

MECHATRONICS

HYTECH

Since 1992

www.hytechautomation.in



HYDRAULIC TRAINING

PNEUMATIC TRAINING



PLC & HMI TRAINING KIT

MODULAR PRODUCTION SYSTEM



Hydraulic Training



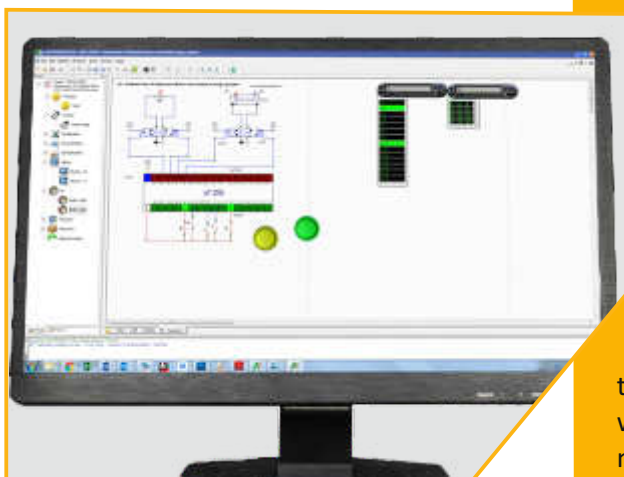
BASIC HYDRAULICS TRAINING KIT

**ELECTROHYDRAULIC TRAINING
Computer Controlled with PLC**



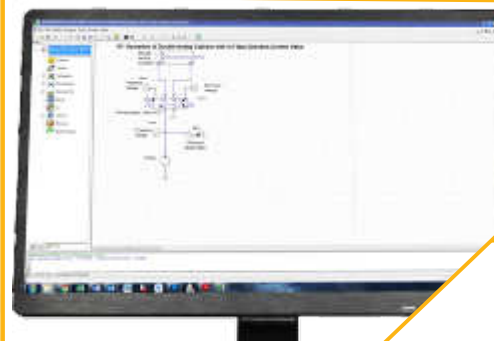
**PROPORTIONAL HYDRAULIC
TRAINING SOLUTIONS**

HYDRAULIC TRAINING KIT - ADVANCE



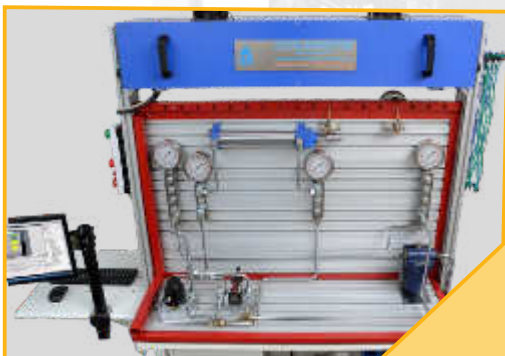
Hytech Electrohydraulic Training kits are computer controlled with PLC. Entire operation can be simulated as well as dynamically operated directly from Hydraulic Circuit Design and Simulation software. Advance Electrohydraulic training kit covers Basic as well as PLC based operation modules of Hydraulic Training.

HYDRAULIC TRAINING KIT - BASIC



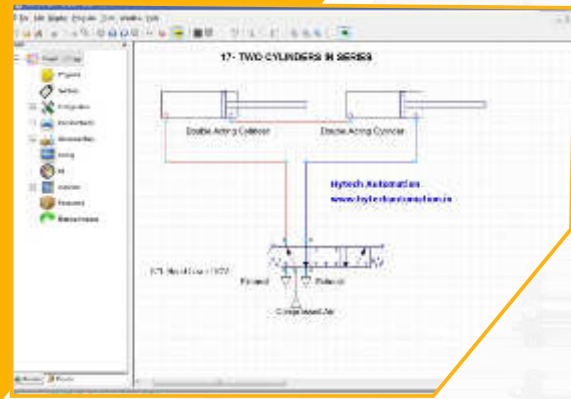
Hytech Basic Hydraulic training kit is a dual faced training kit made of heavy duty aluminum extrusions. Basic hydraulic training kit covers almost all of the commonly used conventional hydraulic valves. Hytech Training kit comes with hydraulic circuit design and simulation software. User can design and simulate a basic hydraulic circuit on software and execute the same on hardware training kit.

PROPORTIONAL VALVE TRAINING KIT



'Hytech Proportional Valve Training Kit' is designed to provide hands on experience on Proportional DCV as well as Proportional PRV. Proportional training kit can be mounted on the back of Advance Hydraulic training kit or can be placed separately on an individual platform. It is equipped with HMI as well as control card for efficient operation. Complete Proportional training kit is hard piped to avoid dust contamination. Industrial high pressure filter is provided for better efficiency. All necessary accessories such as timers and counters are provided to enable efficient data collection.

CIRCUIT SIMULATION AND AUTOMATION MODULES

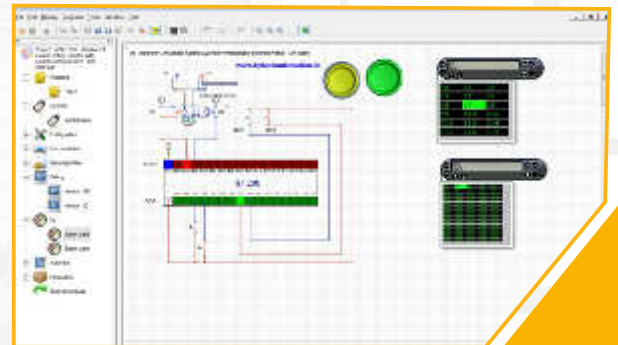


BASIC HYDRAULIC CIRCUIT DESIGN AND SIMULATION

This is a central control station from where operator can control entire system in individual mode as well as in integrated mode. Workstation with dual monitors is provided with ergonomic design. Hardware operation panel is also mounted on the CCU for effective operation control. Teach pendants for Industrial robot, handheld operation unit for ASRS and Gantry are also connected to CCU with RJ 45 connection ports. Central PLC which communicates with all machines is also mounted in CCU control panel.

ADVANCE ELECTROHYDRAULIC (WITH PLC) CIRCUIT DESIGN AND SIMULATION

IRAI Automgen is supplied along with Hytech Advance ElectroHydraulic Training Kits. User can design a PLC ladder diagram along with advance Hydraulic circuit and simulate the same on the software. The software is capable of uploading a ladder diagram in PLC and dynamically operate the entire training kit in real time with simulation. No other software is required for PLC ladder updation. Any circuit (100+ circuits) that can be designed and executed on Hytech Advance ElectroHydraulic training kits can be designed as well as simulated on IRAI Automgen. The software is capable of generating executable circuit simulations which can be simulated on a system without active software license.



ADVANCE HYDRAULICS (ELECTROHYDRAULIC) RELAY BASED OPERATION MODULE



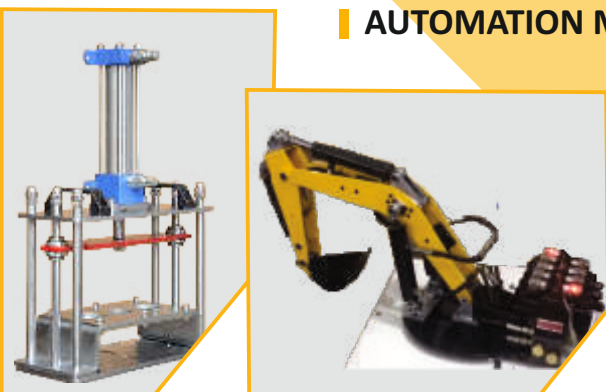
Relay based module consists of Relay Unit (4 CO, 3Qty) and Electrical Push button based power supply module. This module is used for ElectroHydraulic training (Basic) in integration with Advance Hydraulics (ElectroHydraulic) Module 1. This module is equipped with patch cord based Banana sockets with which electroHydraulic training experiments can be performed.

ADVANCE HYDRAULICS (ELECTROHYDRAULIC) PLC BASED OPERATION MODULE

This Advance ElectroHydraulic module consists of PLC, Field Input and Output modules, PLC input and output modules and Workstation to carry out computer controlled ElectroHydraulic training experiments. Entire Hydraulic circuit can be designed, simulated as well as operated directly from IRAI-Automgen software with dynamic real-time simulation.



AUTOMATION MODULES



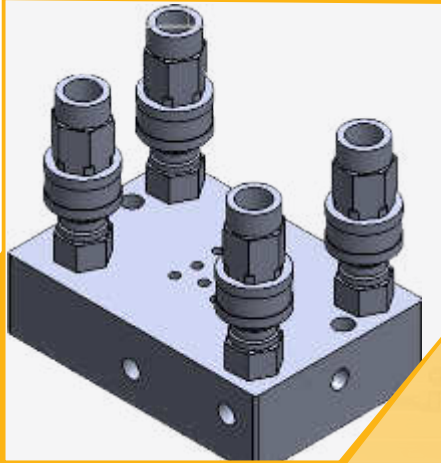
Hytech Hydraulic and ElectroHydraulic training kits have an optional automation modules providing hands on experience on industrial Hydraulics applications. 'Hydraulic Press' module can be integrated with Basic as well as Advance training kits which can be operated with basic conventional valves as well as Solenoid valves in collaboration with PLC.

'PLC Operated Excavator' module can be integrated with Advance Electrohydraulic training kits.

HYDRAULIC VALVE PLATES, POWERPACK AND HOSE TROLLEY

Hydraulic Valve Plates

Hytech Hydraulic training kits are equipped with indigenously designed hydraulic valve plates for CETOP3 mountings. The advanced version is equipped with valve plates having parallel A and B ports for dynamic pressure readings. Each plate is laser engraved with port connection such as P, T, A and B. Each plate is connected with quick release coupling of 3/8 inch. Each plate as well as quick release coupling is tested at 160 Bar pressure.



Hydraulic Power pack

Hytech hydraulic training kits are equipped with hydraulic power packs which are indigenously designed as well as manufactured by us. Each power pack is tested for pressure generation up to 160 Bar. Pressure relief valve (Lockable) is mounted on the power pack to lock the set pressure to avoid any accident. Electric motor in the power pack is protected with MPCB as well as overload relay. Hydraulic power pack is hard piped to pressure and tank manifolds on each face of the hydraulic training kit.



Hydraulic Proportional Valve Training Kit – Piping

Entire proportional valve training kit is hard piped to maintain necessary cleanliness and maintain the dust sensitive proportional valves. High pressure filter is provided in the pressure line. There are no hose connections required to operate proportional valve training kit. Pressure gauges are connected in each pressure line as well as return line of each valve.



Hose Trolley

Advance electrohydraulic training kits are provided with mobile hose trolley with an arrangement to drain spilled oil. Basic hydraulic training kits are equipped with hose stand mounted on the training kit.



HYDRAULIC TRAINING KIT - TRAINING MODULES



Sr No	Description	Qty	Make
1	Trainer Kit Base and Structure (Basic)		
	Basic Hydraulic Trainer Base with Aluminum extrusion based work surface (Double Sided) of minimum dimensions: Horizontal work area on front face : 1200mm x 360mm Horizontal work area on back face : 1200mm x 360mm Vertical work area on front face : 1200mm x 720mm Vertical work area on back face : 1200mm x 720mm MS based structure with castor wheels and load bearing capacity of 380 KG	1	HYTECH
2	Trainer Kit Base and Structure (Advance)		
	Advance Hydraulic Trainer Base with Aluminum extrusion based work surface (Double Sided) of minimum dimensions: Horizontal work area on front face : 1200mm x 450mm Horizontal work area on back face : 1200mm x 450mm Vertical work area on front face : 1200mm x 720mm Vertical work area on back face : 1200mm x 720mm MS based structure with castor wheels and load bearing capacity of 380 KG	1	HYTECH

Sr No	Description	Qty	Make
3	Trainer Kit Base and Structure (Proportional Kit)		
	Proportional Hydraulic Trainer Base with Aluminum extrusion based work surface of minimum dimensions: Horizontal work area : 1200mm x 720mm MS based structure with castor wheels and load bearing capacity of 380 KG	1	HYTECH
4	Hydraulic Power Pack Module		
4.1	Hydraulic tank with 60 Litre capacity, Oil cleanliness: Level 8	1	HYTECH
4.2	Three Phase flange mounted electric motor 2 HP -1500 rpm	1	Siemens / CG
4.3	Gear Pump (Flow Rate: 8 LPM, Max Pressure: 70 Bar)	1	Yuken / Rexroth
4.4	Pressure Gauge 0 to 100 Bar, Glycerin filled, 2 inch	2	Baumer / WIKA
4.5	Pressure Relief Valve (Subplate Mounted) with Locking Arrangement	1	Yuken / Rexroth
4.6	Suction Line Filter	1	Reputed Make
4.7	Return Line Filter	1	Reputed Make
4.8	Pressure Line Manifold with 4 Ports (Hard piped with powerpack and mounted on the front work surface)	1	HYTECH
4.9	Pressure Line Manifold with 2 Ports (Hard piped with powerpack and mounted on the rear work surface)	1	HYTECH

Sr No	Description	Qty	Make
4.10	Return Line Manifold with 4 Ports (Hard piped with powerpack and mounted on the front work surface)	1	HYTECH
4.11	Return Line Manifold with 2 Ports (Hard piped with powerpack and mounted on the rear work surface)	1	HYTECH
4.12	Test Line Manifold with 2 Ports (Hard piped with powerpack and mounted on the front work surface)	1	HYTECH
4.13	Pressure Gauge 0 to 100 Bar, Glycerin filled, 4 inch	1	Baumer / WIKA
5	Basic Hydraulic Module 1		
5.1	Pressure Relief Valve (Direct operated relief valve)	2	Yuken / Rexroth
5.2	Flow Control Valve (Non Pressure Compensated) with Check Valve .	2	Yuken / Rexroth
5.3	Flow Control Valve (Pressure Compensated) with Check Valve	1	Yuken / Rexroth
5.4	Four way Three position manually operated direction control valve - Tandem Center	2	Yuken / Rexroth
5.5	Four way Three position manually operated direction control valve - Closed Center	1	Yuken / Rexroth
5.6	Single Acting Cylinder (Stroke: 100mm, Dia: 25mm, Test Pressure: 70 Bar)	1	Yuken / Rexroth
5.7	Double Acting Cylinder (Stroke: 200 mm minimum Test Pressure 130 Bar)	2	Yuken / Rexroth
5.8	Proximity Sensor Assmby for Hydraulic Cylinder	6	NA
6	Basic Hydraulic Module 2		
6.1	Hydraulic Motor Bidirectional .	1	Yuken / Eaton
6.2	Needle Valve	2	Yuken / Polyhdron
6.3	Pressure Sequence Valve	1	Yuken / Rexroth
6.4	Pressure Reducing Valve	1	Yuken / Rexroth
6.5	Four way Two position manually operated direction control valve	1	Yuken / Rexroth
6.6	Check Valve Direct Operated	1	Yuken / Polyhdron
6.7	Single Pilot Operated Check Valve	1	Yuken / Rexroth
7	Circuit Design and Simulation Software		
7.1	Automgen (IRAI France) - Hydraulic Circuit design and simulation software (Perpetual)	1	IRAI - France
8	Manuals for Basic Hydraulics		
8.1	Operation Manual (Basic Hydraulics)	1	NA
8.2	Experimentation Manual (Basic Hydraulics)	1	NA
8.3	Hydraulics Text Book (Basic Hydraulics)	1	NA
9	Advance Hydraulics (Electrohydraulic) Module 1		
9.1	Pressure Switch	1	Yuken / Rexroth
9.2	Four Way Three Position Double solenoid operated direction control valve	3	Yuken / Rexroth
9.3	Four Way Two Position Single solenoid operated direction control valve	1	Yuken / Rexroth
10	Advance Hydraulics (Electrohydraulic) Relay based operation module		
10.1	2mm Patch cord connector set	1 set	NA
10.2	Electrical Push button based power supply module	1	NA
10.3	Relay unit module (4 CO, 3Qty)	1	NA

Sr No	Description	Qty	Make
11	Advance Hydraulics (Electrohydraulic) PLC Based operation module		
11.1	PLC with 24 inputs and 16 outpts	1	Siemens
11.2	Power supply and control panel for PLC	1	Reputed Make
11.3	Control panel box with mounting for Advance Electrohydraulic Training Kit (1200 x 400 x 300mm)	1	NA
11.4	PLC Input module with input override switches (24 inputs)	1	HYTECH
11.5	Field input module (24 inputs)	1	HYTECH
11.6	PLC output module (24 outputs)	1	HYTECH
11.7	Field output module (24 outputs)	1	HYTECH
11.8	Remote operation unit with 2 selector switches, 2 push buttons and 2 mushroom head switches	1	NA
11.9	2mm Patch cord connector set	1 set	NA
12	Workstation with Simulation software and licensed PLC software		
12.1	Intel Mother board Computer with 21 inch LED Monitor (Acer / Dell) and bluetooth keyboard and mouse	1	ACER / DELL
12.2	IRAI Automgen software license (Perpetual) for hydraulic / electrohydraulic circuit design and simulation	1	IRAI - France
12.3	Necessary interface for direct operation of training kit from simulation software IRAI Automgen (Dynamic realtime simulation and operation)	1	HYTECH
12.4	Workstation operation unit with mounting facility	1	NA
13	Proportional Valve Training Kit Module		
13.1	7 inch colour HMI	1	Siemens
13.2	High Pressure Filter	1	Reputed Make
13.4	Pressure Relief Valve (Subplate Mounted) with Locking Arrangement	1	Yuken / Rexroth
13.5	Pressure Line Manifold with 4 Ports (Hard piped with powerpack)	1	HYTECH
13.6	Return Line Manifold with 2 Ports (Hard piped with powerpack)	1	HYTECH
13.7	Test Line Manifold with 2 Ports (Hard piped with powerpack)	1	HYTECH
13.8	Pressure Gauge 0 to 100 Bar, Glycerin filled, 4 inch	4	Baumer / WIKA
13.9	Complete Piping arrangement	1 Set	HYTECH
13.10	Hydraulic Cylinder with minimum 150mm stroke	1	HYTECH
13.11	Proximity Sensor Assmby for Hydraulic Cylinder	6	NA
14	Proportional DCV Module		
14.1	Proportional Direction Control Valve	1	Yuken / Argo Hytos
14.2	Control card for Proportional Direction Control Valve	1	Yuken / Argo Hytos
14.3	Four way Three position manually operated direction control valve	1	Yuken / Rexroth
15	Proportional PRV Module		
15.1	Proportional Pressure Reducing Valve	1	Yuken / Argo Hytos
15.2	Control card for Proportional Pressure Reducing Valve	1	Yuken / Argo Hytos
15.3	Four way Three position manually operated direction control valve	1	Yuken / Rexroth

Pneumatic Training



BASIC PNEUMATIC TRAINING

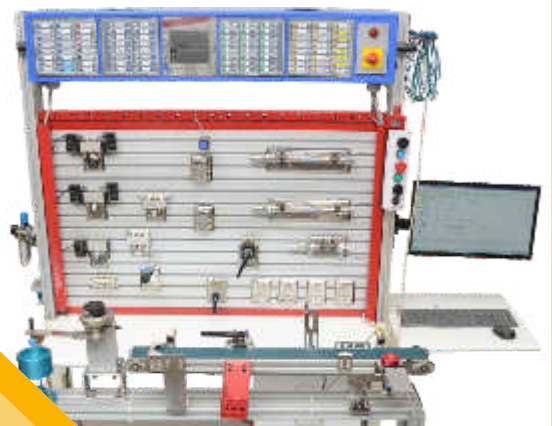


BASIC PNEUMATIC TRAINING

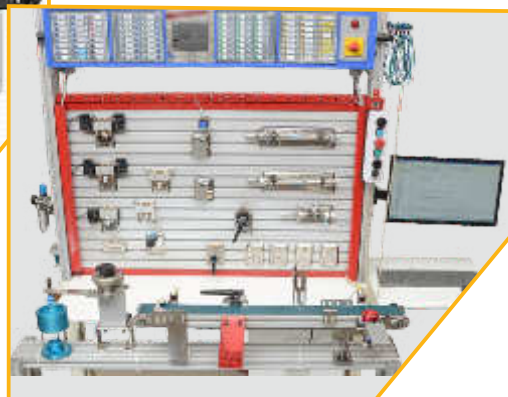
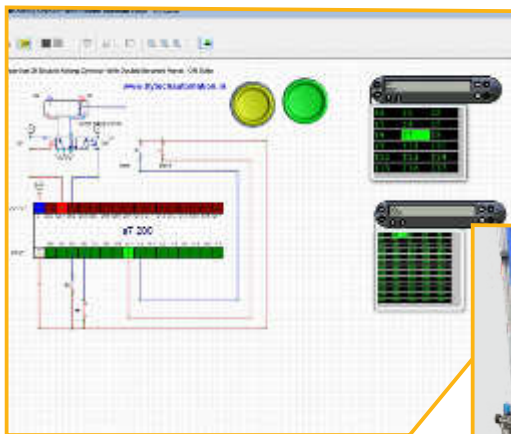


ELECTROPNEUMATIC TRAINING KIT
Computer Controlled with PLC

ELECTROPNEUMATIC TRAINING KIT
Computer Controlled with PLC

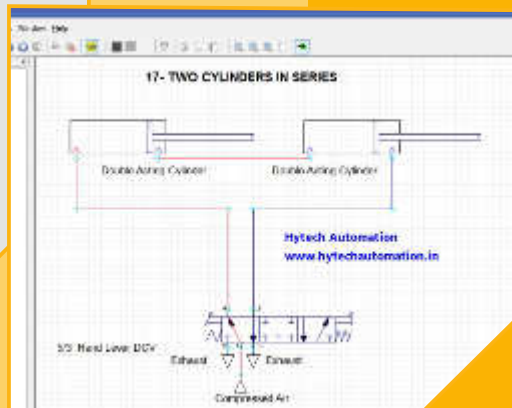


PNEUMATIC TRAINING KIT - ADVANCE



Hytech Electropneumatic Training kits are computer controlled with PLC. Entire operation can be simulated as well as dynamically operated directly from Pneumatic Circuit Design and Simulation software. Advance Electropneumatic training kit covers Basic as well as PLC based operation modules of Pneumatic Training.

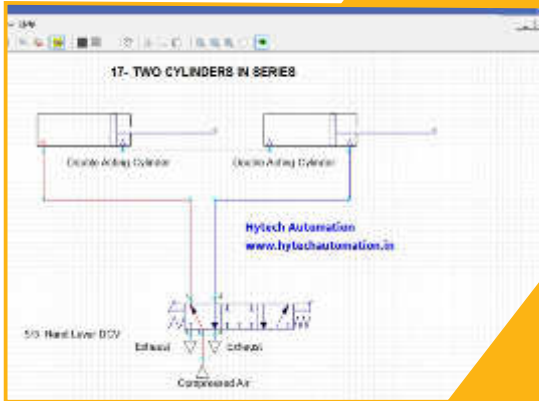
PNEUMATIC TRAINING KIT - BASIC



Hytech Basic Pneumatic training kit is a dual faced training kit made of heavy duty aluminum extrusions. Basic pneumatic training kit covers almost all of the commonly used conventional pneumatic valves. Hytech Training kit comes with pneumatic circuit design and simulation software. User can design and simulate a basic pneumatic circuit on software and execute the same on

PNEUMATIC TRAINING MODULES

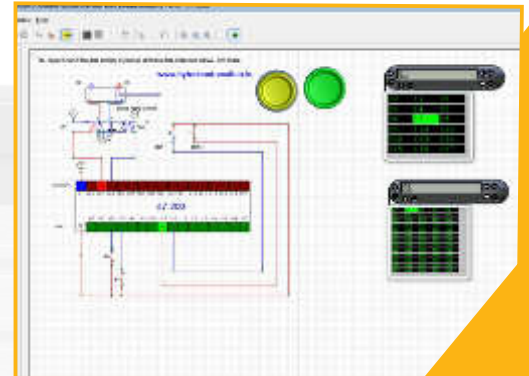
BASIC PNEUMATIC CIRCUIT DESIGN AND SIMULATION



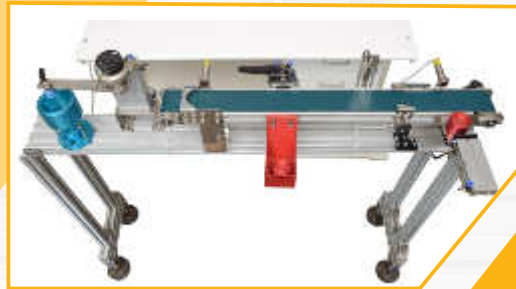
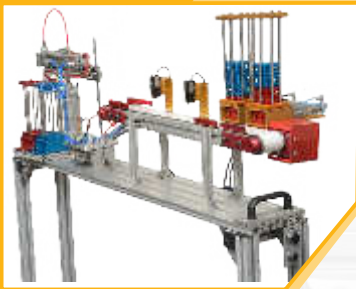
IRAI Automsim is supplied along with Hytech Basic Pneumatic Training Kits. Automsim is a basic pneumatic circuit design and simulation software from IRAI – France. Every valve used in the Hytech Pneumatic Training kit is available in the software library. Participants can design a basic circuit and simulate the same before executing it on Pneumatics Training Kit.

ADVANCE ELECTROPNEUMATIC (WITH PLC) CIRCUIT DESIGN AND SIMULATION

IRAI Automgen is supplied along with Hytech Advance Electropneumatic Training Kits. User can design a PLC ladder diagram along with advance pneumatic circuit and simulate the same on the software. The software is capable of uploading a ladder diagram in PLC and dynamically operate the entire training kit in real time with simulation. No other software is required for PLC ladder updation. Any circuit (100+ circuits) that can be designed and executed on Hytech Advance Electropneumatic training kits can be designed as well as simulated on IRAI Automgen. The software is capable of generating executable circuit simulations which can be simulated on a system without active software license.



AUTOMATION MODULES



integrated with Advance Pneumatic training kits which is operated with Solenoid valves and PLC. 'Color Based Sorting Conveyor' module can be integrated with Advance Pneumatic Training kits which gives hands on experience on industrial color sorting technology.

Hytech Pneumatic and Electropneumatic training kits have an optional automation modules providing hands on experience on industrial pneumatics applications. 'Pneumatic Press' module can be integrated with Basic as well as Advance training kits which can be operated with basic conventional valves as well as Solenoid valves in collaboration with PLC. 'Material Based Sorting Conveyor' module can be

ADVANCE PNEUMATICS (ELECTROPNEUMATIC) RELAY BASED OPERATION MODULE

Relay based module consists of Relay Unit (4 CO, 3Qty) and Electrical Push button based power supply module. This module is used for Electropneumatic training (Basic) in integration with Advance Pneumatics (Electropneumatic) Module 1. This module is equipped with patch cord based Banana sockets with which electropneumatic training experiments can be performed.



ADVANCE PNEUMATICS (ELECTROPNEUMATIC) PLC BASED OPERATION MODULE

This Advance Electropneumatic module consists of PLC, Field Input and Output modules, PLC input and output modules and Workstation to carry out computer controlled Electropneumatic training experiments. Entire pneumatic circuit can be designed, simulated as well as operated directly from IRAI-Automgen software with dynamic real-time simulation.



PNEUMATIC TRAINING MODULES

Sr No	Description	Qty	Make
1	Basic Pneumatic Module 1		
1.1	FRL Unit with Pressure Gauge	1	SMC / Festo
1.2	Junction Box with 8 ports	2	SMC / Festo
1.3	Isolation box with 8 ports	1	SMC / Festo
1.4	Three Way Two Position Hand Slide Valve	1	SMC / Festo
1.5	Two way Flow control valve	4	SMC / Festo
1.6	Single acting cylinder (Stroke: 50 mm, with One Way Flow Control Valve)	1	SMC / Festo
1.7	Double acting cylinder (Stroke: 200mm, with One Way Flow Control Valve)	2	SMC / Festo
1.8	PU Tube Dia 6mm - Blue Color	10 Meter	NA
1.9	PU Tube Dia 6mm - Red Color	10 Meter	NA
1.10	PU Tube Dia 6mm - Black Color	10 Meter	NA
1.11	Blanking Plug Dia 6	12	NA
1.12	Union Tee Dia 6mm	5	NA
1.13	Union Y Dia 6mm	5	NA
1.14	Tube Cutter	1	NA
2	Basic Pneumatic Module 2		
2.1	Two Pressure Valve	2	SMC / Festo
2.2	Shuttle Valve	2	SMC / Festo
2.3	Quick Exhaust Valve	1	SMC / Festo
2.4	Three Way Two Position Way Push Button (Three Port) Valve	2	SMC / Festo
2.5	Three Way Two Position Knob Operated Direction Control Valve (NC Type)	1	SMC / Festo
2.6	Three Way Two Position Roller Operated Direction Control Valve (NC Type)	2	SMC / Festo
2.7	Five Way Two Position Mushroom Head Switch Operated Direction Control Valve	1	SMC / Festo
2.8	Five Way Two Position Lever Operated Direction Control Valve	1	SMC / Festo
2.9	Five Way Two Position Lever Operated Direction Control Valve (Spring Return)	1	SMC / Festo
2.10	Five Way Three Position Lever Operated Direction Control Valve	1	SMC / Festo
3	Basic Pneumatic Module 3		
3.1	Three Way Two Position Pilot Operated Direction Control Valve (NC Type)	1	SMC / Festo
3.2	Five Way Two Position Single Pilot Direction Control Valve	1	SMC / Festo
3.3	Five Way Two Position Double Pilot Direction Control Valve	4	SMC / Festo
3.4	Five Way Three Position Double Pilot Direction Control Valve	1	SMC / Festo
3.5	Three Way Two Position idle return Valve	1	SMC / Festo
4	Basic Pneumatic Module 4		
4.1	Pneumatic Motor	1	Reputed Make
4.2	Pressure Regulator	1	SMC / Festo

Sr No	Description	Qty	Make
4.3	Vacuum generator	1	SMC / Festo
4.4	Vacuum Cup	1	SMC / Festo
4.5	Vacuum Generator based pick and drop assembly module	1	NA
4.6	Three Way Two Position Time Delay Valve	1	SMC / Festo
5	Circuit Design and Simulation Software		
5.1	Automgen (IRAI France) - Pneumatic Circuit design and simulation software (Perpetual)	1	IRAI - France
6	Manuals for Basic Pneumatics		
6.1	Operation Manual (Basic Pneumatics)	1	NA
6.2	Experimentation Manual (Basic Pneumatics)	1	NA
6.3	Pneumatics Text Book (Basic Pneumatics)	1	NA
7	Advance Pneumatics (Electropneumatic) Module 1		
7.1	Three Way Two Position Solenoid Operated Direction Control Valve (NC Type)	1	SMC / Festo
7.2	Five Way Two Position Single Solenoid Direction Control Valve	1	SMC / Festo
7.3	Five Way Two Position Double Solenoid Direction Control Valve	3	SMC / Festo
7.4	Five Way Three Position Double Solenoid Direction Control Valve	1	SMC / Festo
7.5	Magnetic Reed Switch with bracket for Cylinders	6	SMC / Festo
8	Advance Pneumatics (Electropneumatic) Relay based operation module		
8.1	2mm Patch cord connector set	1 set	NA
8.2	Electrical Push button based power supply module	1	NA
8.3	Relay unit module (4 CO, 3Qty)	1	NA
9	Advance Pneumatics (Electropneumatic) PLC Based operation module		
9.1	PLC with 24 inputs and 16 outputs	1	Siemens
9.2	Power supply and control panel for PLC	1	Reputed Make
9.3	Control panel box with mounting for Advance Electropneumatic Training Kit (1200 x 400 x 300mm)	1	NA
9.4	PLC Input module with input override switches (24 inputs)	1	HYTECH
9.5	Field input module (24 inputs)	1	HYTECH
9.6	PLC output module (24 outputs)	1	HYTECH
9.7	Field output module (24 outputs)	1	HYTECH
9.8	Remote operation unit with 2 selector switches, 2 push buttons and 2 mushroom head switches	1	NA
9.9	2mm Patch cord connector set	1 set	NA

PNEUMATIC TRAINING MODULES

Sr No	Description	Qty	Make
10	Workstation with Simulation software and licensed PLC Software		
10.1	Intel Mother board Computer with 21 inch LED Monitor (Acer / Dell) and bluetooth keyboard and mouse	1	ACER / DELL
10.2	IRAI Automgen software license (Perpetual) for pneumatic circuit design and simulation	1	IRAI - France
10.3	Necessary interface for direct operation of training kit from simulation software IRAI Automgen (Dynamic realtime simulation and operation)	1	HYTECH
10.4	Workstation operation unit with mounting facility	1	NA
11	Compressor		
11.1	1HP, 50 Ltr capacity Twin cylinder Silent Compressor (Single Phase Supply)	1	Reputed Make
12	Trainer Kit Base and Structure (Basic)		
12.1	Basic Pneumatic Trainer Base with Aluminum extrusion based work surface (Double Sided) of 950mm x 720mm. MDF based wooden base of 950mm x 800mm. MS based structure with castor wheels and load bearing capacity of 250 KG	1	HYTECH
13	Trainer Kit Base and Structure (Advance)		
13.1	Advance Pneumatic Trainer Base with Aluminum extrusion based work surface (Double Sided) of 1200mm x 900mm. MDF based wooden base of 1200mm x 800mm. MS based structure with castor wheels and load bearing capacity of 300 KG	1	HYTECH
14	Optional Module 1		
14.1	Inductive sensor assembly	2	Omron
14.2	Capacitive sensor assembly	2	Omron
14.3	Optical sensor assembly	2	Omron
14.4	Electrical Counter Module	1	MECO / SELEC
14.5	Electrical Buzzer and Indicator Module	1	MECO / SELEC
14.6	Delay Timer Module	1	MECO / SELEC
15	Automation Module 1 - Pneumatic Press (Compatible with Basic and Electropneumatic)		
15.1	Pneumatic Cylinder (50mm Bore, 200mm Stroke)	1	Festo / SMC
15.2	Reed Switch assembly for Pneumatic Cylinder	2	Festo / SMC
15.3	Bearing Housings	4	NA

Sr No	Description	Qty	Make
15.4	Bearings (30mm Dia)	4	NA
15.5	Pneumatic Press Based Bearing assembly kit	1	HYTECH
16	Automation Module 2 - Material Based Sorting Unit (Compatible with Electropneumatic)		
16.1	Conveyor 70 x 500mm	1	Hytech
16.2	AC Motor for Conveyor Drive with Gearbox	1	Panasonic / ZD
16.3	Rotary Motor with rejection Arm (16mm Bore)	1	Festo / SMC
16.4	Sorting Bin	1	NA
16.5	Guided Cylinder for Pick and Place Unit (Minimum stroke: 100mm)	1	Festo / SMC
16.6	Vacuum Generator with Vacuum Cup	1	Festo / SMC
16.7	Rotary Motor (20mm Bore)	1	Festo / SMC
16.8	Capacitive Proximity Sensor (M18)	1	Omron / Autonics
16.9	Inductive Proximity Sensor (M18)	1	Omron / Autonics
16.10	Auto feeder with guided cylinder	1	Festo / SMC
16.11	Photo Sensor for job loading	1	Omron / Autonics
16.12	Photo Sensor for job unloading	1	Omron / Autonics
16.13	Sorting Bin (Vertical)	1	NA
17	Automation Module 3 - Color Based Sorting Unit (Compatible with Electropneumatic)		
17.1	Conveyor 70 x 500mm	1	Hytech
17.2	AC Motor for Conveyor Drive with Gearbox	1	Panasonic / ZD
17.3	Rotary Motor with rejection Arm (16mm Bore)	1	Festo / SMC
17.4	Sorting Bin	1	NA
17.5	Guided Cylinder for Pick and Place Unit (Minimum stroke: 100mm)	1	Festo / SMC
17.6	Vacuum Generator with Vacuum Cup	1	Festo / SMC
17.7	Rotary Motor (20mm Bore)	1	Festo / SMC
17.8	Color Sensor	1	Takex / Reputed Make
17.9	Auto feeder with guided cylinder	1	Festo / SMC
17.10	Photo Sensor for job loading	1	Omron / Autonics
17.11	Photo Sensor for job unloading	1	Omron / Autonics
17.12	Sorting Bin (Vertical)	1	NA

PLC & HMI Training Kit



**PLC & HMI TRAINING KIT
PH BASIC - TABLETOP**

**PLC & HMI TRAINING KIT
PH ADVANCE - FLOOR MOUNT**



**PLC & HMI TRAINING KIT
PH ADVANCE - FLOOR MOUNT**



PLC & HMI TRAINING KIT - PH ADVANCE



'Hytech PLC and HMI Training Kits' are designed to provide hands on experience on industrial applications of PLC and HMI. Static as well as Dynamic automation modules make sure that students can operate most of the industrial automation components in integration with PLC, HMI and computer workstations.

PLC & HMI TRAINING KIT - PH BASIC



PLC-HMI Training kit is a fully equipped workstation with INPUT and OUTPUT Field as well as PLC modules providing necessary ease in operating complex PLCs as well as HMIs. Various

static and dynamic modules expose users to various advantages of different makes and models of PLCs. Most of the commonly used industrial automation components such as servo motors, stepper motors, external encoders, sensors, pneumatic solenoid valves, etc are ergonomically mounted on the training kits for efficient operation and ladder/screen design.

PLC – HMI KITS



PLC – HMI TRAINING KIT (PH ADVANCE)

PH Advance is a floor mounted training kit equipped with workstation and suitable for higher end (advance) PLC and HMI such as Siemens S7 1200 / S7 1500, Mitsubishi Q series, etc. Dedicated arrangement for high speed outputs as well as analog inputs and outputs is provided in this kit. This is a mobile unit equipped with Caster wheels with brakes as well as stationery mounting arrangement. Arrangement for pneumatic compressor mounting is also provided.



PLC – HMI TRAINING KIT (PH BASIC)

PH Basic is a table top training kit with holding arrangement. This training kit is suitable for entry level PLCs such as Siemens S7 200 Smart, Mitsubishi FX series etc. Limited number of dynamic as well as static automation modules can be integrated with this training kit. External workstation can be connected to the training kit through Ethernet switch.



INPUT AND OUTPUT MODULES

There are four input / output modules in each Hytech PLC – HMI Training kit. First is PLC input module. This module is connected with PLC inputs. This module consists of 24 inputs, each of which is provided with override button. With this push button, user can manually override desired PLC input. Second is Field input module which is connected with field automation components with a 3 pin connector. This module has connections for 24 field input devices. Use of three pin connector makes it very easy to maintain as well as understand electrical connections. Third is PLC output module with 24 connections. First 8 connections are dedicated for high speed outputs as well as analog outputs and next 16 connections are provided with surface mounted relays. Fourth module is field output module which has 24 connections connected to field output devices through 3 pin connectors.

DYNAMIC AUTOMATION MODULES



■ PNEUMATIC SOLENOID VALVES AND CYLINDERS MODULE

Basic concept of this module is to provide hands on experience on Solenoid and pneumatic cylinder operations with reed switch feedback from PLC and HMI. Users can carry out various sequencing, timer as well as counter based applications with this module. Solenoid valves are one of the most popular as well as commonly used industrial automation devices. Necessary pneumatic accessories such as pneumatic junction box, PU tube, push pull connectors as well as necessary spares are provided along with the kit.

■ VFD AND AC MOTOR MODULE

This module works on analog output from PLC which controls the AC Induction motor operation. This is again a very commonly used application in industry which can also be demonstrated as well as integrated with HMI. Handheld RPM indicator is provided as an optional accessory. This module can be operated with digital PLC output as well as analog PLC output.



■ TEMPERATURE CONTROL MODULE



This module works in integration with PLC and HMI. Digital output from PLC is used to activate the module and the output from RTD is used as an analog input to PLC. With efficient calibration, temperature can be indicated on the HMI. Separate display device is also provided on the module to indicate the actual temperature.

■ SWITCHGEAR MODULE

This module is provided along with every PLC – HMI training kit. This module consists of various types of push buttons as well as switches which can be used as input devices. Indicators as well as buzzers are used as output devices.



■ SENSOR MODULE



This module consists of various types of sensors which provide inputs to PLC. This module consists of Photosensors, inductive sensors, capacitive sensors. Analog proximity sensors are also available (Optional) which provide analog output.

■ AC MOTOR AND ENCODER MODULE

This module is designed to provide hands on experience on External encoder with feedback to PLC and HMI. Participants can determine the RPM of motor and represent the same on HMI. Three high speed outputs from External encoder are to be connected to high speed inputs of PLC. AC Motor is provided which is operated on 230V AC +/- 10%. Gear box (In line) is provided along with AC Motor to reduce the speed.



■ SERVO MOTOR MODULE



This module consists of a Servo Motor, Servo Drive, Encoder cable and power cable. Servo motor provided is a low inertia motor which runs on 230V AC supply. This module can also be used as a separate module for Servo motor training. Generally, this module is mounted on a PLC kit for the ease of use as well as operation. High speed inputs are required to operate this module which are provided and indicated on PLC o/p module.

■ STEPPER MOTOR MODULE

This module consists of stepper motor, stepper drive and necessary cables. This module can be operated in integration with PLC and HMI and can be used as an individual unit for stepper motor training.

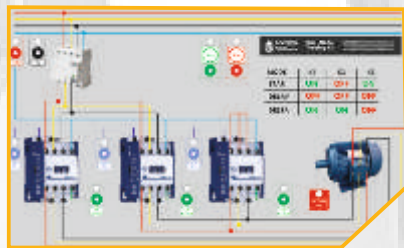


STATIC AUTOMATION MODULES



Static Automation modules are provided to expose users to actual industrial applications of PLC and HMI. These static automation modules represent various industrial processes which can be operated in integration with PLC and HMI. Banana connections are provided on static automation modules for PLC input and output connections. Depending on the user's requirement, various static modules are supplied along with PLC – HMI training kits.

Star Delta Module for AC Induction Motor Operation



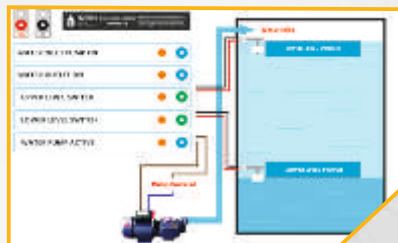
This module is used for Star and Delta connection of AC Induction motor. User can represent this entire operation on HMI as well. K1, K2 and K3 connections for each contactor are provided as outputs auxiliary contacts of each contactor are provided as inputs. Motor indication is provided as PLC output.

Traffic Signal Operation

This module makes use of both counter as well as timer applications of PLC. Each traffic signal light is controlled with PLC output. Start and stop signals act as PLC inputs. This module can be operated in synchronization with HMI for better understanding.



Water Level Controller



This module makes use of timer application. Pump power and water outlet are used as an PLC outputs whereas Lower Level Switch, Upper Level Switch, Water Outlet ON, Pump ACTIVE are used as an PLC inputs.

Staircase Lighting

In this module, each floor is provided with latching input switch which acts as a light switch for each floor. Each light is represented by an LEDs which are activated from PLC outputs. User can make use of timers as well as counters to represent automation.



Elevator Operation



This module represents exact model of elevator with four floors. Elevator module has cabin call switches as inputs to PLCs and their indications as PLC outputs. Floor call switches also act as PLC inputs and lift arrival indication LEDs act as PLC outputs.

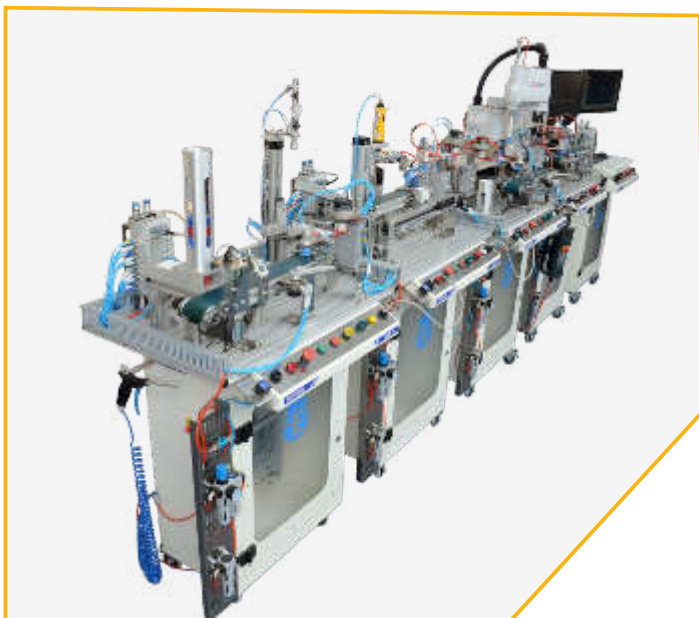
Conveyor Operation



This module represents basic conveyor operation with start and stop overrides. Conveyor Motor ON is used as an PLC output whereas conveyor start / Stop and sensor signals are used as PLC inputs.

Modular Production System

MODULAR PRODUCTION SYSTEM Industry 4.0



Hytech Modular Production Systems (MPS) are designed to provide hands on experience to participants on latest industrial automation practices as well as technology.

Hytech MPS stations are equipped with PLC and SCADA Connectivity. Entire process is dynamically simulated in 3D with OPC UA server giving necessary exposure to participants on factory design and simulation. Entire system is equipped with industry 4.0 connectivity.

MODULAR PRODUCTION SYSTEM WITH INDUSTRY 4.0 / IIOT



CCU STATION

This is a central control station from where operator can control entire system in individual mode as well as in integrated mode. Workstation with dual monitors is provided with ergonomic design. Hardware operation panel is also mounted on the CCU for effective operation control. Teach pendants for Industrial SCARA robot, handheld operation unit with HMI for operation are also connected to CCU with RJ 45 connection ports. Central PLC which communicates with all machines is also mounted in CCU control panel.

SOFTWARE PACKAGE

User can select from the various software packages which can be integrated with Modular Production systems.

SCADA: Entire system is designed as well as controlled from Industrial SCADA with unlimited tags (WinCC Advance)

Layout Planning and Optimisation (Factory Simulation): This is a dynamic 3D process simulation software where students can design various MPS layouts as well as simulate the entire process with more than 3000 industrial automation related components such as gantries, robots, AGVs already present in the library. Participants can also import various pneumatic components' 3D files in this software to simulate the process.



OPC UA Server: With OPC UA connectivity, entire process can be dynamically simulated on factory simulation software. Students can effectively find out the actual process variants and determine the bottlenecks in the system.

Industry 4.0 / IIOT: With this latest industrial technique, user can select the process parameters that will be stored in the dedicated cloud server which can be accessed from anywhere in the world. Students can also select the process parameters which will be conveyed immediately by Email as well as SMS.



INDUSTRIAL SCARA ROBOT

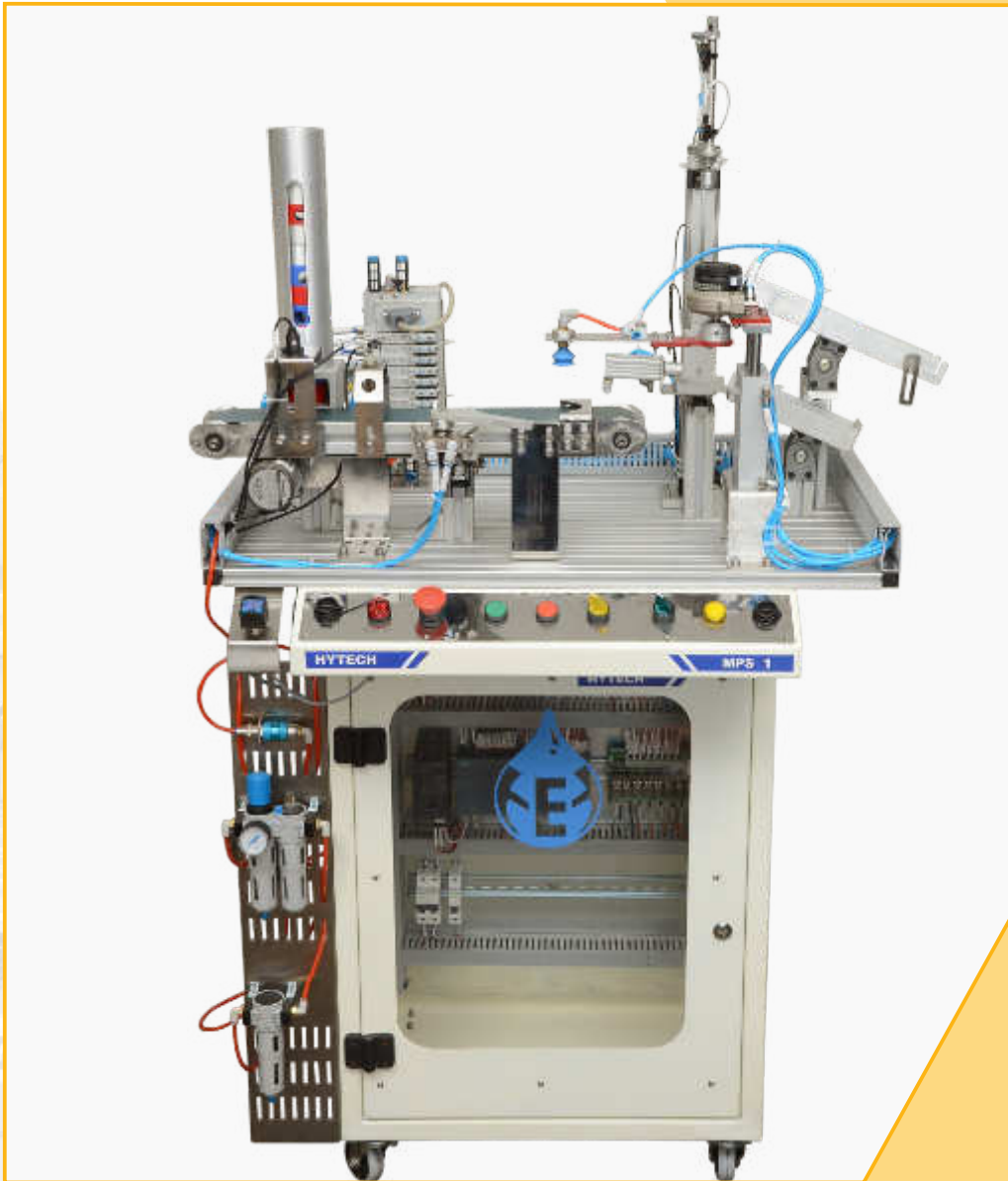
Hytech Modular production System is equipped with Industrial SCARA robot in MPS station 3. User can operate this station in individual mode to get hands on training on Industrial SCARA, SCARA integration with PLC and SCARA operation through SCADA. Various experiments such as pick and place, palletizing, sorting, etc. can be carried out in individual mode.

AIR TREATMENT UNIT

Each Hytech MPS Station is equipped with air treatment unit. This enables users to operate each station individually. Air treatment unit consists of 3/2 way hand slide valve, air filter (5 micron), Digital pressure switch, FRL unit and air gun with spiral PU tube.



MPS 1: MATERIAL BASED SORTING WITH HEIGHT SENSING APPLICATION



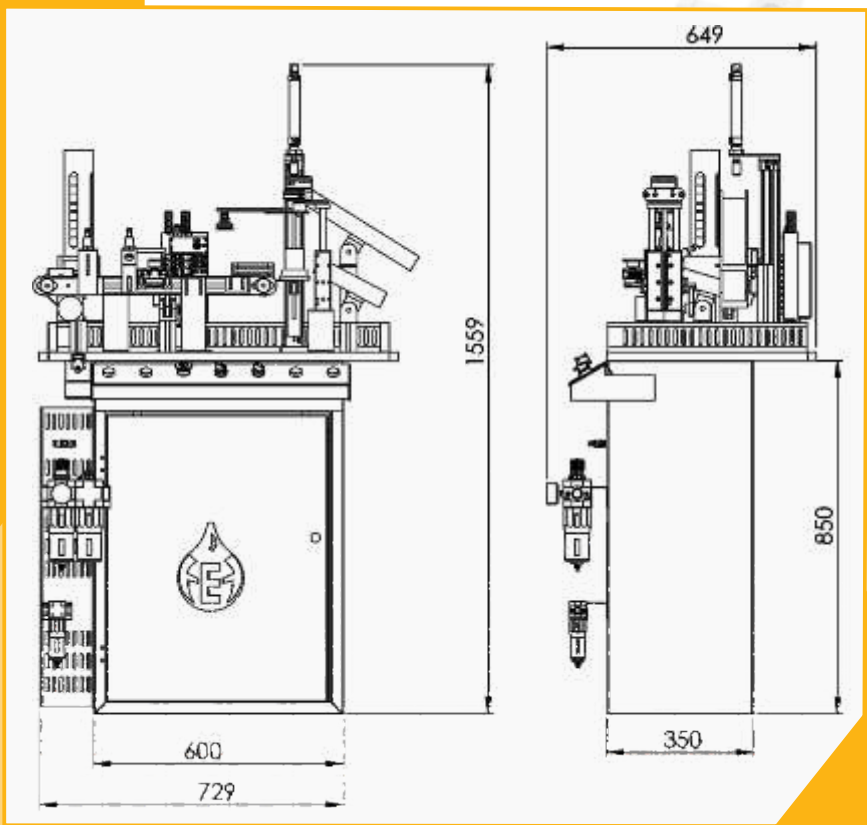
This is the first station of Hytech MPS system which is equipped with automatic loading tube. It can be connected to MPS 2.

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:

1. Material based sensing
2. Height based sensing
3. Acceptance and rejection based on user preference
4. Introduction to rotary pick and place unit
5. Operation of auto loader
6. Operation of rod less cylinder



Sr No	Description
1	Auto Loader Tube 55mm ID
2	Push Cylinder, Guided
3	Sensor Mounting Bracket (Conveyor) M18 x 2
	M18 Capacitive Sensor
	M18 Inductive Sensor
4	Height Sensing Unit
	Square Cylinder 12 x 100
5	Conveyor 70 x 500mm
6	Rotary Rejection Module
	Rotary Vane Motor
	Rejection Slide
7	Stopper Cylinder, Guided
8	Rotary transfer station
	Guided Cylinder 20X100
	Vane Motor
	VACUUM Generator
	Suction Cup

Sr No	Description
9	Vertical transfer station
	Rodless Cylinder, 25 x 250
	Mounting Plate for 40mm workpiece
10	Push Cylinder
	Rejection Push Cylinder
11	Rejection Push Cylinder
	Connecting Slide
12	Solenoid Valve Bank, 10 5/2 DA Solenoid Valves, 1/4
13	Digital Pressure Switch
14	5 Micron Air Filter
15	FRL UNIT
16	Control Panel with Hardware based Operation Module
17	Mounting plate of 22.5 mm thick aluminum extrusions with working dimensions of 820 x 540mm
18	Siemens S7 1200 PLC (S7 1215C)
19	HMI Connection Port

MPS 2: COLOR BASED SORTING WITH PNEUMATIC DRILLING APPLICATION



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.

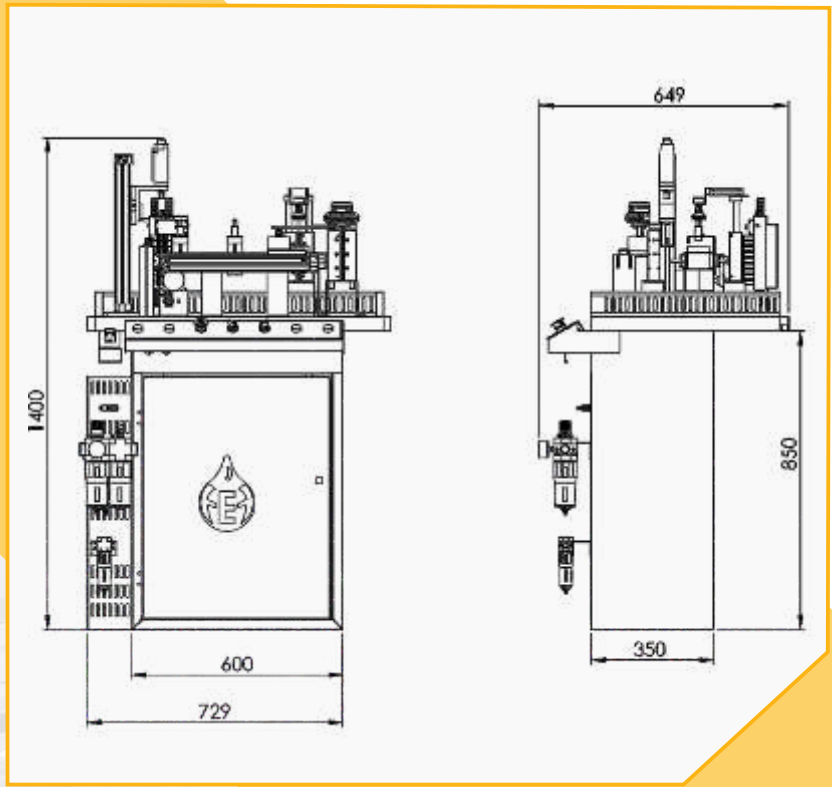
In case of Multi station option, station 2 starts immediately as the job is transferred from Station 1 to station 2. In case of Individual mode, user has to place the job on the conveyor to initiate the system. In case of multi station mode, job is transferred from station 2 to station 3. In case of 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:

1. Color based sensing
2. Pneumatic Drilling Application
3. Acceptance and rejection based on user preference
4. Introduction to rotary pick and place unit
5. Operation of linear transfer station
6. Operation of rod less cylinder



Sr No	Description
1	6 Station Roary Indexing Unit
2	Sensor Station (Conveyor) with M18 Capacitive and M18 Inductive sensor
3	Sensor Mounting Bracket (Conveyor) M18 x 2
	M18 Capacitive Sensor
	M18 Inductive Sensor
4	Height Sensing Unit
	Round Cylinder
5	Pick and Place Arrangement with Vacuum cup
	Guided Cylinder
	Rotary Vane Motor
	In Line VACUUM Generator
	30mm Suction Cup
6	Conveyor 70 x 500mm
7	Color Sensing Assembly
	Color Sensor Mounting Bracket (Conveyor)
	Color Sensor

Sr No	Description
8	Rotary Rejection Module
	Rotary Vane Motor
	Rejection Slide
9	Stopper Cylinder, Guided
10	Pick and Place Arrangement with Vacuum cup
	Guided Cylinder
	Rotary Vane Motor
	In Line VACUUM Generator
11	30mm Suction Cup
	Solenoid Valve Bank, 10 5/2 DA Solenoid Valves, 1/4
12	Digital Pressure Switch
13	10 Micron Air Filter
14	FRL UNIT
15	Control Panel with Operation Module
16	Mounting plate of 22.5 mm thick aluminum extrusions with working dimensions of 820 x 540mm
17	Siemens S7 1200 PLC (S7 1215C)
18	HMI Connection Port with SCADA

MPS 3: WEIGHT BASED SORTING WITH 4 AXES INDUSTRIAL SCARA ROBOT



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.

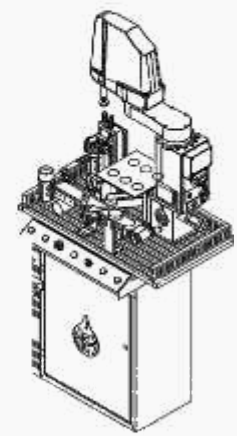
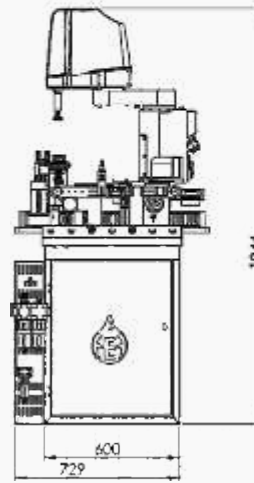
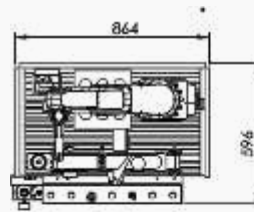
Depending on the weight of the job, user can decide to store the job in a particular slot in MPS 3 pallet (total 9 slots are available) or user can transfer the job to MPS 4. Participants are expected to have hands on experience on MPS programming through which they can decide the flow as well as process 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:

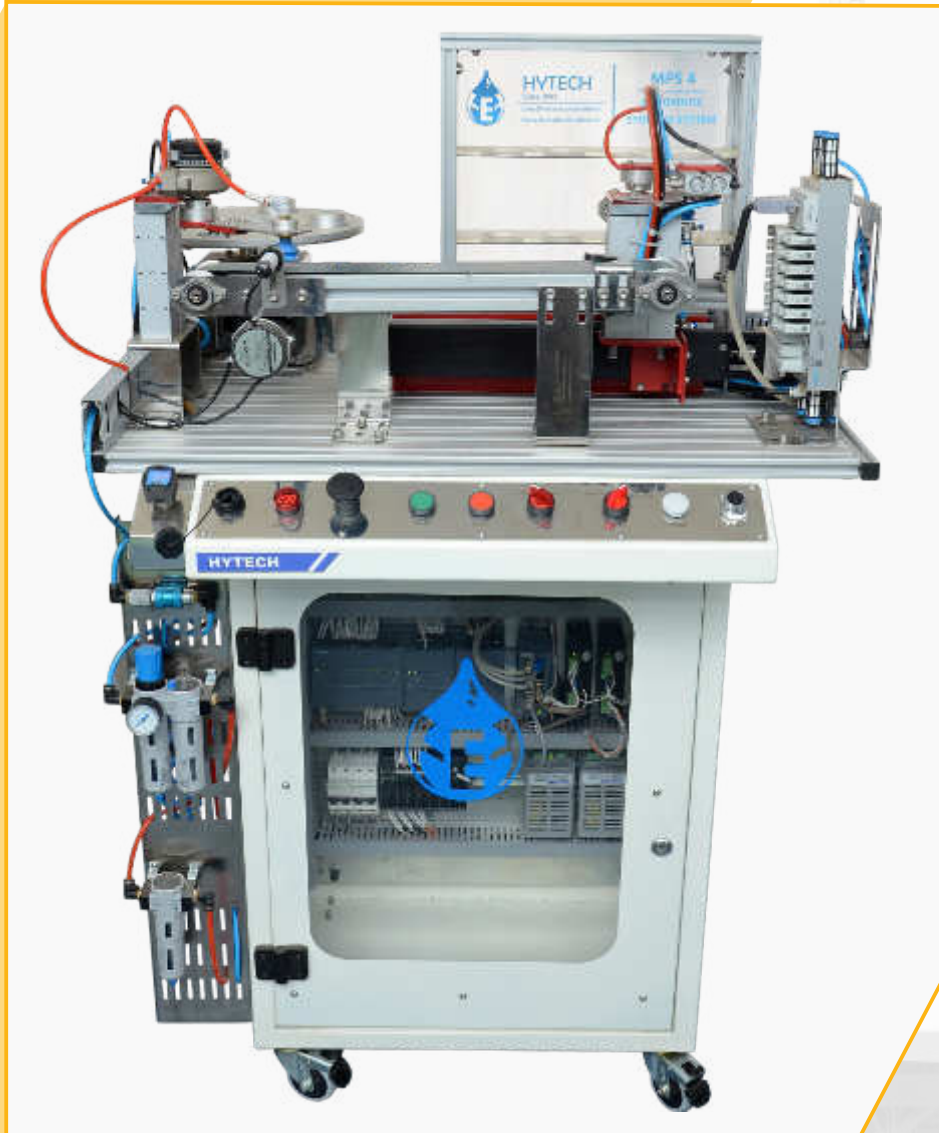
1. Operation of SCARA Robot
2. SCARA Robot operation in individual mode as well as in integration mode with PLC
3. Weight based sorting
4. Integration of Load cell with PLC and SCADA
5. Operation of rotary pick and place station



Sr No	Description
1	Stationary Station for job loading from previous station
	M18 / M12 capacitive sensor connection
2	Pick and Place Arrangement with Vacuum cup
	Guided Cylinder
	Rotary Vane Motor
	In Line VACUUM Generator
	30mm Suction Cup
3	Conveyor 70 x 500mm
4	Rotary Rejection Module
	Rotary Vane Motor
	Rejection Slide
5	Weigh Scale
	Stationary Station
	M18 / M12 capacitive sensor connection
	Load Cell
	Load Cell Amplifier with Display unit and analog output

Sr No	Description
6	Industrial SCARA Robot - 4 Axes (Make: Mitsubishi / Delta)
	In Line VACUUM Generator
7	30mm Suction Cup
	Sorting Pallet
8	Solenoid Valve Bank, 10 5/2 DA Solenoid Valves, 1/4
9	Digital Pressure Switch
10	10 Micron Air Filter
11	FRL UNIT
12	Control Panel with Operation Module
13	Mounting plate of 22.5 mm thick aluminum extrusions with working dimensions of 820 x 540mm
14	Siemens S7 1200 PLC (S7 1215C)
15	HMI Connection Port with SCADA
16	Control Panel for SCARA

MPS STATION 4 : 4 STATION ROTARY INDEXING WITH AUTOMATIC STORAGE SYSTEM (STEPPER MOTOR DRIVEN)



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.

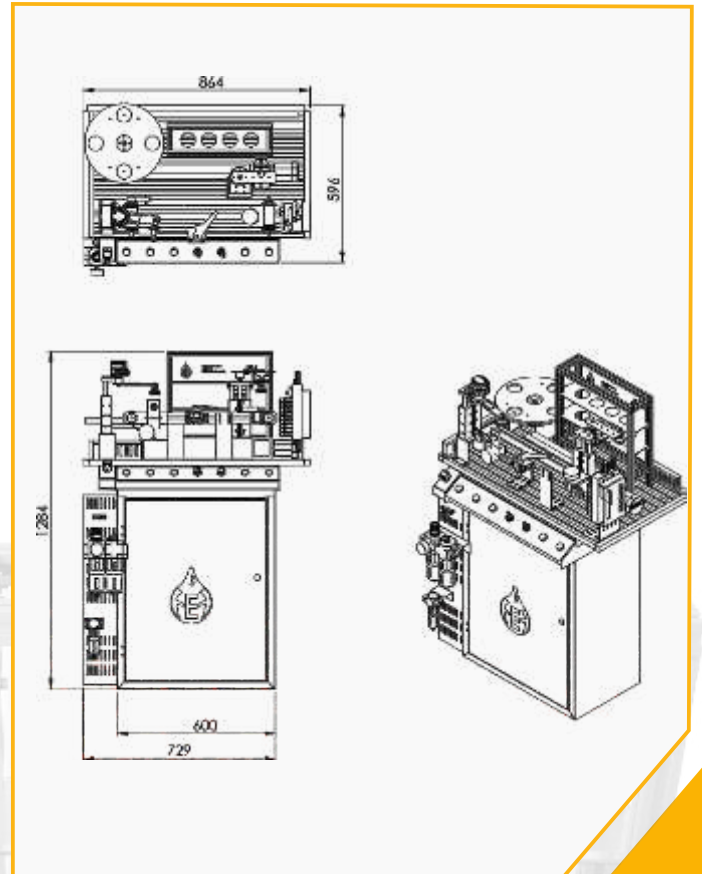
Students can get hands on experience on the operation of stepper motor from PLC and SCADA.

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:

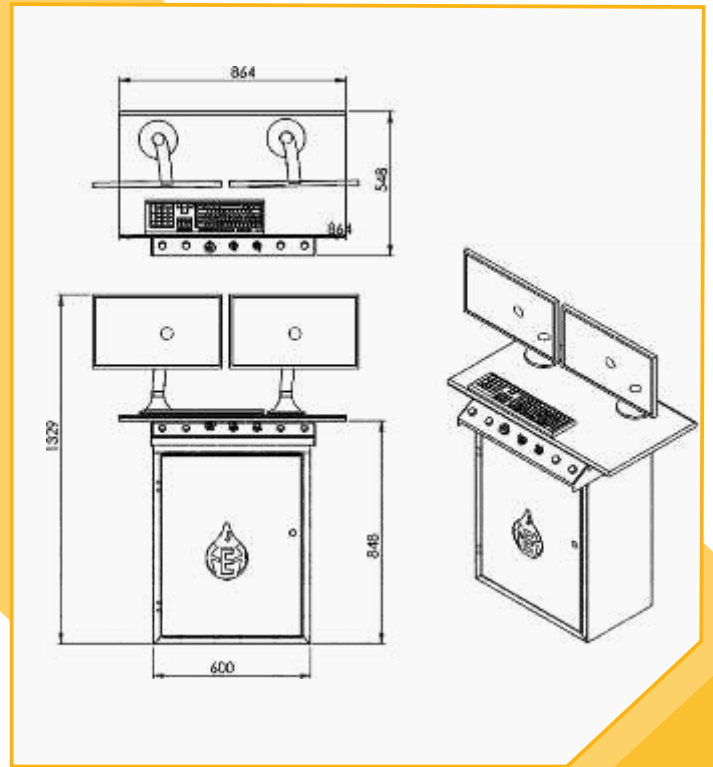
1. Operation of linear slide operation with stepper motor and PLC
2. Operation of incremental position control
3. Operation of rotary indexing station
4. Homing / Referencing of stepper motor with PLC
5. Calibration of linear slide



Sr No	Description
1	4 Station Indexing Mechanism
	M18 Capacitive sensor for position referencing
	Station mounting stand in SS 304
	Stepper motor with stepper drive of suitable capacity
2	Pick and Place Arrangement with Vacuum cup
	Guided Cylinder
	Rotary Vane Motor
	In Line VACUUM Generator
	30mm Suction Cup
3	Conveyor 70 x 500mm
4	Automatic Storage System with 8 stations (Pallet with 2 storey, 4 stations on each)
	500mm Linear slide with Linear motion guideways and ball screw
	Stepper motor with stepper drive of suitable capacity

Sr No	Description
4	M12 Capacitive sensor for position referencing
	Pick and Place Arrangement with Vacuum cup
	Guided Cylinder
	Rotary Vane Motor
	In Line VACUUM Generator
	30mm Suction Cup
5	Solenoid Valve Bank, 10 5/2 DA Solenoid Valves, 1/4
6	Digital Pressure Switch
7	10 Micron Air Filter
8	FRL UNIT
9	Control Panel with Operation Module
10	Mounting plate of 22.5 mm thick aluminum extrusions with working dimensions of 820 x 540mm
11	Siemens S7 1200 PLC (S7 1215C)
12	HMI Connection Port with SCADA

MPS CCU: CENTRAL CONTROL UNIT



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:

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