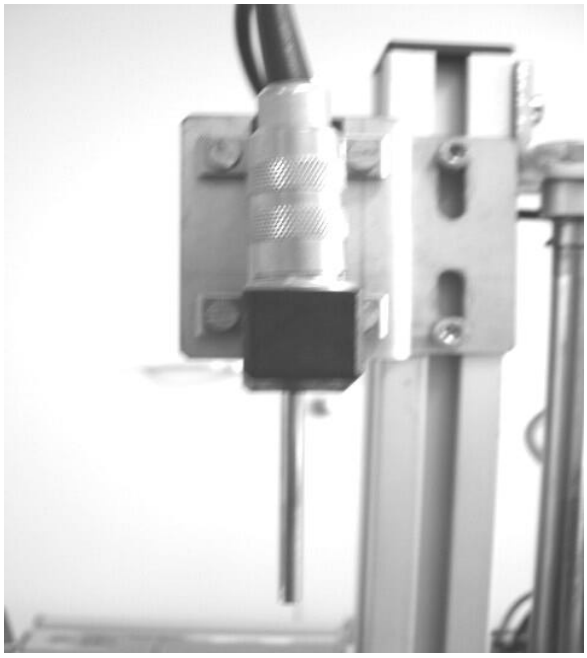
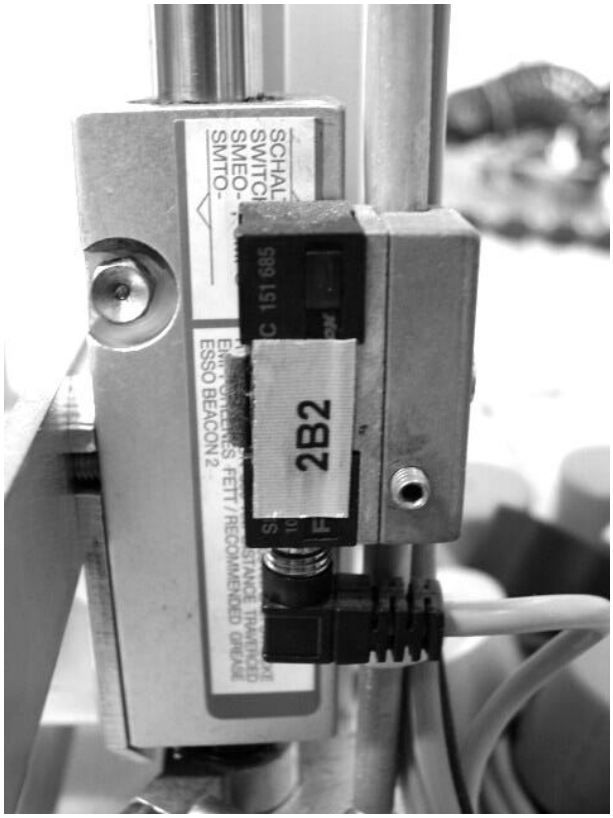
Information about sensors and actuators on the Festo Testing Station.

Solenoid valves are used for lifting and lowering the platform and operating the ejecting cylinder on the testing station. Work pieces are place one at a time on the platform for taking sensor readings and then ejected to either a top bin or a bottom bin.

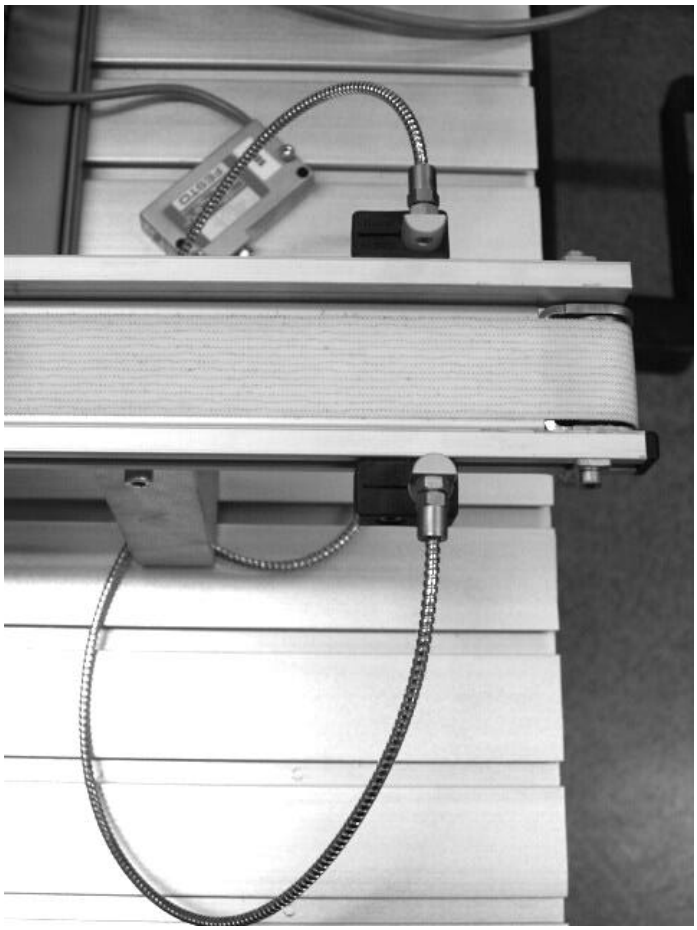


Resistance probe: This moves up and down and is used for measuring height or height differences. There are two types of testing stations with two modes of operation. In one type, the platform with the work piece is raised to this sensor. The displacement of the sensor produces a change in resistance and a voltage proportional to this change is output. In the other type, the sensor is brought down to the platform on the work piece. In either case, there is a displacement and a voltage proportional to this displacement is output. It is an analog voltage which can be adjusted to be in the range 0 to 10V. The change in voltage can be converted to a difference in height between the work pieces. For the assignment, you will use the A/D converter on the RCM4000 and digitize the analog voltage. The digitized value can be converted to height difference or height. A reference work piece may be required to calibrate the device. Two reference heights can also be used if desired.

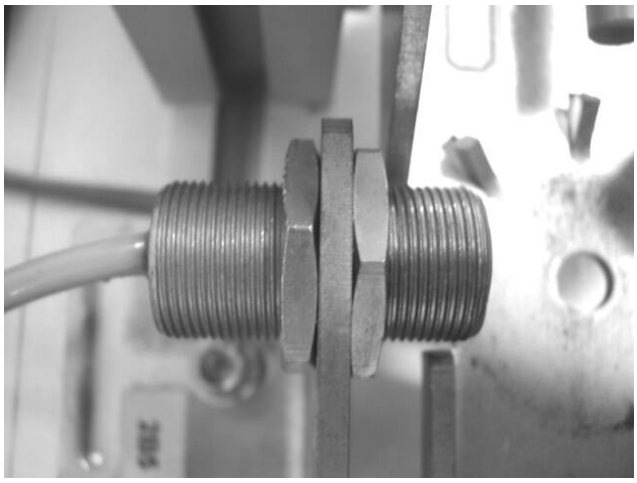
It should be noted that the digitized value may be longer than 8 bits and cannot be transferred as is over a serial channel in one character.



Reed switches are used to indicate whether the pneumatic cylinders associated with them are in extended or retracted state.



Photoelectric switches are used to (a) sense the location of a work piece as it comes to a particular spot or (b) sense the colour or composition of the work piece. The former type of sensor uses interruption of light between two points which carry light through optical fibers. The second type uses light reflected from the work piece. The intensity of the reflected light depends on whether it is non-metallic and its colour.



Proximity switch – senses metallic objects.

Pin-Line List for Festo Didactic modules

Note: direction of line denoted by prefixes I & O:

- *"I-X" means input to communication network from Module (ie from a sensor device) and indicates a query of the module's state*
- *"O-X" means output from communication network to Module (ie an actuator device) and indicates a command*

Note: Line No is the I/O interface to process controller line number, not the I/O number between I/O and device.

Testing Station

Module I/O Interface Pin	Actuator/Sensor Code	Line No (I/O – PC)	Description
1	2Y1	O-1	Lifting Cylinder: Lower
2	2Y2	O-2	Lifting Cylinder: Raised
3	2Y3	O-3	Ejecting Cylinder:Extend
13	2B5	I-0	Workpiece is: Metallic
14	2B6	I-1	Workpiece is: In Lifting Device
15	2B7	I-2	Workpiece is: Orange or Metallic
16	2B2	I-3	Lifting Cylinder is: Lowered
17	2B1	I-4	Lifting Cylinder is: Raised
18	2B3	I-5	Ejecting Cylinder is: Retracted
19	2B4	I-6	Ejecting Cylinder is: Extended