Order Code - 52387
Mechatronics Trainer Kit
IOT Based Industrial Process Demonstration Plant

IOT Based Industrial Process Demonstration Plant (52387) provides you with the perfect method for teaching automation technology step by step – from simple procedures right through to complex processes based on the principles of Industry 4.0. The modular design is therefore useful for imparting knowledge and practical experience and is equally suitable for initial operational training and advanced technical training. Various functional assemblies (like two belt conveyor beds, stacking assembly, heating module, drilling assembly, weighing platform), a robotic pick & place arm assembly and two control systems (PLCs) are mounted on the mobile powder coated metal trolleys. This configuration allows the user to implement various automated processes. The processes undergone by the work pieces are controlled by the Barcode labels put on the work pieces which are read by barcode scanners. One section of the system can be removed to reduce the overall process. The whole process data is locally monitored on HMI's, stored on local computer system as well as uploaded on cloud & can be remotely accessed for **Data Analysys for Optimal Plant Operation** thereby increasing productivity, Efficiency & profitability.

Features

- Compact Ergonomic Design.
- All Pneumatic components identical to those used in industry.
- User Friendly, Self Explanatory Systems.
- Data can be locally monitored, stored and uploaded on cloud using OPC server and can be remotely accessed, monitored for data analysis.
- Leak proof Safety Measures, sturdy piping & Robust Construction.
- Training Manual, mimic Charts for Operation Ease.
- System Frame with Caster Wheel Arrangement for ease in movement.
- M.S. fabricated powder coated with necessary fittings & Pneumatic Connections.
- Inbuilt Safety Measures to avoid improper usage.
- Integration of Electronic, Instrumentation and Pneumatic in single unit.
- Detailed Operation & Instruction Manual
- Caster wheel mounted movable frame

Services Required

- Electric supply 230 V AC, 50 Hz.

Note: Specifications are subject to change.

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Technical Specification

(A) ELECTRICAL CONTROL PANEL

No.	Item Name	Technical Specifications
1	PLC 2 Nos.:	**1) Allen Bradley Micrologix 1400/Eqvt.** Digital Inputs- 20, Digital Outputs- 12, Analogue input- 4, Analogue output- 2, Input /Output LED indication on front panel. PC interface facility, HMI-PLC interfacing cable. **2) Siemens S7-1200/Mitsubishi/Schneider/Eqvt.** Digital Input- 14, Digital Output- 10; Input/ Output LED indication on front panel. PC interface facility, HMI-PLC interfacing cable.
2	Power Supply	24 VDC, Power Source- 5A
3	VFD	1 No. Supply: 230V AC, 1500 RPM, ½ HP; Make: Siemens Sinamics V20/Allen Bradley PowerFlex/Eqvt.
4	Proximity Sensors	Inductive type: 06 nos., 3wire PNP type, 24 VDC, Sensing Distance: 5-8mm Optical Type: 4 nos., 3 Wire, Sensing Distance: 30mm, 24 VDC
5	Indicating Lamps	24 V DC, On front panel for display of digital input/output status Amber : 20 Nos., Red : 16 Nos.
6	Momentary Push Buttons	24 V DC operated, 08 nos.
7	Human Machine Interface (HMI)	**2 Nos.** Make: Siemens/Mitsubishi/Schneider/Delta/Eqvt. Size: 7”
8	Energy meter	Make: Selec/Eqvt.; 230V, 50 Hz power supply, Output: Pulse type
9	Computer (Optional)	Make: Asus/Acer/Dell/Eqvt.; 18.5” LED Monitor, CPU with Intel i3/i5, 4 GB RAM, 500 GB Hard Disk, Keyboard, Mouse and Supporting Operating System (Windows 10)
10	Gateway and Cloud Subscription	a) Yearly Cloud Subscription (Single User/Device) b) Dashboard and API Subscription (Single User/Device) Note: Subscription is for one year only.
11	Electronic Control Panel	MS Powder coated panel with switches, indicator, test Points, controller on front fascia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & Through 1”×1” PVC Cable Tray. Dimensions: 3.5 ft x 2 ft x 5 ft
12	Base platform / Mounting Table	MS powder coated frame. Dimension: 5 ft x 3.5 ft x 4ft

(B) PNEUMATIC CONTROL PANEL

No.	Item Name	Technical Specifications/Objective
1	Ejector unit	a. Double Acting Cylinder: Mounting: Foot, 6 nos., ¼” connection b. 5/2 way Solenoid Valves: 6 nos., 24 V DC operated, ¼” Connection
2	One way Solenoid Valves	1 No. 24 V DC operated, ¼” Connection
3	Manifold	10 Way, 1 No.
4	FRL Unit	1 No., ¼”, 0-10 Kg/cm2

(C) PROCESS MODULES

I) STACKING MODULE

No.	Item Name	Technical Specifications/Objective
1	Raw material stacker	01 No., Dimension: 80mm x 80mm x 460mm
2	Ejector unit	Double Acting Cylinder (1 no.) - Used for Pushing the object from stacker to conveyor module.
3	Raw material	Cubical Boxes, 9 Nos. Dimension: 75mm x 75mm x 75mm

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Technical Specification

II) CONVEYOR MODULE

No.	Item Name	Technical Specifications
1	Conveyor Belt	**2 Nos.** Dimension: 100mm x 1610mm; Thickness: 2 mm
2	Gear Motor	**2 Nos.** 1) AC Induction type, Single phase 230 V Supply, 30 RPM 2) AC Induction type, Three Phase 230V Supply, 30 RPM

III) SORTING MECHANISM/MODULE

No.	Item Name	Technical Specifications/Objective
1	Sorting Mechanism	Used to sort different Objects, such as Metallic Objects & non-metallic objects
2	Ejector unit	Double Acting Cylinder (1 no.) - Used to sort the Object & push it off the Roller Conveyor.

IV) LIFTING MECHANISM/MODULE

No.	Item Name	Technical Specifications/Objective
1	Platform	Dimension: 100mm x 100mm
2	Ejector unit	Double Acting Cylinder (1 no.) - Used for Lifting Up the Objects, thus forming a Lifting Mechanism. The Piston rod of the Double Acting Cylinder lifts the object.

V) TEMPERATURE/HEATING MODULE

No.	Item Name	Technical Specifications/Objective
1	Temperature Sensor with Transmitter	Input: RTD PT-100, Output: 4-20mA, Sensor Length: 150 mm, DC Supply 24V, 50mA Range: 0-100ºC
2	Dryer	1 No., For heating the raw material 1000 W, 230V AC Supply, Range: 0 to 60°C

VI) DRILLING PROCESS MODULE

No.	Item Name	Technical Specifications
1	Pneumatic Rotary Actuator	Used for drilling purpose. RPM: 10000
2	Ejector unit	Double Acting Cylinder (1 no.) - Used for UP & DOWN movement of pneumatic rotary actuator.

VII) WEIGHING PROCESS MODULE

No.	Item Name	Technical Specifications
1	Weighing Platform	Load Cell Range: 0 to 3 Kg Output: 4 to 20 mA Power supply: 230 V 50 Hz Used for weight measurement of objects.

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