

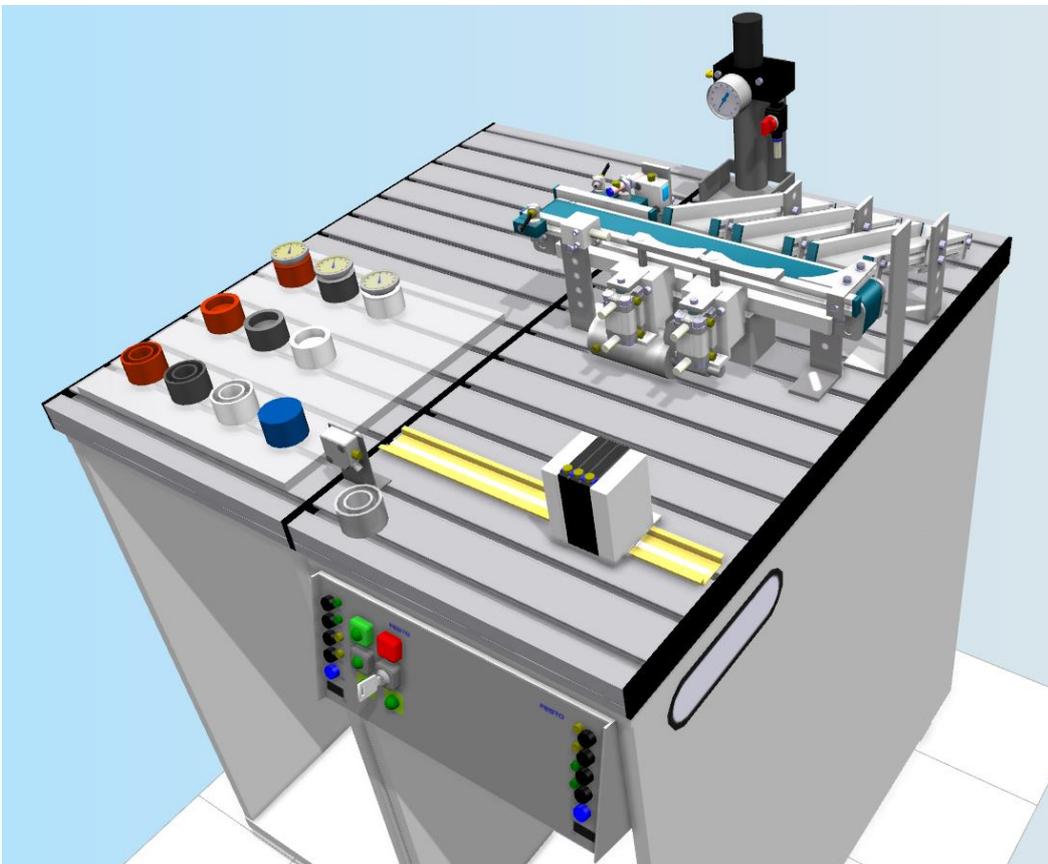
## SW Test project for software participant

### Programming and commissioning of a sorting station

Maximum time: 90 minutes

#### Situation

You have been given the task of programming and commissioning a station that has been delivered assembled. The station will be purchased by a customer in France to partially automate a production line.



#### Task

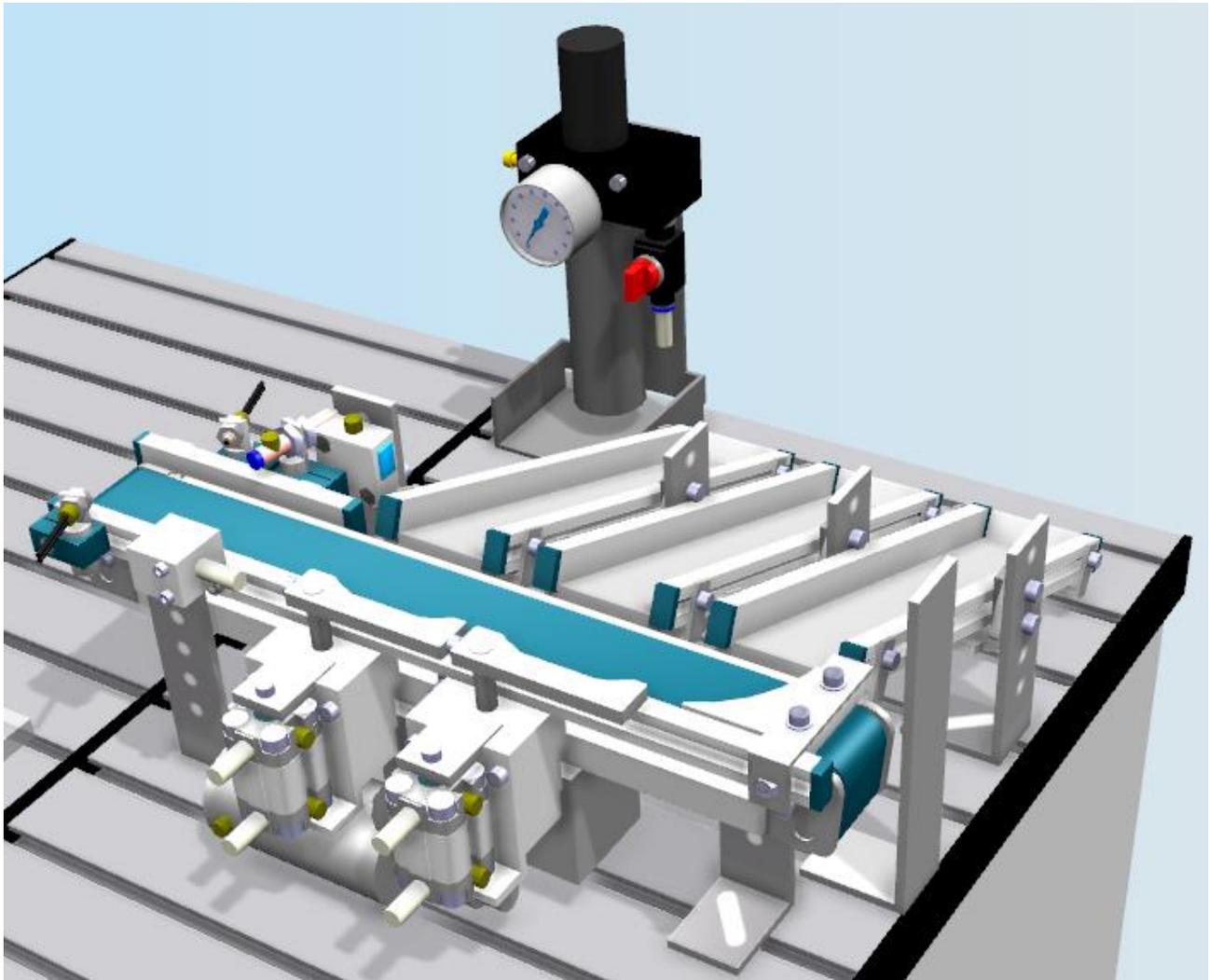
Create a programme so that commissioning is made easier for the customer. Le programme est testé dans une simulation.

Your task is complete when:

1. The correct execution of the program with PLC activation (based on evaluation with PLC) is guaranteed

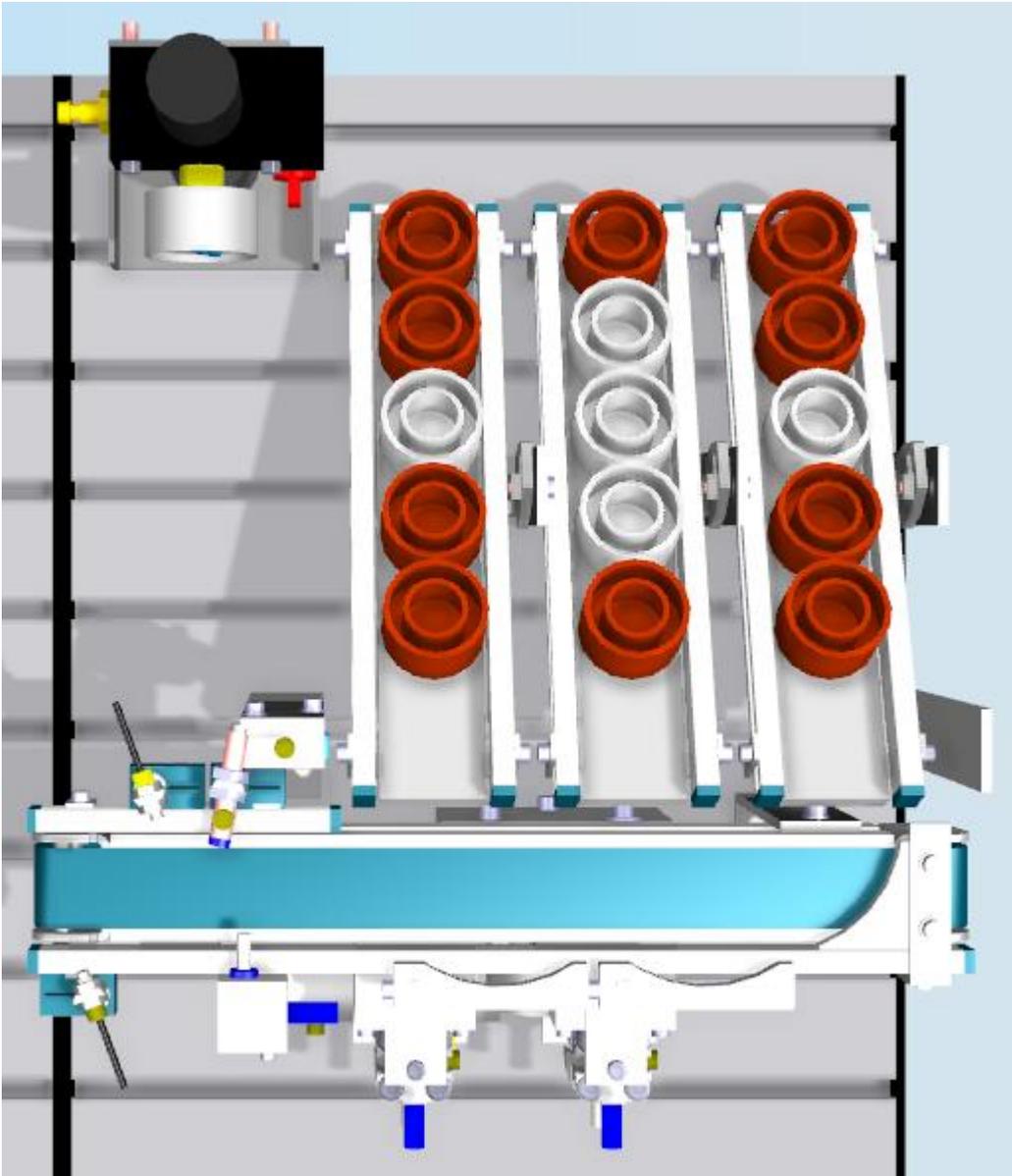
The station will be sent to the customer as soon as you are finished. You will have no opportunity to make improvements later.

### Initial position



- Conveyor OFF
- Stopper extended
- Switches retracted
- No workpiece on the station

**Storing the workpieces**



**Order of workpiece during manual loading on the conveyor**

R-M-R-M-R-M-R-M-R-M-R-R-R-R-R

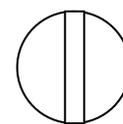
## Allocation I/O terminal

### Station - Byte 0

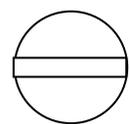
I/O Terminal (IN)	Comment – Signal 1 indicates	I/O Terminal (OUT)	Comment – Signal 1 set
DI 0	Workpiece available	DO 0	Conveyor motor on
DI 1	Metallic workpiece	DO 1	Extend switch 1
DI 2	Workpiece is not black	DO 2	Extend switch 2
DI 3	Slide full	DO 3	Retract stopper
DI 4	Switch 1 retracted	DO 4	
DI 5	Switch 1 extended	DO 5	
DI 6	Switch 2 retracted	DO 6	
DI 7	Switch 2 extended	DO 7	

Control console - Byte 1

I/O Terminal (IN)	Comment – Signal 1 indicates	I/O Terminal (OUT)	Comment – Signal 1 set
DI 0	S1 START Button	DO 0	P1 START indicator light
DI 1	S2 STOP Button (NC)	DO 1	P2 RESET indicator light
DI 2	S3 Key Switch MAN/AUTO	DO 2	P3 Q1 Indicator light
DI 3	S4 RESET Button	DO 3	P4 Q2 Indicator light
DI 4		DO 4	
DI 5		DO 5	
DI 6		DO 6	
DI 7		DO 7	



AUTO



MAN

**Evaluation form SW Test project for software participant**

**Programming and commissioning of a sorting station**

**Competitor:** .....

**Expert at the evaluation** (name, signature): .....

**Maximum time:** 90 minutes

**Time needed:** .....

Description / PLC Function	Result	Mark Awarded
 <p>Preparation: Connect the PLC board with the I/O terminals, switch key to the position AUTO, start the PLC, no programming cable and no communication between PC and PLC, valve for air opened, conveyor is empty. You will get time to check that before the evaluation!</p>		
Lamp RESET ON		0.3
Press the RESET button then the sequence is initialized, the station goes to the base position		0.3
If station is in initial position, then lamp RESET OFF and lamp START ON		0.6
Switch key to position MAN		
Press the START button		0.3
A: Place the first workpiece at the beginning of the conveyor then lamp START OFF		0.3
B: Transport workpiece on the slide		0.3
A: Place the second workpiece at the beginning of the conveyor		0.3
B: Transport workpiece on the slide		0.3
Continue with the process A-B for the next 6 workpieces	0,15 points/workpiece	0.9
After 8 workpieces on slides then lamp Q1 ON		0.3
Switch key to position MAN		
C: Press the START button		0.3
D: Place the first workpiece at the beginning of the conveyor		0.3
E: Transport workpiece on the slide		0.3

C: Press the START button		0.3
D: Place the first workpiece at the beginning of the conveyor		0.3
E: Transport workpiece on the slide		0.3
Continue with the process C-D-E for the next workpieces		0.9
If all 15 workpieces on slides then lamp Q2 ON		0.3
Correct arrangement according to assignment		4.5
Remove all workpieces by hand		
Switch key to position AUTO and press the RESET button		
All lamps OFF		0.6
<b>Total PLC Function</b>		<b>12</b>

The STOP button is not used.

Description	Result	Mark Awarded
Time evaluation only if the maximum number of points is achieved for PLC function 0.15 points for each minute gained		
<b>Total time evaluation</b>		<b>3</b>

Description	Result	Mark Awarded
Points for PLC function		12
Points for time evaluation		3
<b>Total des points</b>		<b>15</b>