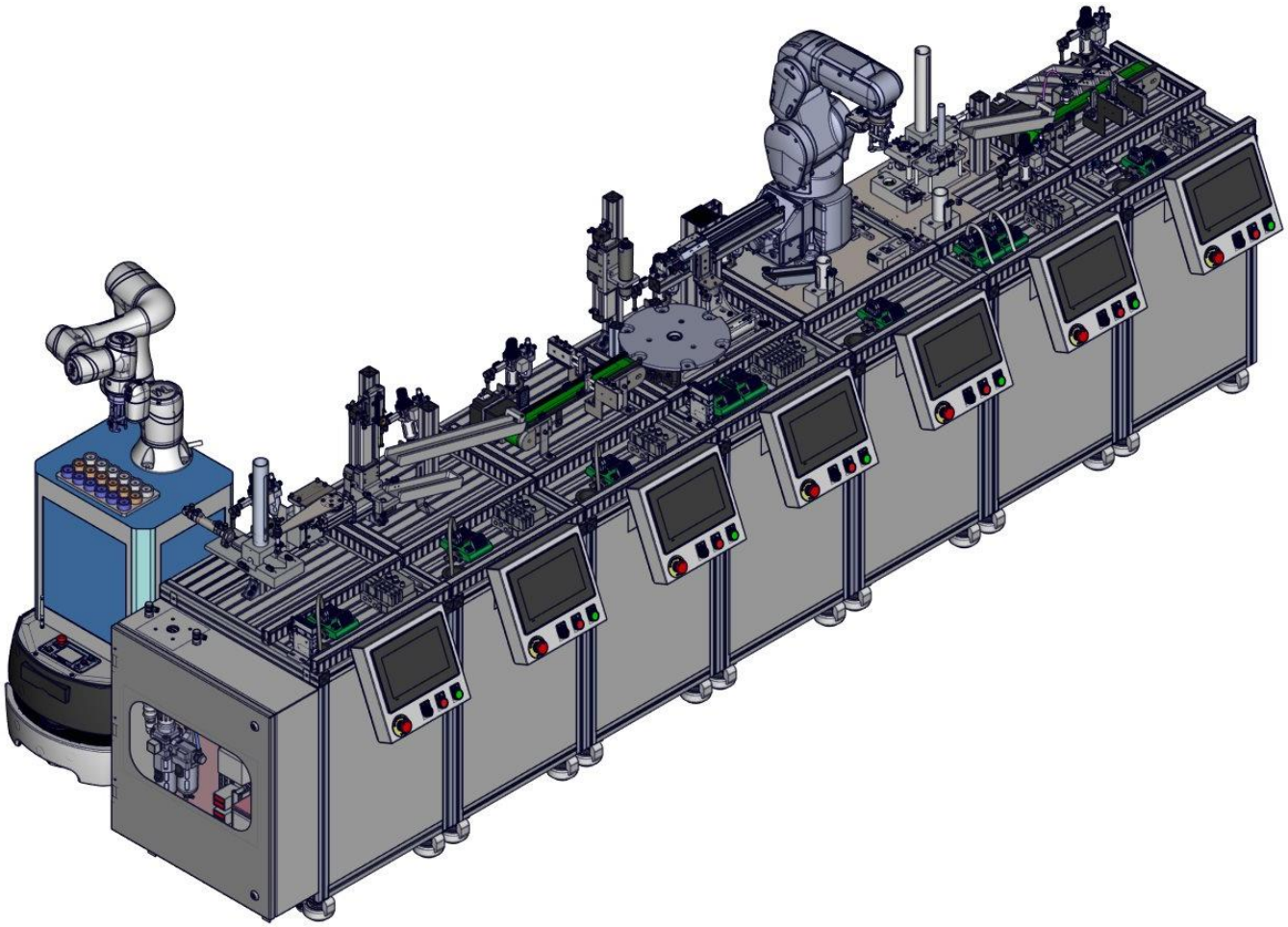
INDUSTRY 4.0

Technical specifications of

Modular Manufacturing System with Industry 4.0



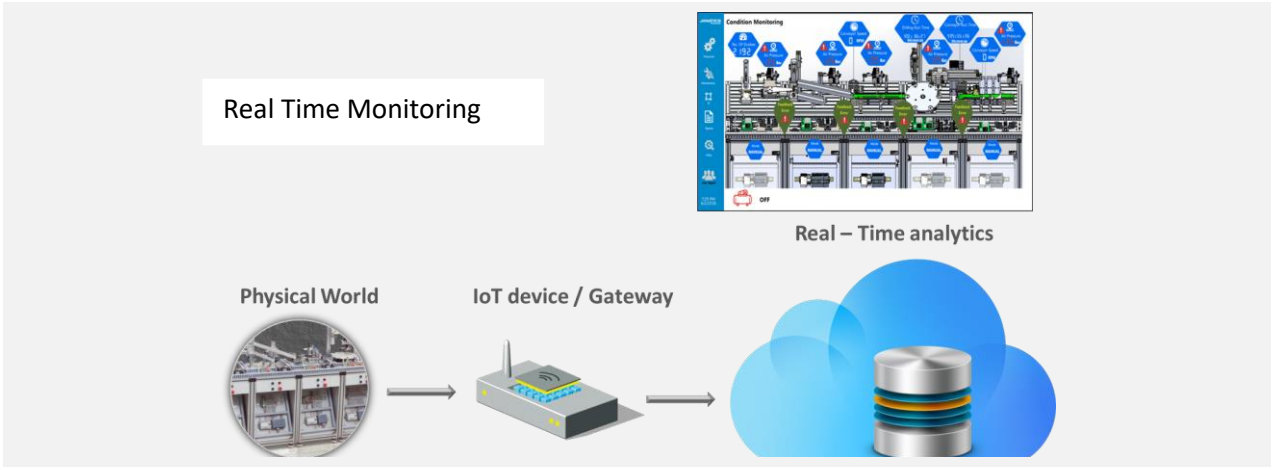
HIGHLIGHTS

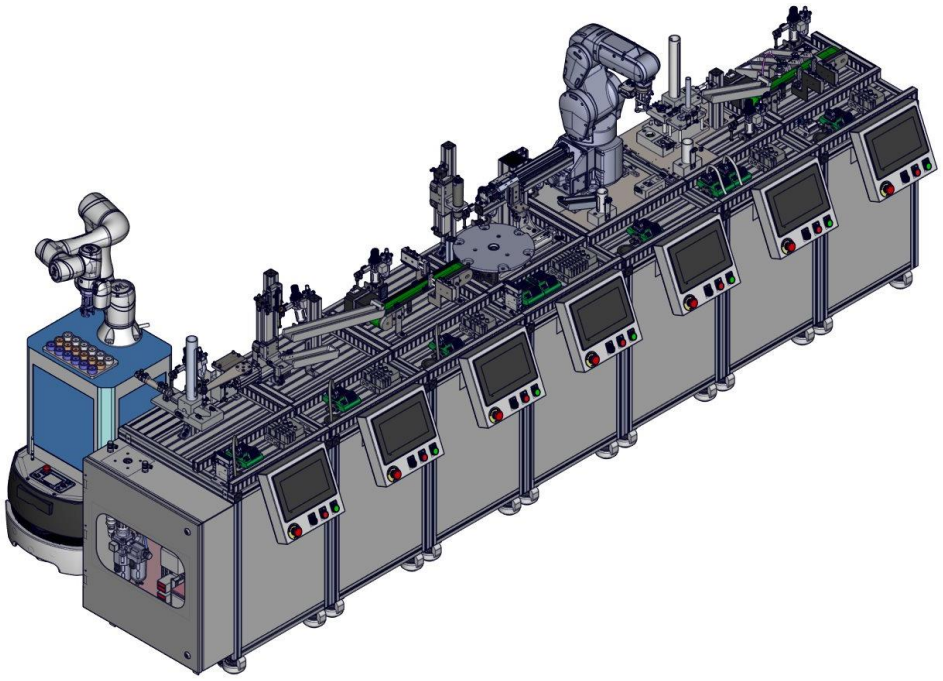
- Modular System
- Energy Management
- Augmented Reality
- Manufacturing Execution System
- Overall Equipment Effectiveness (OEE)
- Management Information System
- Intelligent Maintenance system
- Autonomous Mobile Robot

Learning Objectives

- Learn about Industry 4.0 and Digitization of Value chain management.
- Understand & simulate the concept of various integration associated with Industry 4.0 such as Vertical, Horizontal, Integrated & Digital workforce.
- Understand the concepts of IIoT
- Learn about the architecture and design of IIoT systems.
- Understand the benefits of IIoT systems.
- Learn about the Remote monitoring of machine in real time
- Development of AR (Augmented Reality) applications
- Development of IIOT dashboard applications for different industry scenarios
- Development of SCADA Applications
- Understand the Data communication to cloud through IOT Gateway module
- Integration of AMR

System Architecture & Function





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Function

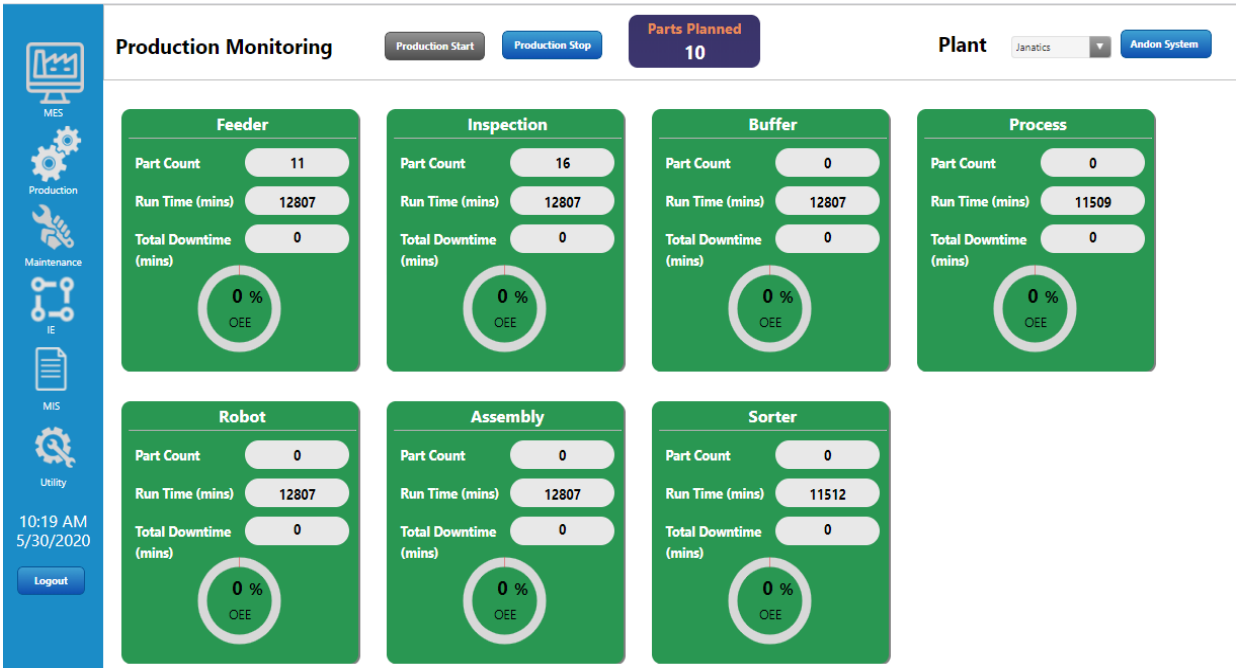
The Modular Manufacturing System with Industry 4.0 is a miniature factory which includes the industry standard processes such as Feeder, Inspection, Buffer, Process, Robot, Assembly and Sorting.

The MMS4.0 system produces orders executed from Manufacturing Execution System (MES) which is an interface for the complete value chain management.

The feeder station feeds the work pieces to the inspection station, in which the height of the work piece is measured, and only approved work pieces are allowed to the buffer station. The buffer station allows the work pieces one by one to the process station based on the demand received from the process station. The process station is performing drilling operation and further transfers the work pieces to the Robot and assembly station for assembly of Digital pressure gauge and quality testing. After testing the assembled work piece was transferred to sorting station. The sorting station segregates the work pieces based on the material type and color.

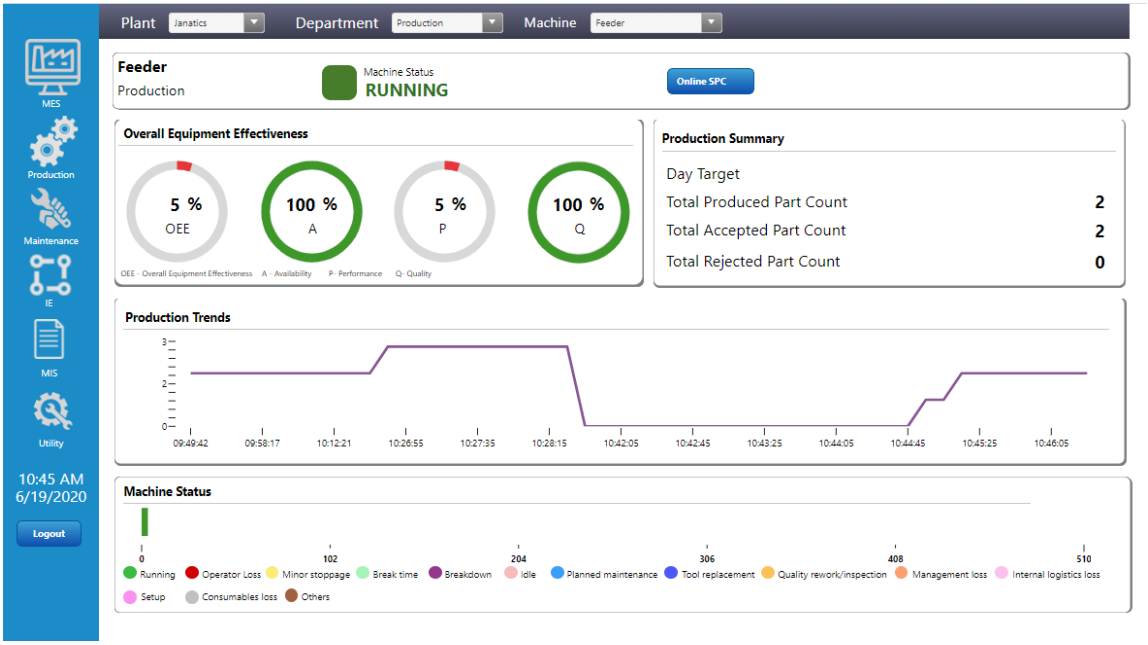
System Features

I. PRODUCTION MONITORING – ANDON



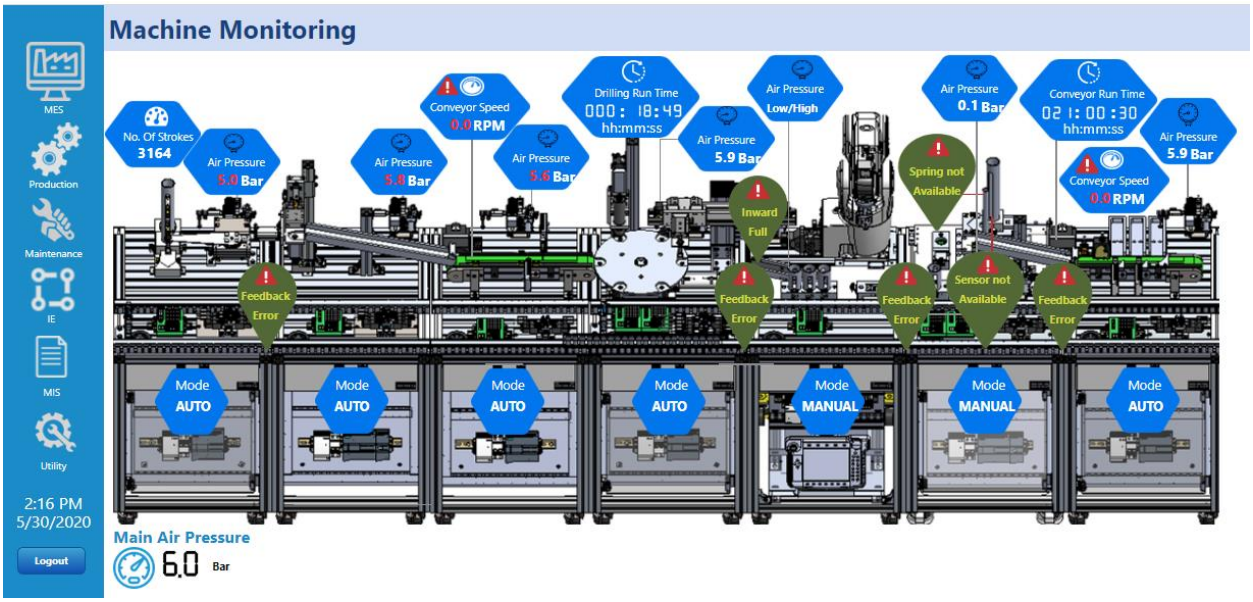
Production monitoring enables to understand the Productivity, Run Time & Down Time of the various machines available in the factory.

II. OVERALL EQUIPMENT EFFECTIVENESS - OEE



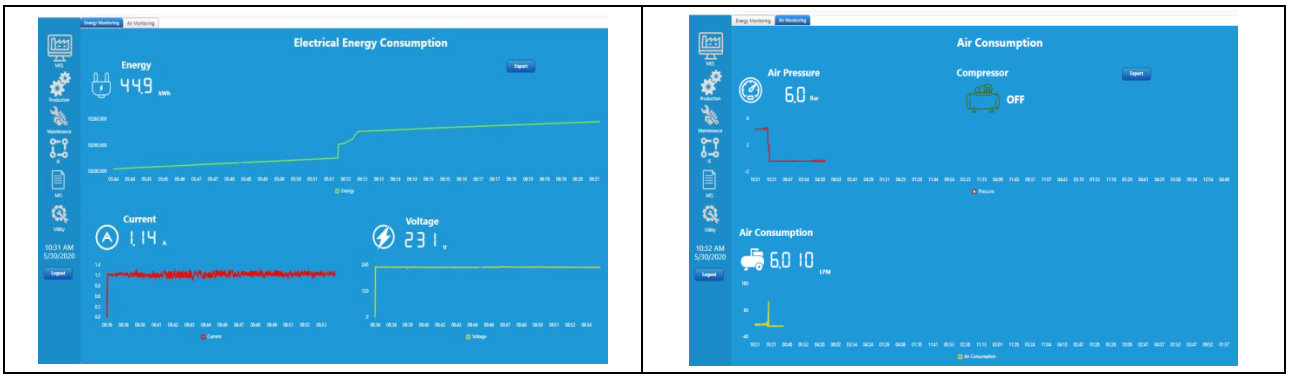
OEE (Overall Equipment Effectiveness) enables to measure and monitor the Performance, Quality & Availability of the Individual Machines

III. MACHINE MONITORING



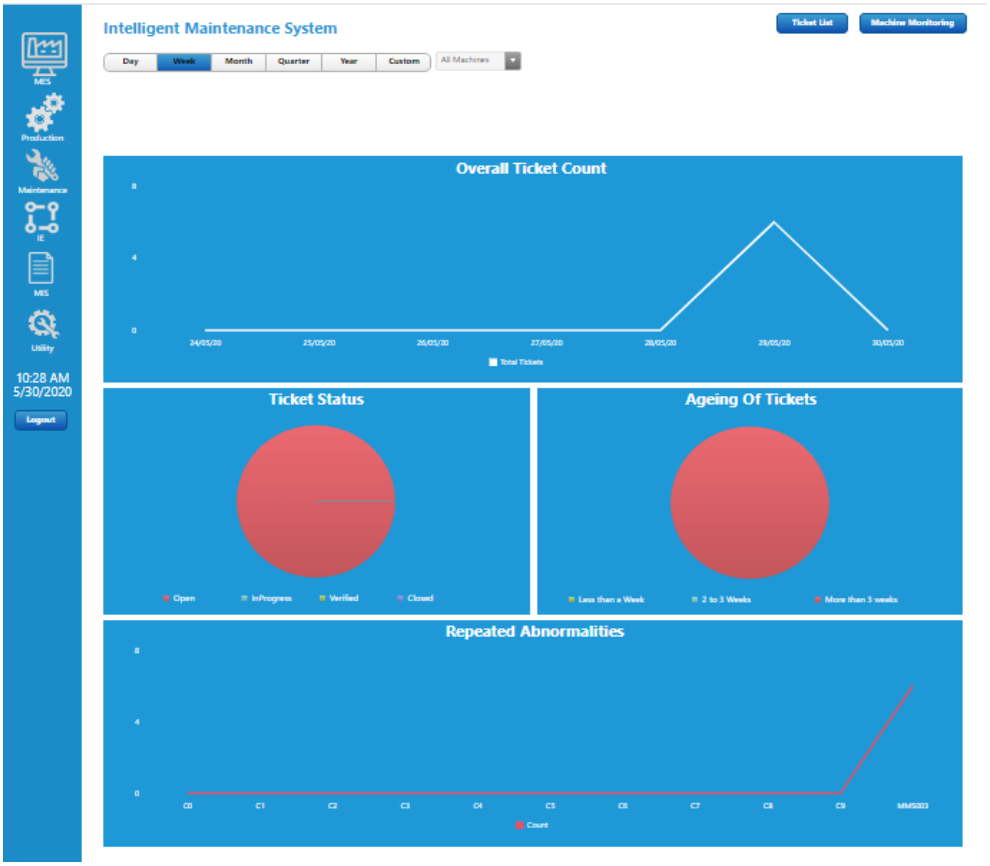
Condition monitoring enables to monitor the real time data of the machine through which down time can be reduced.

IV. ENERGY MANAGEMENT



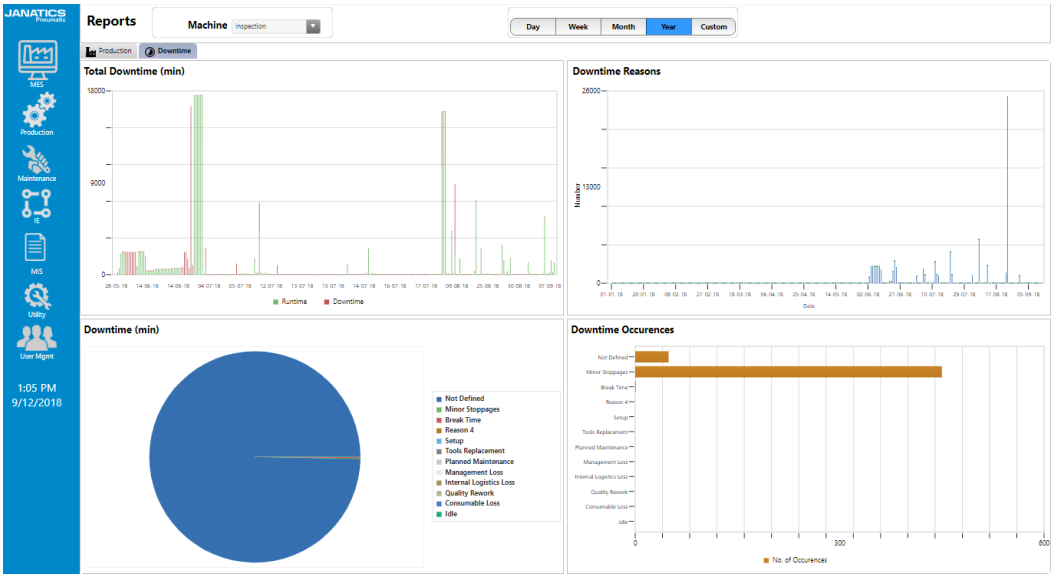
Energy management enables us to monitor and record the trend of Electrical and Air consumption of the machine.

V. INTELLIGENT MAINTENANCE SYSTEM



Intelligent Maintenance System enables us to monitor the Breakdowns.

VI. MANAGEMENT INFORMATION SYSTEM



Management information system enables to monitor the trend of Production and Downtime

VII. AUGMENTED REALITY

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Augmented reality enables us to see Real-time data, assembly instruction, step by step instructions, and machine to design visualization.

Deliverables

S. No	Product Description	Product No.	Qty	UOM
1.	MMS4.0 Combination stations (1-2-3-4-6-7-5)	MMS40-C06-PXX	1	Set
1.1	MMS4.0 Control Unit	-	1	Nos
1.2	Feeder Station with HMI	-	1	Nos
1.3	Inspection Station with HMI & RFID	-	1	Nos
1.4	Buffer Station with HMI	-	1	Nos
1.5	Process Station with HMI	-	1	Nos
1.6	Robot station with HMI	-	1	Nos
1.7	Assembly station with HMI & RFID	-	1	Nos
1.8	Sorting Station with HMI	-	1	Nos
2	AMR with COBOT	-	1	Nos
3	PLC Software and Accessories	-	1	Set
4	Technical Documents	MMS40-C06-PXX-TD	1	Set
5	Work Piece set with RFID Tag	MMS-WP-S3-00	1	Set
6	Smart Manufacturing Execution System Application (1-year subscription)	JSMES-MMS4-001-01-03	1	Nos
7	Janatics Augmented Reality Application– JARA4.0 (1-year subscription)	JAR-MMS4-001-01-03	1	Nos

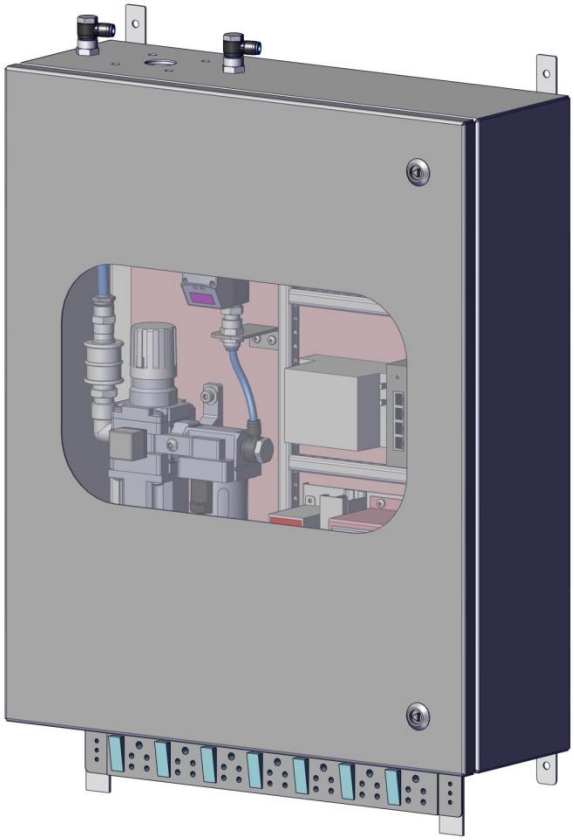
Note:

1. Apple I-Pad and Desktop PC / Laptop is mandatory for effective utilization of software application, which has to be purchased and preconfigured by end user@.
2. Smart Manufacturing Execution System Application & Janatics Augmented Reality Application is provided on SaaS basis with 1 years subscription, which shall be renewed after the term
3. Compressed Air connection with Max. 8 bar pressure to be provided by the customer.

@ - Recommended System Requirements

Desktop PC / Laptop		I-Pad	
Configuration	Processor: 12th Generation Intel® Core™ i5 processor or Latest Hard disk: 512GB or above RAM : 8GB or above	Make	Apple
		Screen Size	11 Inch
		RAM	16 GB
		Connectivity	Wi-Fi + Cellular
		Screen Size	11 Inch
		Memory	128 GB
		Accessories	Smart Folio for iPad Pro 11-inch

1.1 MMS4.0 Control Cabinet



Technical specification

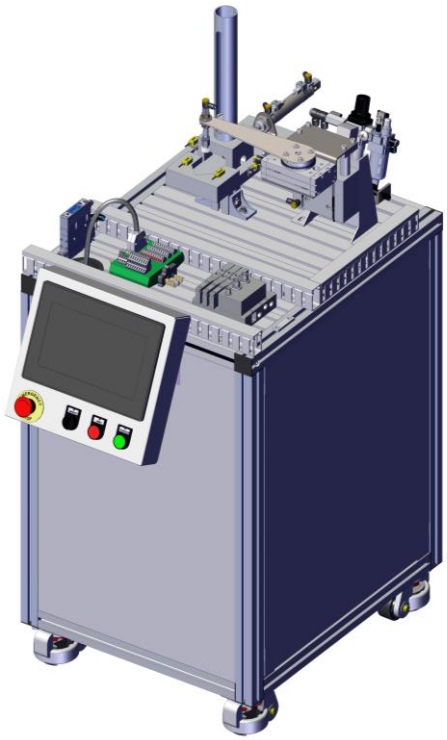
Ordering No	JPS1527
Size (L x W x H) in cm	60x83x20
Installation	Vertical
Medium	Electrical
Operating Voltage +/- 10%	230V
Power consumption	180 W (224 VA)
Material	CRCS

Scope of supply:

S. No	Item with description	Qty
1.	**Power supply Module** a) Power supply: Input voltage :230/115 V AC (47 – 63 Hz) b) Output voltage: 24 V DC c) Short-circuit-proof Output current: Maximum 3A d) Miniature circuit breaker DC voltage with max.5A current rating e) RJ45 Cable (5 mtr. length) – 15no's f) Terminal blocks g) Power Connection cable: 3-pin plug with length of 1.3 Mtr.	1
2.	**Gate Way module**: a) Operating voltage: 24V DC b) Communication: Ethernet c) SD Card reader: Yes d) Programmable: JAVA 2, standard edition e) Cellular: 3G with Antenna connector	1
3.	**Ethernet Switch:** a) No of Ports: 8 (Min.) b) Operating voltage: 24V DC/AC c) Communication: Ethernet d) Connector: RJ45, female e) Transmission Speed: 10/100 Mbps	2
4.	**Energy Module:** a) Size: (L x W x H)- 300 x 190 x 100 mm (Min.) **Energy Meter:** a) Input Voltage: 110 - 415 V, programmable 1 Set b) Input Frequency: 45 - 65 Hz. **Communication:** a) RS485 serial channel communication, Wi-Fi – Router b) Operating Voltage: 5-40V c) Interface: Ethernet;100Mbps d) Connection: RJ45 e) Switching: RS232/485, automatic switching f) Wireless Frequency Range: 2.412 GHz-2.484 GHz **Current Transformer**: a) Operating frequency: 50 Hz / 60 Hz b) Rated Primary rating: 1A – 7500A. c) Rated Secondary Output: 5A (Min.) d) RJ45 Cable e) Power Connection cable: 3-pin plug with length of 1.3 Mtr.	1
5.	**Air Monitoring Module:**	1

	Flow Sensor a) Flow range: 0-500 LPM b) Operating Voltage: 24V DC c) Analogue Output: 4-20 mA **Pressure Sensor** a) Operating Voltage: 24V DC b) Pressure Range: 0-10 Bar c) Analogue output: 1-5V d) Digital Outputs: 2 **Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and startup valve**: a) Port size -1/4 inch b) Flow rate – 500 l/min c) Maximum supply pressure – 10 bar d) Operating pressure- 6 bar e) Filtering element grade – 40 µm f) Minimum operating flow – 12 l/min g) Filter Bowl capacity – 9 ml h) Lubricator Bowl capacity – 20 ml i) Connection for tube 8 mm dia. input and 8 mm dia. Output j) Mounting – Socket head cap screw with M6 hammer head nut	
6.	**PLC S7 -1200, CPU1212:** a) CPU 1214 PLC with b) Digital Inputs- 8 c) Digital Outputs – 6 d) 1 x TCP/IP e) Ethernet Communication port; 2 x AI 4 Channel Analog Input module f) Power supply: Input voltage :230/115 V AC (47 – 63 Hz), Output voltage: 24 V DC g) Short-circuit-proof Output current: Maximum 3A	1
7.	RJ45 – RJ45 Cable - 2 Meter length	10

1.2 Feeder Station with HMI



Features

- Vacuum based 180° Rotary Pick and Place
- Energy saving vacuum ejector.
- Valve terminal with Fieldbus communication
- HMI control console
- Completely preassembled system
- Easy to use, and commission.
- Workbook with tasks and Solutions

Application

These Mechatronics systems are fully functional models of actual applications, mimicking hybrid, real life, industrial automation scenarios. A wide variety of project assignments and learning objectives help students to build hybrid systems by integrating important automation technologies, such as

- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors
- Vacuum

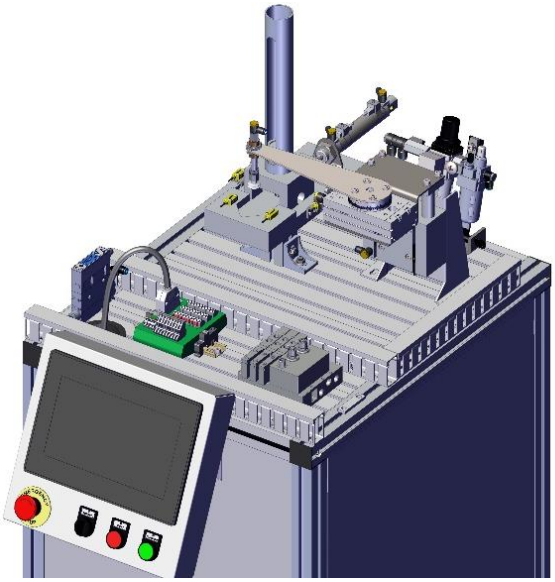
Technical Specifications

Model	MMS4
Size (in cm)	54x70x134
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	6-8 bar
Operating Voltage +/- 10%	230V AC, 50HZ
Power consumption	180 W (224 VA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, Plastic. etc.

FUNCTION

The Feeder Station separates the components from the Stack Magazine and distributes the components one by one via rotary pick and place module for further processing. The Station consist of the following major parts.

- FRCLM module
- Dispensing module
- Rotary Pick and Place module
- Vacuum ejector module
- Valve module with Field bus communication
- I/O Interface Module
- Profile Table work bench
- PLC control
- HMI Control Console



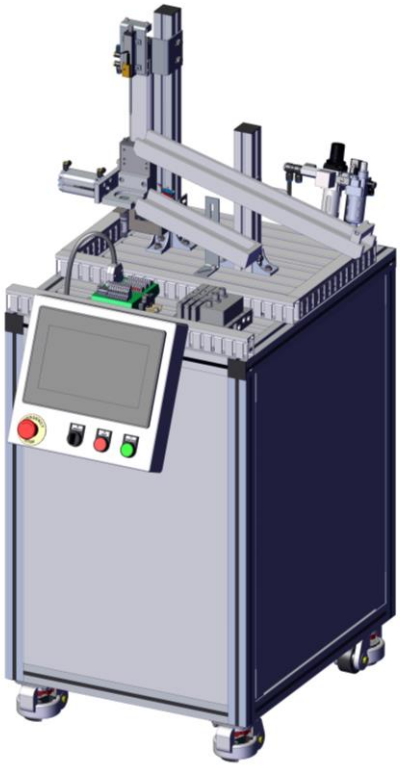
The Dispensing module separates the jobs stacked in magazine tube with the help of pneumatic cylinder and provisions made for detecting the availability of jobs with optical sensors. Rotary Pick and Place module have a rotary actuator with an arm and suction cup to pick up work pieces and relocate them to positions from '0 degree to 180 degrees' on horizontal plane, so as to feed the subsequent stations. The end positions of all pneumatic actuators are detected by using Magnetic sensors. The feeder station consists of an aluminum anodized profile table, filter regulator and lubricator unit with pressure gauge, solenoid valve, one touch fittings mounted with suitable mountings for easy assembly and disassembly. Networking and signaling the subsequent station for further processing done by establishing I/O communication between the PLCs of subsequent stations. The PLC used for the station is capable of handling digital inputs and outputs, and it has Ethernet interface to communicate with PC for programming.

SCOPE OF SUPPLY:

S. No	Item with description	Qty
1.	Horizontal Aluminum profile table: a. (L x W x H)- 540 x 640 x 790 mm b. Aluminum profile Tabletop profile – 40 x 160 mm Supporting profile- 40 x 40 mm c. Grid spacing (From slot to slot) – 40 mm. d. Profile groove width – 8.3 mm e. Leveling casters for quick setting and smooth movement f. Profile plate connectors: Length 55 mm, thickness 5mm Mounting method M6 Socket head screw with M6 hammer head nut	1
2.	I/O Interface module: a. 25 Pin D-Sub connector interface board for interfacing valves and actuators b. 25 Pin D-Sub cable for establishing the connection between I/O module and PLC control	1
3.	Valve Manifold with Field bus communication a) L x W x H :120.5x119.4x29.8 mm b) Grid spacing – 19 mm. c) Mountable valve port size 1/8’’ d) Silencers for reducing the dB level of exhausted air. e) 5/2 Double solenoid pilot operated valve: f) Material- Extruded aluminum with anodized g) Voltage DC24V, Current consumption <120mA Solenoid valve a) Size – 1/8’’ b) Design – Spool type c) Pressure range – 2 – 10 bar d) Flow rate – 450 l / min e) Manual override- Resetting f) Fitted with 1/8’’ flow control valve	1
4.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and start up valve: a) Port size -1/4 inch b) Flow rate – 500 l/min c) Maximum supply pressure – 10 bar d) Operating pressure- 6 bar. e) Filtering element grade – 40 µm f) Minimum operating flow – 12 l/min g) Filter Bowl capacity – 9 ml h) Lubricator Bowl capacity – 20 ml i) Connection for tube 8 dia input and 8 dia output j) Mounting – Socket head cap screw with M6 hammer head nut	1

S. No	Item with Description	Qty
5.	Stack Magazine module: a) Comprising of Miniature cylinder of dia 25 and stroke 80 mm Height: 516 mm, Width: 125 mm and Length: 390 mm b) Magnetic sensor for position sensing c) Light barrier Module: Type: Infra-red Sensing range: 2m Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @ 20 mA max current, Switch output: PNP, normally open/normally closed Output Protection: Protected against false pulse on closed contact. power- up, short-circuit protected	1
6.	Transfer Module: a) Cylinder rotation angle (rotary cylinder fitted with shock absorbers), 180 degrees (freely selectable) b) Compact guided cylinder dia 40 mm, Stroke - 50 mm c) Height: 325.5 mm, Width: 127 mm, Length: 223 mm d) Vacuum gripper module capable of handling 100gm e) Magnetic sensor for position sensing	1
7.	HMI Control console: a) 10” HMI, Make: Exor/Equivalent b) Cycle start push button –Green with illuminated c) Auto / Manual selector switch -Black d) Home position push button –Red with illuminated e) Emergency button -Red	1
8.	Cable duct and accessories: a. Wire duct size 45x25 b. Fastening screws	
9.	PLC control panel with S7 1200 PLC: CPU 1214 a) Power supply: Input voltage :230/115 V AC (47 – 63 Hz), Output voltag24 V DC, short-circuit-proof Output current: Maximum 3A b) Miniature circuit breaker DC voltage with max.5A current rating c) Digital inputs-14,Digital outputs 10, Analog inputs 2 Ethernet interface 1 x TCP/IP, 10 Mbit/s d) 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm^2 e) Cable ducts a) Power Connection cable:3pin plug with length of 1.3m	1

1.3 INSPECTION STATION WITH HMI



FEATURES

- LVDT based height measurement.
- Rod less Pneumatic drive
- RFID Tracking
- Valve terminal with Fieldbus communication
- HMI control console
- Completely preassembled system
- Easy to use, and commission
- Workbook with tasks and Solutions

APPLICATION

These Mechatronics systems are fully functional models of actual applications, mimicking hybrid, real life, industrial automation scenarios. A wide variety of project assignments and learning objectives help students to build hybrid systems by integrating important automation technologies, such as

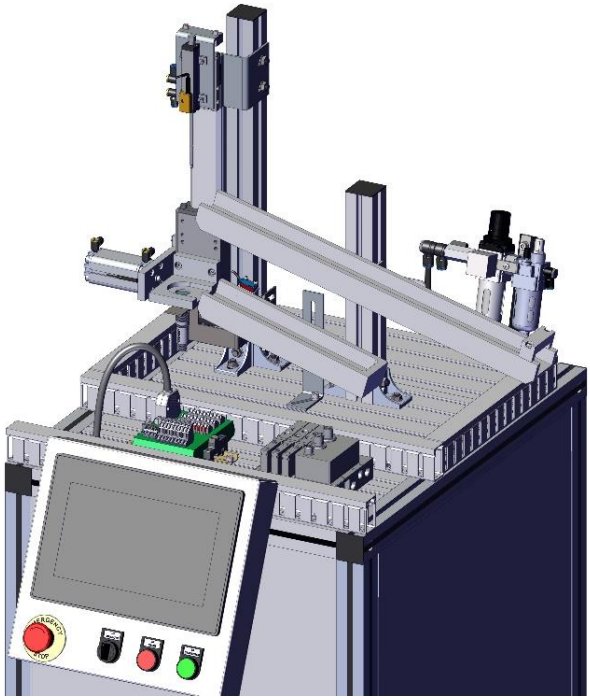
- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors

TECHNICAL SPECIFICATIONS

Model	MMS4
Size (in cm)	68x64x135
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	6 - 8 bar
Operating Voltage +/- 10%	230V AC, 50HZ
Power consumption	180 W (224 VA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, Plastic.etc.

FUNCTION

The Inspection station measures the height of the components received from its downstream station and transfers the correct and incorrect components to appropriate slides.



The Inspection station consists of the following.

- FRCLM module
- Measuring module
- Inspection slide module
- Valve module with Field bus communication
- I/O Interface Module
- Profile Table work bench
- PLC control
- HMI Control Console

Inspection station checks the jobs for height of about 25 mm using analog sensors and provisions have been made to detect work piece presence with the help of optical sensor. An arrangement is provided to transfer the right work piece by a slide to the next station and send faulty rejected work piece to the rejection bay.

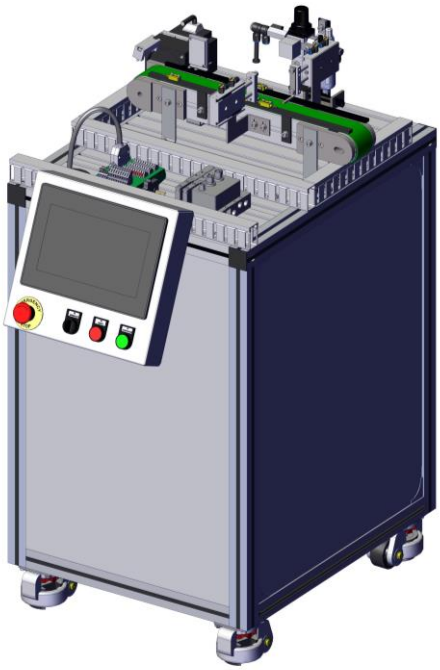
The station consists of anodized profile table, filter regulator and lubricator unit with pressure gauge, on/off valve quick push connections and couplings mounted with suitable mountings for easy assembly and disassembly.

SCOPE OF SUPPLY:

S. No	Item with description	Qty
1.	Horizontal Aluminum profile table: a. (L x W x H)- 540 x 640 x 790 mm b. Aluminum profile Tabletop profile – 40 x 160 mm Supporting profile- 40 x 40 mm c. Grid spacing (From slot to slot) – 40 mm d. Profile groove width – 8.3 mm e. Leveling casters for quick setting and smooth movement f. Profile plate connectors: Length 55 mm, thickness 5mm Mounting method M6 Socket head screw with M6 hammer head nut	1
2.	I/O Interface module: a. 25 Pin D-Sub connector interface board for interfacing valves and actuators b. 25 Pin D-Sub cable for establishing connection between IO module and PLC control	1
3.	Valve Manifold with Field bus communication a. L x W x H :120.5x119.4x29.8 mm b. Grid spacing – 19 mm. c. Mountable valve port size 1/8'' d. Silencers for reducing the dB level of exhausted air. e. 5/2 Double solenoid pilot operated valve: f. Material- Extruded Aluminum with anodized g. Voltage DC24V, Current consumption <120mA **Solenoid valve** a. Size – 1/8'' b. Design – Spool type c. Pressure range – 2 – 10 bar d. Flow rate – 450 l / min e. Manual override- Resetting f. Fitted with 1/8'' flow control valve	1
4.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and start up valve: a. Port size -1/4 inch b. Flow rate – 500 l/min c. Maximum supply pressure – 10 bar d. Operating pressure- 6 bar e. Filtering element grade – 40 µm f. Minimum operating flow – 12 l/min g. Filter Bowl capacity – 9 ml h. Lubricator Bowl capacity – 20 ml i. Connection for tube 8 dia input and 8 dia output	1

	j. Mounting – Socket head cap screw with M6 hammer head nut	
5.	Measuring module: a. Pneumatic Linear Drive of dia 25mm and Stroke 100 mm b. LVDT with signal conditioner: Maximum permissible applied voltage - 42V Output: 4 – 20 mA Overall length – 95 mm c. Diffuse Sensor: Type: Infra-red Sensing range: 15mm Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @ 20 mA max current Switch output: PNP, normally open/normally closed contact Output Protection: Protected against false pulse on power-up, short-circuit. Protected d. RFID sensor: Read/write distance :15mm(min) Supply Voltage:10 to 30V DC M8 Communication/ Power cable	1
6.	Approve and rejection Slide Module	1
7.	HMI Control console: a. 10” HMI Make: Exor/Equivalent b. Cycle start push button –Green with illuminated. c. Auto /Manual selector switch -Black d. Home position push button –Red with illuminated e. Emergency button -Red	1
8.	Cable duct and accessories: a. Wire duct size 45x25 b. Fastening screws	1
9.	PLC control panel with AB PLC MicroLogix 1400: a. Power supply: Input voltage :230/115 V AC (47 – 63 Hz), Output voltage: 24 V DC, short-circuit-proof Output current: Maximum 3A b. Miniature circuit breaker DC voltage with max.5A current rating c. Digital inputs-20,Digital outputs 12, Analog inputs 4, Ethernet interface 1 x TCP/IP, 10 Mbit/s d. Analogue module: Analogue input(4-20mA) e. Terminal blocks f. 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm^2 g. Cable ducts h. Power Connection cable:3pin plug with length of 1.3m i. IO link module • Number of Inputs, voltage(V): 2, 20-28VDC	1

1.4 BUFFER STATION WITH HMI



FEATURES

- DC Brushless motor conveyor
- Twin Piston rod cylinders
- Valve Terminal with Field bus communication
- HMI control console
- Completely preassembled system
- Easy to use, and commission.
- Workbook with tasks and Solutions

APPLICATION

These Mechatronics systems are fully functional models of actua applications, mimicking hybrid, real life, industrial automatio scenarios. A wide variety of project assignments and learnin objectives help students to build hybrid systems by integratin important automation technologies, such as

- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors

TECHNICAL SPECIFICATIONS

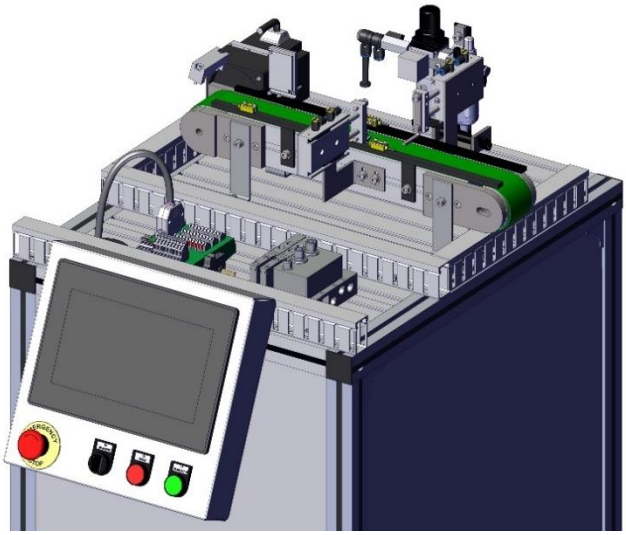
Model	MMS4
Size (in cm)	55x64x106
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	6 - 8 bar
Operating Voltage +/- 10%	230V AC, 50HZ
Power consumption	180 W (224 VA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, Plastic. etc.

FUNCTION

Buffer Station ensures steady flow of components to the process station by allowing one component at a time for processing. It can store up to 5 work pieces at a time and if the count has exceeded 5, it communicates with the downstream stations to STOP the processing activities until the count reaches 5.

Buffer Station consists of the following.

- FRCLM module
- Conveyor module
- Valve module with Fieldbus communication
- I/O Interface Module
- Profile Table work bench
- PLC control
- HMI Control Console



Buffer station can buffer up to 5 jobs. The buffering process should be controlled by a separator using upstream and downstream light barriers sensors. Retro reflective sensor detects the inserted job and keeps tag on the nos. of jobs buffered precisely while the separator module passes the job to the next station if the transfer point is free. The buffer station waits for the signal from the downstream station & as soon as it receives the signal is transferred. The end position of all pneumatic actuators is detected by using Magnetic sensors.

The station consists of anodized profile plate, filter regulator and lubricator unit with pressure gauge, on/off valve quick push connections and couplings mounted with suitable mountings for easy assembly and disassembly.

SCOPE OF SUPPLY:

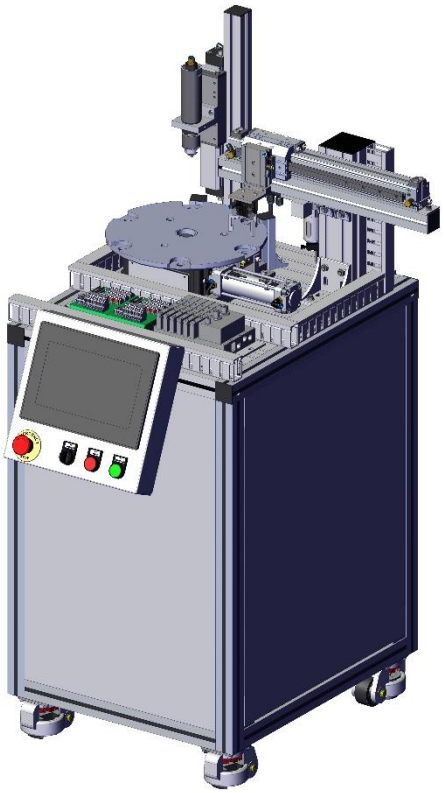
S. No	Item with description	Qty
1.	Horizontal Aluminum profile table: a. (L x W x H)- 540 x 640 x 790 mm b. Aluminum profile Tabletop profile – 40 x 160 mm Supporting profile- 40 x 40 mm c. Grid spacing (From slot to slot) – 40 mm d. Profile groove width – 8.3 mm e. Leveling casters for quick setting and smooth movement f. Profile plate connectors: Length 55 mm, thickness 5mm Mounting method M6 Socket head screw with M6 hammer head nut	1
2.	I/O Interface module: a. 25 Pin D-Sub connector interface board for interfacing valves and actuators b. 25 Pin D-Sub cable for establishing connection between IO module and PLC	1
3.	Valve Manifold with Field bus communication a. L x W x H :104.5x119.4x29.8 mm b. Grid spacing – 19 mm. c. Mountable valve port size 1/8’’ d. Silencers for reducing the dB level of exhausted air. e. 5/2 Double solenoid pilot operated valve: f. Material- Extruded Aluminum with anodized g. Voltage DC24V, Current consumption <120mA Solenoid valve a. Size – 1/8 ’’ b. Design – Spool type c. Pressure range – 2 – 10 bar d. Flow rate – 450 l / min e. Manual override- Resetting f. Fitted with 1/8’’ flow control valve	1
4.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and start up valve: a. Port size -1/4 inch b. Flow rate – 500 l/min c. Maximum supply pressure – 10 bar d. Operating pressure- 6 bar e. Filtering element grade – 40 µm f. Minimum operating flow – 12 l/min g. Filter Bowl capacity – 9 ml h. Lubricator Bowl capacity – 20 ml	1

	i. Connection for tube 8 dia input and 8 dia output j. Mounting – Socket head cap screw with M6 hammer head nut	
5.	Conveyor Module: a. Flat belt conveyor with overall length of 500mm b. Conveyor to be driven by 24V DC motor of reputed make. c. Conveyor to be provided with electronic drive unit for regulating the speed, reversing the direction and other function. d. Separator Module: Comprising of 2 pneumatic cylinders of dia 25 mm and stroke 25mm e. Retro reflective -Photo electric sensor (Upstream): i. Type: Infra-red ii. Sensing range: 2m iii. Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @20mA max current iv. Switch output: PNP, normally open/normally closed contact v. Output Protection: Protected against false pulse on power-up, short circuit protected. f. Thru beam -Photo electric sensor (Downstream): i. Type: Infra-red ii. Sensing range: 2m iii. Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @ 20 mA max current iv. Switch output: PNP, normally open/normally closed contact v. Output Protection: Protected against false pulse on power-up, short-circuit protected. g. Diffuse Sensor - Photo electric: i. Type: Infra-red ii. Sensing range: 15mm iii. Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @ 20 mA max current iv. Switch output: PNP, normally open/normally closed contact v. Output Protection: Protected against false pulse on power-up, short-circuit protected	1
6.	HMI Control console: a. 10” HMI Make Exor/Equivalent b. Cycle start push button –Green with illuminated. c. Auto /Manual selector switch -Black d. Home position push button –Red with illuminated e. Emergency button -Red	1
7.	Cable duct and accessories: a. Wire duct size 45x25	1
8.	PLC control panel with S7 1200 PLC: CPU 1214 a. Power supply: Input voltage :230/115 V AC (47 – 63 Hz), Output voltag24 V DC, short-circuit-proof Output current: Maximum 3A b. Miniature circuit breaker DC voltage with max.5A current rating c. Digital inputs-14,Digital outputs 10, Analog inputs 2Ethernet interface 1 x TCP/IP, 10	1

	Mbit/s d. Terninal blocks e. 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm^2 f. Cable ducts g. Power Connection cable:3pin plug with length of 1.3m h. Optocoupler	

1.5 PROCESS STATION WITH HMI

FEATURES



- 6 stage Rotary Indexing table
- Rod less Pneumatic drive
- Pneumatic motor
- Pneumatic based linear Pick and Place
- Valve Terminal with Field bus communication
- HMI control console
- Completely preassembled system
- Easy to use, and commission.
- Workbook with tasks and Solutions

APPLICATION

These Mechatronics systems are fully functional models of actual applications, mimicking hybrid, real life, industrial automation scenarios. A wide variety of project assignments and learning objectives help students to build hybrid systems by integrating important automation technologies, such as

- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors
- Vacuum

TECHNICAL SPECIFICATIONS

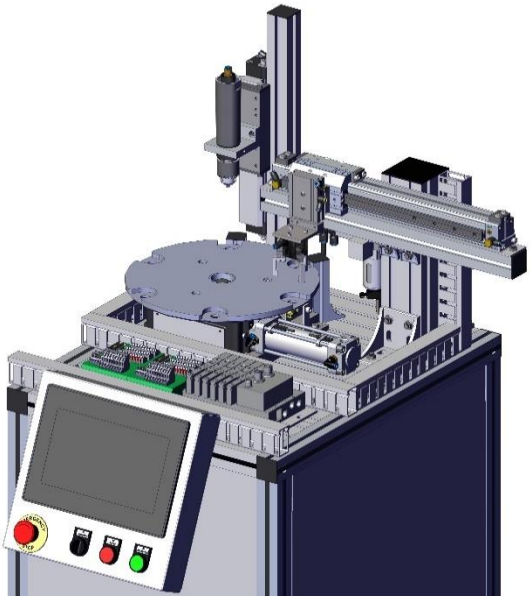
Model	MMS4
Size (in cm)	72x64x141
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	6-8 bar
Operating Voltage +/- 10%	230V AC, 50HZ
Power consumption	180 W (224 VA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, Plastic. etc.

FUNCTION

The Process Station performs mechanical operations like Drilling, Inspection etc on a pneumatically driven rotary indexing table and transfers the work piece via Pick and place module to downstream Station.

The Process Station consists of the following.

- FRCLM module
- Rotary Indexing table module
- Drilling module
- Pick and Place module.
- Valve module with Fieldbus communication
- I/O Interface Module
- Profile Table work bench
- PLC control
- HMI Control Console



The processing station is capable of processing machining operations like drilling/grinding/polishing using pneumatically driven indexing table and electrically driven drilling machine using the six processing locations on the indexing table. A pneumatic linear drive module moves the drill unit up and down. Provisions can be made to detect the position of hole and the depth of hole using sensors. The station is provided with a Pick and place module to transfer the job the next station.

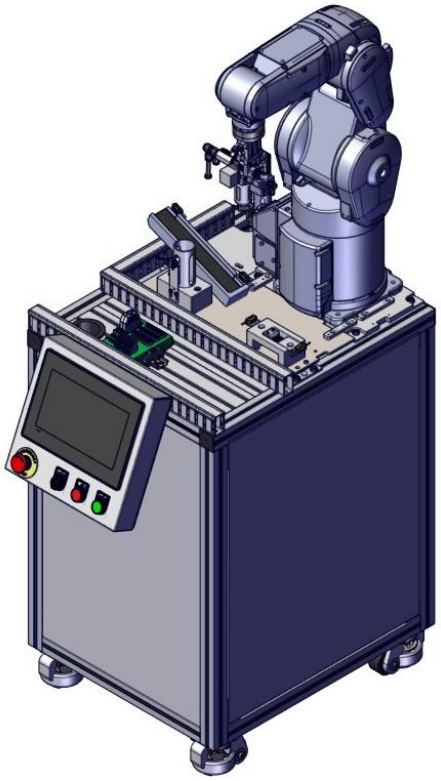
The station should consist of anodized profile plate, filter regulator and lubricator unit with pressure gauge, on/off valve quick push connections and couplings mounted with suitable mountings for easy assembly and disassembly.

SCOPE OF SUPPLY:

S. No	Item with description	Qty
1.	Horizontal Aluminum profile table: a. (L x W x H)- 540 x 640 x 790 mm b. Aluminum profile Tabletop profile – 40 x 160 mm Supporting profile- 40 x 40 mm c. Grid spacing (From slot to slot) – 40 mm. d. Profile groove width – 8.3 mm e. Leveling casters for quick setting and smooth movement f. Profile plate connectors: Length 55 mm, thickness 5mm Mounting method M6 Socket head screw with M6 hammer head nut	1
2.	I/O Interface module: a. 25 Pin D-Sub connector interface board for interfacing valves and actuators b. 25 Pin D-Sub cable for establishing connection between IO module and PLC control	1
3.	Valve Manifold with Field bus communication a. L x W x H :168.5x119.4x29.8 mm b. Grid spacing – 19 mm. c. Mountable valve port size 1/8’’ d. Silencers for reducing the dB level of exhausted air. e. 5/2 Double solenoid pilot operated valve: f. Material- Extruded Aluminum with anodized g. Voltage DC24V, Current consumption <120mA Solenoid valve a. Size – 1/8 ’’ b. Design – Spool type c. Pressure range – 2 – 10 bar d. Flow rate – 450 l / min e. Manual override- Resetting f. Fitted with 1/8’’ flow control valve	1
4.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and start up valve: a. Port size -1/4 inch b. Flow rate – 500 l/min c. Maximum supply pressure – 10 bar d. Operating pressure- 6 bar e. Filtering element grade – 40 µm f. Minimum operating flow – 12 l/min g. Filter Bowl capacity – 9 ml h. Lubricator Bowl capacity – 20 ml	1

	i. Connection for tube 8 dia input and 8 dia output j. Mounting – Socket head cap screw with M6 hammer head nut	
6.	Rotary indexing table module: a. Pneumatically driven rotary indexing table capable of handling load up to 50 kg b. Indexing table to be driven by cylinder of Ø 40 x 75 mm c. Indexing angle 60 degrees d. Indexing plate diameter-320 mm Diffuse Sensor: a. Type: Infra-red b. Sensing range: 15mm c. Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @ 20 mA max current d. Switch output: PNP, normally open/normally closed contact e. Output Protection: Protected against false pulse on power-up, short-circuit protected	1
7.	Drilling Module: a. Drilling machine to be mounted on a pneumatic linear drive of stroke. 100mm b. Pneumatic drilling machine: No-load Speed: 3000 rpm, Weight: 1.4 Kg	1
8.	Pick and Place module. a. Rod less cylinder – dia 25 mm x 250 mm stroke b. Aluminum profile pillar – 80 x 80 mm c. Rod less cylinder mounting profile- 40 x 40 mm d. Twin rod cylinder- 15 mm stroke length e. 3 jaw pneumatic gripper	1
9.	HMI Control console: a. 10” HMI Make: Exor b. Cycle start push button –Green with illuminated. c. Auto /Manual selector switch -Black d. Home position push button –Red with illuminated e. Emergency button -Red	1
10.	Cable duct and accessories: a. Wire duct size 45x25 b. Fastening screws	1
11.	PLC control panel with Mitsubishi PLC – FX Series: a. Power supply: Input voltage :230/115 V AC (47 – 63 Hz), Output voltage: 24 V DC, short-circuit-proof Output current: Maximum 3A b. Miniature circuit breaker DC voltage with max.5A current rating c. Digital inputs-32, Digital outputs 32, Analog inputs 2, Ethernet interface 1x TCP/IP, 10 Mbit/s d. Terminal blocks e. 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm2. f. Cable ducts g. Power Connection cable:3 pin plug with length of 1.3m	1

1.6 ROBOT STATION WITH HMI



FEATURES

- 6 Axis Articulated Robot
- Servo operated.
- 4Kg Payload
- 1 Phase power supply
- Inbuilt servo controller
- HMI Control console
- Completely preassembled system
- Easy to use, and commission.
- Workbook with tasks and Solutions

APPLICATION

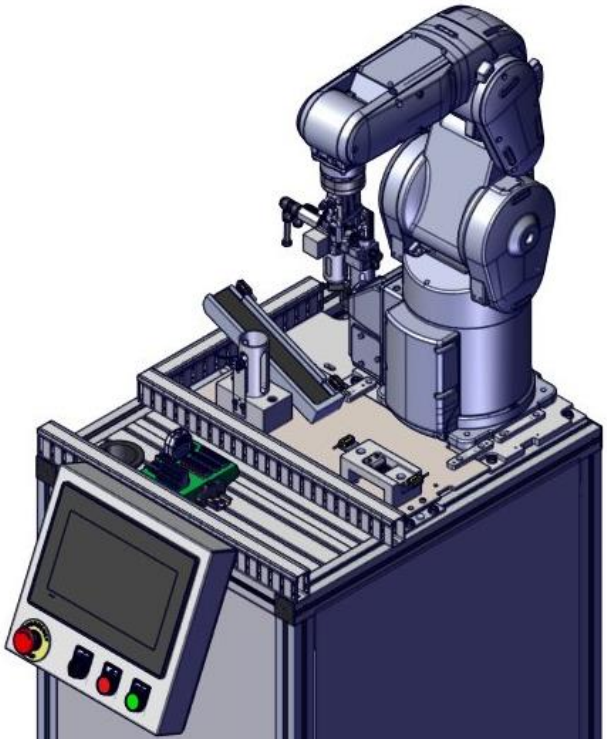
These Mechatronics systems are fully functional models of actual applications, mimicking hybrid, real life, industrial automation scenarios. A wide variety of project assignments and learning objectives help students to build hybrid systems by integrating important automation technologies, such as

- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors
- Robotics

Technical Specifications

Model	MMS4
Size (in cm)	54x64x155
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	2-3 bar
Operating Voltage +/- 10%	230V AC, single phase 50HZ
Power consumption	1.9 KW (2.1KVA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, SS, Plastic .etc.

FUNCTION



Robot station with the combination of assembly station assembles the incoming work piece with spring and digital sensor assembly and sends to downstream station.

Robot takes the work piece from the inward slide using parallel gripper and orients the component at orientation module and places the same in assembly area.

Robot picks and places the spring on to the work piece from the spring dispenser module and picks the digital sensor assembly from the Cap dispenser module and orients at orientation module. After orientation, robot test the digital sensor for quality check and approved work piece is assembled. If, the work piece is not approved then it is moved to the rejection bin. After assembling, the robot picks the assembled work pieces from the assembly location and sends the same to the downstream station through outward slide.

SCOPE OF SUPPLY:

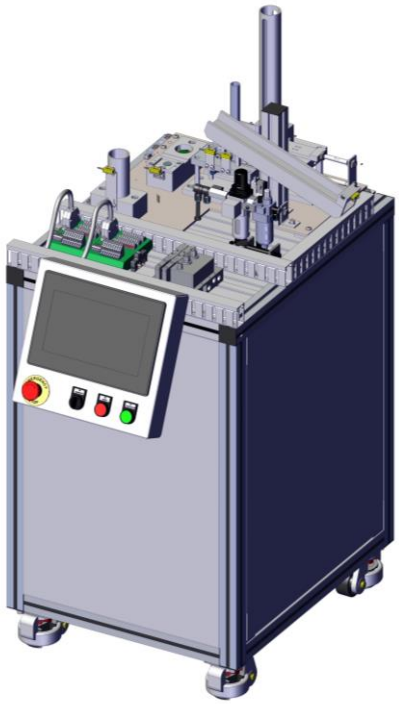
S. No	Item with description	Qty
1.	Robot module: a. Make : Mitsubishi b. Axes : 6 c. Drive motor : All-axis servo motor d. Maximum motion area : 515mm e. Maximum payload : 4kg f. Cycle time : 0.35sec g. Position repeatability : ±0.02mm h. Signal line : 10 (for proximity sensor signals, etc.) i. Air pipe solenoid valve : 2 solenoid valves j. Maximum air pressure : 5bar max k. Controller operating voltage : Single phase, 230VAC	1
2.	Horizontal Aluminum profile table: a. (L x W x H) : 540 x 640 x 790 mm b. Aluminum profile : Tabletop profile – 40 x 160 mm : Supporting profile- 40 x 40 mm c. Grid spacing (slot to slot) : 40 mm d. Profile groove width : 8.3 mm e. Profile plate connectors: : Length 55 mm, thickness 5mm f. Mounting method : M6 Socket head screw & hammer head nut g. Leveling casters for quick setting and smooth movement	1
3.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and start up valve: a. Port size : 1/4 inch b. Flow rate : 500 l/min c. Maximum pressure : 10 bar d. Operating pressure : 6 bar e. Filtering element grade : 40 µm f. Minimum operating flow : 12 l/min g. Filter Bowl capacity : 9 ml h. Lubricator Bowl capacity : 20 ml i. Tube Connection : 8 dia input and 8 dia output j. Mounting : M6 Socket head screw & hammer head nut	1
4.	Storage module: Comprising of a storage block with assembly bins and sensors	1
5.	Inward slide module: Comprising of a slide module with sensors.	1
6.	Orientation module: Comprising of an orientation block with orientation sensors	1

7.	HMI Control console: a. 10” HMI Make: Exor b. Cycle start push button –Green with illuminated. c. Auto /Manual selector switch -Black d. Home position push button –Red with illuminated e. Emergency button -Red	1
8.	Controller module: Consists of Robot controller with I/O cables assembled on the aluminum. profile assembly	1
9.	I/O interface module: a. Input voltage :24V b. Output current: Maximum 3A c. Miniature circuit breaker DC voltage with max.5A current rating d. Terminal blocks e. 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm2. f. Cable ducts g. Power Connection cable:3pin plug with length of 1.3m	1
10.	Cable duct and accessories: a. Wire duct size 45x25 b. Fastening screws	1

1.7 ASSEMBLY STATION WITH HMI

FEATURES

- Pneumatic drives-based feeder system
- RFID Tracking
- Valve terminal with Field bus communication
- HMI Control console
- Completely preassembled system
- Easy to use, and commission
- Workbook with tasks and Solutions



APPLICATION

These Mechatronics systems are fully functional models of actual applications, mimicking hybrid, real life, industrial automation scenarios. A wide variety of project assignments and learning objectives help students to build hybrid systems by integrating important automation technologies, such as

- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors

TECHNICAL SPECIFICATIONS

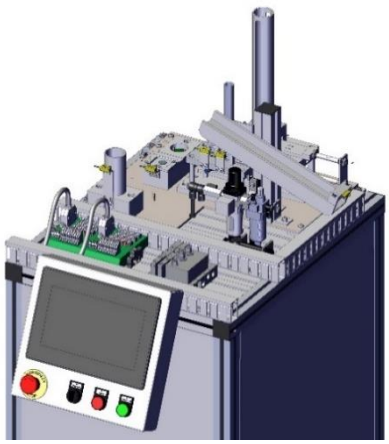
Model	MMS4
Size (in cm)	54x64x115
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	2-3.5 bar
Operating Voltage +/- 10%	230V AC,50HZ
Power consumption	180 W (224 VA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, SS, Plastic. etc.

FUNCTION

Assembly station is add-on module of Robot station. Cap dispensing module dispenses the digital sensor and spring dispensing module dispenses the spring required for assembly. The testing and assembly module allows the robot to test and assemble the work pieces. The outward module allows the assembled work pieces to move to the downstream station. Rejection module holds the rejected components/work pieces.

The Assembly Station consists of the following.

- Horizontal Profile Table work bench with castor wheels
- FRCLM Module
- Assembly and Testing module
- Cap dispenser module
- Spring dispenser module
- Outward slide module
- Rejection module
- HMI Control console
- PLC board assembly module
- I/O interface module
- Valve module with Fieldbus communication
- Cable duct with accessories



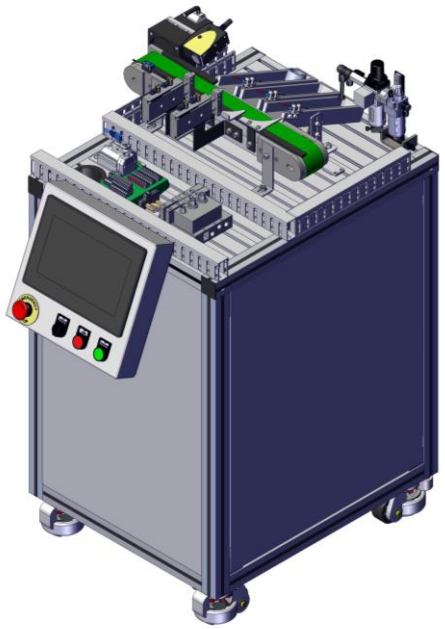
The station should consist of anodized profile table, filter regulator and lubricator unit with pressure gauge, on/off valve quick push connections and couplings mounted with suitable mountings for easy assembly and disassembly. Networking and signaling to the subsequent station for further processing should be done by establishing profinet communication between the PLC and robot controller. The robot controller used in this station should be capable of handling various digital inputs/output

SCOPE OF SUPPLY:

S. No	Item with description	Qty
1.	Horizontal Aluminum profile table: a. (L x W x H) : 540 x 640 x 790 mm b. Aluminum profile : Tabletop profile – 40 x 160 mm : Supporting profile- 40 x 40 mm c. Grid spacing (slot to slot) : 40 mm d. Profile groove width : 8.3 mm e. Profile plate connectors: : Length 55 mm, thickness 5mm f. Mounting method : M6 Socket head screw & hammer head nut g. Leveling casters for quick setting and smooth movement	1
2.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge and start up valve: a. Port size : 1/4 inch b. Flow rate : 500 l/min c. Maximum pressure : 10 bar d. Operating pressure : 6 bar e. Filtering element grade : 40 µm f. Minimum operating flow : 12 l/min g. Filter Bowl capacity : 9 ml h. Lubricator Bowl capacity : 20 ml i. Tube Connection : 8 dia input and 8 dia output j. Mounting : M6 Socket head screw & hammer head nut	1
3.	Assembly and Testing module: a. Assembly and Testing block with electrical assembly and sensor b. RFID sensor • Read/write distance :15mm(min) • Supply voltage: 10 to 30 V DC • M8 Communication/ Power cable	
4.	Cap dispenser module: Consists of Machined dispenser module with sensors and Linear Motion rail and guide.	1
5.	Spring dispenser module: Consists of Machined dispenser module with sensors and Linear Motion rail and guide.	1
6.	Outward slide module: Comprising of a slide module with sensors.	1
7.	Rejection module: Comprising of a rejection block with a bin and sensor.	1

8.	HMI Control console: a. 10” HMI Make: Exor b. Cycle start push button –Green with illuminated. c. Auto /Manual selector switch -Black d. Home position push button –Red with illuminated e. Emergency button -Red	1
9.	PLC board assembly module: a. PLC control panel with S7 1200 PLC, CPU 1214 b. Input voltage :230/115 V AC (47 – 63 Hz), c. Output voltage: 24 V DC, short-circuit-proof d. Output current: Maximum 3A e. Miniature circuit breaker DC voltage with max.5A current rating f. Digital inputs-14 g. Digital outputs 10 h. Analog inputs 2Ethernet interface 1 x TCP/IP, 10 Mbit/s i. Terminal blocks j. 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm2. k. Cable ducts l. Power Connection cable:3pin plug with length of 1.3m	1
10.	I/O Interface module: a. 25 Pin D-Sub connector interface board for interfacing valves and actuators b. 25 Pin D-Sub cable for establishing connection between IO module and PLC control	1
11.	Valve Manifold with Field bus communication a. L x W x H :104.5x119.4x29.8 mm b. Grid spacing – 19 mm. c. Mountable valve port size 1/8’’ d. Silencers for reducing the dB level of exhausted air. e. 5/2 Double solenoid pilot operated valve: f. Material- Extruded Aluminum with anodized g. Voltage DC24V, Current consumption <120mA Solenoid valve a. Size – 1/8 ’’ b. Design – Spool type c. Pressure range – 2 – 10 bar d. Flow rate – 450 l / min e. Manual override- Resetting f. Fitted with 1/8’’ flow control valve	1
12.	Cable duct and accessories: a. Wire duct size 45x25 b. Fastening screws	1

1.8 SORTING STATION WITH HMI



FEATURES

- DC Brushless conveyor
- Twin piston rod cylinder
- Inductive sensor
- Optical based RGB color sensor
- Valve terminal with Field bus communication
- HMI Control console
- Completely preassembled system
- Easy to use, and commission.
- Workbook with tasks and Solutions

APPLICATION

These Mechatronics systems are fully functional models of actual applications, mimicking hybrid, real life, industrial automation scenarios. A wide variety of project assignments and learning objectives help students to build hybrid systems by integrating important automation technologies, such as

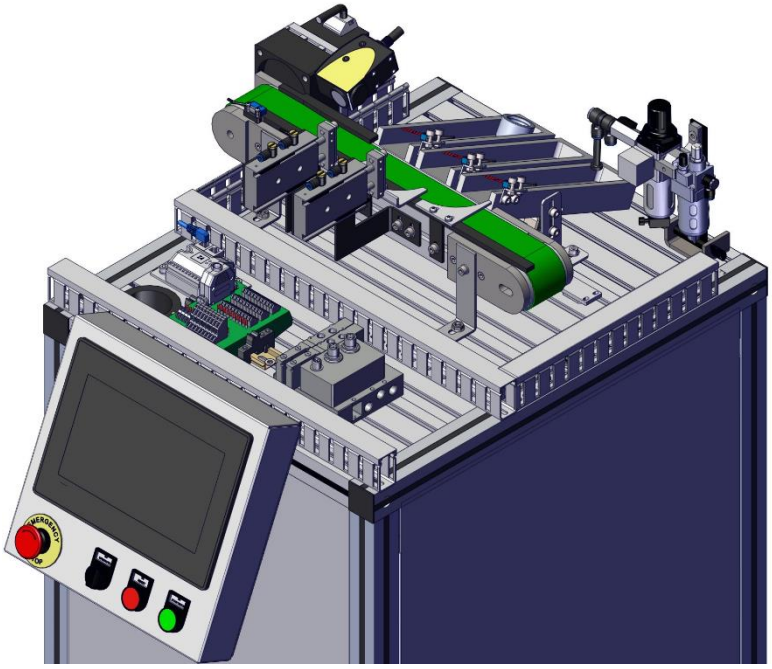
- Pneumatics
- Electrical
- PLC
- Mechanical
- Sensors

TECHNICAL SPECIFICATIONS

Model	MMS4
Size (in cm)	54x64x110
Installation	Vertical
Ambient temperature	60°C Max.
Medium	Filtered Compressed air
Operating Pressure range (Bar)	6-8 bar
Operating Voltage +/- 10%	230V AC, 50HZ
Power consumption	180 W (224 VA)
Sensors and actuator operating voltage	24V, DC
Material of construction	Aluminum, mild steel, Plastic etc.

FUNCTION

Sorting Station sorts the incoming work piece based on colour and material characteristics to appropriate slides.



The Sorting Station consists of the following.

- FRCLM module
- Sorting Conveyor module
- Valve module with Fieldbus communication
- I/O Interface Module
- Profile Table work bench
- PLC control
- HMI Control Console

The sorting station has 3 slides to sort the different materials and color of jobs that are arriving at this station. The sensors sense the presence of jobs at the start of the conveyor and also detect features of the jobs in order to start the conveyor and control the diversion of material in the appropriate slide. The pneumatically actuated sorting arrangements extend to intercept the work pieces into the appropriate slides. The station consists of anodized profile table, filter regulator and lubricator unit with pressure gauge, on/off valve quick push connections and couplings mounted with suitable mountings for easy assembly and disassembly.

SCOPE OF SUPPLY:

S. No	Item with description	Qty
1.	Horizontal Aluminum profile table: a. (L x W x H)- 540 x 640 x 790 mm b. Aluminum profile Tabletop profile – 40 x 160 mm Supporting profile- 40 x 40 mm c. Grid spacing (From slot to slot) – 40 mm d. Profile groove width – 8.3 mm e. Leveling casters for quick setting and smooth movement f. Profile plate connectors: Length 55 mm, thickness 5mm Mounting method M6 Socket head screw with M6 hammer head nut	1
2.	I/O Interface module: a. 25 Pin D-Sub connector interface board for interfacing valves and actuators b. 25 Pin D-Sub cable for establishing connection between IO module and PLC control	1
3.	Valve Manifold with Field bus communication a. L x W x H :104.5x119.4x29.8 mm b. Grid spacing – 19 mm. c. Mountable valve port size 1/8’’ d. Silencers for reducing the dB level of exhausted air. e. 5/2 Double solenoid pilot operated valve: f. Material- Extruded Aluminum with anodized g. Voltage DC24V, Current consumption <120mA Solenoid valve a. Size – 1/8 ’’ b. Design – Spool type c. Pressure range – 2 – 10 bar d. Flow rate – 450 l / min e. Manual override- Resetting f. Fitted with 1/8’’ flow control valve	1
4.	Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge & start up valve: a. Port size -1/4 inch b. Flow rate – 500 l/min c. Maximum supply pressure – 10 bar d. Operating pressure- 6 bar e. Filtering element grade – 40 µm f. Minimum operating flow – 12 l/min g. Filter Bowl capacity – 9 ml h. Lubricator Bowl capacity – 20 ml i. Connection for tube 8 dia input and 8 dia output	1

	j. Mounting – Socket head cap screw with M6 hammer head nut	
5.	Sorting Conveyor Module: a. Flat belt conveyor with overall length of 500mm b. Conveyor to be driven by 24V DC motor of reputed make. c. Conveyor to be provided with electronic drive unit for regulating the speed, reversing the direction and other functions. d. Comprising of 2 pneumatic cylinders of dia 25 mm and stroke 40 mm e. Sorting slides for collecting the work piece on appropriate slides. Color Sensor: a. Sensing range: 15mm b. Supply Voltage and Current: 10 to 30V DC (10% max. ripple) c. Switch output: PNP, normally open/normally closed contact d. Output Protection: Protected against false pulse on power-up, short-circuit protected. e. Output rating: 100 mA Proximity sensor: a. Type - Cylindrical inductive type b. Supply voltage -12 – 24V DC c. Sensing range – 8 mm Diffuse Sensor: a. Type: Infra-red b. Sensing range: 15mm c. Supply Voltage and Current: 10 to 30V DC (10% max. ripple) @ 20 mA max current d. Switch output: PNP, normally open/normally closed contact e. Output Protection: Protected against false pulse on power-up, short-circuit protected RFID sensor: a. Read/write distance :15mm(min) b. Supply Voltage:10 to 30V DC c. M8 Communication/ Power cable	1
6.	HMI Control console: a. 10” HMI Make: Exor b. Cycle start push button –Green with illuminated. c. Auto /Manual selector switch -Black d. Home position push button –Red with illuminated e. Emergency button -Red	1
7.	Cable duct and accessories: a. Wire duct size 45x25 b. Fastening screws	1
8.	PLC control panel with DELTA PLC – DVP Series: a. Power supply: Input voltage :230/115 V AC (47 – 63 Hz), Output voltage: 24 V DC, short-circuit-proof Output current: Maximum 3A b. Miniature circuit breaker DC voltage with max.5A current rating c. Digital inputs-24, Digital outputs 16, Analog inputs 4, Ethernet interface 1 x TCP/IP, 10 Mbit/s d. Terminal blocks	1

	e. 25pin D-sub I/O data cable length 1.5 m, wire used 0.25 mm2. f. Cable ducts g. Power Connection cable:3pin plug with length of 1.3m h. Opto- Coupler i. IO link module j. Number of Inputs, voltage(V): 2, 20-28VDC	

2. AUTONOMOUS MOBILE ROBOT (AMR) WITH COBOT

FEATURES

- Safety in collaborative applications
- Quick configuration
- Intelligent navigation system
- Works safely with people.
- High Accuracy Positioning System using Vision Camera
- Improve material trace ability.
- Easy to integrate with MES, ERP and WMS system.

(The above image is only for reference. The actual system may slightly differ from the image.)

APPLICATION

The AMR is used to demonstrate the material transportation, Assembly, Pick and place, Warehouse management & logistics in industries.

TECHNICAL SPECIFICATIONS

Model	-
AMR	
Make	Addverb / MiR
Size	920mm x 755mm x 300mm
AMR Payload	200 Kg
AMR Speed m/sec	2
Battery	22-30 V DC
Run Time	4 hours (Continuous)
Turning radius	On spot turning
Ambient temperature (ºC)	5 to 40 ºC
Charging Power	230 V AC, 50 Hz

User interface communication Wireless	802.11 a/b/g/n/ac
Operating Voltage +/- 10%	22 to 30 V DC
Power consumption	2.1 KW
Other features	Safety laser scanners & Ultrasonic sensors Safety System: 1 Lidar sensor (mounted at the front), 3D Depth camera, bumper on front and back side, 2 emergency stop buttons Safety Sensor: 2D LIDAR Operational Mode : Auto / Manual Precision Docking: +/- 5mm Stopping Accuracy Docking : +/-20 mm Stopping Accuracy Positioning: +/-50 mm
COBOT	
Make	Techman
Cobot Payload in kg	4 kg
Cobot Reach in mm	Max. 900 mm
Number of axis	6
Power supply	24V/2A
IP Classification	IP54 Robot arm,IP32 Control Box
Mounting	Any angle Including table mounting, wall mounting and Ceiling mounting

FUNCTION

The Autonomous mobile robot is used for Autonomous material transportation in Smart manufacturing / Smart Factory environment.

The AMR station consists of the following.

- Cobot module with in-built vision system
- AMR module
- Electrical gripper module
- Controller module
- Storage module

The collaborative robot (COBOT) is mounted on top of an Automated Mobile Robot (AMR). The cobot has an in-built vision and payload capacity of 4 Kg. The cobot can be programmed using ROS or the TM Flow software. The AMR uses a LIDAR and two depth cameras to navigate using Natural Navigation. It has a payload of 200 kg. The AMR can be controlled using a Fleet Management System. The AMR can be deployed to different locations using REST Api communication through the Fleet Management System. The AMR can be integrated with Modular Manufacturing System (MMS4.0) and additive or subtractive manufacturing machines for simulation of complete smart factory system.

3. PLC SOFTWARE AND ACCESSORIES

Ordering No	-	
PLC Programming software		
Technical specifications		
Make	Siemens TIA Portal Basic,	
License	1 User each	
Version	Latest	
Packing	CD / OSD	
PLC programming cable		
Technical specifications		
Make	Phoenix	
Cable	RJ45 to RJ45	
Length	5meter	
Quantity	1 Nos	

4. TECHNICAL DOCUMENTS

FEATURES

- Conforms to DIN ISO 1219-1
- Includes Pneumatic & Electrical circuit, positional sketch, assembly procedure, installation procedure, technical specifications of components and troubleshooting etc.
- Available for all stations & combinations
- Packed with 4 ring binder.

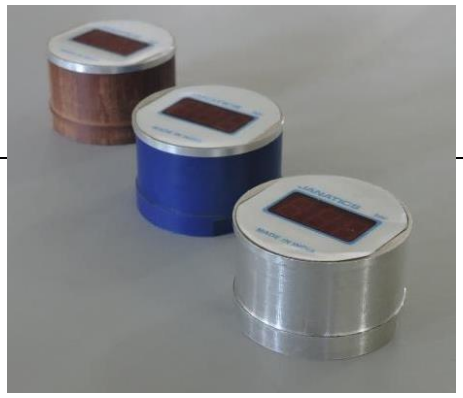
APPLICATION

Technical document enables user to understand the technical information like Pneumatic & Electrical circuit, positional sketch, assembly procedure, and installation procedure, technical specifications of components and troubleshooting etc. of the Modular manufacturing system.

S.no	Description	Qty
1	Technical Document for Feeder station with HMI	1
2	Technical Document for Inspection station with HMI	1
3	Technical Document for Buffer station with HMI	1
4	Technical Document for Process station with HMI	1
5	Technical Document for Robot station with HMI	1

6	Technical Document for Assembly station with HMI	1
7	Technical Document for Sorting station with HMI	1
8	Technical Document for Combination stations	1

5. WORK PIECE SET

Ordering code		**MMS-WP-03-00**	
Technical Specification			
Type	Inbuilt with RFID tag		
Work piece Approved	Diameter	39.5mm	
	Height	27mm	
Work piece Rejected	Diameter	39.5mm	
	Height	23.5mm	
Aluminium Work Piece - Approved		1set (6nos)	
Delrin Work Piece - Approved		1set (6nos)	
Hylum Work Piece - Approved		1set (6nos)	
Rejection work piece – Aluminium, Delrin & Hylum		6 no's (Each 2nos)	
Digital cap Approved		18 no's	
Digital cap Rejected		6no's	

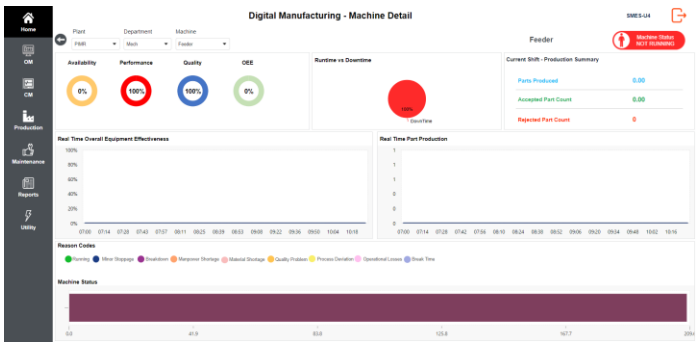
6. SMART MANUFACTURING EXECUTION SYSTEM

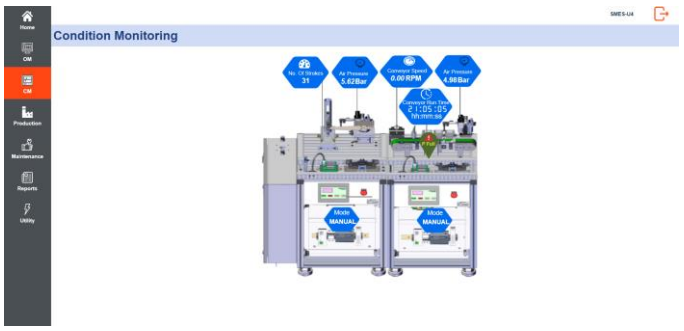
FEATURES

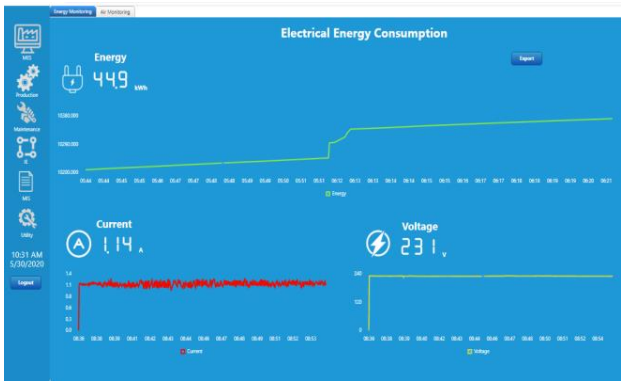
- Production Monitoring
- Overall Equipment Effectiveness – OEE
- Condition Monitoring
- Order Management
- Energy Management
- Management Information System
- Maintanence

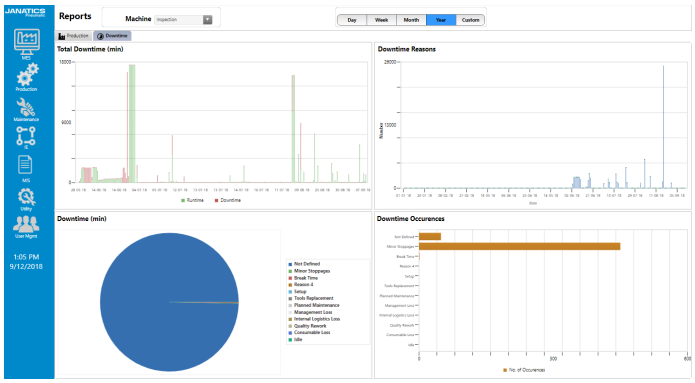
Application

The SMES4.0 application is a Manufacturing Execution System, which establishes the communication between Operational technology (OT) and Information Technology (IT) for the complete value chain management of the Smart manufacturing System. It is provided on SaaS (Software as a Service) platform with yearly subscription.









Ordering Code : JSMES-MMS4-006-01-03

7. JANATICS AUGMENTED REALITY APPLICATION– JARA4.0

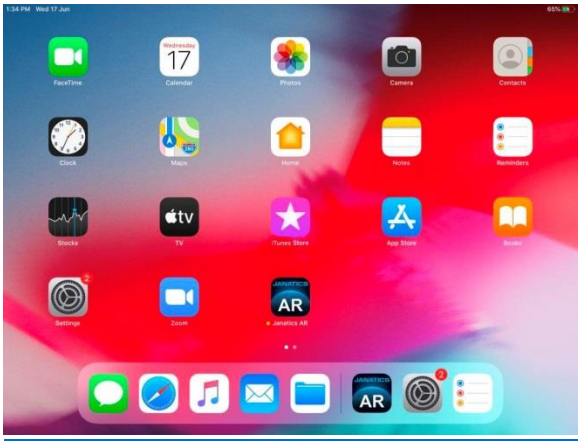
FEATURES

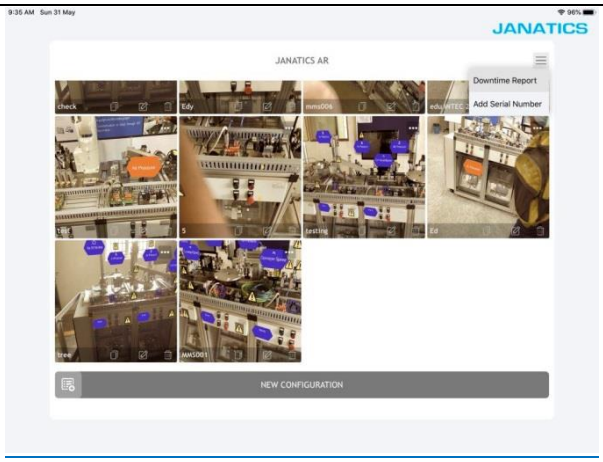
- Detects machine without any identification marks like QR code.
- Displays the real time machine status and error notification for machine monitoring and diagnostics.
- Provides online user manual and machine assembly & dismantling procedure.
- Provides user to generate machine report.
- Possible to self-create the error notifications for learning purposes.
- It is compatible to mobile gadgets iOS & wearable gadget.

APPLICATION

Janatics AR app allows users to create and access Augmented Reality experiences of the Modular Manufacturing System on your tablet or smartphone. Janatics AR application is freely downloadable from Apple store.

Janatics AR app displays real time machine data, the troubleshooting procedure in the form of digital documents and Videos and Machine downtime report. Users can also configure and position the real time data variables to be displayed and integrate them with products like modular manufacturing system.





Ordering Code: JAR-MMS4-006-01-03