

About Hytech Automation

Hytech Group, established in the year 1992 is a technology oriented manufacturing industry based in Pune, Maharashtra, India. Hytech group started as Hytech Hydraulics catering to hydraulics automation requirement for process industries. Now, there are Today, Hytech Group owns four verticals broadly classified as under -

- Hytech Automation
- Hytech Automation – Didactic Solutions
- Hytech Hydraulics
- Hytech Distribution

Hytech Automation

Hytech Automation is one of the channel partners for the integration of Fanuc Industrial Robots. Core activity of Hytech Automation is automation related solutions. This is a project oriented division that caters to industrial robotics integration as well as application oriented process integration. Few top clients include Maruti Suzuki, Indian Railways, LG India, etc.

Hytech Automation also manufactures special purpose machines required for technologically advanced applications. One of the most successful product is Laser assisted CNC Turning machine which was developed in collaboration with DRDO – INDIA and LZH – Germany. This specially designed CNC turning machine can machine components up to 78 HRC.

Hytech Automation – Didactic Solutions

Hytech Automation – Didactic Solutions mostly deals with the Automation and Application Engineering related Educational Solutions. These Didactic Solutions involve manufacturing of training kits as well as services such as ‘Syllabus Designing’ and ‘Train the Trainer Program’. There are four verticals in this division namely, CIM – Computer Integrated Manufacturing, Mechatronics, CNC Machines and Robotics.

With more than 20 years’ experience in the field of technological solutions, Hytech Automation – Didactic has acquired necessary expertise to provide industry oriented educational solutions which are relevant almost all over the world.

Hytech Automation is authorized channel partner for Fanuc Robots as well as Fanuc CNC related products. With client base in more than 25 countries, ‘Hytech Automation – Didactic Solution’ has more than 3000 active customers in educational as well as industrial sector. Few of the reputed customers include Maruti Suzuki - India, Bosch – India, Indian Navy, Mahindra and Mahindra, Myanmar Navy, Singapore Polytechnic, Khartoum University - Sudan, Palestine Technical University, etc.

Hytech Hydraulics

Hytech Hydraulics is the oldest vertical under Hytech umbrella. It caters to the hydraulic related automation as well as project requirements in process industry. Few top clients include Thyssen Krupp, Wonder Cement, Ambuja Cement, Dalmia Cement, etc. Hytech Hydraulics has supplied more than 300 kiln thrusters operating in 4 different continents. Few of the kiln thrusters are operational 24 x 7 for more than 22 years.

Hytech Hydraulics has designed and patented a fine flow control valve which is considered as a monopolistic product in the cement industry. More than 2000 such valves are operational in various cement plants all across the globe.

Hytech Distribution

Hytech Distribution is the trading arm of Hytech Group. Over the years, Hytech Group has established collaborations with few reputed manufacturers as well as service providers from all over the world. Hytech holds distributorship of BobCAD – CAM, Fanuc NC Guide, Fanuc Roboguide, Fanuc Simulator, Visual Components, IRAI – Automgen, etc.



Models



MPS / Industry 4.0



MPS CCU: Central Control Unit



MPS / Industry 4.0



Hytech – MPS (Modular Production Stations)

- Hytech MPS are designed to provide hands on experience on industrial automation practices in collaboration with PLC – HMI – OPC UA as well as Industrial SCADA
- Basic concept of Hytech MPS is to provide integrated training of pneumatics, PLC as well as latest industrial automation related components on a single integrated training kit with actual industrial applications.
- Participants can change the sequence, modify the ladder depending on their requirement. They can also create various data points and graphs with SCADA.
- Industry 4.0 connectivity with cloud based monitoring system is also provided.
- Each MPS station can be operated individually or in integration with the other MPS stations. MPS CCU can be connected with any number of MPS stations. MPS CCU is equipped with Industrial SCADA, Dynamically linked 3D design and simulation software. MPS CCU is an individual unit which can be integrated with a single MPS station or a complete set up of 4 MPS stations.

Hytech – MPS (Modular Production Stations) What can be achieved?

- Basic introduction to industrial automation components and processes such as auto feeder, photo sensors, load cell application, analog to digital conversion, SCARA Robot operation, rotary dispensing station, color based sorting, Height based sorting etc
- Hands on experience on PLC – HMI integration with industrial automation components, SCARA Robot, SCADA, OPC – UA, etc.
- SCARA Robot operation and complete application with PLC and SCADA integration
- Complete design and dynamic simulation of entire process through OPC UA connectivity on 3D simulation software
- Entire process operation through SCADA
- Participants can modify the complete process and return back to factory settings within few seconds giving them necessary confidence to operate the system and not only observe the process.
- Participants can operate individual stations separately as well as the complete system in integration with CCU

Industrial Automation

- Photo Sensor
- Capacitive Sensors, Inductive Sensors
- Height Based Sensing
- Color Sensor
- Rodless Cylinder
- Profinet based Solenoid Valve Bank
- 4 Axes Industrial SCARA Robot
- Load Cell with Display
- Analog to Digital Conversion
- Conveyor
- 6 Station Rotary Indexing Station
- Automatic Storage System (Warehousing)

Control System

- Siemens S7 1200 (1215C) for MPS Station
- Industrial SCADA (Siemens WinCC Advance) with unlimited Tags
- HMI – Siemens KTP 700
- Licensed TIA software for PLC and HMI
- OPC UA Connectivity
- RJ 45 port for each MPS Station
- 3D Design and Simulation Software with Dynamic process simulation
- Individual software for analysis and operation of 4 axes Industrial SCARA Robot

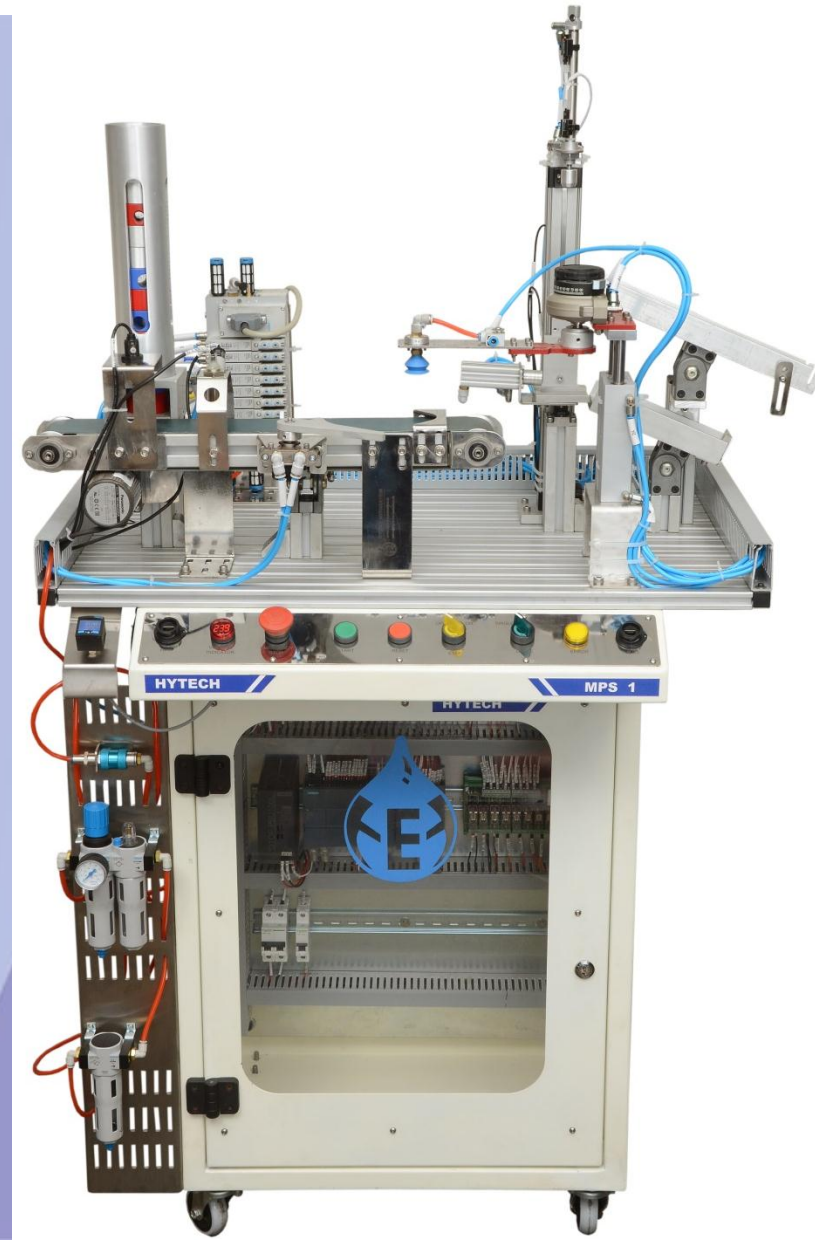
MPS Station 1 Material Based Sorting with Height Sensing Application

Key Features

- This is the first station of Hytech MPS system which is equipped with automatic loading tube. It can be connected to MPS 2.
- Basic operational concept of this MPS is material based sorting along with Height sensing application. There are two separate provisions for rejections in this MPS. First rejection arrangement is mounted on the conveyor. Participants can select the job based on material (MS / SS / PU) to process further.
- Height based sensing is again a rejection mechanism. Students can select the height of the job which will be processed to next station. In case if there is no MPS 2, participants can sort the jobs based on their heights.

What can be achieved with MPS 1:

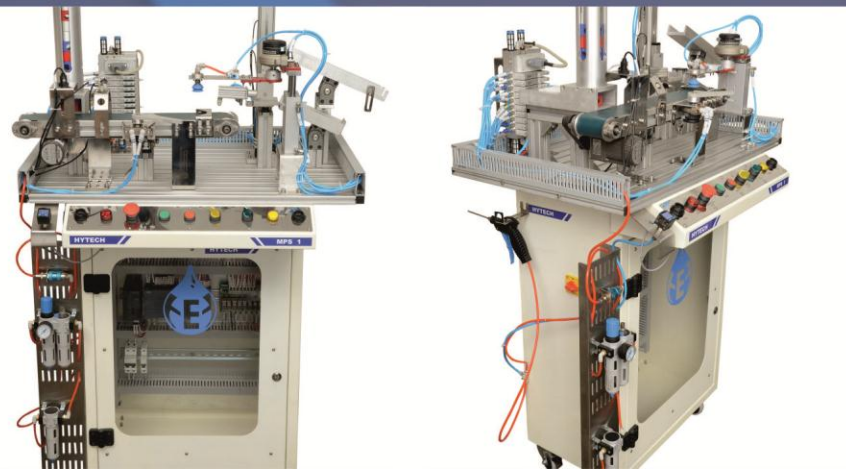
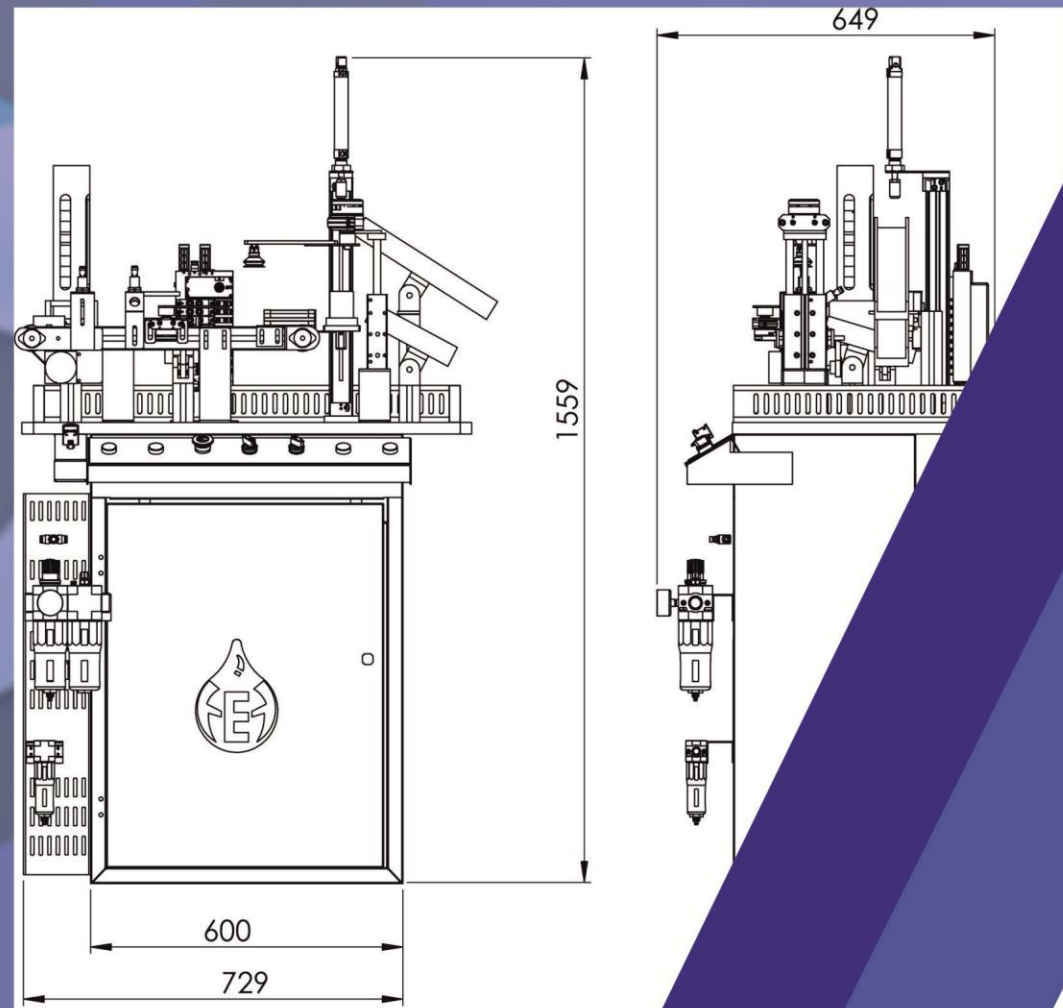
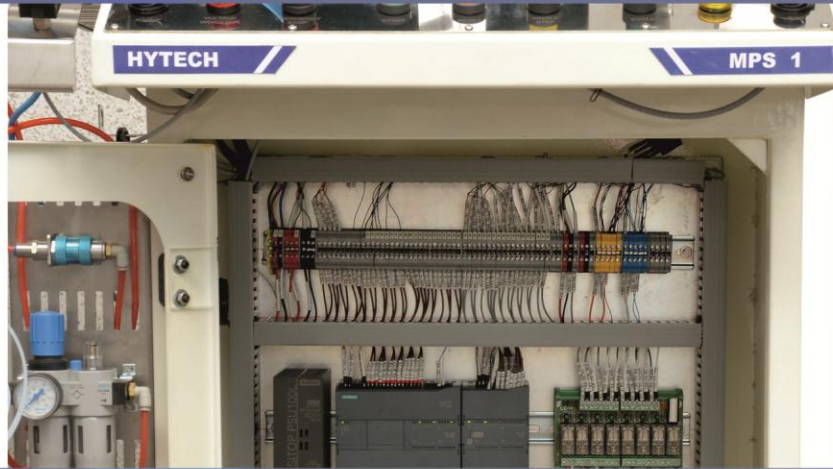
- Material based sensing
- Height based sensing
- Acceptance and rejection based on user preference
- Introduction to rotary pick and place unit
- Operation of auto loader
- Operation of rod less cylinder



MPS Station 1

Material Based Sorting with Height Sensing Application

MPS 1: Material Based Sorting with Height Sensing Application



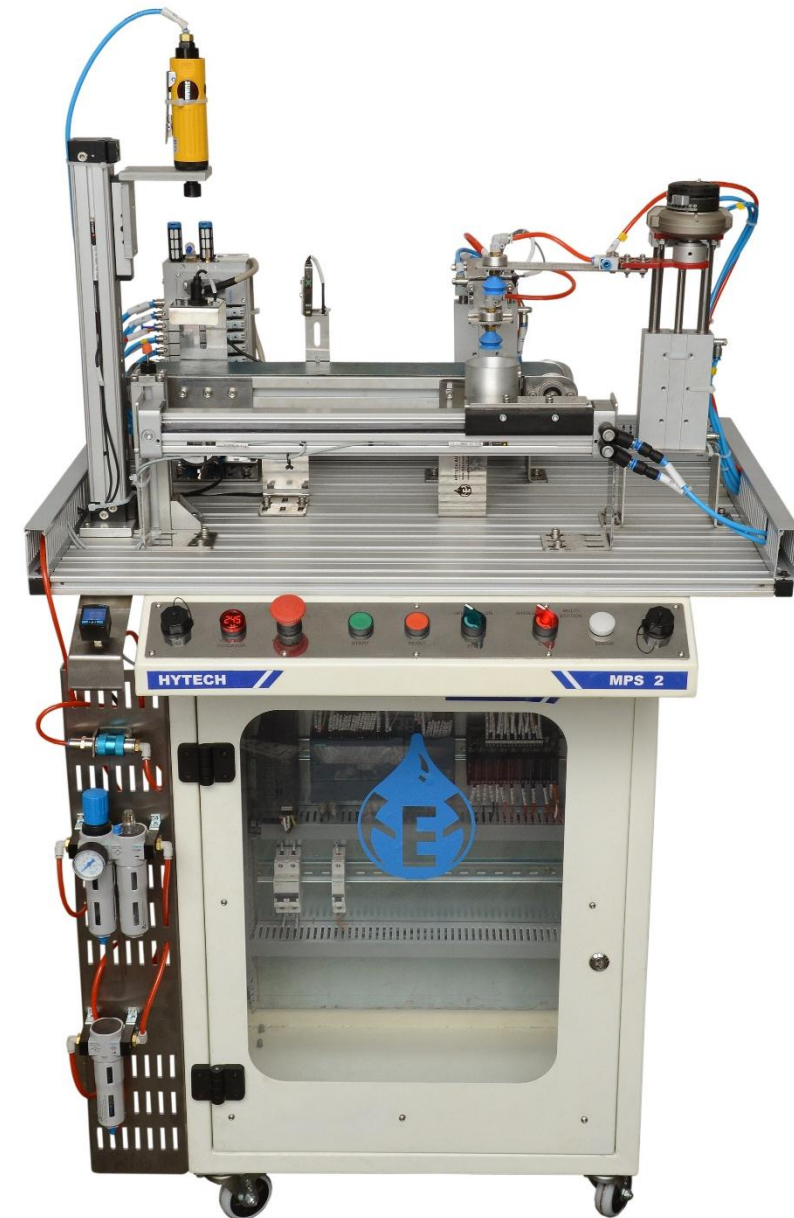
MPS Station 2 Color Based Sorting with Pneumatic Drilling Application

Key Features

- This is ideally a second station in Hytech MPS system which is preceded by MPS 1. Job can be directly transferred from station 1 to station 2.
- In case of Multi station option, station 2 starts immediately as the job is transferred from Station 1 to station 2. In case of Individual mode, user has to place the job on the conveyor to initiate the system. In case of multi station mode, job is transferred from station 2 to station 3. In case of individual mode, processed job from station 2 is dropped in a bin to conclude the process.
- Digital sensor is provided in station 2 which can be taught to sense a particular color. This input of a digital color sensor can be used to decide the process flow or to display the count on SCADA.
- Pneumatic drilling application can actually drill on a raw job of operator's choice. User can decide the jobs (based on color from MPS2 / material from MPS1) that will be drilled and the ones that will not be drilled.

What can be achieved with MPS 2:

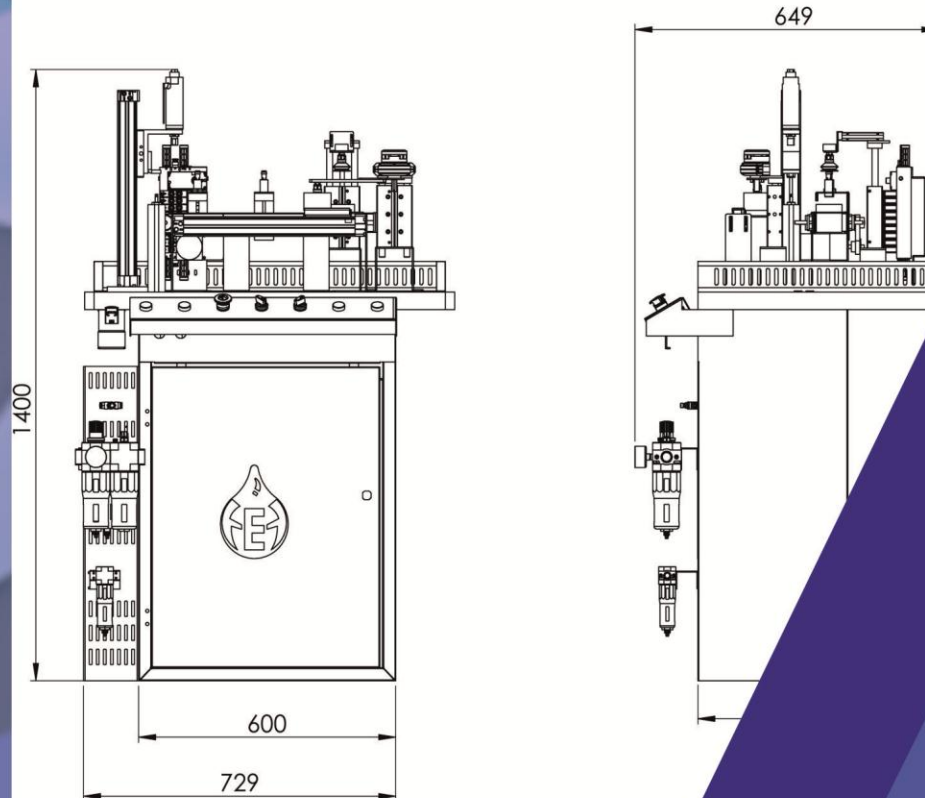
- Color based sensing
- Pneumatic Drilling Application
- Acceptance and rejection based on user preference
- Introduction to rotary pick and place unit
- Operation of linear transfer station
- Operation of rod less cylinder



MPS Station 2

Color Based Sorting with Pneumatic Drilling Application

MPS 2: Color Based Sorting with Pneumatic Drilling Application



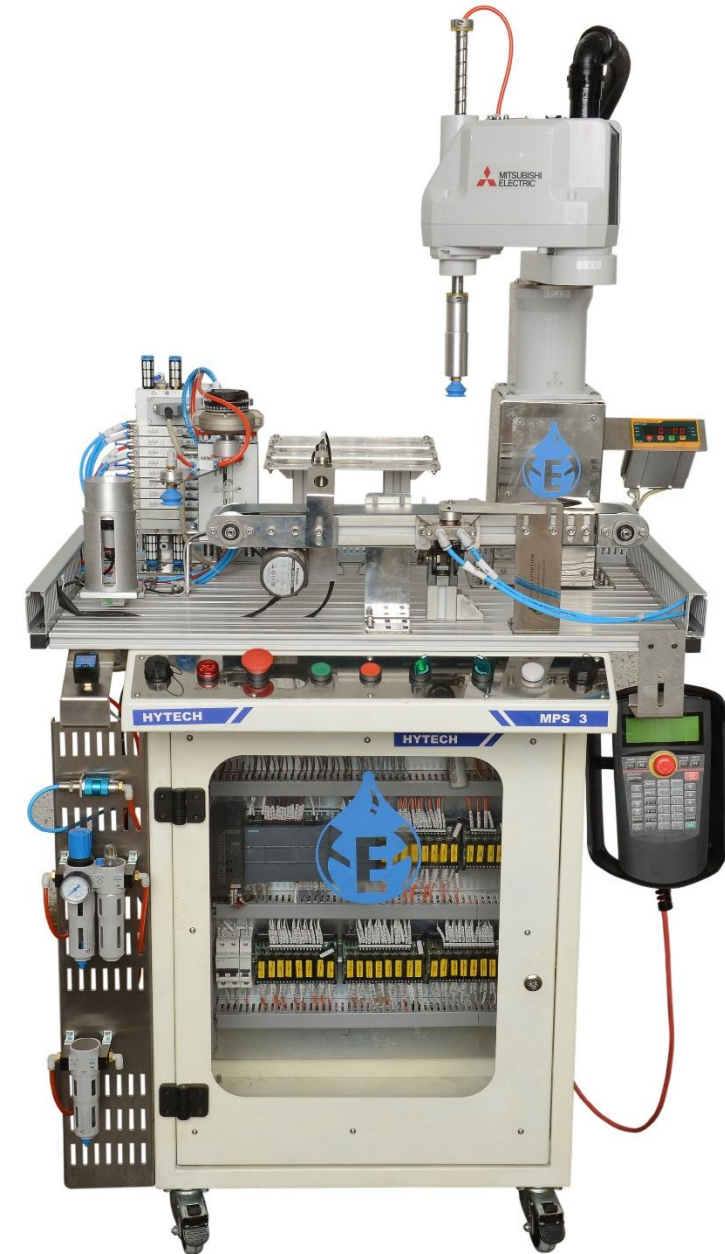
Weight Based Sorting with 4 axes Industrial SCARA Robot

Key Features

- This is ideally a third station in Hytech MPS system which is preceded by MPS 2. Job can be directly transferred from station 2 to station 3.
- In case of Multi station option, station 2 places the job in a load cell in MPS 3. The measured weight of the job is displayed on a digital display. Analog output is also provided from an amplifier which can be used to display the weight in SCADA.
- Depending on the weight of the job, user can decide to store the job in a particular slot in MPS 3 pallet (total 9 slots are available) or user can transfer the job to MPS 4. Participants are expected to have hands on experience on MPS programming through which they can decide the flow as well as process in each station.
- 4 axes industrial SCARA robot is used to transfer jobs from conveyor to either pallet or to MPS 4.
- In case if the MPS 4 is being used in individual mode, user has to load the job in a load cell pallet to initiate the process. In individual mode, user can use SCARA to store the jobs in SCARA Pallet. MPS 3 is designed particularly to operate efficiently in individual mode to provide hands on experience on SCARA operations which can be termed as SCARA Operation Training as well. Industrial pendant is provided for SCARA operation as well as programming. Software with 3D simulation of SCARA for designing as well as executing various individual SCARA programs is also provided along with a system.

What can be achieved with MPS 3:

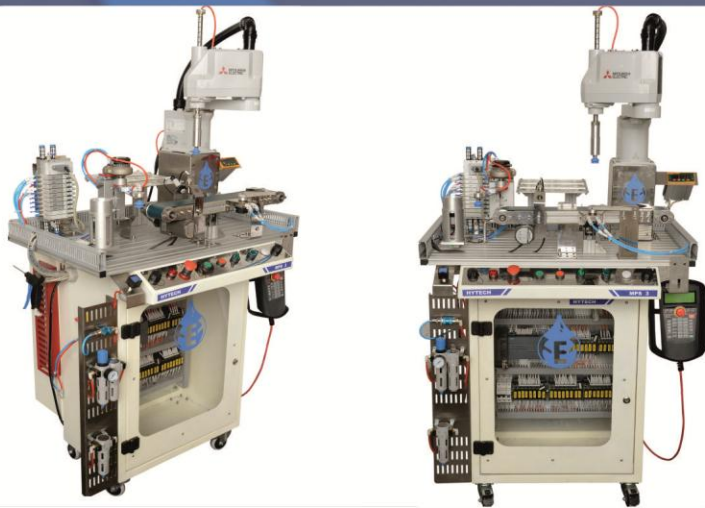
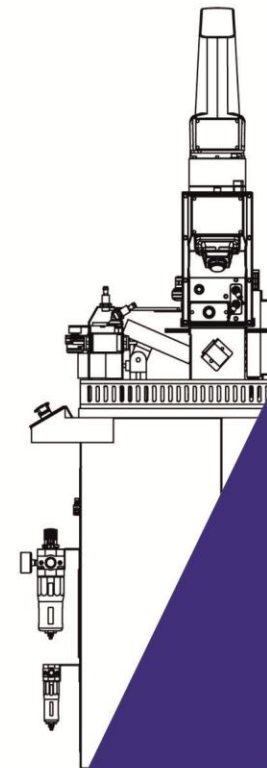
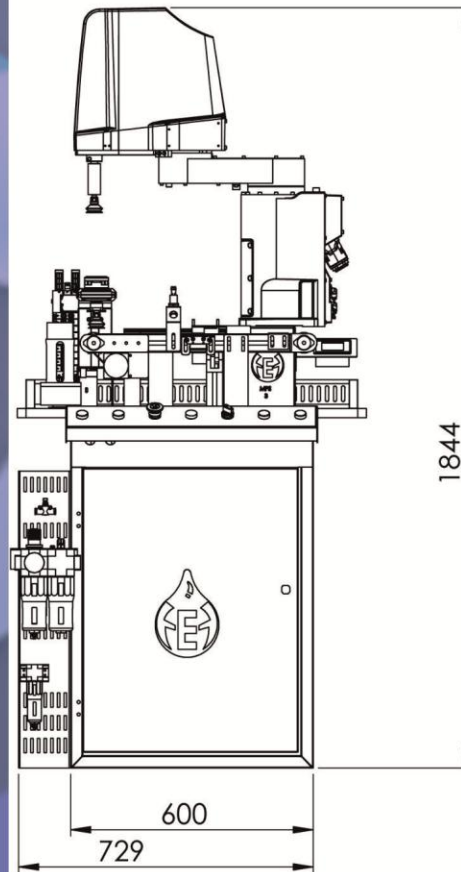
- Operation of SCARA Robot
- SCARA Robot operation in individual mode as well as in integration mode with PLC
- Weight based sorting
- Integration of Load cell with PLC and SCADA
- Operation of rotary pick and place station



MPS Station 3

Weight Based Sorting with 4 axes Industrial SCARA Robot

MPS 3: Weight Based Sorting with 4 axes Industrial SCARA Robot



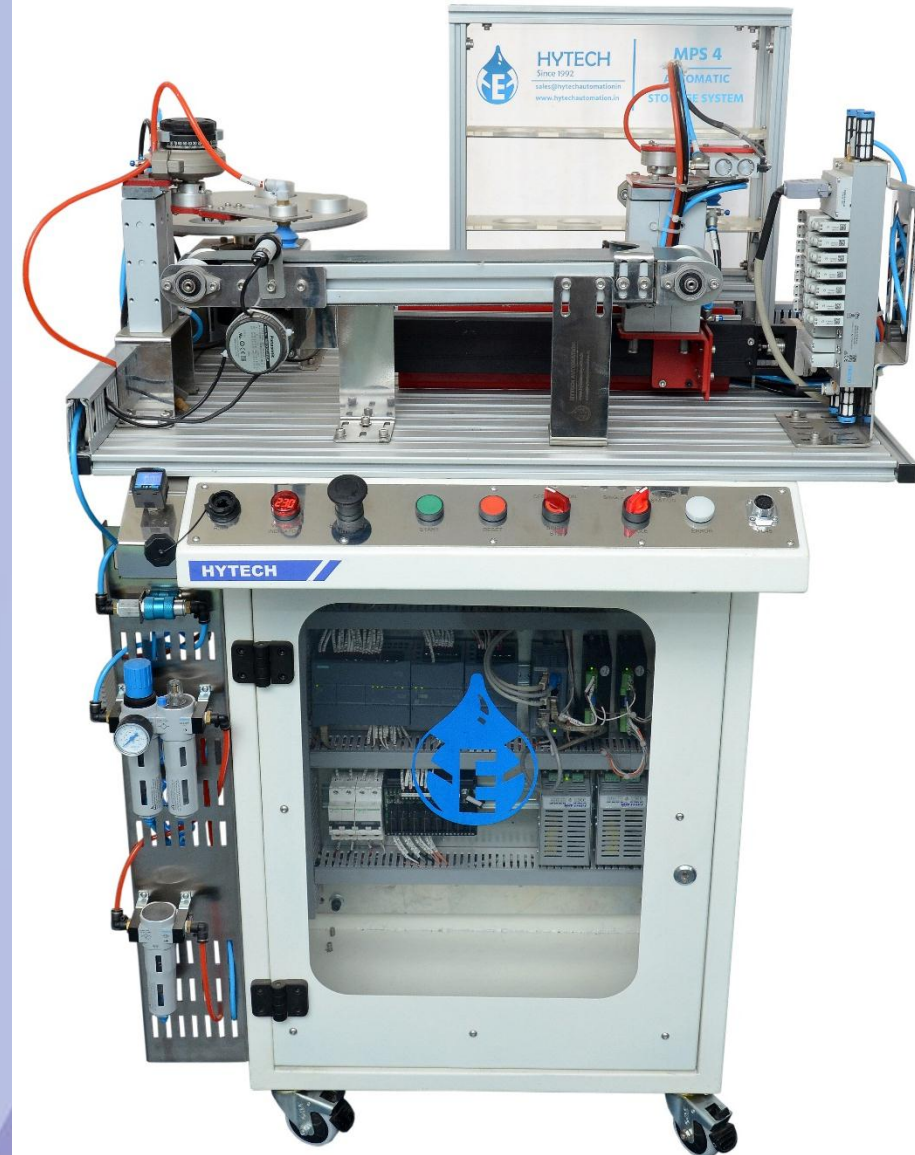
4 Station Rotary Indexing with Automatic Storage System (Stepper Motor Driven)

Key Features

- This is ideally a last station in Hytech MPS where job is stored in one of the 8 storage cells. This station is equipped with stepper motors for rotary indexer as well as linear movement of the job loader.
- Students can get hands on experience on the operation of stepper motor from PLC and SCADA.
- During the startup, referencing of rotary indexing unit as well as the linear transfer station should be carried out. Coordinates of each stepper motor can be displayed on the SCADA.
- User has to decide the pallet in which job will be stored.

What can be achieved with MPS 4:

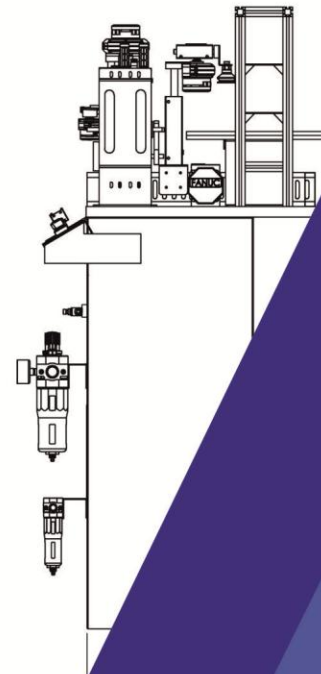
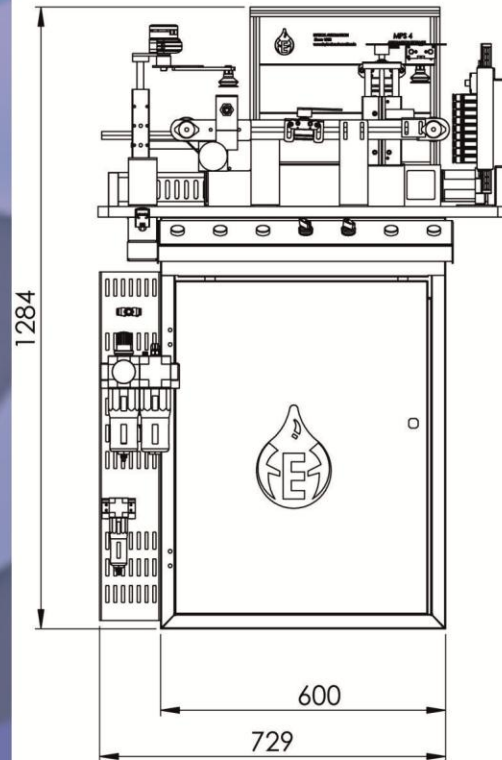
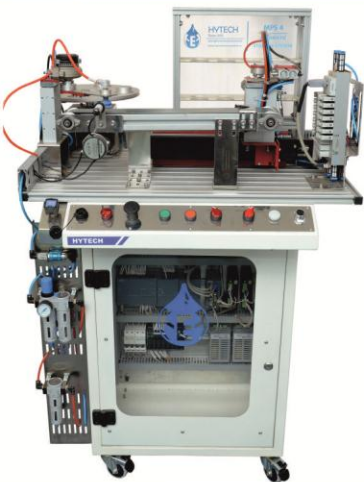
- Operation of linear slide operation with stepper motor and PLC
- Operation of incremental position control
- Operation of rotary indexing station
- Homing / Referencing of stepper motor with PLC
- Calibration of linear slide



MPS Station 4

4 Station Rotary Indexing with Automatic Storage System (Stepper Motor Driven)

MPS 4: 4 Station Rotary Indexing with Automatic Storage System



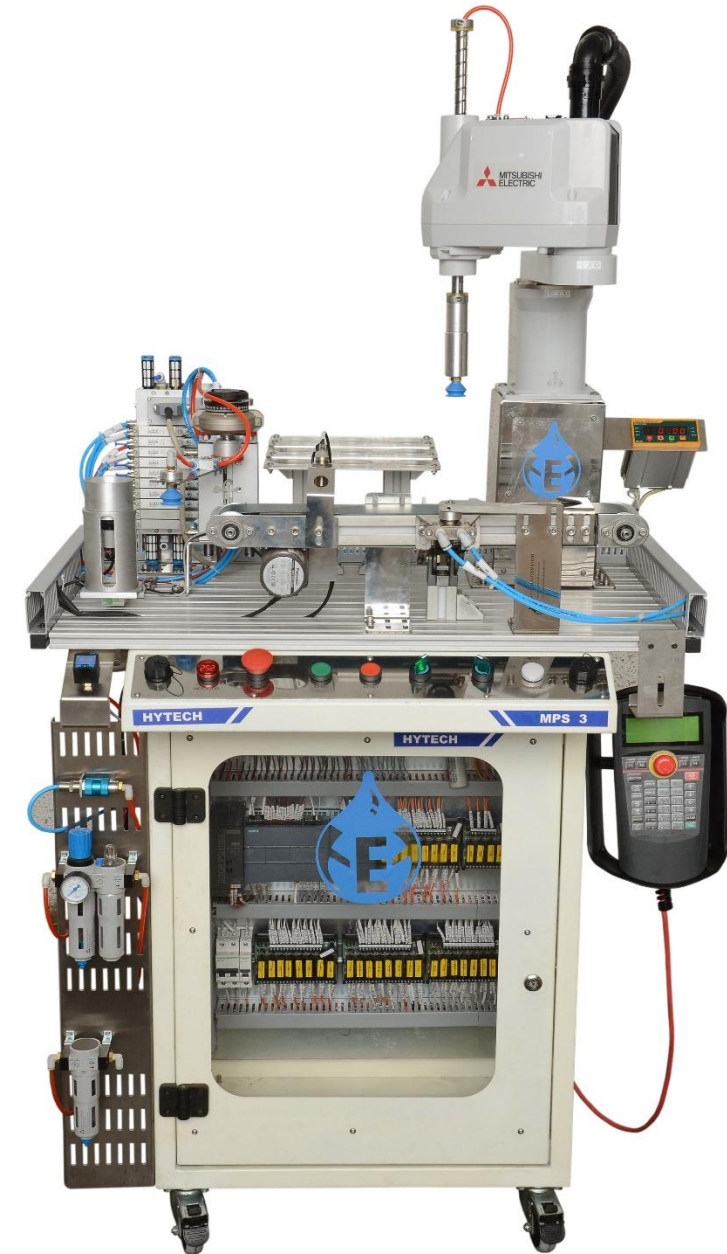
MPS CCU Central Control Unit

Key Features

- This is the final station of MPS which is connected to all other MPS stations through Ethernet connection with a separate direct communication with Industrial SCARA Robot.
- MPS CCU is equipped with SCADA through which participants can control individual stations as well as entire MPS system in integration mode. Participants can select between Remote mode and station mode through which systems can be operated remotely.
- CCU is industry 4.0 ready.
- 3D simulation and designing software is displayed on the second screen of CCU. Entire MPS operation can be dynamically simulated on this software through OPC UA connectivity.

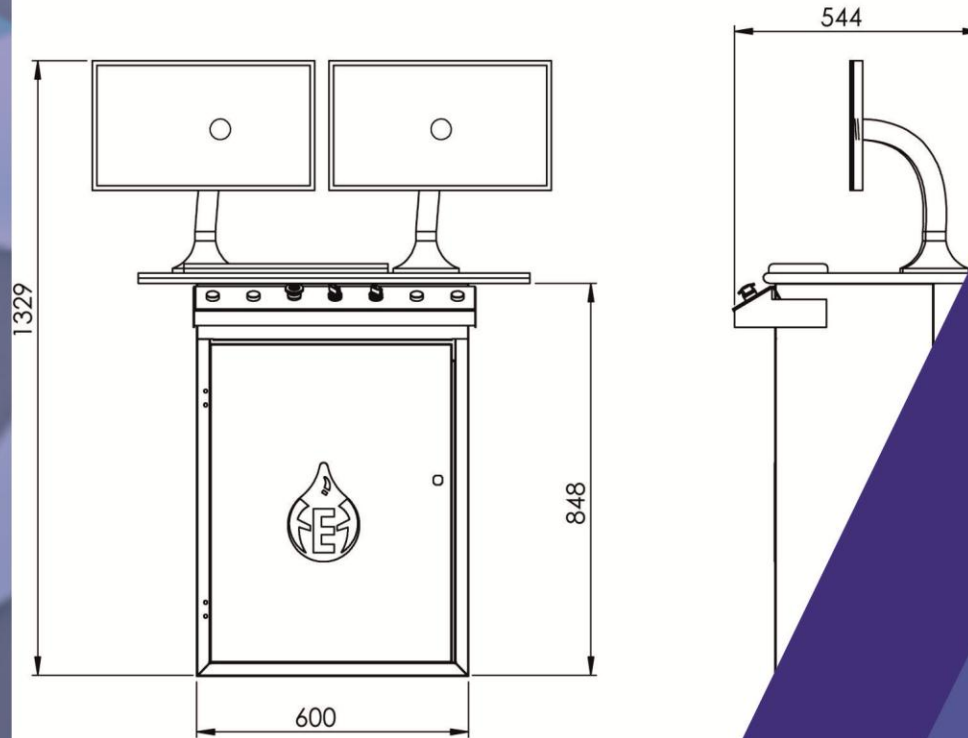
List of softwares installed in CCU:

- SCADA (Siemens WinCC Professional with minimum 4096 tags with developer license)
- Visual components 3D with OPC UA connectivity
- Mitsubishi RT Tool box with dynamic 3D simulation
- TIA Basic for ladder design and updation of individual station's PLC

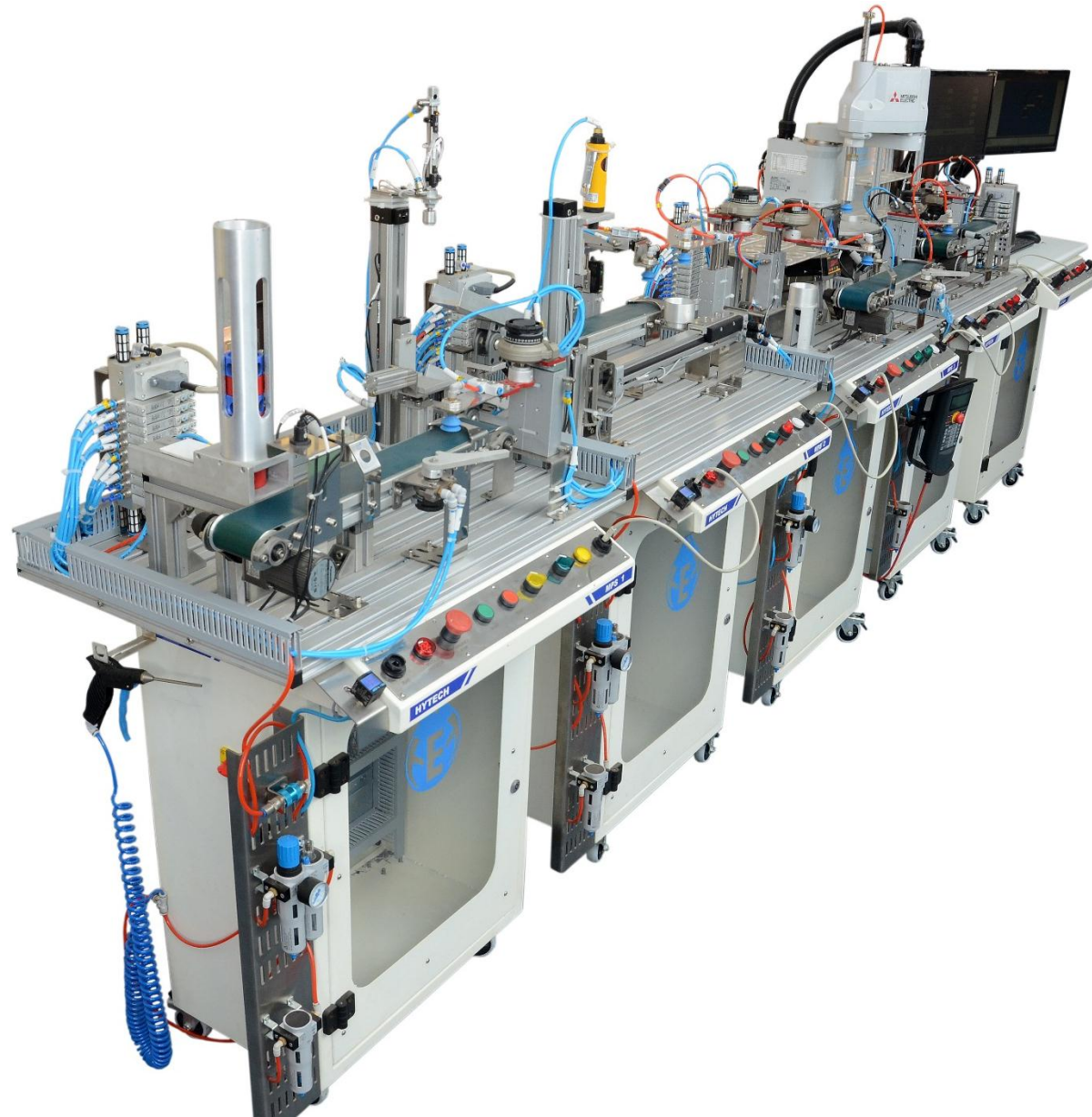


MPS CCU Central Control Unit

MPS CCU: Central Control Unit











Thank You!

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