



# 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 / Layouts

1. Robotic Handling Cell
2. Robotic Welding Cell
3. Integrated Handling and Welding Cell with Industrial Automation
4. Advance Robotic Cell with AGV and ASRS



## Hytech Robotic Cells

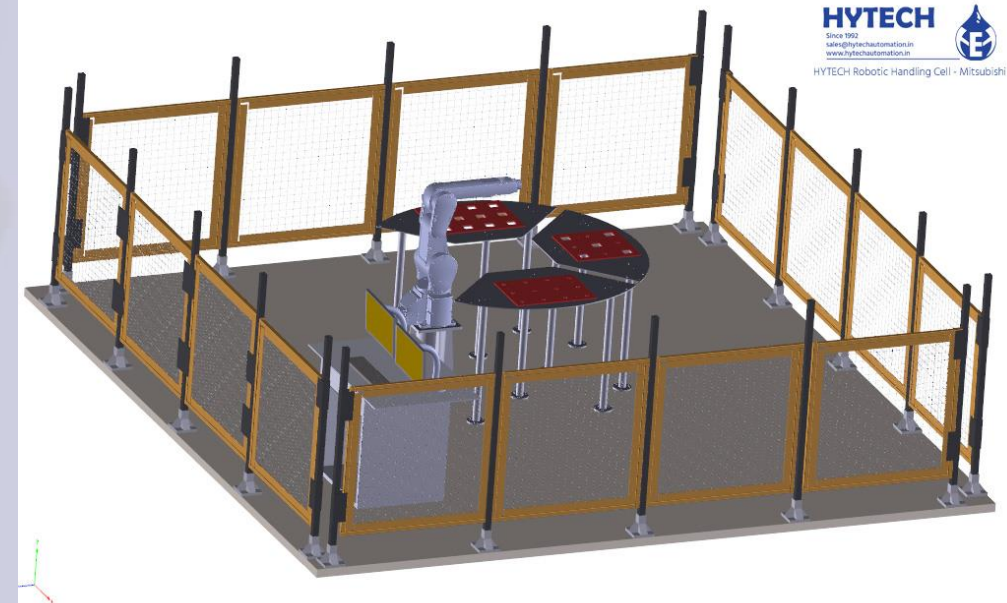
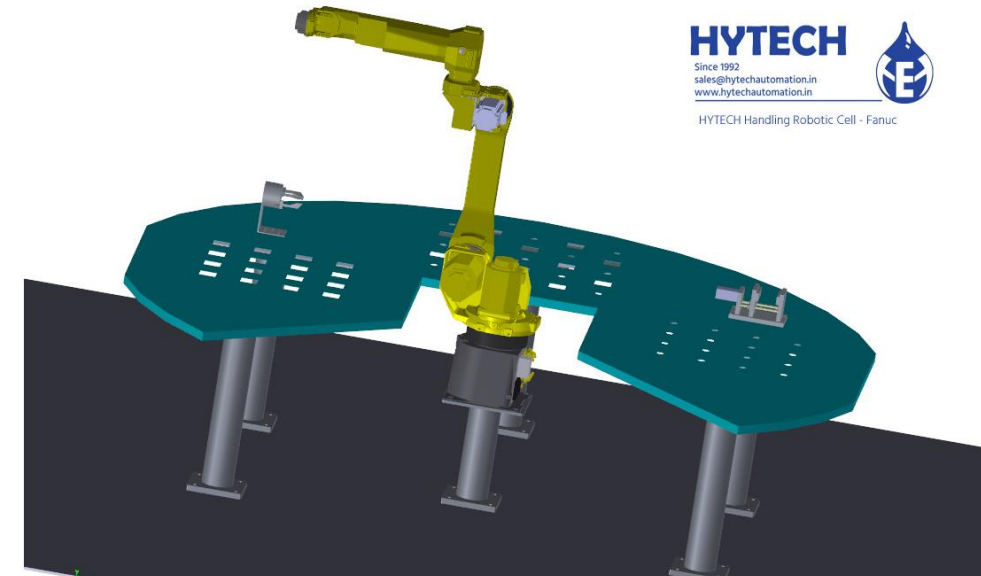
- Hytech Robotic cells are equipped with industrial Robots to make sure that students are exposed to latest industrial robotics technology.
- Hytech Robotic cells are not only focusing on robotics operations but also on their integration with PLC and SCADA.
- Every robotic cell is equipped with PLC and SCADA. Whole system can be designed as well as dynamically simulated in a 3D factory simulation software
- Students can experience complete operation as well as integration of industrial robots with industrial automation components.
- 'Integrated Robotic Cell' is equipped with SCADA, Conveyors, Vision System, etc. The complete cell is an automated system which provides hands on experience on the latest automation techniques
- 'Advance Robotic Cell' is equipped with ASRS – Automated Storage and Retrieval System, AGV – Automated Guided Vehicle, SCADA, vision system which can be considered as complete computer integrated sorting system with vision inspection.
- Hytech Robotic cells are designed to provide hands on experience on latest industrial practices with robotic solutions.





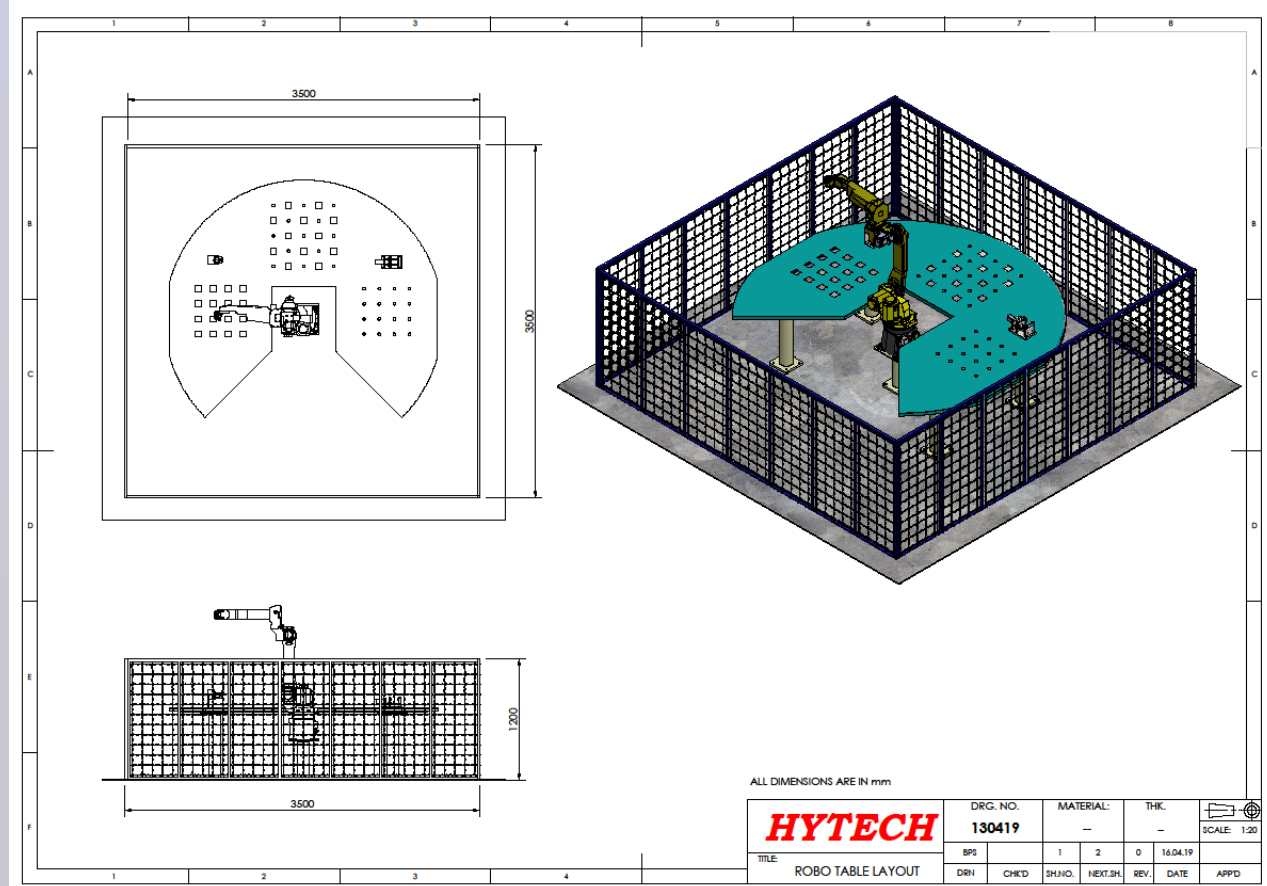
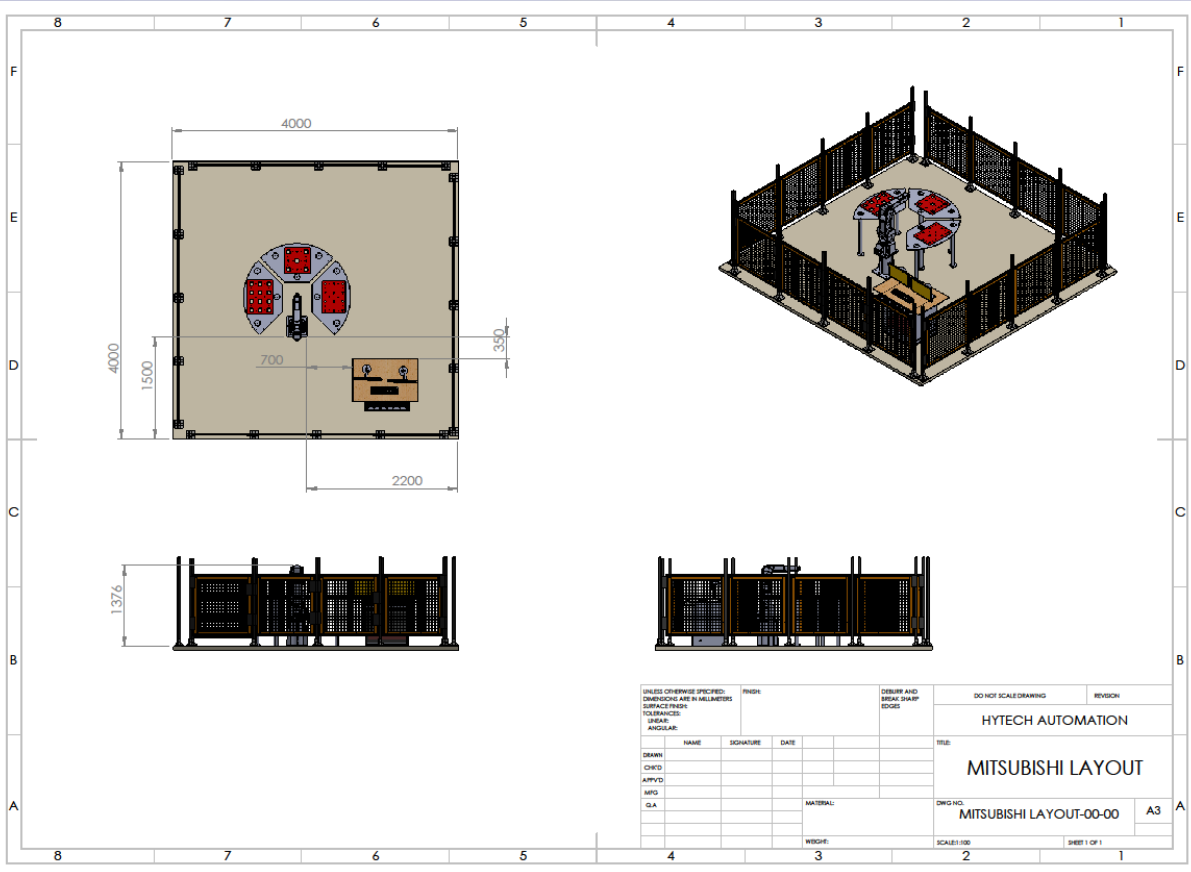
## Robotic Cell - Handling

- Hytech Robotic Handling Cell comes with an industrial robot from leading manufacturers such as Fanuc, Mitsubishi, KUKA, etc.
- Handling cell is equipped with PLC as well as SCADA which provides students with hands on experience on integration of industrial robot with latest automation techniques.
- Pneumatic chuck as well as pneumatic vice are also provided which offer hands on experience on machine tending applications.
- Various operations / applications that can be performed are as follows:
  1. Pick and Place
  2. Palletising
  3. Machine Tending
  4. Integration of Robot with PLC
  5. Integration of Robot with SCADA
  6. Assembly
  7. Vision Sensing (2D / 3D) with Integration
- Cell is equipped with complete fencing arrangement as well as door locking switches to provide necessary safety during operation





# Robotic Cell - Handling



## Robotic Cell - Handling

List of accessories provided along with Hytech Robotic Cell (Pick and Place) are as follows:

- 6 Axes Industrial Robot (Fanuc / Mitsubishi / KUKA)
- Industrial Gripper (SMC / Festo)
- Robot table for pick and place operations with size as per the robot reach
- Raw jobs (Cylindrical job and flat plate)
- Pneumatic Vice
- Pneumatic Chuck
- Pneumatic Compressor
- Five Way Two Position Double acting solenoid valve (Qty: 03)
- Robot Pedestal with chemical grouting
- Complete fencing arrangement with grouting
- Door locking switch
- I/O compatibility with minimum 16 inputs and 16 outputs
- Stabiliser along with 5 meter power cable
- Air compressor with minimum 60 Ltr tank and 1Hp Motor capacity
- Digital Pneumatic pressure switch with analog output
- Chemical grouting kit
- 3 storey tower lamp for operation indication
- PLC (Siemens S7 1200)
- SCADA (WinCC Advance)
- Vision Sensor (2D / 3D)
- Factory Design and Simulation software (30 seats)

Experiments that can be performed on this kit:

- Pick and place operation of Cylindrical job
- Pick and place operation of flat plate
- Assembly of cylindrical job over flat plate
- Machine loading operation with flat plate pneumatic vice
- Machine loading operation with cylindrical job and pneumatic chuck
- Robot operation with Door switch function
- Integration of Robot with PLC
- Integration of Robot with SCADA
- Vision Sensing (2D / 3D) with Integration

**Robotic Cell – Handling  
Cell Overview Video**



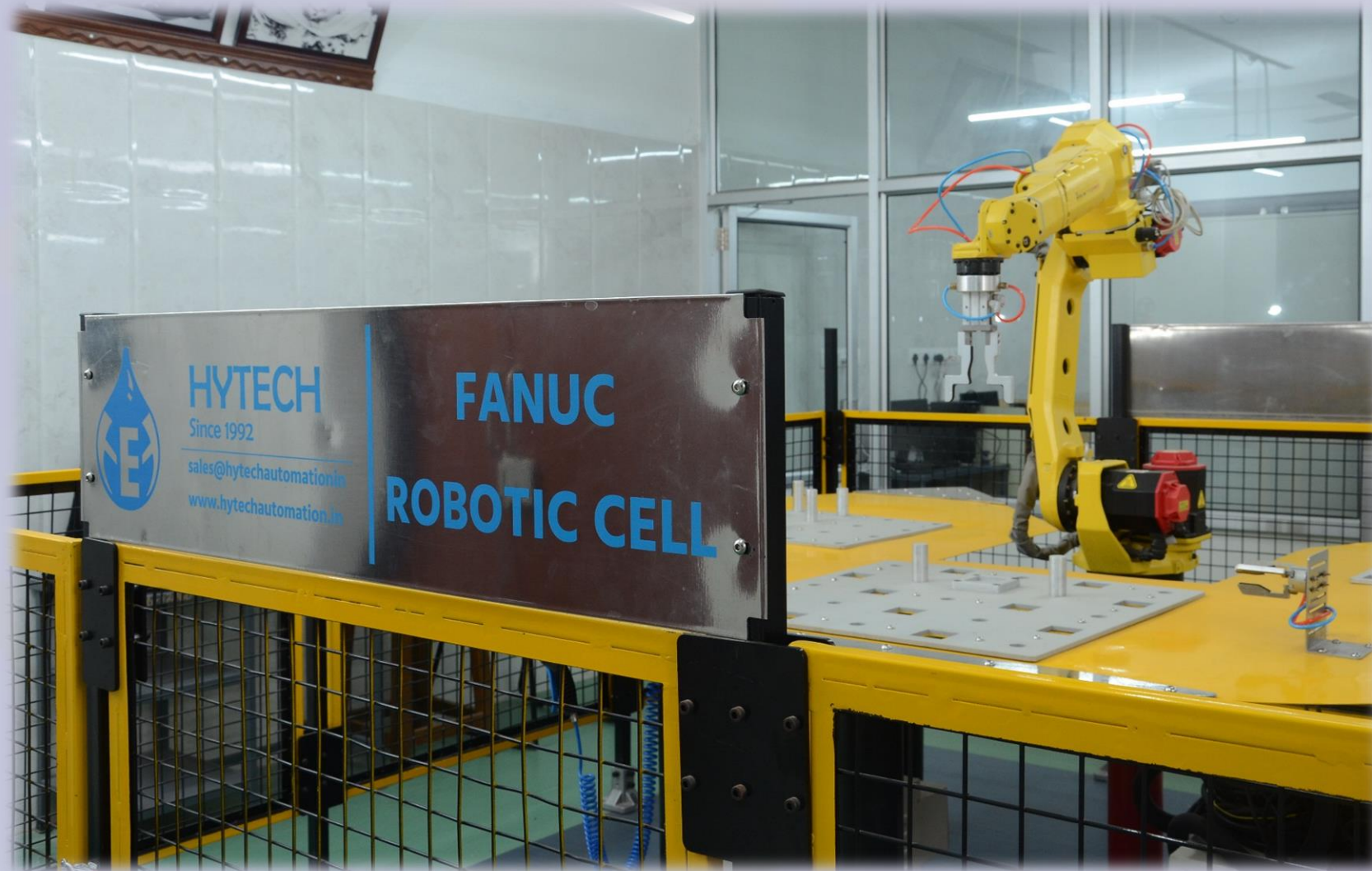
**Video Link**

<https://youtu.be/CAzqHGe8sXk>





**Robotic Cell – Handling  
Cell Operation Video**



**Video Link**

<https://youtu.be/s8pDvWeZy1U>



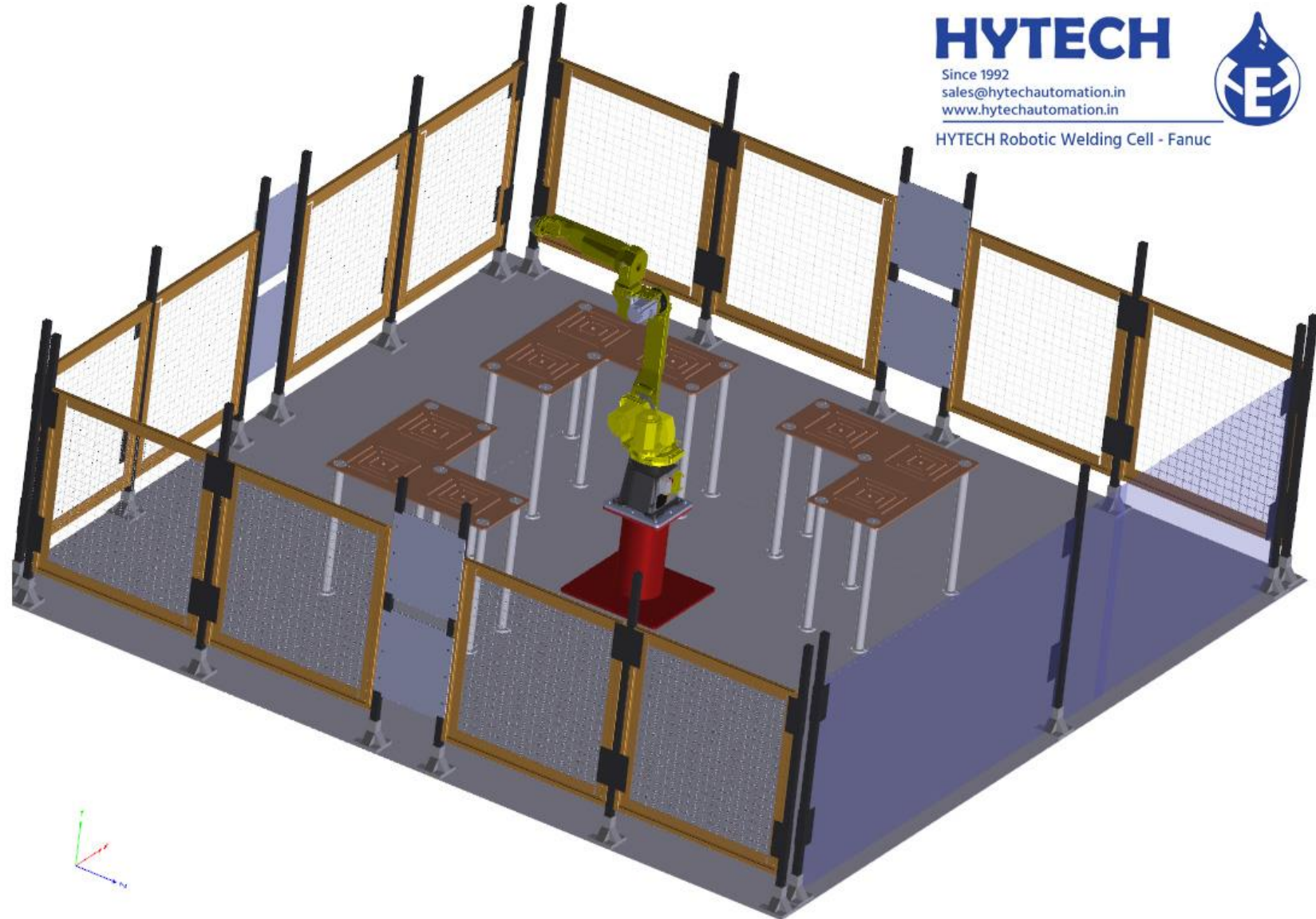




## Robotic Cell - Welding

### Hytech Robotic Welding Cell

- Hytech Robotic Welding cell is a complete solution for robotic welding. Cell is provided with all necessary accessories such as weld spool, stabiliser as well as protective glasses. As shown in the adjacent picture, entire one side of the cell is equipped with weld protective curtain to make sure that students can observe the welding process.
- Since welding fixtures requires considerable setup time, the cell is provided with three welding tables. When the welding is in process on first table, participants can setup the jobs on other two tables to use the available time efficiently.
- Hytech Robotic welding cells are provided with Fanuc welding robots as well as Fanuc welding power source. Fanuc 'Roboguide' software is also included in a setup where students can design and simulate the process on a computer screen. The same program can be directly operated in a robot reducing the programming time efficiently.



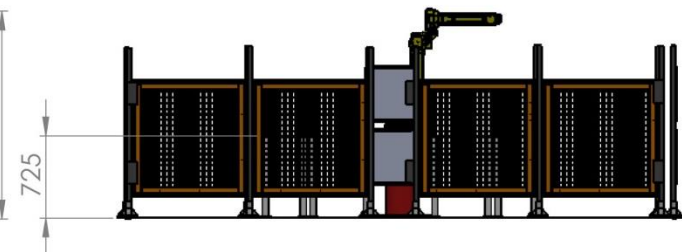
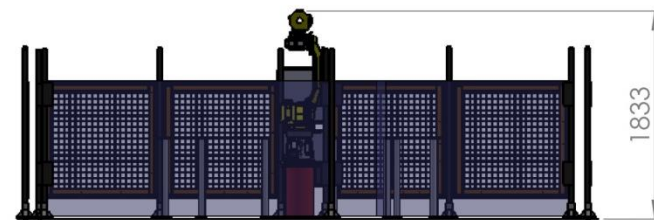
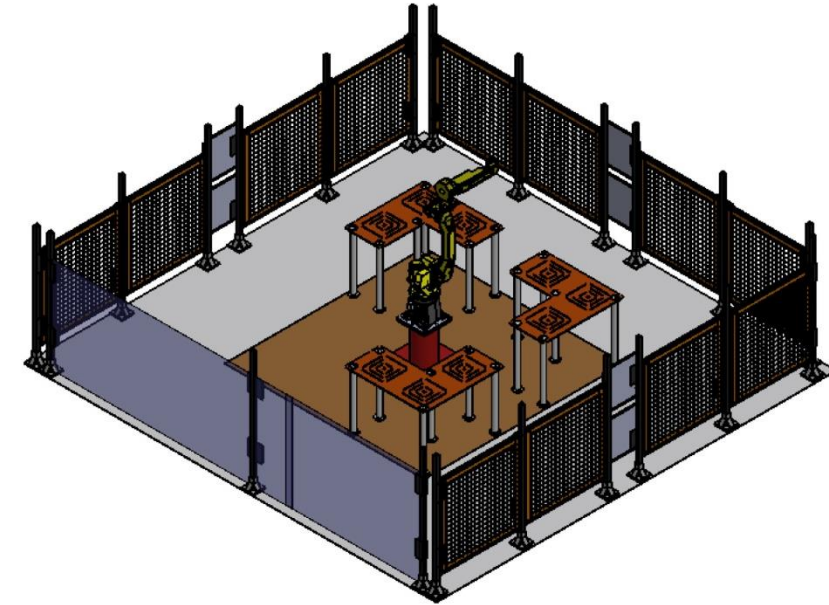
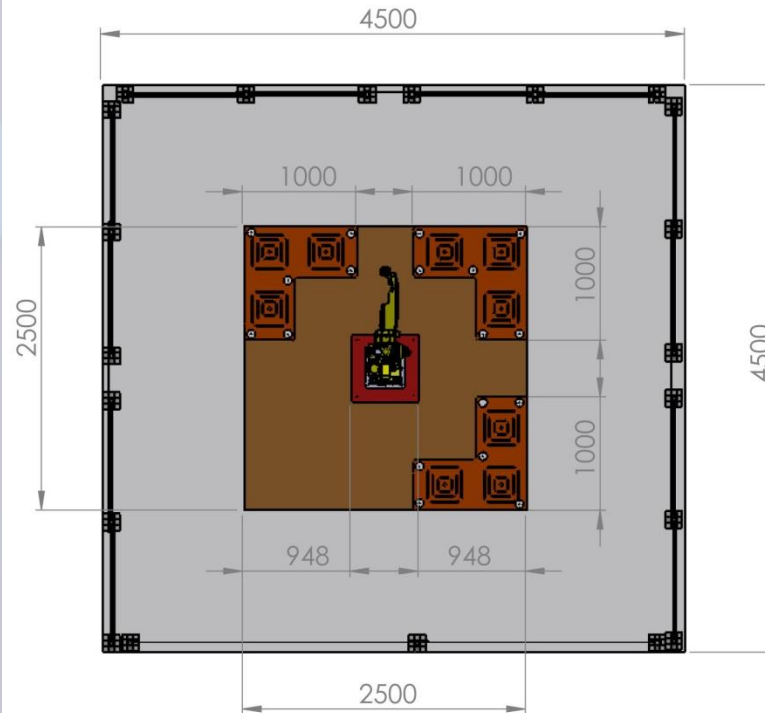
## Robotic Cell - Welding

### Hytech Robotic Welding Cell:

This robotic cell is designed for hands on training on industrial robots with welding arrangement. Cell includes entire accessories such as fencing, door switch as well as manual welding clamps to carry out different welding exercises.

Fixtures with following arrangements are provided to make sure that participants can carry out different welding programs on different geometrical objects.

- Flat plate on a flat plate (L joint)
- Flat plate on a flat plate (T joint)
- Round job on a flat plate with manual holding
- Round job on a flat plate with pneumatically actuated automatic holding
- Round Job on a round job with manual holding



## Robotic Cell - Welding

Following Accessories are provided along with a robotic cell:

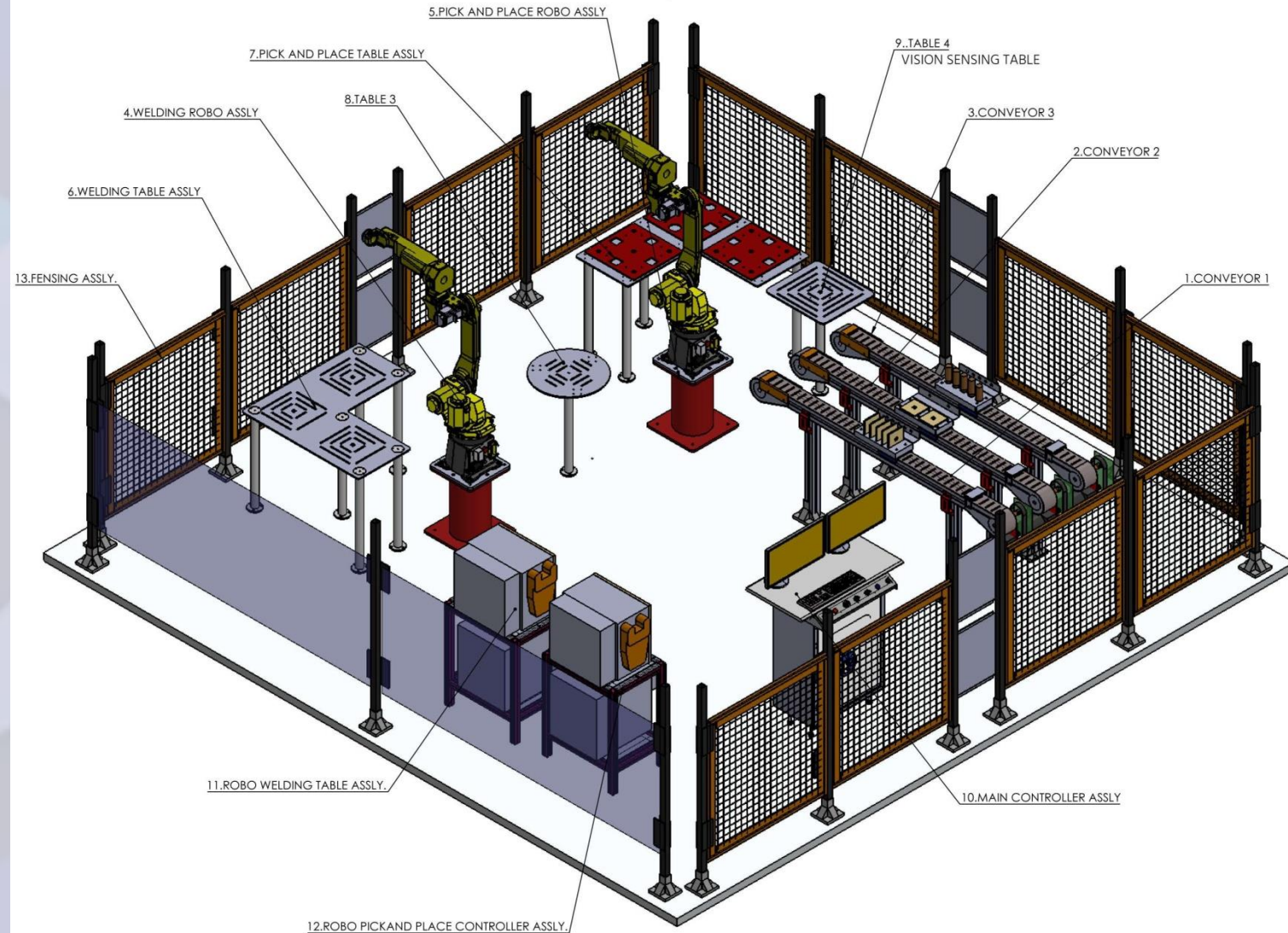
- 6 Axes Industrial Robot (Fanuc)
- Welding Source (MIG 350 A)
- The MIG Welding torch unit consisting of: Control switch, Power cable, Conduit, Contact tip, Gas nozzle and Gas hose.
- Fencing arrangement on three sides with necessary grouting
- PVC Welding curtain on the fourth side with necessary mounting arrangement
- Welding spool (1.2mm, 30 KG)
- Manual holding clamps with fixtures (8 Qty)
- Pneumatic holding station for round job and flat plate with 2 qty of 5/2 double acting solenoids
- Welding tables with necessary grouting arrangement
- Robot pedestal with necessary grouting arrangement
- Chemical grouting kit
- Welding gas cylinder with mounting stand (with castor wheels)
- Welding gas flow switch with analog output
- 3 storey tower lamp for operation indication



## Robotic Cell – Integrated Handling and Welding with Automation

### Hytech Robotic : Integrated Handling and Welding with Automation

- This is an advanced robotic training cell with PLC and SCADA.
- Students are exposed to actual industrial robotic applications with state of the art automation technology.
- Entire cell is industry 4.0 ready. The cell is supplied with a factory design and operation simulation software with OPC UA connectivity. Students can design the entire setup and simulate the same dynamically.
- Three conveyors are provided for material movement. Two conveyors are used to transfer raw jobs and third conveyor is used to transfer final welded assembly.
- Welding table is provided at the center with pneumatic (Automatic) holding arrangement.
- Each robot can be used in individual mode and individual experiment tables are provided for each robot. Handling robot is also provided with Pneumatic vice and Pneumatic chuck on which machine loading / unloading experiments can be performed.
- Central Control Station with SCADA is provided along with operation panel.



## Robotic Cell – Integrated Handling and Welding with Automation

### Hytech Robotic : Integrated Handling and Welding with Automation

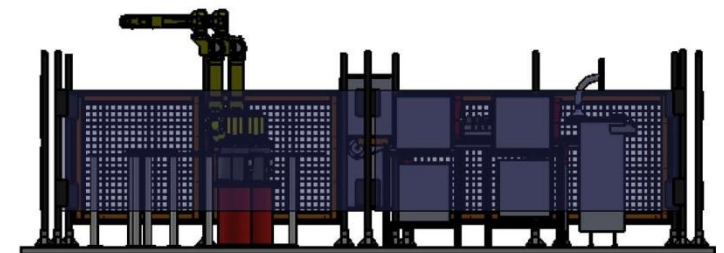
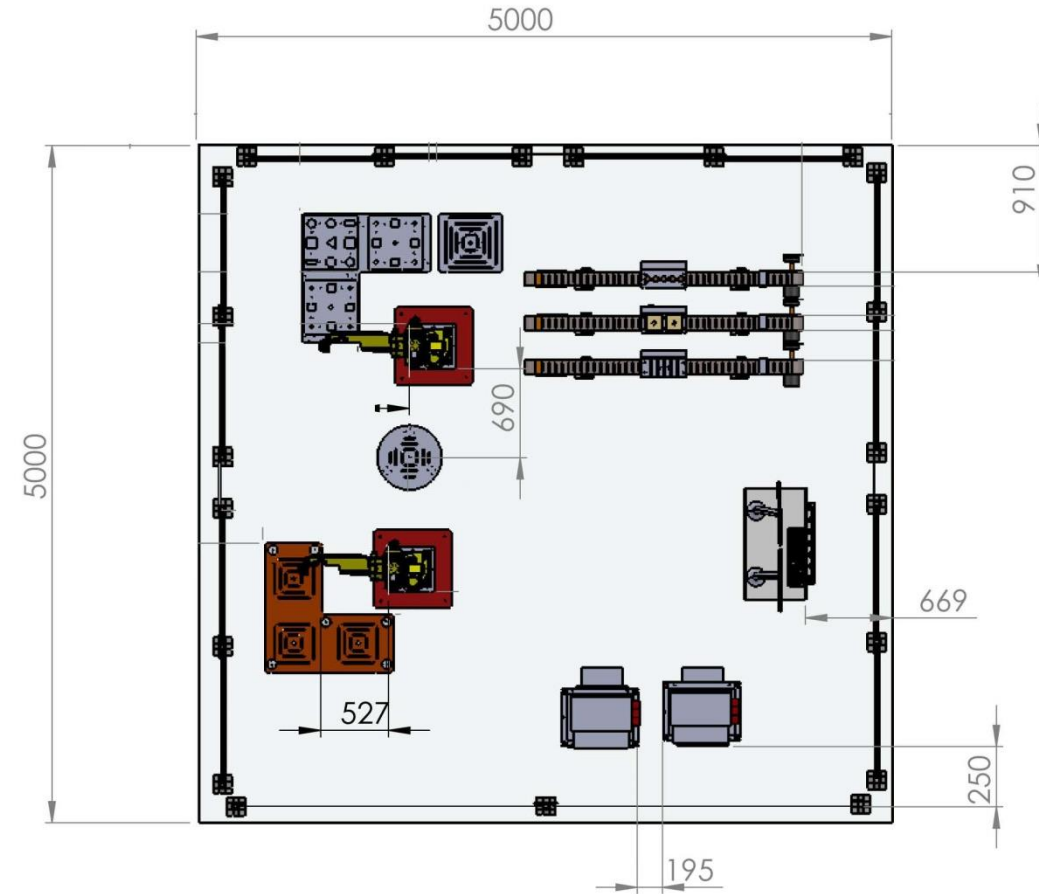
Entire system can be termed as Computer integrated robotic welding system with entire process automation which includes:

- Pick up of first raw job (Flat plate) from first conveyor by handling robot (Robot 1)
- Placing of first raw job in a pneumatically actuated fixture by Robot 1.
- Pick up of second raw job (cylindrical job) from second conveyor by handling robot (Robot 1)
- Placing of second raw job (cylindrical) in first raw job (Flat plate)
- Welding of two raw jobs with welding robot
- Pick up of processed (Welded final) job from the fixture and placing it in third conveyor

This robotic cell is designed for hands on training on industrial robots with welding arrangement. Cell includes entire accessories such as fencing, door switch as well as manual welding clamps to carry out different welding exercises.

Fixtures with following arrangements are provided to make sure that participants can carry out different welding programs on different geometrical objects.

- Flat plate on a flat plate (L joint)
- Flat plate on a flat plate (T joint)
- Round job on a flat plate with manual holding
- Round job on a flat plate with pneumatically actuated automatic holding
- Round Job on a round job with manual holding
- Round Job on a round job with pneumatically actuated automatic holding





## Robotic Cell – Integrated Handling and Welding with Automation

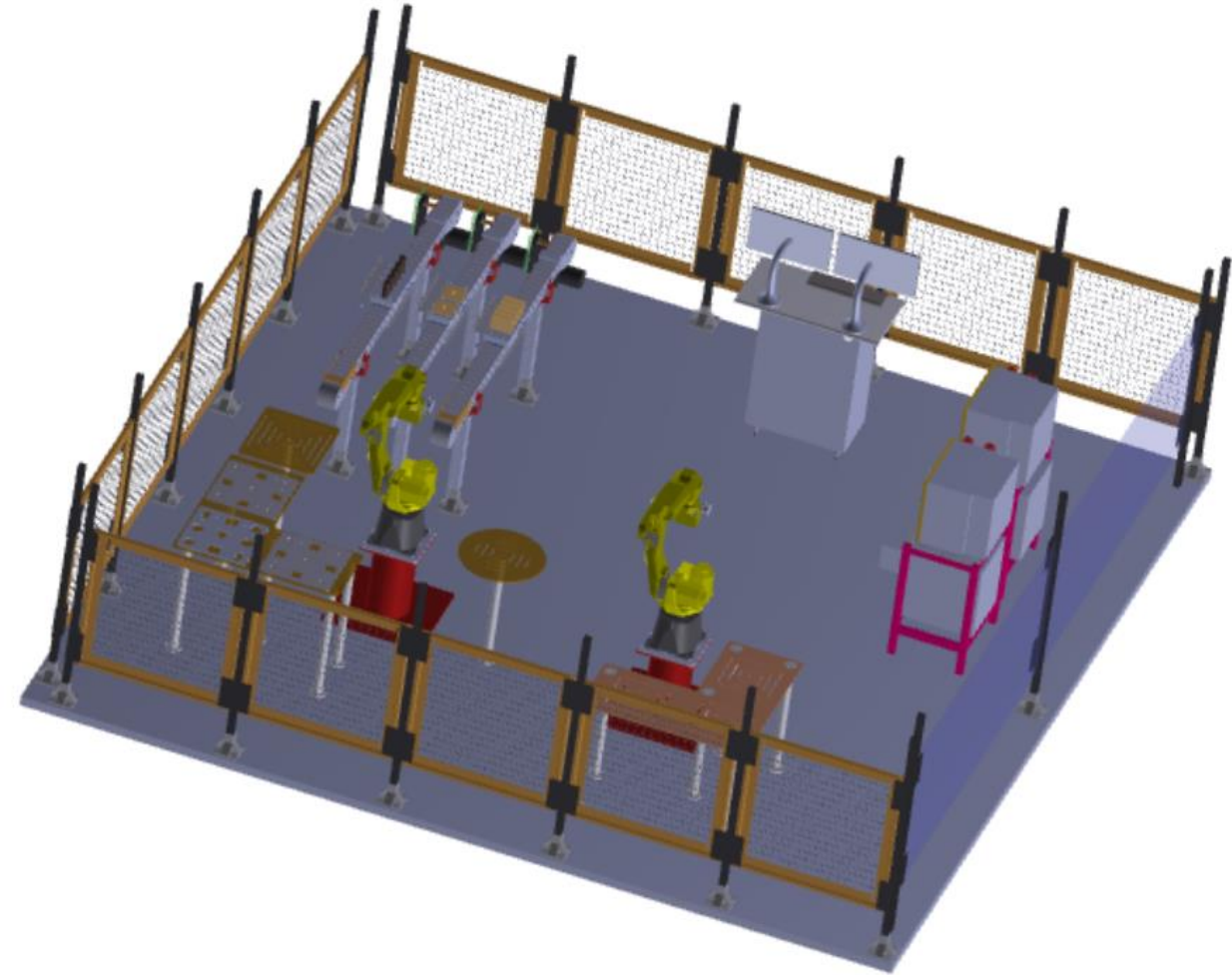
### Hytech Robotic : Integrated Handling and Welding with Automation

Following Accessories are provided along with a robotic cell:

- 6 Axes Industrial Robot (Fanuc)
- Welding Source (MIG 350 A)
- The MIG Welding torch unit consisting of: Control switch, Power cable, Conduit, Contact tip, Gas nozzle and Gas hose.
- Fencing arrangement on three sides with necessary grouting
- PVC Welding curtain on the fourth side with necessary mounting arrangement
- Welding spool (1.2mm, 30 KG)
- Manual holding clamps with fixtures (8 Qty)
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- Robot pedestal with necessary grouting arrangement
- Chemical grouting kit
- Welding gas cylinder with mounting stand (with castor wheels)
- Welding gas flow switch with analog output
- 3 storey tower lamp for operation indication

### Additional Automation Accessories:

- Each conveyor is provided with a fixture equipped with photo sensors. Conveyor movement can be activated immediately after the fixture is empty / full depending upon user requirements.
- Provision of 2D vision sensor for job orientation and edge alignment.



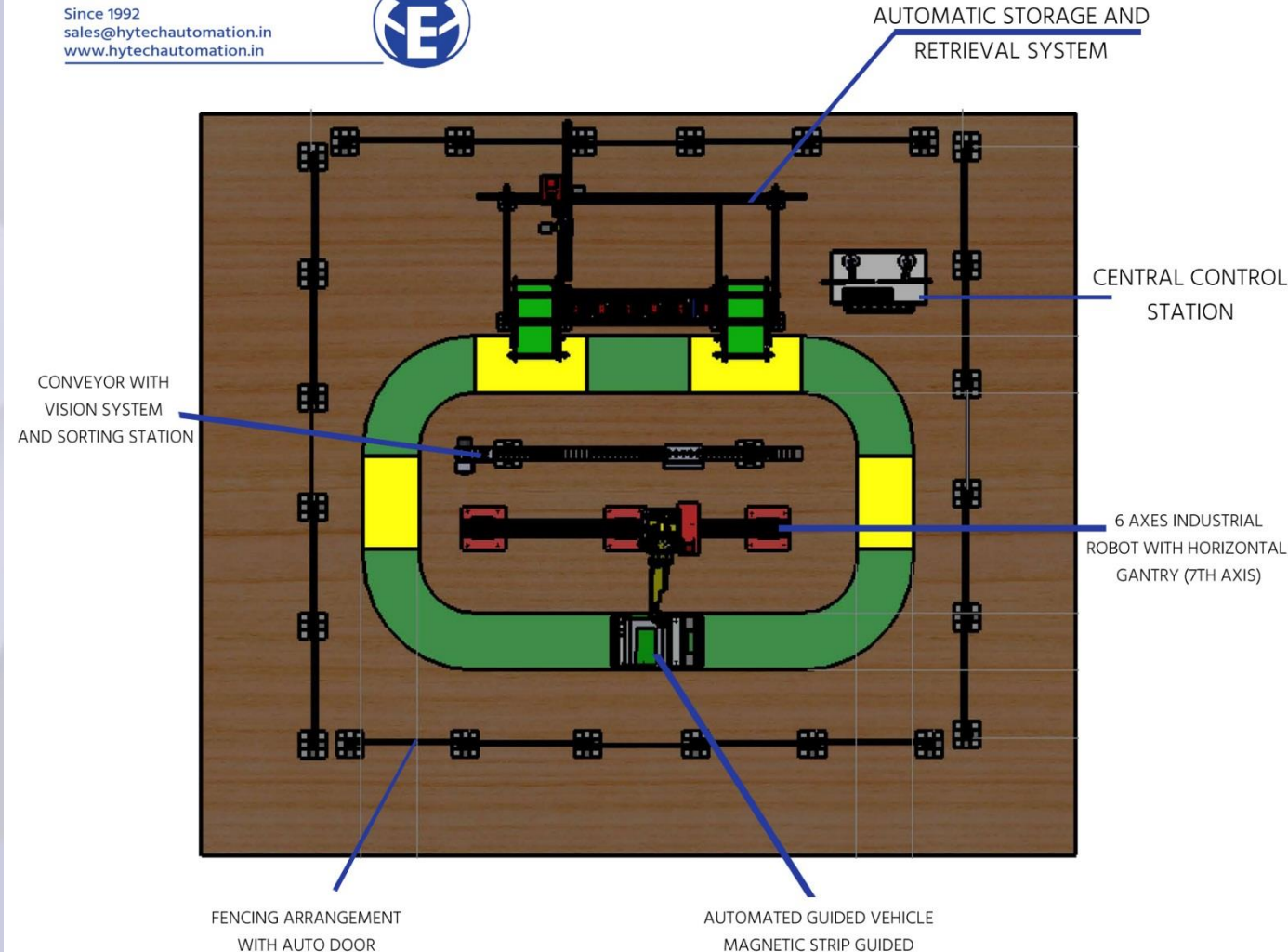


## Robotic Cell – Advance Robotic Cell with AGV and ASRS

### Hytech Robotic : Advance Robotic Cell with AGV and ASRS

#### Major Components:

- Automatic Storage and Retrieval System
- Magnetic Strip Guided 'Automated Guided Vehicle'
- 6 Axes Fanuc Robot mounted on a gantry (Mobile Robot application) with minimum linear travel of 4 meter
- Fanuc Delta Robot
- 2D Vision system with color based sorting, shape based sorting and size based sorting
- Transfer conveyor (Flex Belt) with minimum travel of 3 meter
- Central Control Unit with S7 1500 PLC, KTP 900 HMI, Siemens Industrial SCADA (WinCC Advance)
- Barcode Printer and Scanner with SCADA Connectivity



## Advance Robotic Cell with AGV and ASRS

## Robotic Cell – Advance Robotic Cell with AGV and ASRS

### Hytech Robotic : Advance Robotic Cell with AGV and ASRS

#### Advantages of Advance Robotic System:

##### Automatic Storage and Retrieval System:

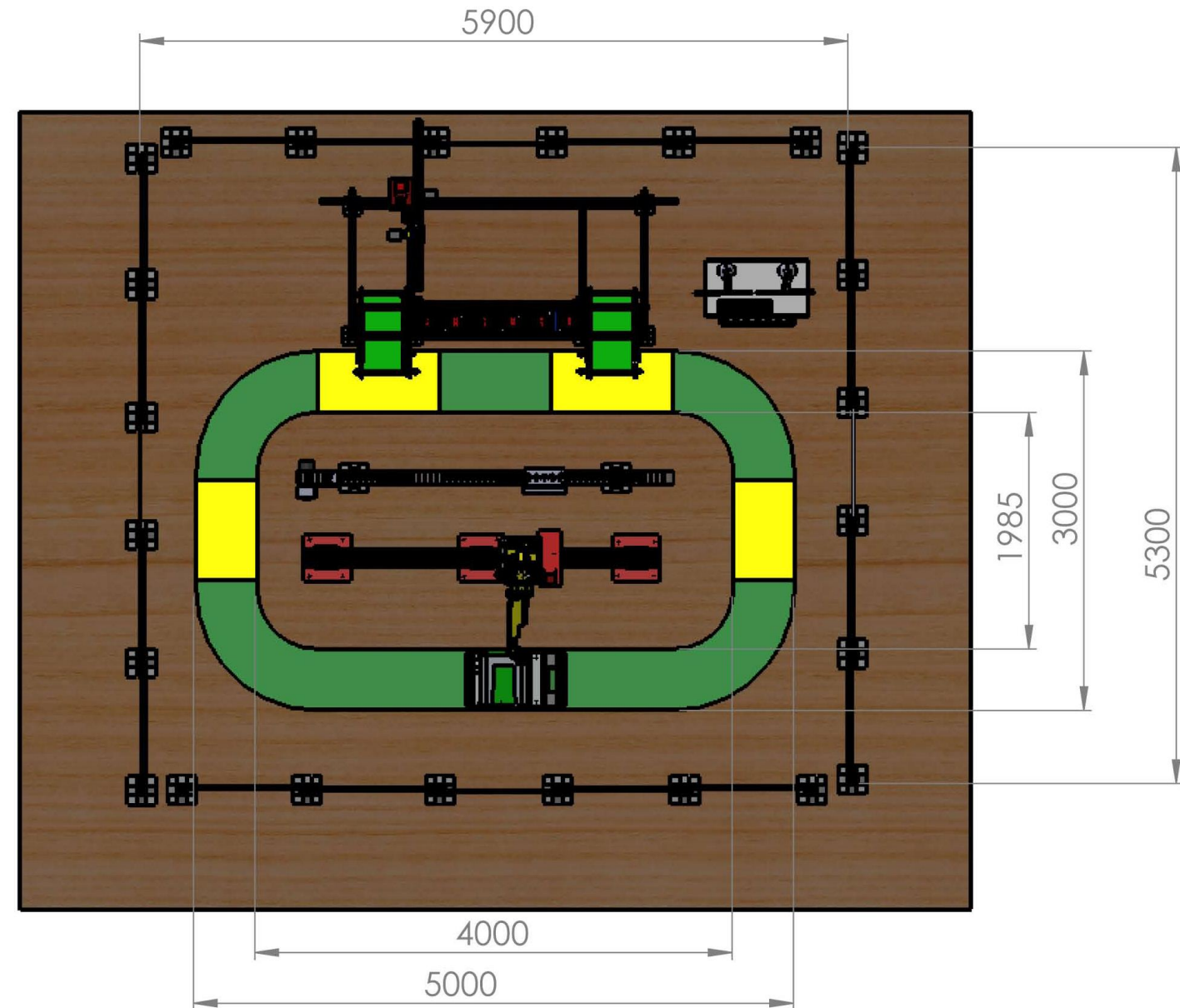
- Complete system can be operated in individual as well as integrated mode.
- User can program each cell as well as each transfer station through PLC and HMI.
- User can design the PLC ladder as well as SCADA based program for ASRS operation
- Barcode Scanning process and relevant program selection through PLC can be achieved

##### Magnetic Strip Guided AGV:

- AGV can be operated in individual as well as integrated mode.
- User can design a path with a very easy to use magnetic strip which can be directly pasted on the floor without any preparation
- User can design as path as well as achieve Wifi based communication with Central PLC
- User can communicate necessary input as well as output signals with Central PLC as well as SCADA
- Control of Magnetic strip guided vehicle through Wifi with Central PLC and SCADA

##### 6 Axes Fanuc Robot mounted on a gantry (Mobile Robot application) with minimum linear travel of 4 meter

- This mobile robot can be operated in individual as well as integrated mode.
- This Robot can be termed as a mobile robot with 7 axes
- User can demonstrate basic applications of mobile robot
- Exposure to basic interlocks as well as basic safety parameters required for mobile robot application
- User can understand as well as demonstrate the difference in application as well as safety measures of mobile robot in comparison with standalone robot





## Robotic Cell – Advance Robotic Cell with AGV and ASRS

### Hytech Robotic : Integrated Handling and Welding with Automation

#### Fanuc Delta Robot

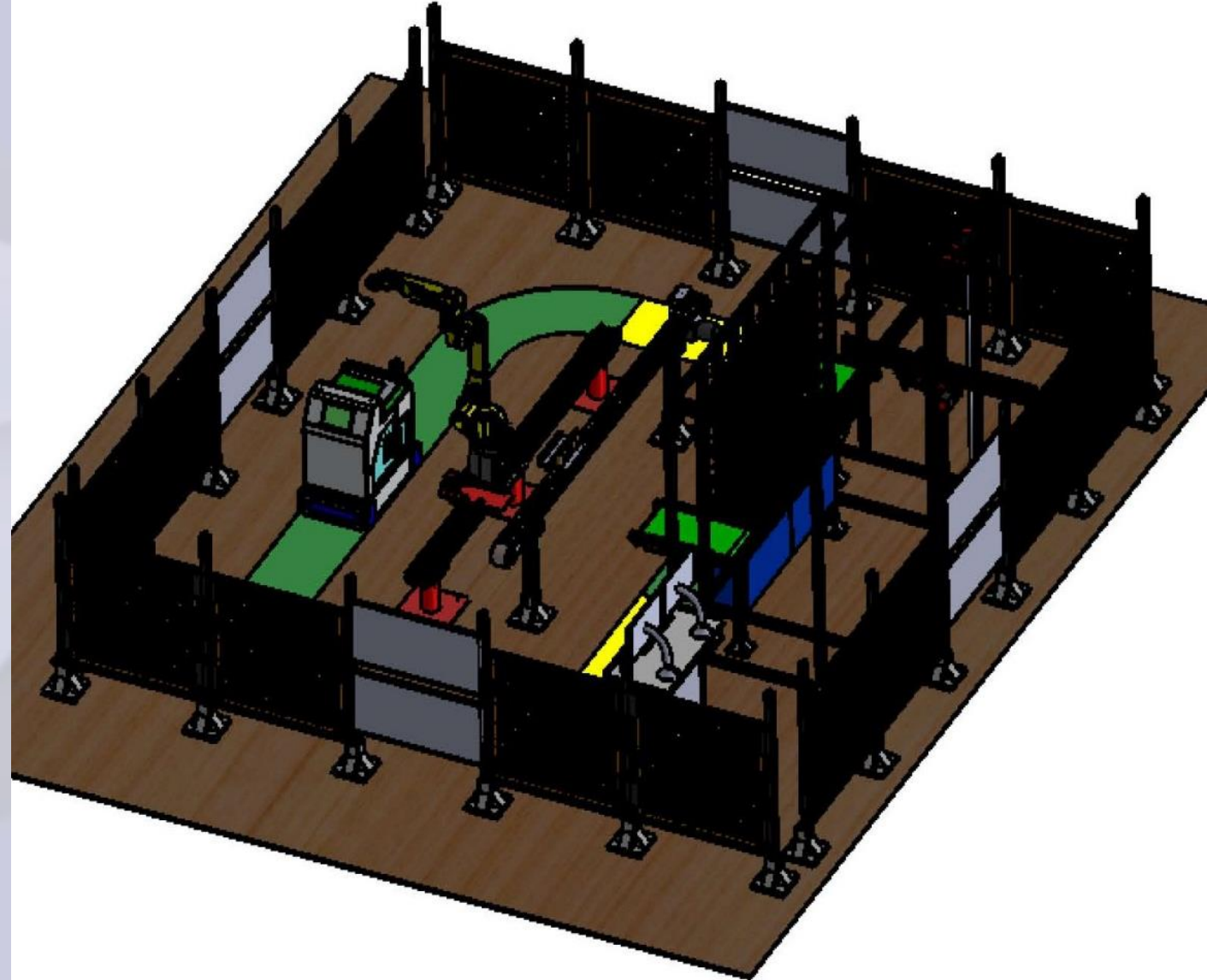
- Fanuc Delta Robot can be operated in individual as well as integrated mode.
- User can understand and demonstrate the use as well as advantages of Delta robot as compared with articulated robot
- Various features can be demonstrated as well as utilized
- Delta robot can be operated in collaboration with vision sensing, PLC as well as SCADA
- Use and integration of delta robot with vision sensor as well as PLC is in itself is a learning experience

#### 2D Vision system with color based sorting, shape based sorting and size based sorting

- One of the best vision system available in the market with direct compatibility with Fanuc robots
- User can operate this system in collaboration with Robot as well as PLC and SCADA
- User can carry out teaching based on shape, size as well as colour.
- Transfer conveyor (Flex Belt) with minimum travel of 3 meter
- Flex belt conveyor which operates with AC Induction motor as well as VFD.
- Conveyor can be operated as well as integrated with PLC and SCADA
- Conveyor can be operated in individual mode as well as integrated mode

#### Central Control Unit with S7 1500 PLC, KTP 900 HMI, Siemens Industrial SCADA (WinCC Advance)

- Complete system is integrated through CCU
- Can be used for PLC training as well
- Provided with Siemens HMI which can be used for operation
- User can design as well as operate the HMI based on operator based cycles







**Thank You!**

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