001_opened	Bool	1
AI_CJ_H0_Instantaneous0001_closed	Bool	0
AI_CJ_H0_Instantaneous0001_error	Bool	0
AI_CJ_H0_Instantaneous0001_close	Bool	0
AI_CJ_H0_Instantaneous0002_mainMode	Bool	0
AI_CJ_H0_Instantaneous0002_stopMode	Bool	1
AI_CJ_H0_Instantaneous0002_command	Bool	0
AI_CJ_H0_Instantaneous0002_opened	Bool	0
AI_CJ_H0_Instantaneous0002_closed	Bool	1
AI_CJ_H0_Instantaneous0002_error	Bool	0
AI_CJ_H0_Instantaneous0002_close	Bool	0
AI_CJ_H0_Instantaneous0003_mainMode	Bool	0
AI_CJ_H0_Instantaneous0003_stopMode	Bool	0
AI_CJ_H0_Instantaneous0003_command	Bool	1
AI_CJ_H0_Instantaneous0003_opened	Bool	0
AI_CJ_H0_Instantaneous0003_closed	Bool	0
AI_CJ_H0_Instantaneous0003_error	Bool	1
AI_CJ_H0_Instantaneous0003_close	Bool	0
AI_CJ_H0_Instantaneous0004_mainMode	Bool	0
AI_CJ_H0_Instantaneous0004_stopMode	Bool	0
AI_CJ_H0_Instantaneous0004_command	Bool	0
AI_CJ_H0_Instantaneous0004_opened	Bool	0
AI_CJ_H0_Instantaneous0004_closed	Bool	1
AI_CJ_H0_Instantaneous0004_error	Bool	0
AI_CJ_H0_Instantaneous0004_close	Bool	0

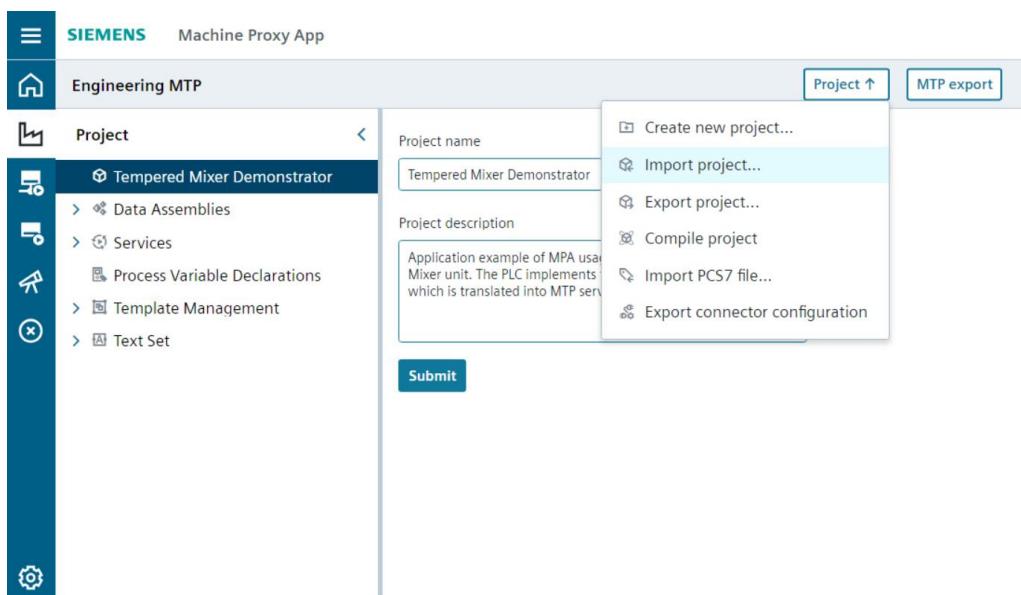
## 3.4 Machine Proxy runtime

1. In Machine Proxy go to "MTP Engineering" by clicking on its icon.

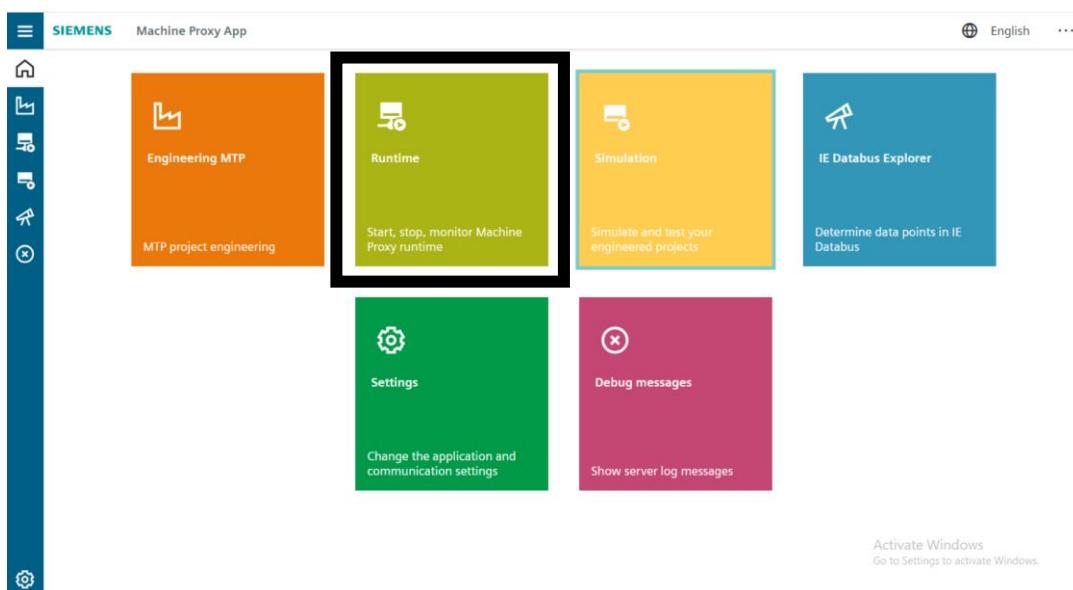


2. Click on "Project" icon and select "Import project..."

### 3 Initiating project runtime simulation



3. Import the "MPADemo.yaml" file.
4. Go to runtime section.

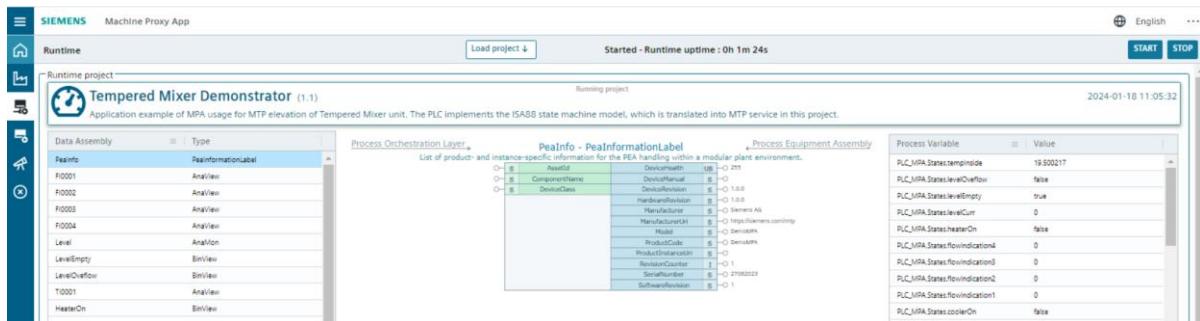


5. Click on "Load project" and import the project from engineering.



### 3 Initiating project runtime simulation

6. Click on "Start" button and runtime should be started.



7. OPC UA server with the MTP interface is accessible on the following URL:  
opc.tcp://<IP address of Edge device>:48020

#### IP Address of the Edge device

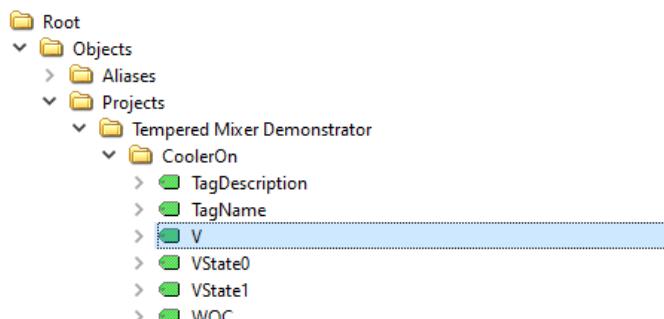
If you are using all the preset configuration from the files attached to this application example, your PLC and PC station should have IP addresses listed in the beginning of chapter 2 of this document (opc.tcp://192.168.203.130:48020)

We recommend, for the sake of this demonstrator, using static IP addresses settings according to chapter 2. Therefore, it is necessary to change the IP Address of your Edge device, which can be done in "Settings" > "Connectivity" > "LAN network" directly on the edge device web GUI.

#### NOTE



8. Data Assemblies interfaces can be then accessed on the server with the following path: "Root">"Objects">"Projects">"Tempered Mixer Demonstrator"

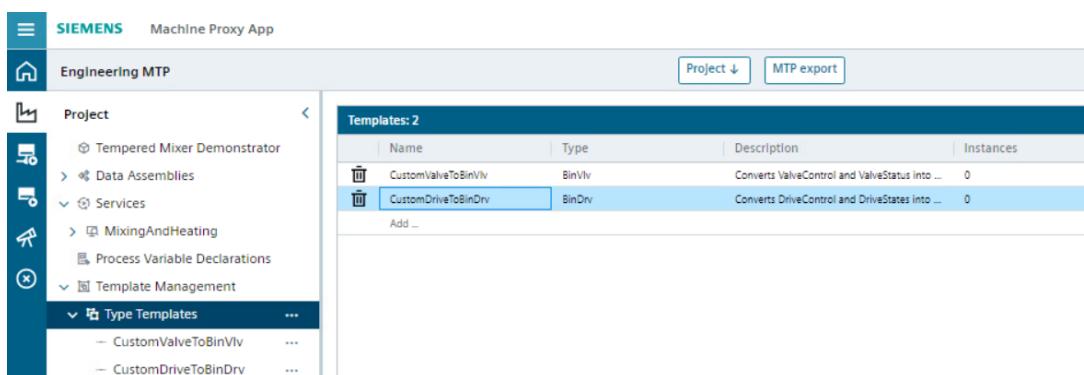


## 3.5 Application V1.1 updates

To obtain more detailed information about the new features, please refer to the Application Manual, 12/2023; V.1.1, A5E51896539-AA

### 3.5.1 Templates for services

To create services based on a template, you first need to set up this template in the "MPA Engineering MTP" view. Under "Template Management" in the project tree, all templates are listed that are saved in the project. In this view, you can create new templates, edit the existing ones and delete them.



#### Creating templates

1. In the project tree, select "Template Management > Templates".
2. Click "Template Add". A pop-up window appears. Under "Types", all common Data Assembly types are listed in a tree topology that you can use as the basis for the new template.

#### NOTE

If you want to create custom services using a template, first define a template of type "ServiceControl". To instantiate the template, navigate to "Services" in the project tree and create new services using the template.

3. As soon as you click on the selected type in the tree topology, the "Type" field is filled.
4. Enter a unique name and a description for the template.
5. Add one or more parameters to the template.
6. Optional: Select one of the available PLC structures from the drop-down menu and enter a name for it. You can add several PLC structures to a template.

### 3 Initiating project runtime simulation

Add Template

Select type

Type

Name

Description

Parameter

Cancel Create

7. As soon as you click on the selected type in the tree topology, the "Type" field is filled.
8. Enter a unique name and a description for the template.
9. Add one or more parameters to the template.
10. Optional: Select one of the available PLC structures from the drop-down menu and enter a name for it. You can add several PLC structures to a template.
11. Click "Create". The new template has been created and is listed in the template table.
12. Select the newly created template in the template table. The PLC structures added to the template are listed under "Parameters" right next to the template table.

SIEMENS Machine Proxy App

Engineering MTP

Project

Templates: 2

Name	Type	Description	Instances
CustomValveToBinVlv	BinVlv	Converts ValveControl and ValveStatus into ...	0
CustomDriveToBinDrv	BinDrv	Converts DriveControl and DriveStates into ...	0

Parameters

Name	Type
ValveControl	ValveControl
ValveStates	ValveStates

Add PLC structure

#### 3.5.2 Modeling text list – TextAspect

During the configuration of PEA-POL communication, TextAspectSet is used to model text lists.

The use of TextAspectSet is described in the guideline VDI/VDE/NAMUR 2658 sheet 4.

According to the guideline, TextAspectSet can be subdivided into the following categories:

- Enum definitions (Enum Definitions)
- Service positions (Service Positions)
- Service interactions (Service Interaction)

The modeling of Enum-definitions and service positions is identical.

## Creating Enum definitions / service positions

- In the project tree, navigate to "Text Set > Enums".  
The table "Enum Definitions" is displayed.

The screenshot shows the Siemens Machine Proxy App interface. On the left, there is a project tree with nodes like Project, Services, and Text Set. Under Text Set, the 'Enums' node is selected. In the main area, there are two tables. The top table is titled 'Enum definitions' and contains one row: 'LevelStageEnum' with the description 'Stages of level fullness'. Below it is a button labeled 'Add'. The bottom table is titled 'LevelStageEnum - Stages of level fullness' and lists six entries from 1 to 6, each with a corresponding text value: '10% - Almost empty', '20% - One fifth', '30% - almost third', '40% - forty percent', '50% - half', and '60% - above half'.

- Double-click the last empty row in the table and enter a unique name and description for the new Enum definition.

You can edit the Enum definition by changing the name or description.

A Enum definition / service position is created and displayed in the table.

## Assigning values to the Enumdefinitions / service positions

- Select the desired Enum definition in the table "Enum Definitions".
- Enter the values in the table below.

This screenshot shows the same interface as the previous one, but with a different state. The 'Enum definitions' table now has a second row: 'LevelStageEnum' with the description 'Stages of level fullness'. The 'Add' button is still present. The 'LevelStageEnum - Stages of level fullness' table now has nine entries from 1 to 9, with the last entry being '90% - almost full'.

You can assign only numerical values to an Enum definition.

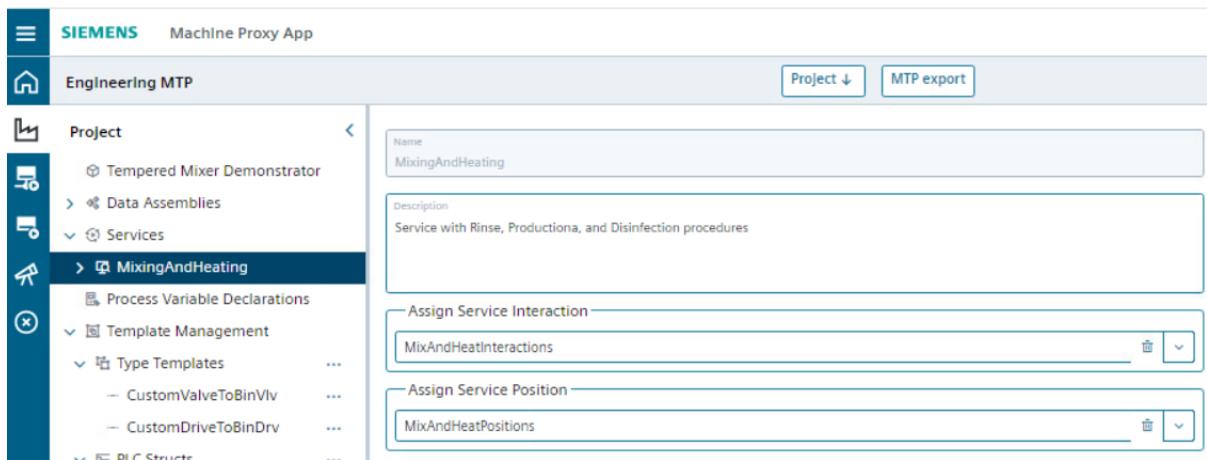
### 3 Initiating project runtime simulation

You have assigned values to the Enum definition / service position.

#### Using service positions for services

You can assign service positions to your services.

1. In the project tree go to "Services" and click on the desired service.
2. In the field "Assign service position", select a service position you created from the drop-down menu.



#### Create service interaction

For each service that requires a service operator interaction, create a service interaction:

1. In the project tree, navigate to "Text Set > Service Interactions".

The table "Service Interactions" is displayed.

Name	Description
MixAndHeatInteractions	Interactions with the Mixing and Heating Service

MixAndHeatInteractions: Questions	
Id	Question
1	Should I produce good quality?
Add	

1: Answers	
Id	Answer
1	Yes, good quality please!
2	Doesn't matter
3	It is up to you
Add	

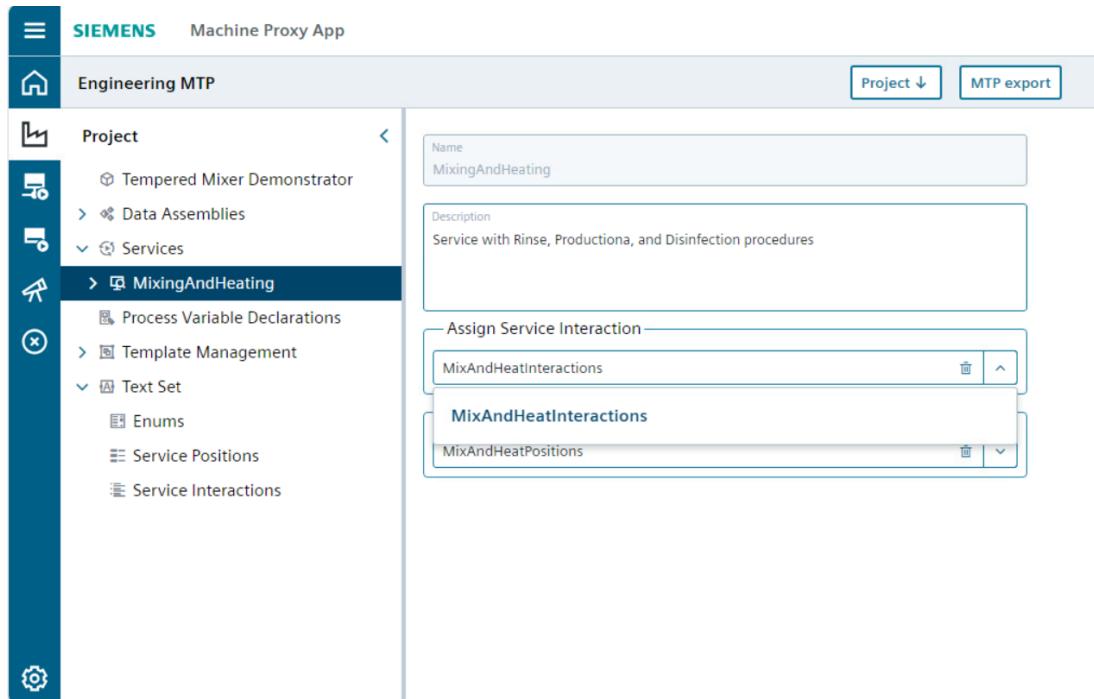
2. Double-click the last empty row in the table and enter a unique name and description for the new service interaction. You can edit the service interaction at any time by changing the name or description.

The service interaction is created and displayed in the table.

#### Using service interactions for services

You can use service interactions for services.

1. In the project tree go to "Services" and click on the desired service.
2. In the field "Assign service interaction", select a service you created from the drop-down menu.

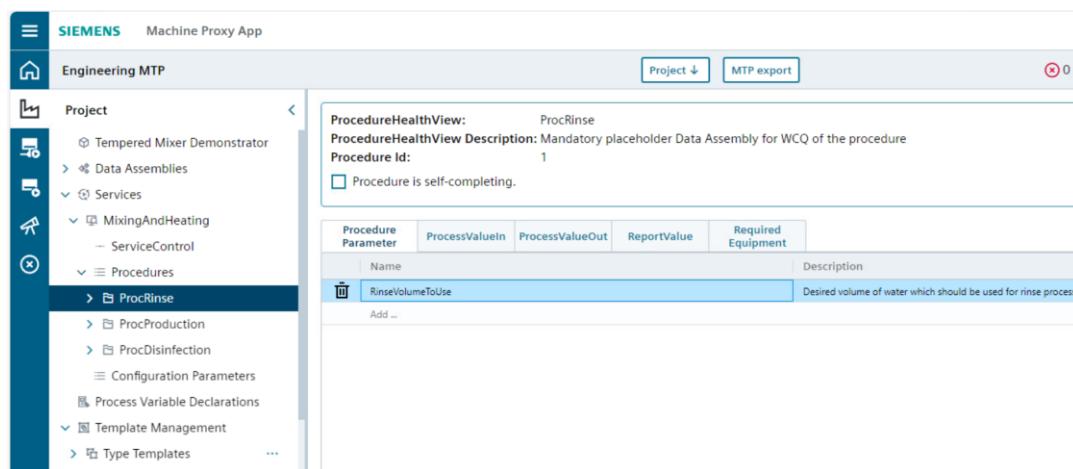


#### 3.5.3 Connecting a Data Assembly with procedure parameters

You can configure MTP procedures by associating Data Assemblies with the procedures as "ProcedureParameter", "ProcessValueIn", "ProcessValueOut" or "ReportValue". In addition, you can connect Data Assemblies and other services to the procedures as "RequiredEquipment".

##### Procedure

1. In the project tree navigate to "Services" and select a service name.
2. In the project tree, click on a procedure listed under the selected service.  
The procedure details are displayed.



### 3 Initiating project runtime simulation

- To assign a Data Assembly or a service as a "RequiredEquipment", click on the "RequiredEquipment" tab.

The screenshot shows the 'Engineering MTP' software interface. On the left, there is a sidebar with icons for Home, Project, Data Assemblies, Services, Procedures, and a gear. The 'Procedures' section is expanded, and 'ProcRinse' is selected. The main area has a title bar with 'Engineering MTP', 'Project', 'MTP export', and status indicators (0 errors, 0 warnings, 0 info). Below the title bar, it says 'ProcedureHealthView: ProcRinse' and 'ProcedureHealthView Description:'. Under 'Procedure Id:', there is a checkbox for 'Procedure is self-completing'. To the right, there is a table titled 'Procedure Parameter' with columns: Procedure Parameter, ProcessValueIn, ProcessValueOut, ReportValue, and Required Equipment. The table lists various parameters with their descriptions:

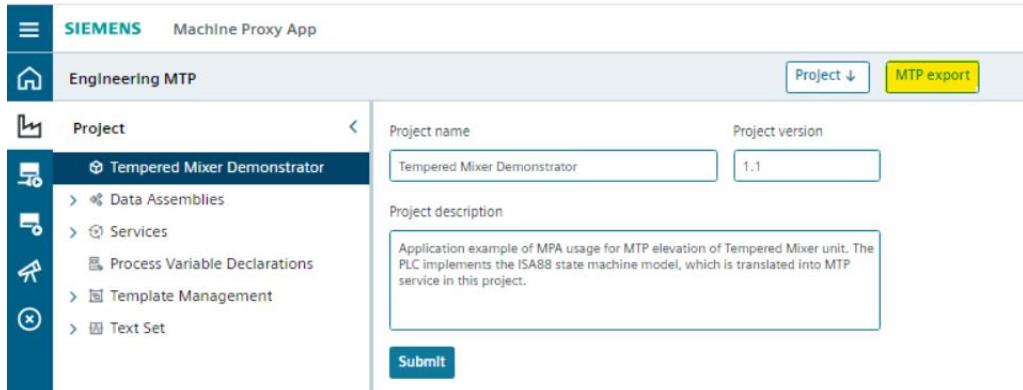
Procedure Parameter	ProcessValueIn	ProcessValueOut	ReportValue	Required Equipment
Select / Deselect all				
FI0001	AnaView			Flow detector for pipe on H0001
FI0002	AnaView			Flow detector for pipe on H0002
FI0003	AnaView			Flow detector for pipe on H0003
FI0004	AnaView			Flow detector for pipe on H0004
Level	AnaMon			Current tank level
LevelEmpty	BinView			Mixer empty signal
LevelOverflow	BinView			Mixer overflow signal
TI0001	AnaView			Temperature inside the mixer
HeaterOn	BinView			Indicates if the heater is on
TI0002	AnaView			Temperature of the medium from CIP

In the left column, select individual Data Assemblies and services. All selected Data Assemblies and services are assigned to the procedure as "RequiredEquipment".

- To select or deselect all Data Assemblies or services, click "Select / Deselect all".
- If you want the procedure to end automatically when it has finished, activate the self-completing option.

## 3.6 Export MTP file

1. In MTP Engineering click on "MTP Export" button in the top-right corner.



2. The MTP file is then downloaded by your browser into the default folder.

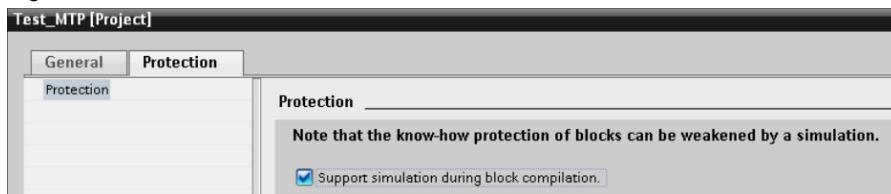
## 3.7 Frequent issues

In case of problems with starting the PLC or WinCC Unified, please double-check the following settings in TIA Portal and download the configuration again.

### 3.7.1 Project Protection

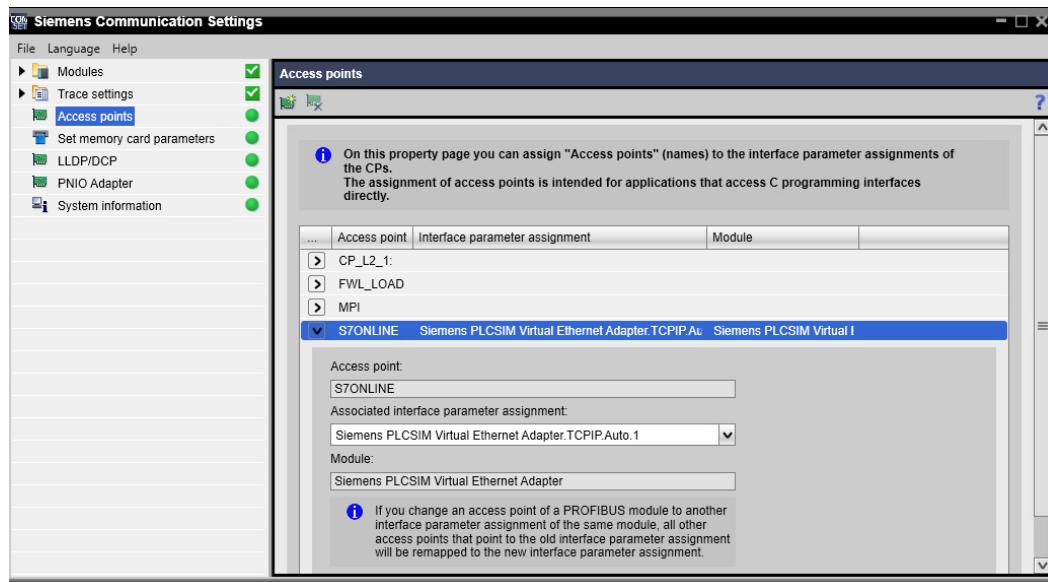
In TIA Portal project settings, allow support of the Simulation during block compilation.

Figure 3-1

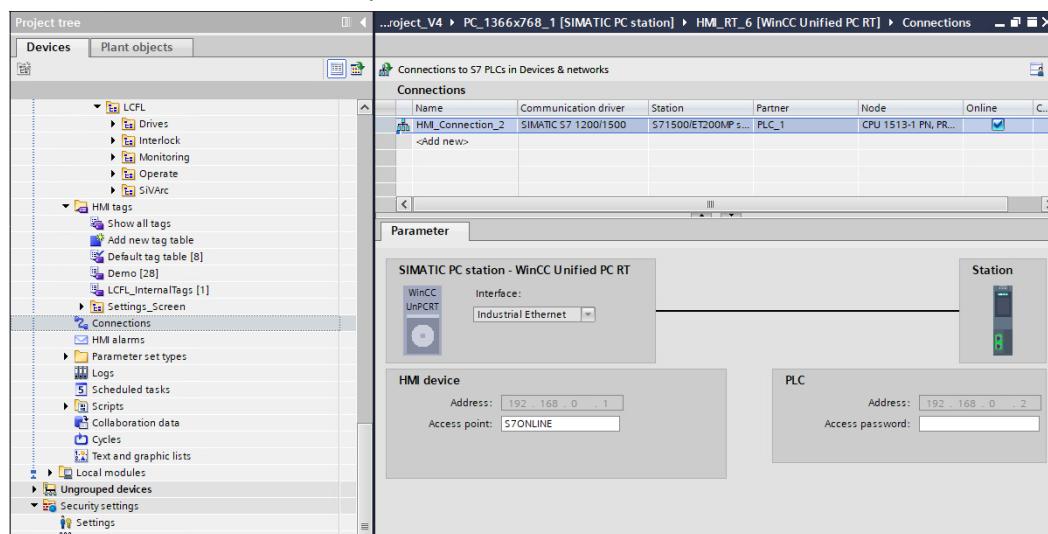


### 3.7.2 Setup PG/PC Interface

1. In the Windows Control Panel open "Communication Settings". Check if the S7ONLINE Access point is predefined correctly.



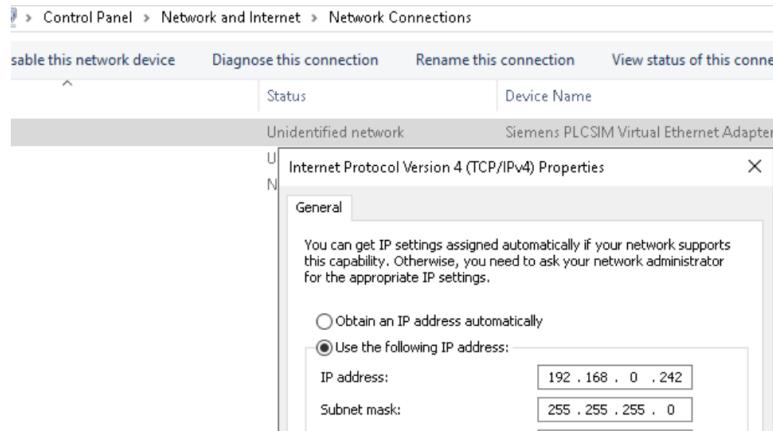
2. Check if the same access point has been set in HMI Connections.



### 3.7.3 PLCSIM Advanced Virtual Ethernet Adapter

The IP Address of the PLCSIM Virtual Ethernet adapter should be in the same subnet as the plant bus.

Figure 3-2



## 4 Appendix

### 4.1 Service and support

#### Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

[support.industry.siemens.com](https://support.industry.siemens.com)

#### Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers

– ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:

[siemens.com/SupportRequest](https://siemens.com/SupportRequest)

#### SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

[siemens.com/sitrain](https://siemens.com/sitrain)

#### Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

[support.industry.siemens.com/cs/sc](https://support.industry.siemens.com/cs/sc)

#### Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

[support.industry.siemens.com/cs/ww/en/sc/2067](https://support.industry.siemens.com/cs/ww/en/sc/2067)

## 4.2 Industry Mall



The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:

[mall.industry.siemens.com](http://mall.industry.siemens.com)

## 4.3 Links and literature

Table 4-1

Nr.	Thema
\1\	Siemens Industry Online Support <a href="https://support.industry.siemens.com">https://support.industry.siemens.com</a>
\2\	Link to this entry page of this application example <a href="https://support.industry.siemens.com/cs/ww/en/view/109824432">https://support.industry.siemens.com/cs/ww/en/view/109824432</a>
\3\	Delivery release SIMATIC WinCC V18 <a href="https://support.industry.siemens.com/cs/ww/en/view/109813587">https://support.industry.siemens.com/cs/ww/en/view/109813587</a>
\4\	Modular production with "Module Type Package (MTP)" - Module design with TIA Portal <a href="https://support.industry.siemens.com/cs/ww/en/view/109783062">https://support.industry.siemens.com/cs/ww/en/view/109783062</a>
\5\	Databus - Manual <a href="https://support.industry.siemens.com/cs/ww/en/view/109818812">https://support.industry.siemens.com/cs/ww/en/view/109818812</a>
\6\	SIMATIC S7 Connector - Manual <a href="https://support.industry.siemens.com/cs/ww/en/view/109813186">https://support.industry.siemens.com/cs/ww/en/view/109813186</a>
\7\	HMI design with the HMI Template Suite <a href="https://support.industry.siemens.com/cs/ww/en/view/91174767">https://support.industry.siemens.com/cs/ww/en/view/91174767</a>

## 4.4 Change documentation

Table 4-2

Version	Date	Modifications
V1.0	09/2023	First version
V1.1	06/2024	Update