

This Modular Automation Production System (MAPS) is an easy system designed to teach transfer system functions used in automation industry.

The process starts with movement of workpiece on the belt conveyor system. When the capacitive sensor detects the presence of a workpiece, it triggers the horizontal transfer unit, which moves the unit to a specific position. The rotary pick and place arm picks up the workpiece and transfers it to the rotary indexing table. The rotary indexing table is programmed to index to a specific position, where a second pick and place arm picks up the workpiece and drops it into a bin.

All the modules are robust and standardized for flexible configuration. The system is supplied with complete PLC control with easy plug-n-play functionality. The system be reconfigured by easily removing and repositioning of modules to create different processes. The accompanying PLC programming software can be used to program the newly created process. The teacher can introduce faults into the system for the students to troubleshoot and fix, thus teaching them automation troubleshooting techniques.



TECHNICAL SPECIFICATIONS

- **Key Advantages of Tesca Mechatronics MAPS systems:**

- The industry is looking for students who have skills and knowledge of **integrated engineering technologies and problems solving skillsets**. Tesca's Adv Mfg & Automation training solutions are designed to deliver the same through our **Industry 4.0 Smart Factory, and Smart Mechatronics products**. We have already delivered over **50+ systems globally** to highly reputed educational institutions.
- The Tesca product portfolio is ready for Industry 4.0 integration and IIOT Training
- Our training solutions are developed with focus on delivering skills and transferrable knowledge that students can carry from their classroom/ labs to the industry
- Our hardware is accompanied with world-class online training courses (SKILLON365)
- **IOT Ready:** Equipment is Internet of Things ready and can be interfaced with IoT platform. This is an option.
- **Digital Twin:** Digital twin is available for all mechatronics system as an option.
- Approach to the design, construction, training and future ready concepts aligned with European and American educational system
- **Train on Automation in Circuit:** Understand how automation works - from simple to complex circuits
- **Train on Automation in Application:** Understand how automation works in industries - from simple to complex applications, programming & control
- Train on Automation in Maintenance: Understand how to identify faults and troubleshoot in automation -variety of exercises to train in this area
- **SKILLON365:** Online courseware that gives the users flexibility of selecting courses from a variety of technologies and changeable each year.
- Tesca modules are built for durability, robustness and performance, high quality and aesthetic finish
- **Highly reliable components:** Pneumatics from Festo, PLC from Siemens, Sensors for reputed international manufacturers, Mechanical components from reputed international industrial suppliers
- **Serviceability:** We support our product globally through our reselling partners and through "Going Digital with Tesca" platform, where you can connect with our service specialists through asynchronous communications or synchronous communication means

MAPS 1 -Weighing & Palletizing System Consists off the following

- Complete workstation mounted on a aluminium profile plate with operating console, consisting of: - **1No.**
- Belt conveyor- **1No.**
- Linear pick & place unit (LPP) Module- **1No.**
- Linear Conveyor Module (Horizontal transfer unit)- **1No.**
- Rotary Pick and Place (RPP) Module (Transfer Module)- **1No.**
- 4 Station Rotary Carousel Table (Rotary Indexing Table)- **1No.**
- Dispensing module- **1No.**
- PLC - SIEMENS- **1No.**
- Safety light curtain - **Optional**
- Mobile Trolley- **1No.**

Note: Specifications are subject to change.

Tesca Technologies Pvt. Ltd.

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1. Aluminium Profile Plate

Aluminium Profile Plate for mounting all pneumatic & other components to the modules. A Mobile trolley which can fit the aluminium profile plate is provided as optional. All electrical and electronic items shall be housed in the bottom of the trolley below the platform

2. Belt Conveyor Module

The conveyor module conveys the part from one end to another.

Specification:

- Motor : 12 V DC power motor
- Length : 420mm
- Height : 60mm
- Width : 40mm
- Belt : Nylon fabric belt
- 4 gates provided for fixing sensors and part ejection.
- Knob screw (1 no) and T-nuts of diameter M6 are provided for quick fixing of the module on profile plate.



3. The Linear Pick And Place (LPP) Module

Specification:

- | | |
|-----------------------------------|--------------------|
| Double acting pneumatic cylinders | : 2 |
| Single acting pneumatic cylinders | : 1 |
| Reed switches | : 4 |
| Solenoid coils | : 5 |
| Horizontal stroke | : 80mm |
| Vertical stroke | : 20mm |
| Mounting | : Knob screw (1no) |

Scope of supply

- Quick mounting knob screw and T-nut – 1
- Pneumatic module
- Air supply module



4. Linear Transfer Module (horizontal Transfer Unit)

This module transfers work piece from conveyor module to rotary pick and place module position.

- Type : Electro-Pneumatic System
- Cylinder : Pneumatic Rod-less cylinder

Sensor : Magnetic reed switch -2

No. of I/O elements : 2 inputs & 1 outputs



5. The Rotary Pick And Place (RPP) Module

The rotary pick and place (RPP) module picks the work piece from one position, horizontally rotates by 90° and then places the work piece to another position.

The part shall be moved to next location for processing, in a rotary manner. The module is a stand alone functional unit with readiness to connect electrically and pneumatically through external valve module and PLC and I/Os to actuate the function. The module is completely ready to mount with quick mounting knob screw and T-nut on 8mm T-slotted n tube.

Specification:

- | | |
|-----------------------------------|--------------------|
| Double acting pneumatic cylinders | : 3 |
| 5/2 Single acting solenoid valve | : 1 |
| 5/2 Double acting solenoid valve | : 2 |
| Reed switches | : 4 |
| Rotation angle | : 90° |
| Vertical stroke | : 20mm |
| Mounting | : Knob screw (1no) |

Scope of supply

- Quick mounting knob screw and T-nut – 1
- Pneumatic module
- Air supply module



Note: Specifications are subject to change.

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6. Rotary Indexing Table (rotary Carousel Table)

The rotary indexing module indexes and moves the work piece to the destination position in its platform. Rotary indexing module is to move workpiece location in fixed intervals up to 3 indexing which can be further expanded based on the project. The customer can specifically request for additional indexing. The workpiece shall be indexed to next location for processing, in a rotary manner. The module is a stand alone functional unit with readiness to connect electrically to PLC and I/Os to actuate the function.

Specification:

Mounting : Knob screw (2nos)
 Home sensor : 1

Scope of supply

Quick mounting knob screw and T-nut – 2
 Pneumatic module
 Air supply module



7. PLC

Specifications:

- Siemens PLC S7-1200
- 24 Digital input, 16 Digital output & 2 Analog input
- Process image
- 1024 bytes for inputs, 1024 bytes for outputs"
- Work memory (integrated)-100 KB, Load memory (integrated)-4 MB
- Software: TIA Portal V13 step7
- 24V Power supply, 4.5 Amps
- ON/OFF Switch
- 110/ 230 V Male Plug
- Fuse Bank
- E-Stop, start, stop Switch
- 12v power supply
- 24v Compact Relay
- Sticker Layout



8. Air Supply Module (FRL Unit)

This consists of the air filter, pressure regulator and lubricator unit, and supplies compressed air to control the movement of the pneumatic cylinders.

Pressure regulator – The pressure regulator maintains a constant output pressure independent of pressure fluctuations and air consumption. The output pressure can be reduced by means of a secondary venting without compressed air consumers.

Air filter – The air filter removes contamination, pipe sinter, rust and condensate from compressed air.

Lubricator – The proportional lubricator adds precision adjustable quantity of oil to the compressed air. The oil droplets are atomized just downstream from proportional valve in the air duct. The oil mist component is proportional to the compressed air flow rate.



Scope of supply

Quick mounting knob screw and T-nut – 1
 shut-off valve and 5m tube of diameter 8mm

9. Light Sensor for Safety

The station mainly consists of safety light curtain sensor, capacitive sensor, inductive sensor, photo electric sensor, reed sensor etc. It also acts as a safety measure and the entire system stops when someone puts their hand thru and starts working again when the hand is moved. This is to teach industrial safety standards as to how industrial systems stop when there is a human intervention

10. Mobile Trolley

Mobile Trolley is a profile frame on wheels that provides a base module for the MAPS – Stations. The mounting surface is a T-grooved plate for positioning the various modules / stations and allows a variety of adjustments. This allows for the systems to be moved to different locations such as simulation lab, classroom to lab etc.



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DIMENSIONS AND WEIGHT OF MAPS

L x W x H : 710 x 640 x 1160 mm
Weight : 120 Kgs (approx.)

REQUIRED EQUIPMENT AT SITE AND UTILITIES TO BE PROVIDED BY THE BUYER DURING COMMISSIONING, DEMONSTRATION & TRAINING

For MAPS

- Desktop computer required with specification below
- Operating System : Windows 7 Professional or higher
- Processor Required At least i3 3.3GHz or equivalent, RAM : at least 4 GB
- 19inch LCD Monitor - 1 no
- Compressor - 100 Litre tank Capacity, 6 to 8 Bar (100 – psi) - 1No

Set of Standard Tools and Accessories Included

Work Piece : 8 Nos.
screw M6x10 : 12Nos.
PU 4 hose : 5 mtrs
M6 profile slot stone tennon : 20 Nos.
Allen key set : 1 set
Screwdriver set : 1 set
cleaning brush : 1 No.
Ethernet cable : 1 No.

Set Of Spares

Photoelectric sensor : 1 Nos.
Capacitive sensor : 1 Nos.
Fuse : 10 Nos.
Relay : 2 Nos.
Workpieces : 4 Nos.
Pneumatic hose : 2 mtr

Note: As part of continuous improvement, Tesca reserves the right to alter machine design and specification without prior notice.

Ordering Details		
SN.	Order Code	Details
1.	54030A	Export Packing

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