Siemens S7-1200

CPU 1212C AC/DC/Relay

Move, Compare and Math Operators

Application

Objective

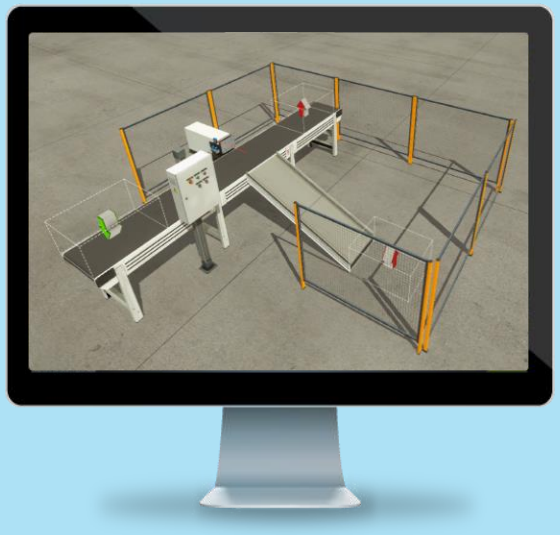
Monitor & control the level of water in tank

Commands to practice:

- Compare: >,<, ==, In_Range
- MOV
- MUL

Code and Compile
Learning Made Easy
www.codeandcompile.com

Software Platform by:
realgames



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PLC used
S7-1200

Programming Software
Siemens TIA

3D Software Platform
FACTORY I/O

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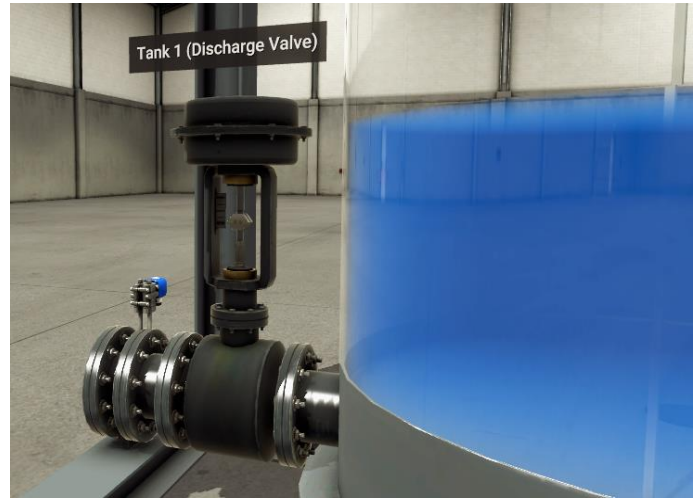
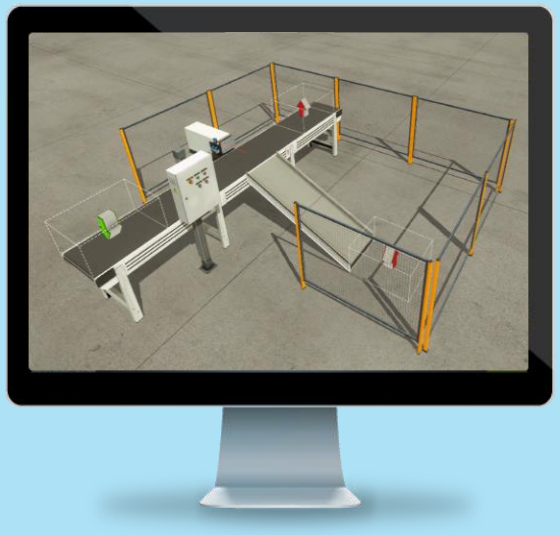


The tank has been configured with **Analog mode**.



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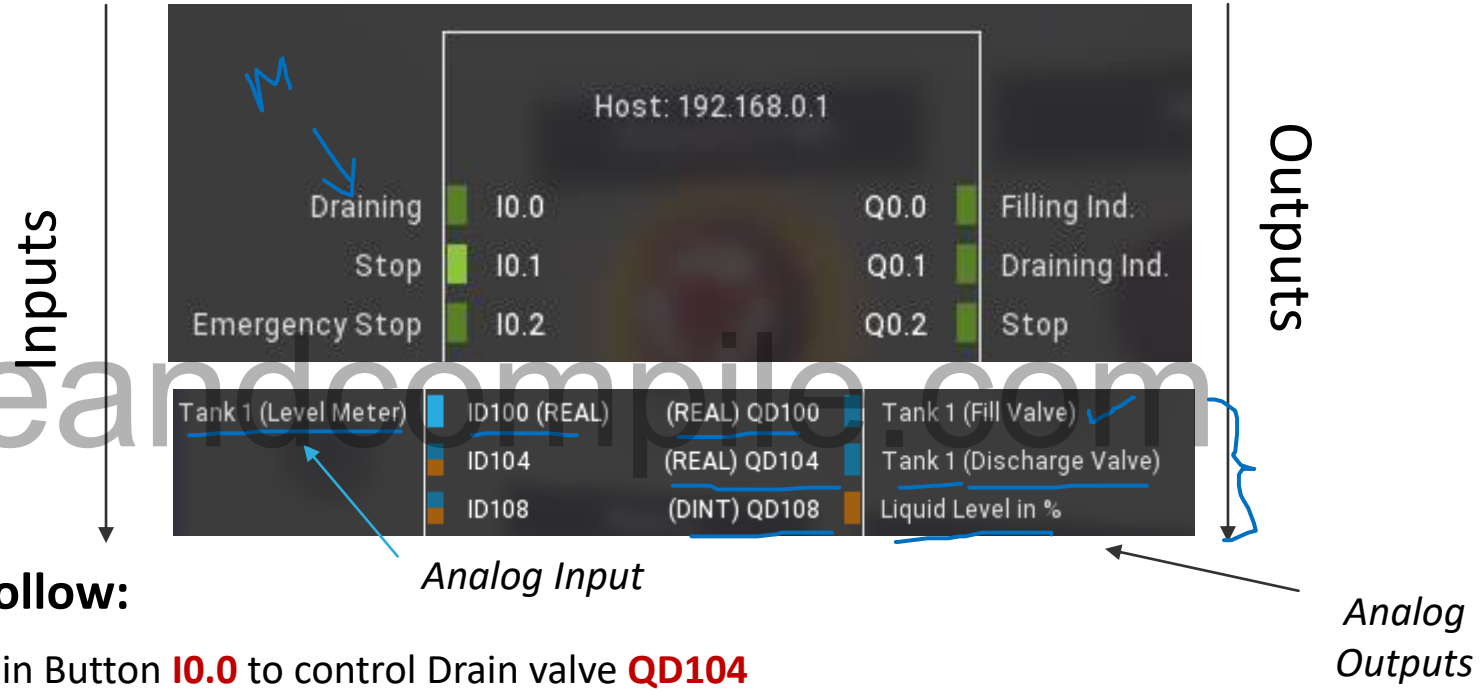
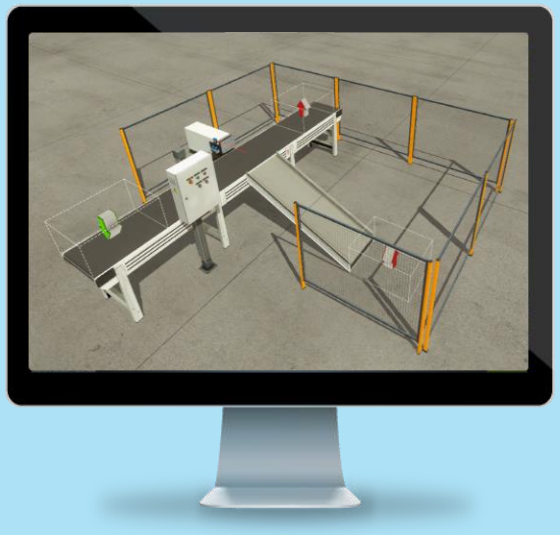
Objective: Monitor & control the level of water in tank

Assigned Inputs & Outputs:



Steps to follow:

1. Use Drain Button **I0.0** to control Drain valve **QD104**
2. Monitor the tank level **ID100** and control fill valve **QD100** in step mode
3. Indicate filling and draining operation with blinking of indicator **Q0.0** and **Q0.1** respectively
4. Display the tank level **ID100** in % on Liquid Level display **QD108**
5. Include emergency button **I0.2** to halt the operation
6. **Download the Logic and Test!**



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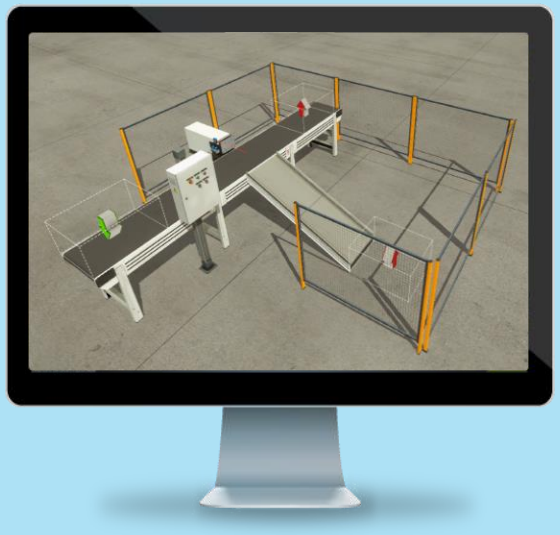
Necessary Steps:

1. Define **tags** in Siemens TIA ✓

	Name	Tag table	Data type	Address
1	Draining	Default tag table	Bool	%I0.0
2	Stop	Default tag table	Bool	%I0.1
3	Emergency Stop	Default tag table	Bool	%I0.2
4	Filling Indicator	Default tag table	Bool	%Q0.0
5	Draining Indicator	Default tag table	Bool	%Q0.1
6	Stop Light	Default tag table	Bool	%Q0.2
7	Tank Level	Default tag table	DWord	%ID100
8	Fill Valve	Default tag table	Real	%QD100
9	Discharge Valve	Default tag table	Real	%QD104
10	Liquid Level Display	Default tag table	DInt	%QD108
11	Clock_Byte	Default tag table	Byte	%MB100
12	Clock_10Hz	Default tag table	Bool	%M100.0
13	Clock_5Hz	Default tag table	Bool	%M100.1
14	Clock_2.5Hz	Default tag table	Bool	%M100.2
15	Clock_2Hz	Default tag table	Bool	%M100.3
16	Clock_1.25Hz	Default tag table	Bool	%M100.4
17	Clock_1Hz	Default tag table	Bool	%M100.5
18	Clock_0.625Hz	Default tag table	Bool	%M100.6
19	Clock_0.5Hz	Default tag table	Bool	%M100.7

2. Configure the tank to **Analog Mode**: ✓

Right Click on Tank -> Configuration -> Digital



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How Analog Input and Output works in FACORY I/O:

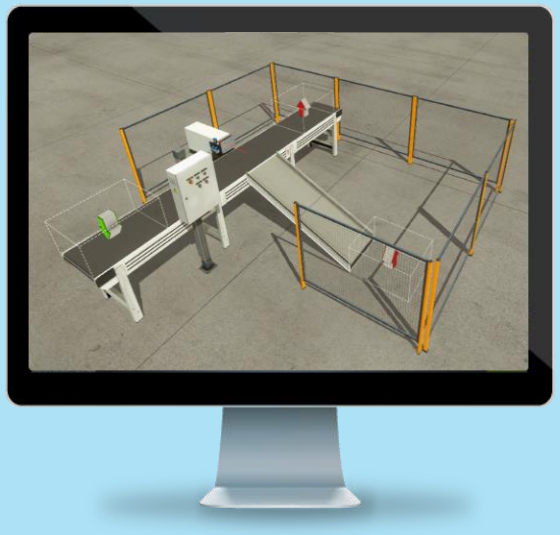
Analog Input

Tank 1 (Level Meter)	ID100 (REAL)	(REAL) QD100	Tank 1 (Fill Valve)
	ID104	(REAL) QD104	Tank 1 (Discharge Valve)
	ID108	(DINT) QD108	Liquid Level in %

Analog Output

Tank Level	PLC Input ID100
0%	0.0
25%	2.5
50%	5.0
75%	7.5
100%	10.0

Input Dec	Fill Valve QD100	Discharge Valve, QD104
0.0	Closed	Closed
2.5	25% Open	25% Open
5.0	50% Open	50% Open
7.5	75% Open	75% Open
10.0	100% Open	100% Open



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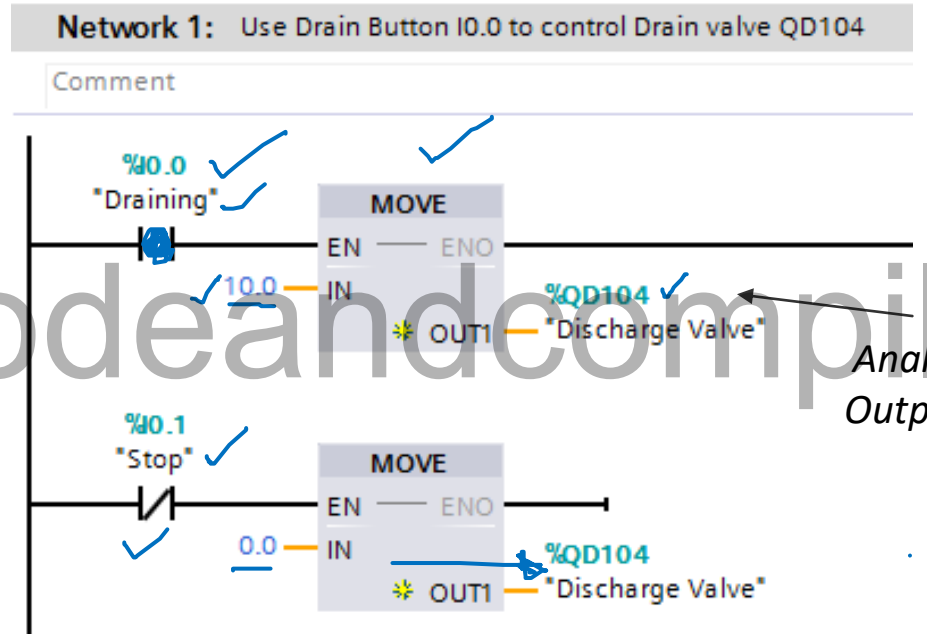
Steps to follow:

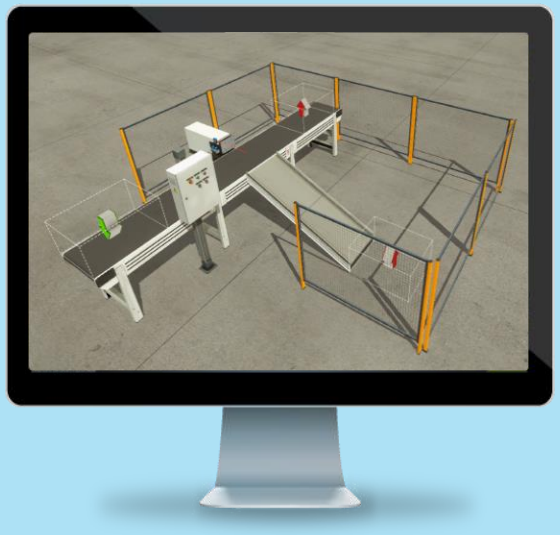
1. Use Drain Button **I0.0** to control Drain valve **QD104**



Analog Outputs

Discharge Valve
Proportional Control

Input Decimal	Valve Output QD104 (Real)
0.0	Closed
10.0	100% Open



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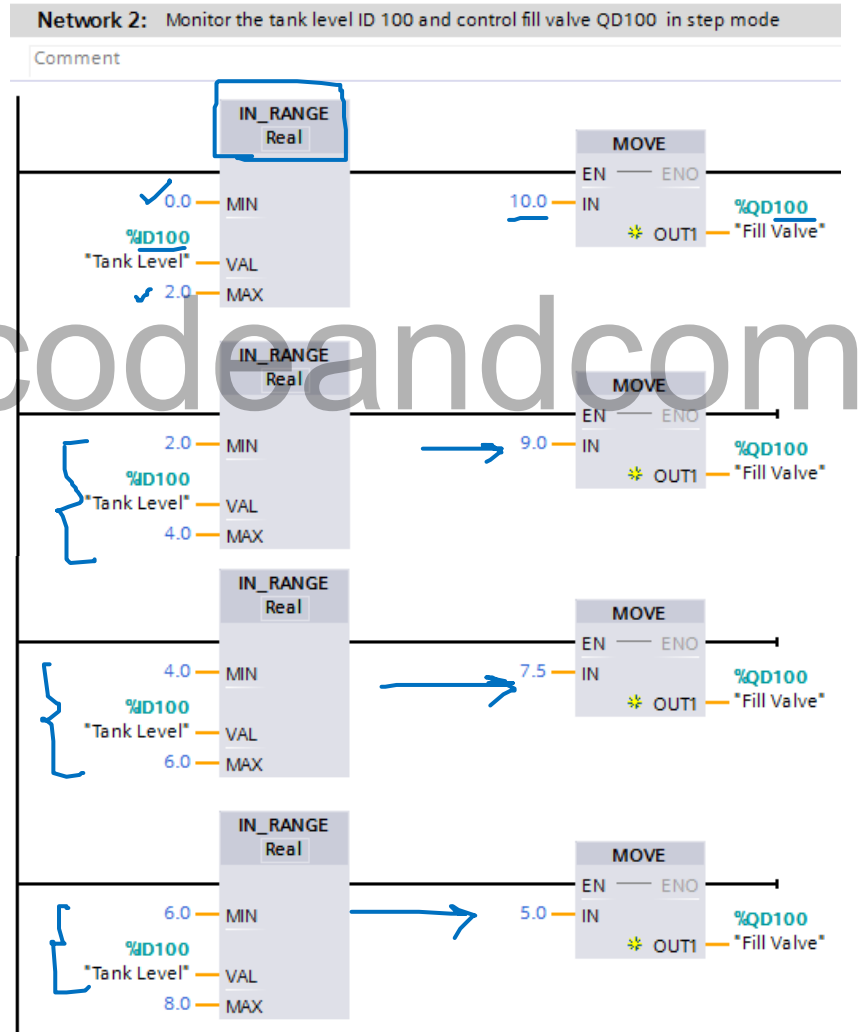
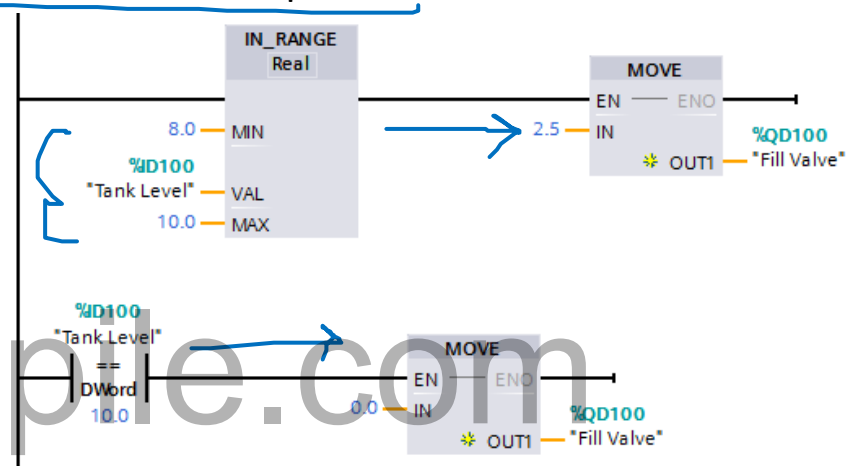
Objective: Monitor & control the level of water in tank

Steps to follow:

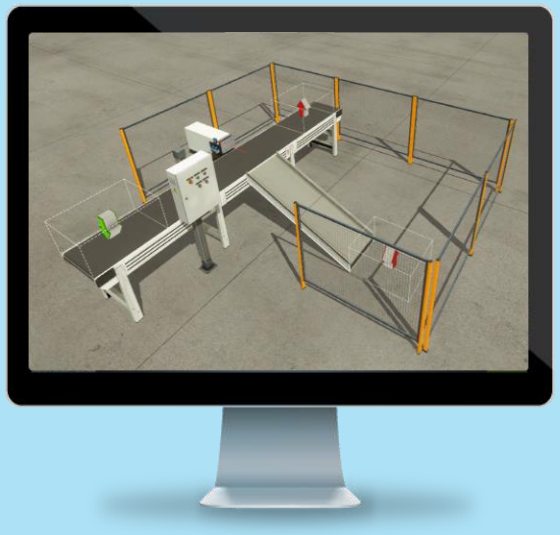
2. Monitor the tank level **ID100** and control fill valve **QD100** in step mode





Analog Input & Output Relation

Tank Level	Valve Output QD100
0 - 20 %	100% Open
20 - 40 %	90% Open
40 - 60 %	75% Open
60 – 80 %	50% Open
80 - 100%	25% Open
100%	Closed



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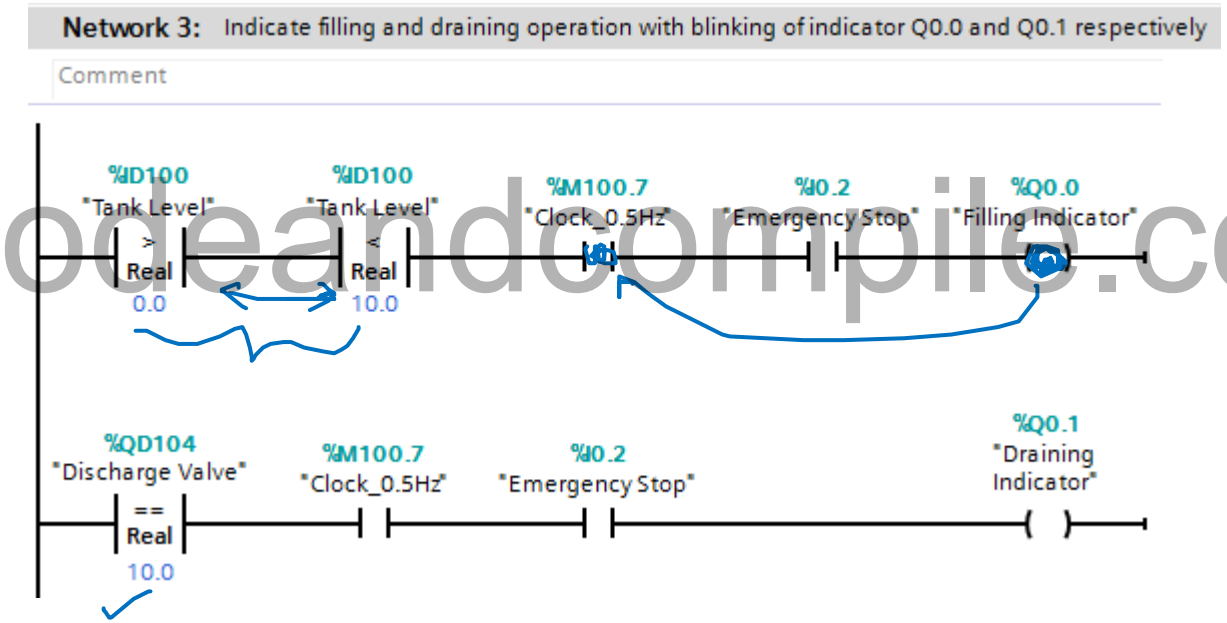

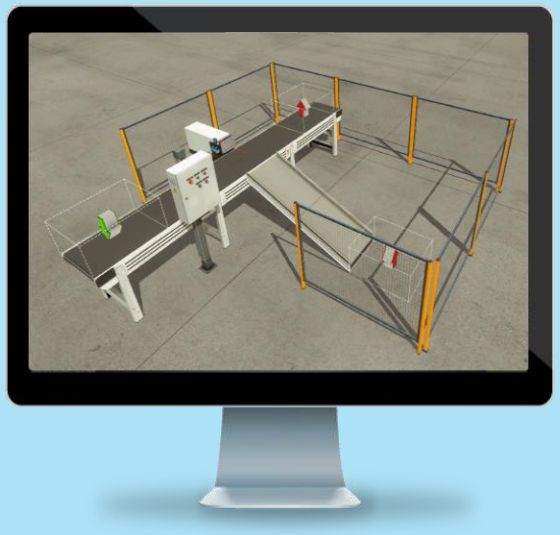

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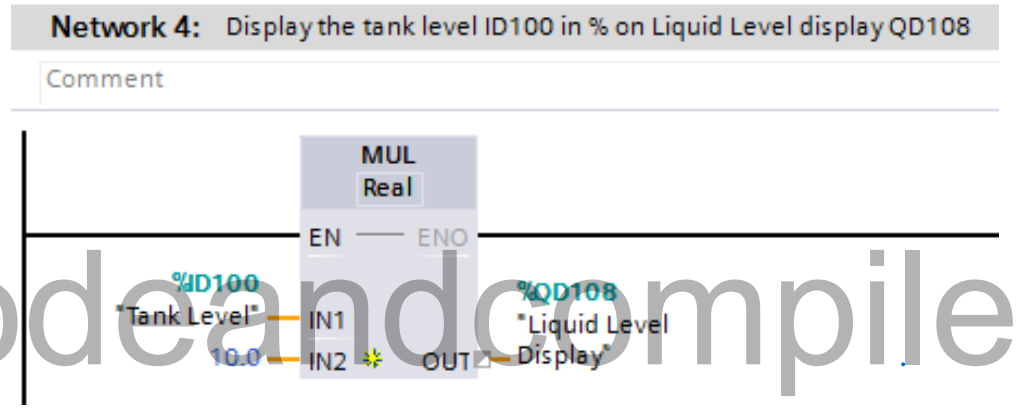
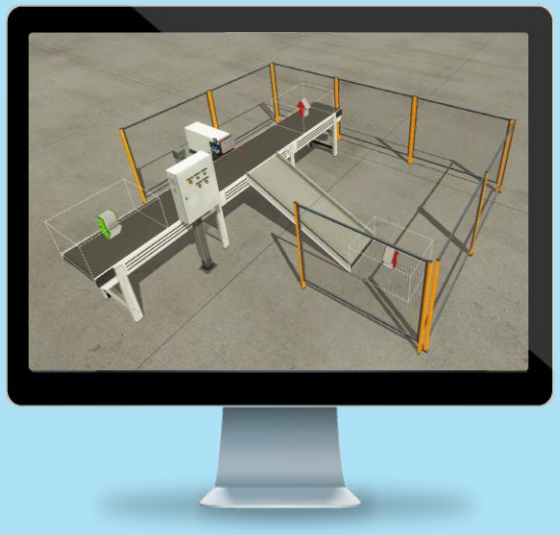
Steps to follow:

4. Display the tank level **ID100** in % on Liquid Level display **QD108**



Tank Level (REAL)	Tank Level (REAL)	Multiplication Factor	Liquid Level Display
0.0	0.0	10	0
25%	2.5		25
50% Open	5.0		50
75% Open	7.5		75
100% Open	10.0		100



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Steps to follow:

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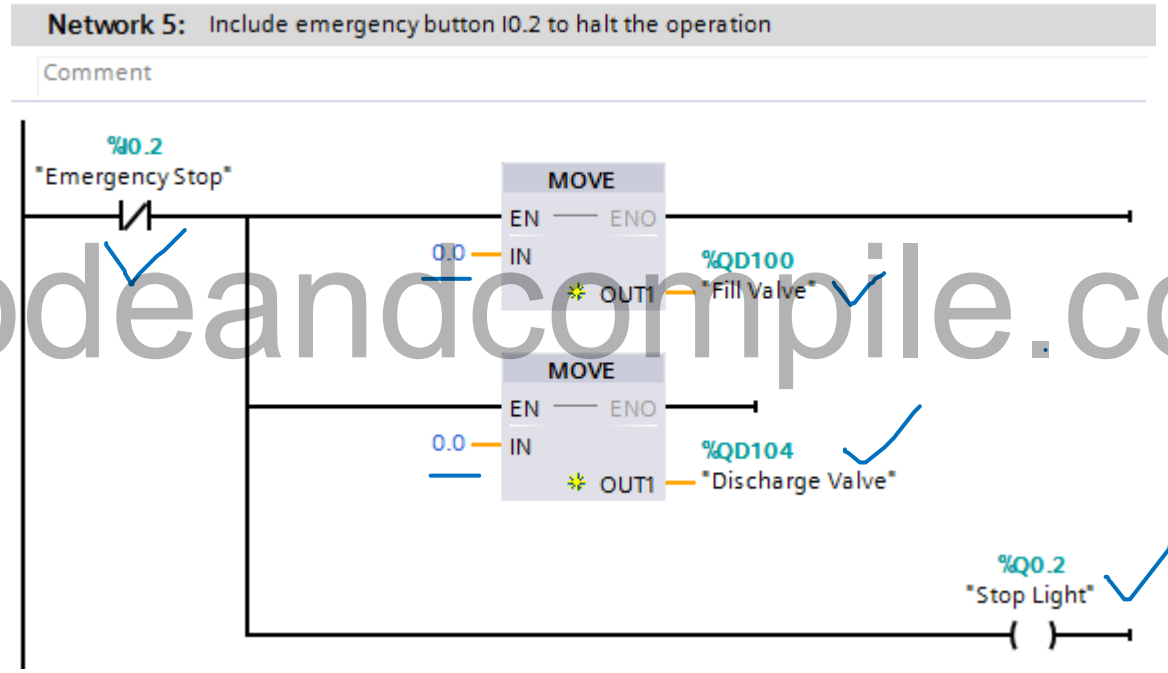

6. **Download the Logic and Test!**

DID YOU KNOW ?

*You can control the **FACTORY I/O** environment without using hardware PLC via Control I/O Driver. This driver is available at NFI website www.nfiautomation.org. Special offer for student license.*

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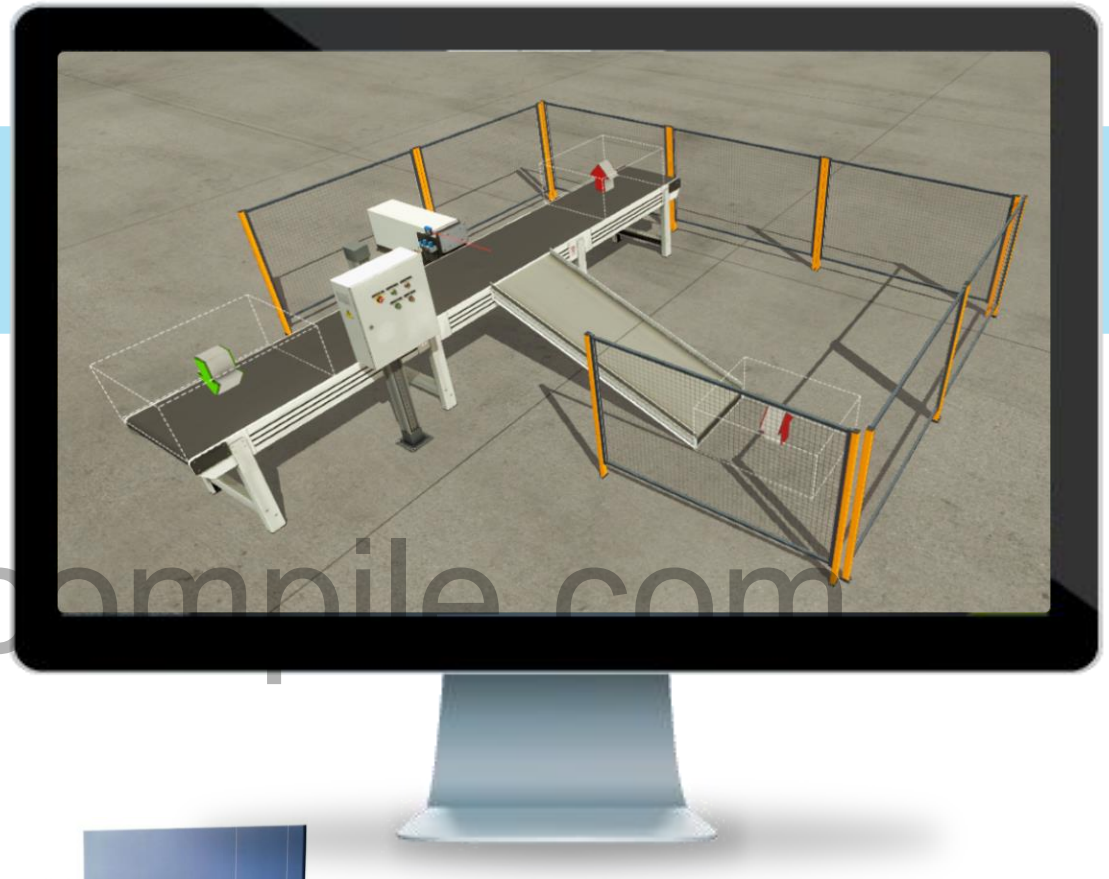
CPU 1212C AC/DC/Relay

Move, Compare and Math Operators Application



Thank you

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