

www.dsa-automation.com

SMART FACTORY SOLUTIONS FOR METAL MANUFACTURING

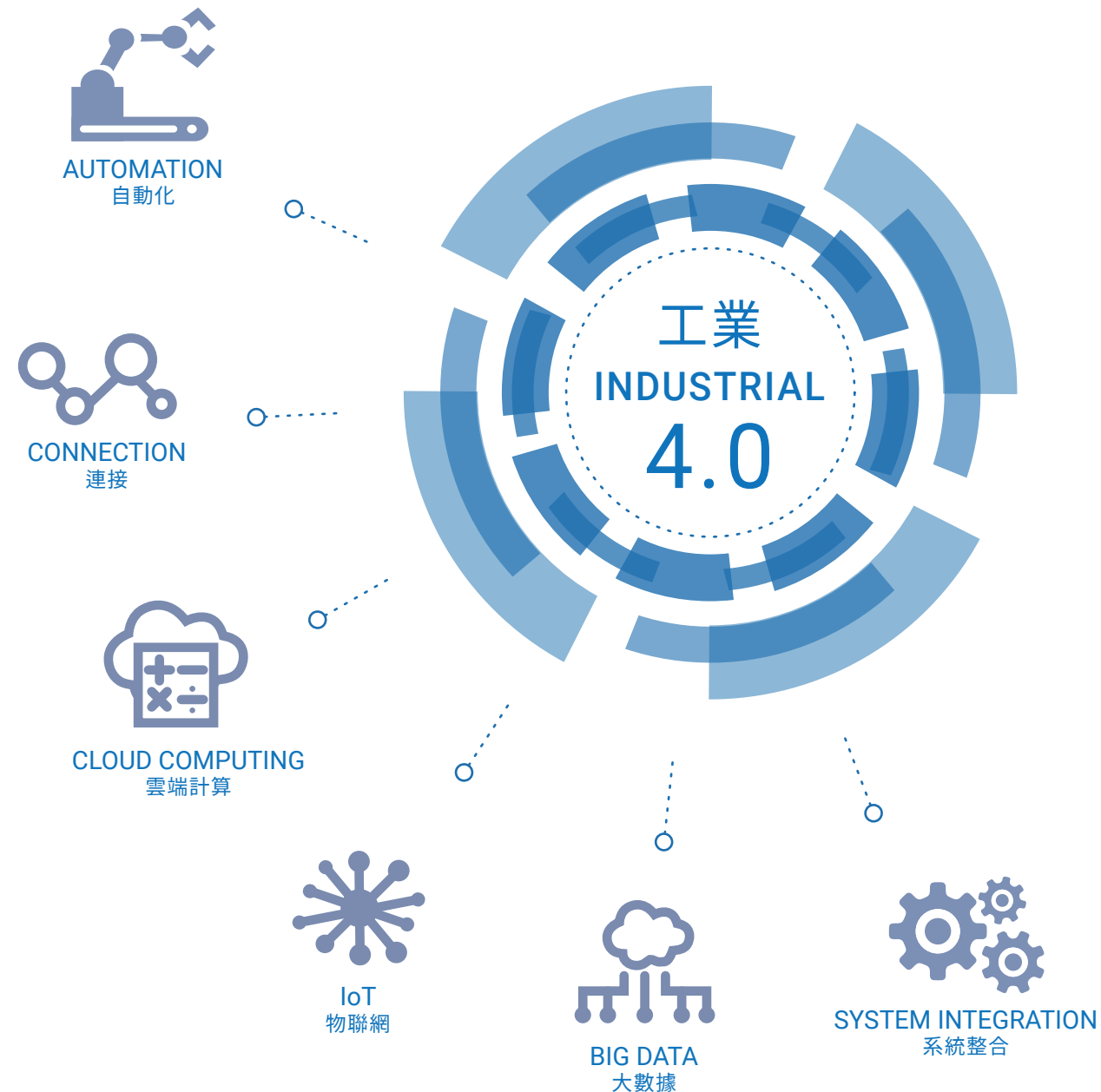
金屬製造業智慧製造解決方案

About DSA

Da Shiang Automation (DSA) is located in Guishan industrial park, Taoyuan Taiwan. With the Business philosophy of Innovation, Technical, Scientific Spirit to service customer, DSA has been growing continuously.

As a highly skilled system integrator in automation with software and hardware technical skills, DSA has more than 10 years experiences in Investment Casting, Sand Casting, Die Casting, Gravity Casting Process, Robotic Welding and Machine Tending etc.

In order to provide advanced smart automation solutions, DSA further integrated industry 4.0 concept to casting and machine tending operation to fulfill customers' expectations.



Our Services

Automation Service

- ▶ Investment Casting Process
精密鑄造製程
- ▶ Sand Casting Process
砂模鑄造製程
- ▶ Die Casting Process
壓力鑄造製程
- ▶ Gravity Casting Process
重力鑄造製程
- ▶ Post-Treatment of Machining & Casting
鑄造後處理製程
- ▶ Robotic Welding Process
機械手焊接製程
- ▶ Machine Automation Process
機械加工製程

Distribution

- ▶ **ABB** - Robotic
- ▶ **DSA** - Gantry Robot / Travelling Track for Robot Conveyor / HA Server / Flexible Gripper
- ▶ **Robotmaster** - Off-line Programming
- ▶ **OMRON** - AMR

AI & Intelligent Manufacturing Service

- ▶ Manufacturing Execution System
MES系統
- ▶ Smart Machine Box
SMB系統
- ▶ DS Intelligent Tool Management System
DSA智能刀具管理系統

Automated Storage-Retrieval System

- ▶ Automated Storage-Retrieval System
AS/RS自動倉儲系統

DTboost

- ▶ E-Bike Service
E-Bike電動輔助自行車事業

- ▶ **UNIVERSAL ROBOTS** - Collaborative Robots
- ▶ **BOOSTER** - Deburring / Grinding Polishing Tools
- ▶ **SCHUNK** - Grippers / Robot Parts

DSA provides turnkey and completed solution for casting process automation.

Wax Mold Process

- Automatic Wax Tree Assembly System
- Automatic Wax Cleaning System



Shell Mold Process

- Dipping and Coating Automation System
- Flexible Shell Mold Production System
- Rapid Infrared Drying System
- Vertical Conveyor Drying System
- Energy-Saving Constant Temperature and Humidity System

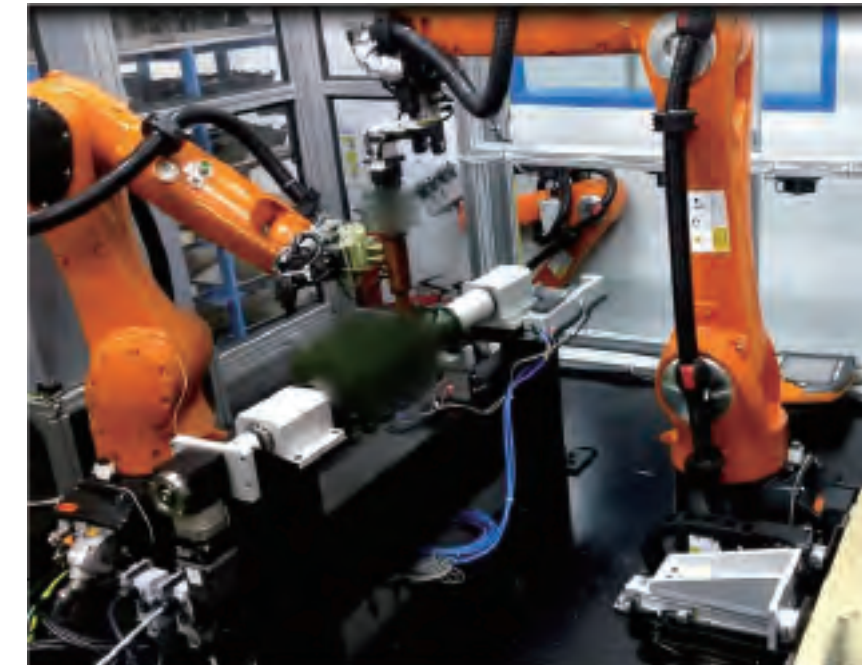


Casting Process



Automatic Wax Tree Assembly System

- ▶ 3D storage and tray feeding design for saving working space
- ▶ Robot cooperation makes the wax assembly process high efficiency
- ▶ Tool changing function makes the production flexible
- ▶ Customized gripper
- ▶ The soldering iron can be designed according to the wax mold with temperature control automatically
- ▶ The wax joint surface can be more solid and smooth by controllable soldering iron



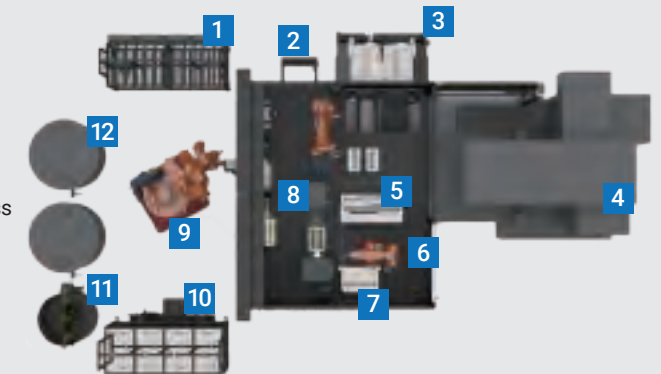
Automatic Wax Cleaning System

- ▶ The robot clean up the parting agent from wax tree after assembly
- ▶ Speed up the wax drying process
- ▶ Fully automatic production from wax molding process to wax tree assembly can save manpower and improve production efficiency



Layout of Automatic Wax Tree Assembly and Cleaning System

- | | |
|-------------------------------|------------------------------|
| 1 Cleaning Wax Rack | 7 Air Cleaning Box |
| 2 Robot Tool Change | 8 Assembly Wax Tree Rack |
| 3 Lifting Feeding Platform | 9 Robot for Cleaning Process |
| 4 Wax Injection Machine | 10 Mobile Wax Tree Rack |
| 5 Wax Tree Assembly Workbench | 11 Blowing Station |
| 6 Robot for Wax Tree Assembly | 12 Purge Tank |



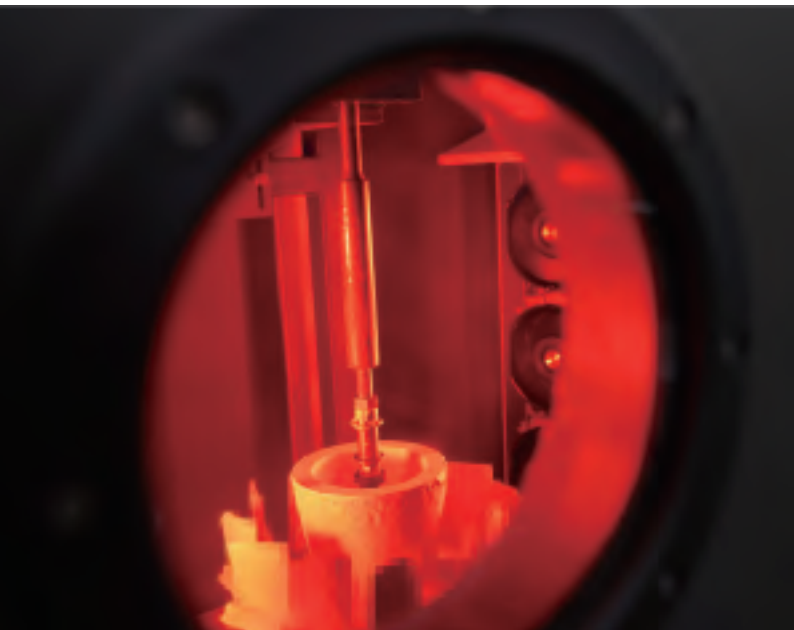
Dipping and Coating Automation System

- ▶ We provide the customized integrated system for slurry tanks, float and rainfall sanders, and conveyor...etc.
- ▶ Customized grippers
- ▶ More stable and labor saving
- ▶ Intelligent flexible production system: AI record offers tracking, process parameter setting, analysis and risk protection for various and small amount of products
- ▶ The integrated robot system combines with external axis to approach production flexible



Rapid Infrared Drying System

- ▶ Drying speed is 7 times faster than traditional process
- ▶ Relative humidity is able to reach the minimum of 5%
- ▶ Improve the quality and strength of the shell mold
- ▶ Equipped with the heat recycling system
- ▶ Friendly Human-Machine Interface
- ▶ Temperature error is $\pm 0.5^{\circ}\text{C}$ and humidity error is $\pm 3\%$
- ▶ Small batch production



Layout of Rapid Infrared Drying System

- 1 Rainfall Sanders
- 2 Trolley Conveyor
- 3 Rapid Infrared Drying System
- 4 Robot with Linear Units
- 5 Feeding Cart
- 6 Robot Equip with Searching Slurry level System
- 7 Slurry Tank



Flexible Shell Mold Production System

- ▶ The system identifies the state of the shell mold through RFID and automatically integrates the dipping, coating, and drying processes
- ▶ The AI management system offers automatic parameter setting for shell mold process
- ▶ Applied the RFID to the different rod, that makes the robot can automatically choose the corresponding program to process the operation to the mold
- ▶ Friendly HMI system providing operators easy to use
- ▶ Customized grippers

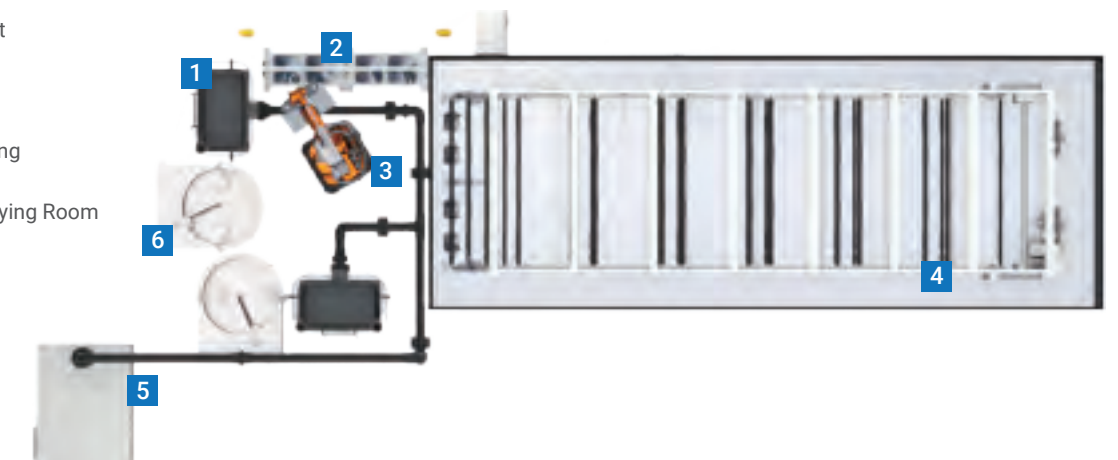


Vertical Conveyor Drying System

- ▶ Vertical conveyor drying room with flexible production can optimize the procedure of drying and saving space
- ▶ The shell mold can be dried faster and better quality by the design of the wind field

Layout of Flexible Shell Mold Production System

- 1 Sand Floating Bucket
- 2 Tending Rack
- 3 Robot for Shell Making
- 4 Vertical Conveyor Drying Room
- 5 Blower
- 6 Slurry Tank



1 Cold-Core Coating Automation System for Sand Casting

- ▶ The robot completes coating process to approach the goal of saving labor cost



2 Laser Marking Automation System for Sand Casting

- ▶ The robot is working with laser marking machine for marking process automatically



3 Dispensing & Molding Assembly System for Sand Casting

- ▶ Integrated dispensing & molding assembly sand-mold by robot
- ▶ Handling the sand-mold & deliver to next process



4 Screwing System for Sand Casting

- ▶ The system can control the screwing torque to complete screwing process.
The screwing automation system includes feeding and detecting sliding teeth function.



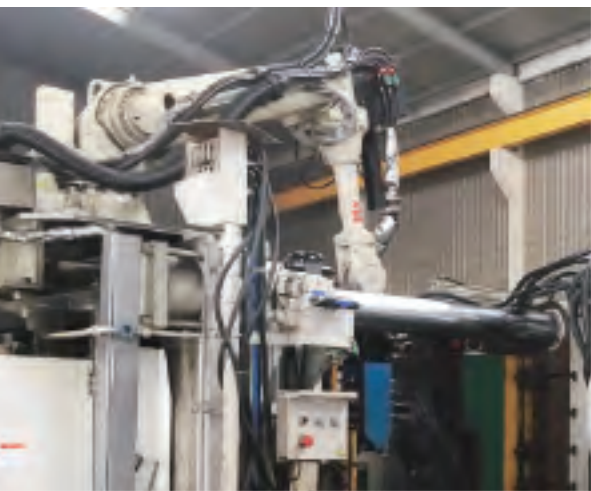
5 Handling System for Sand Casting

- ▶ The robot includes tool change function to handle the sand-core.
The sand core can be placed in a sandbox for delivery to the casting area for casting.



Automatic Die Casting System

- ▶ Replacing humans in high-risk environment
- ▶ Integrate several die-casting processes with robot
- ▶ We design a suitable gripper that can work in the high temperature environment

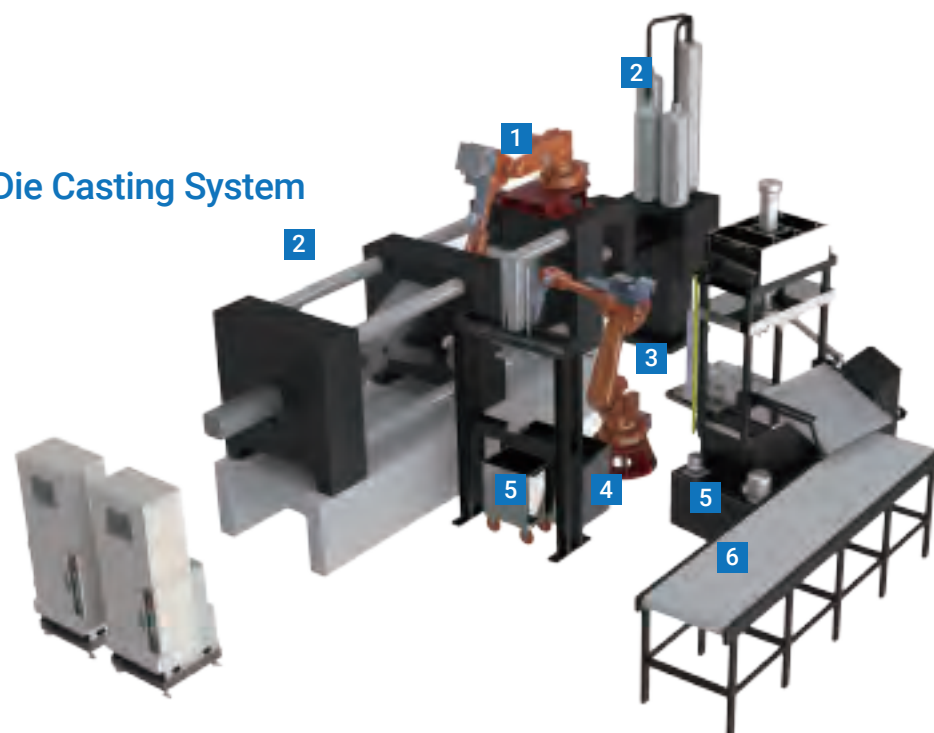


Mold Release Fluid Spraying for Die-Casting

- ▶ It sprays release agent in specific areas as requirement
- ▶ Controlling & cooling the mold temperature
- ▶ Well-distributed spraying & controlled spraying effect of the release agent level up the casting quality
- ▶ Saving the storage space of spraying nozzle module

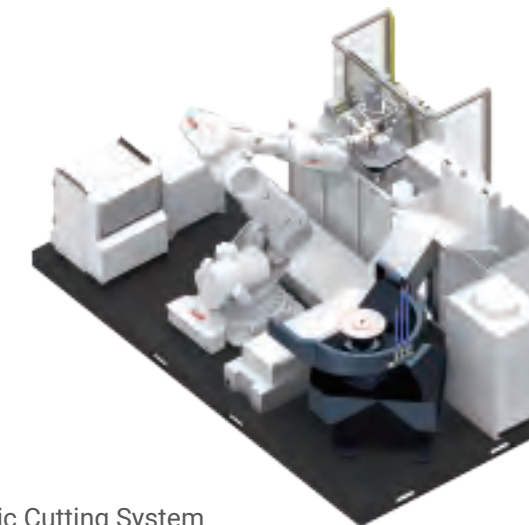
Layout of Automatic Die Casting System

- 1 Spraying Robot
- 2 Die-Casting Machine
- 3 Extraction Robot
- 4 Cooling Tank
- 5 Cutting Press Machine
- 6 Unloading Conveyor



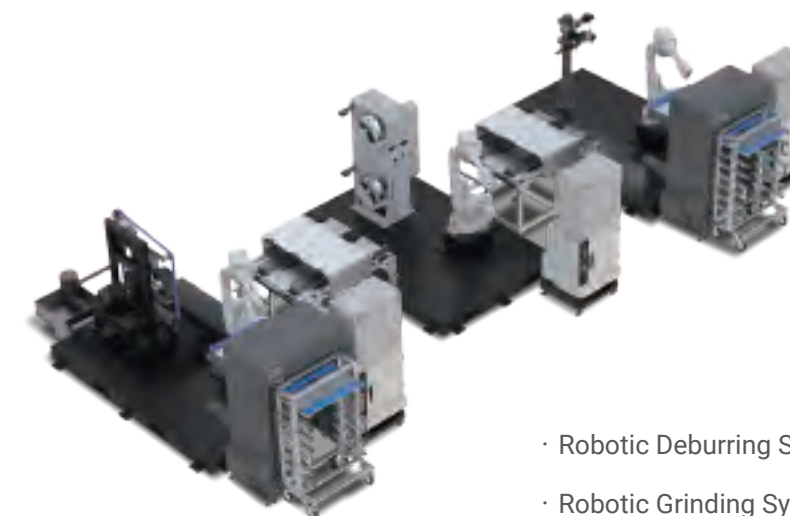
DSA provides turnkey and complete solution for post-treatment of machining & casting

Cutting



Robotic Cutting System

Deburring
&
Grinding

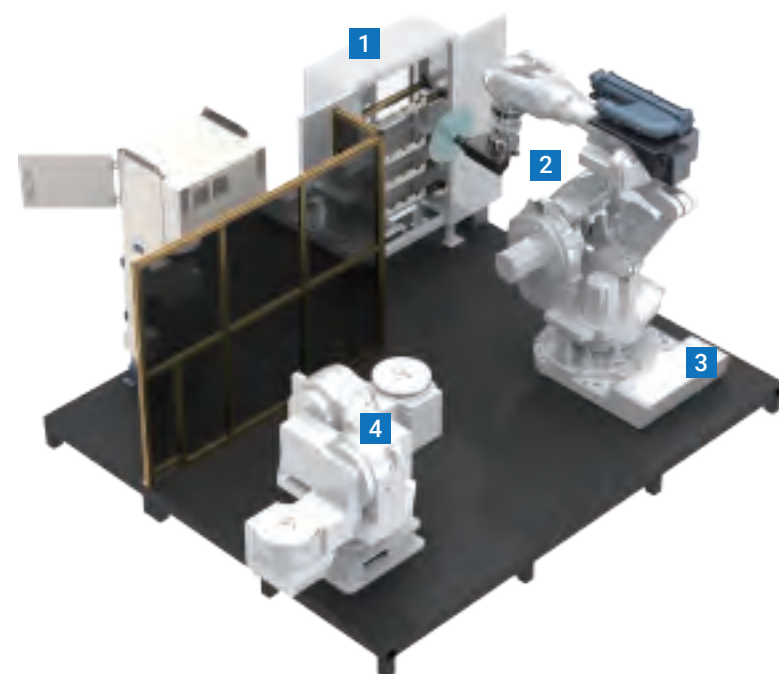


- Robotic Deburring System
- Robotic Grinding System

Sandblasting

Robotic Sandblasting System





- 1 Automatic Tool Magazine Storage
- 2 Cutting Spindle
- 3 Robot
- 4 Duplexed Rotary Positioner

Robotic Cutting, Deburring, Grinding Multi-function Machine

- ▶ Cutting and grinding
- ▶ With tool magazine, robot can change the tool automatically
- ▶ Intelligent monitoring system
- ▶ Increasing productivity, labor saving, safety
- ▶ With multi-axis positioner, the robot can work with multi-angle to make the processing without a blind spot
- ▶ With Force Sensor, the robot can control velocity and power accurately
- ▶ Application material: Aluminum, zinc

Modularized Grinding System

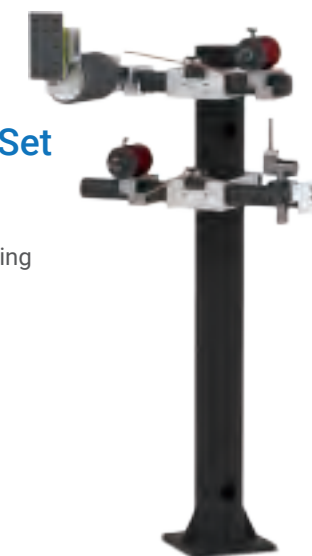
- ▶ Flexible modularization:
Various module options, e.g. deburring tool set belt grinder, flap wheel, etc
- ▶ Perfect for diverse production:
Processes can be flexibly planned and altered for various orders
- ▶ Complete multiple processes at once:
A one-stop station can combine deburring, surface sanding, grinding, polishing, etc

1 Deburring Tool Set

- ▶ Multiple options available:
Optimal deburring and grinding tools can be applied for different workpieces

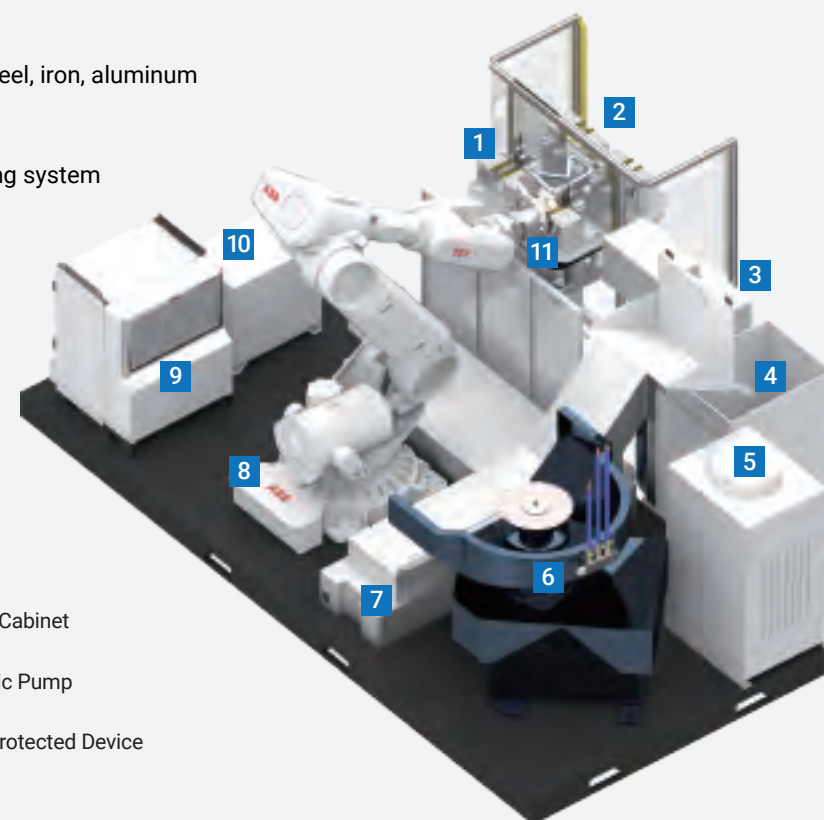
2 Modular Base

- ▶ Requiring no floor fixture and can be moved freely

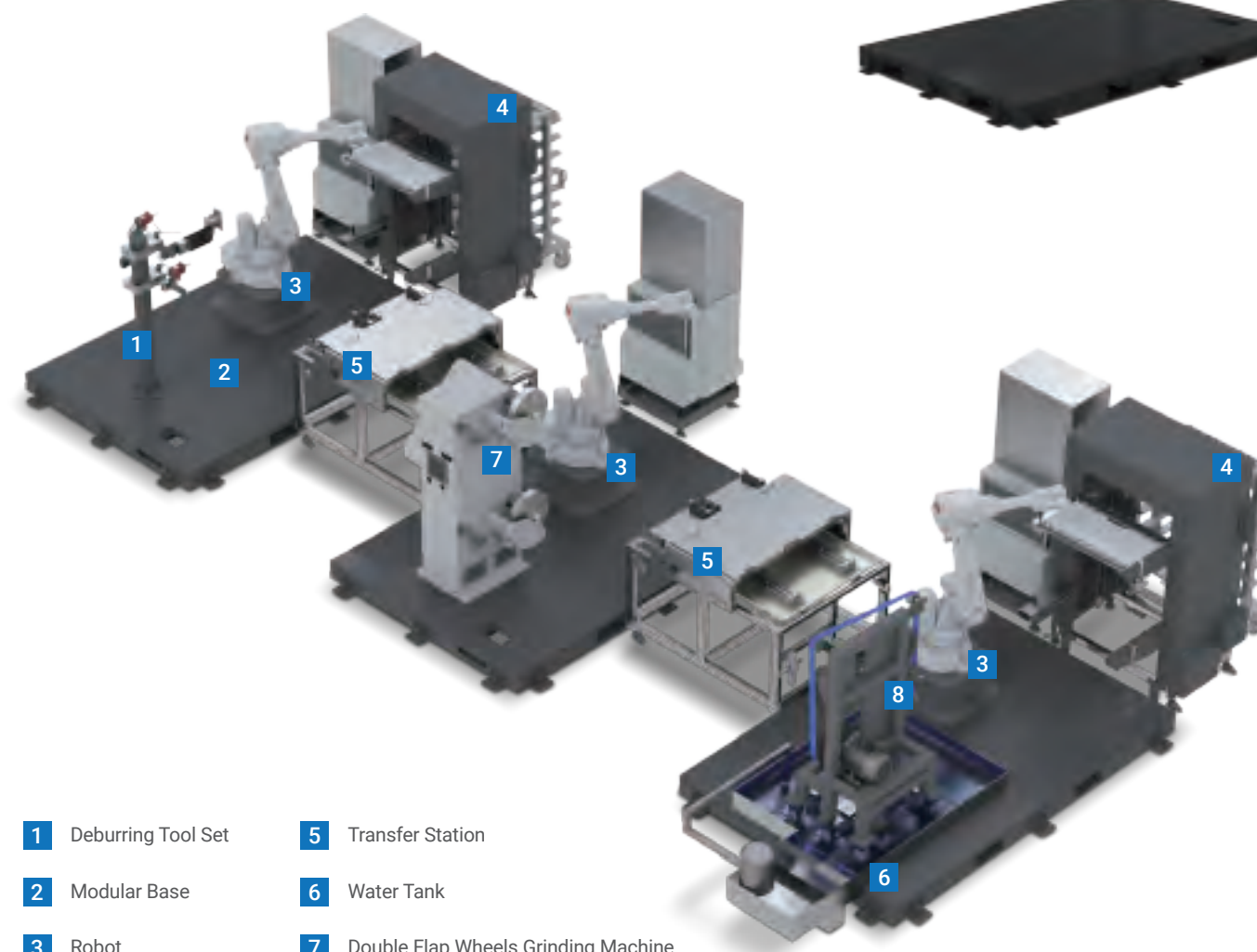


Gate, Riser & Runner Cutting Machine

- ▶ Automatic cutting
- ▶ Double station feeder
- ▶ Increasing proauctivity, labor saving, safety
- ▶ Applied material: Steel, iron, aluminum
- ▶ Intelligent monitoring system



- 1 Hydraulic Gripper
- 2 Rotary Feeder
- 3 Finished Product Unload Conveyor
- 4 Waste Tank
- 5 Oil Cooling Machine
- 6 Cutting Spindle
- 7 Cutting Fluid Cycled Sink
- 8 Robot
- 9 Control Cabinet
- 10 Hydraulic Pump
- 11 Robot Protected Device



- 1 Deburring Tool Set
- 2 Modular Base
- 3 Robot
- 4 Modular Loading Cart
- 5 Transfer Station
- 6 Water Tank
- 7 Double Flap Wheels Grinding Machine
- 8 Belt Grinder

3 Robot

Customized process combinations:
Including deburring, surface grinding,
and polishing processes

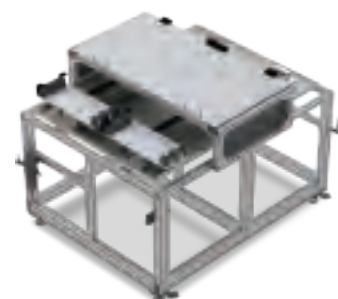


4 Modular Loading Cart

The FORK with carts stores workpieces
effectively. Quickly swapped carts require
less manpower

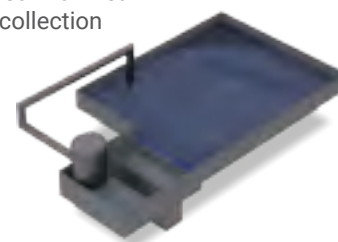


5 Transfer Station



6 Water Tank

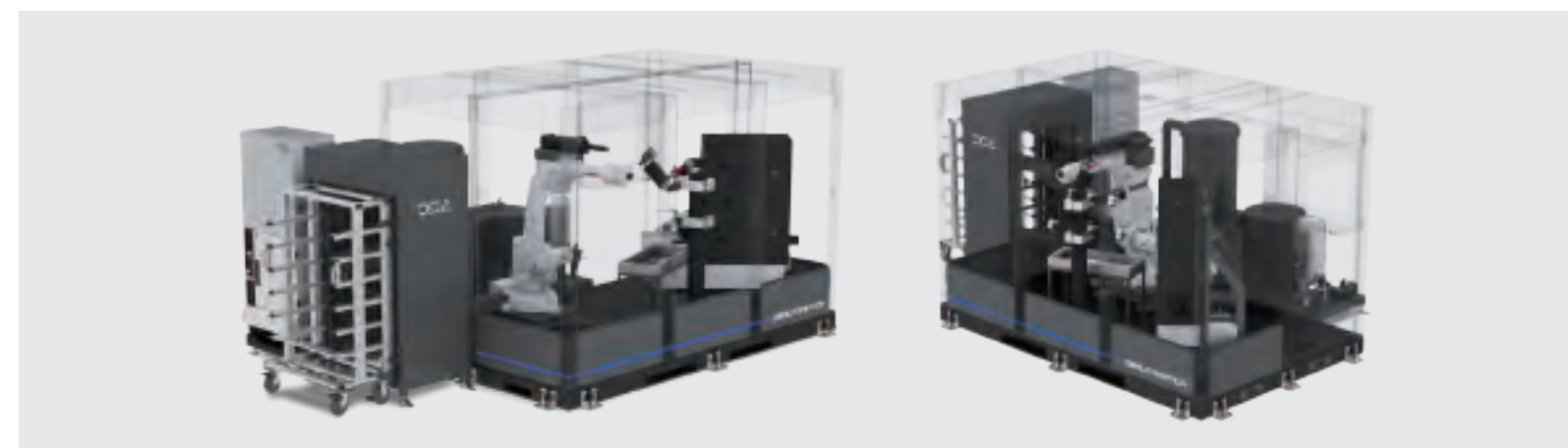
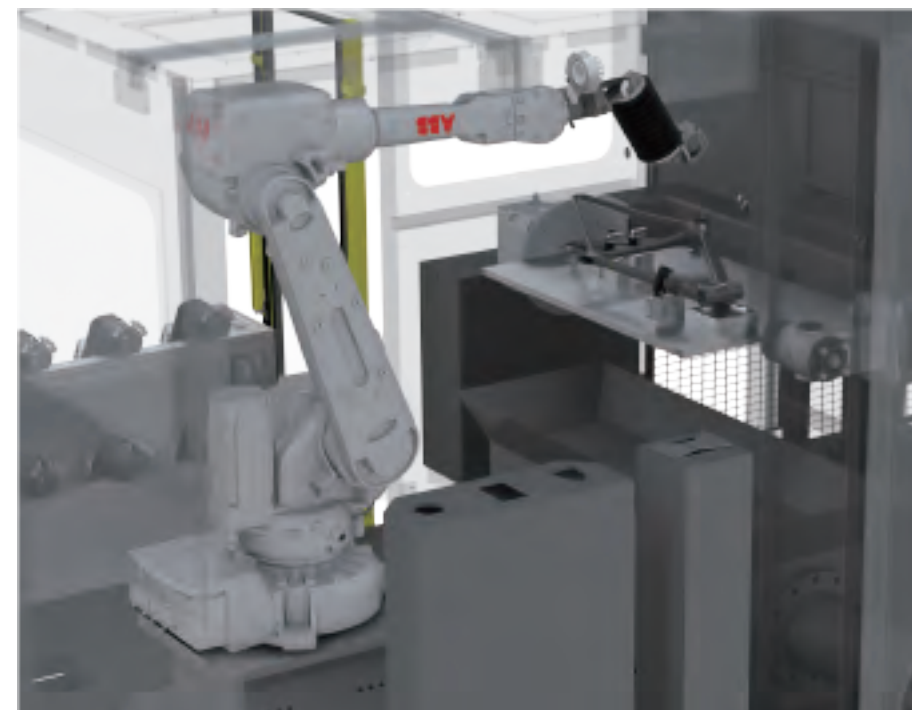
Active metal dust hazards
avoided with wet
dust collection



Deburring / Grinding System	7	8			
Device Name	Double Flap Wheels Grinding Machine	Belt grinder	Double Belt, Double Wheel	Double Belt, Large Single Wheel	Double Belt, Small Single Wheel
Rotational Speed (rpm)	1700	1700	1700	1700	1700
Kilowatt	3.7	3.7	3.7	3.7	3.7
Floating	No	Yes	Yes, no	Yes, no	Yes
Linear Speed	30 m/s	30 m/s	30 m/s	30 m/s	30 m/s
Features	It can be installed different grinding wheels. The AI system calculates the loss of grinding wheel automatically	Adjustable grinding force & belt tension	Adjustable grinding force & belt tension	Adjustable grinding force & belt tension	Adjustable grinding force & belt tension

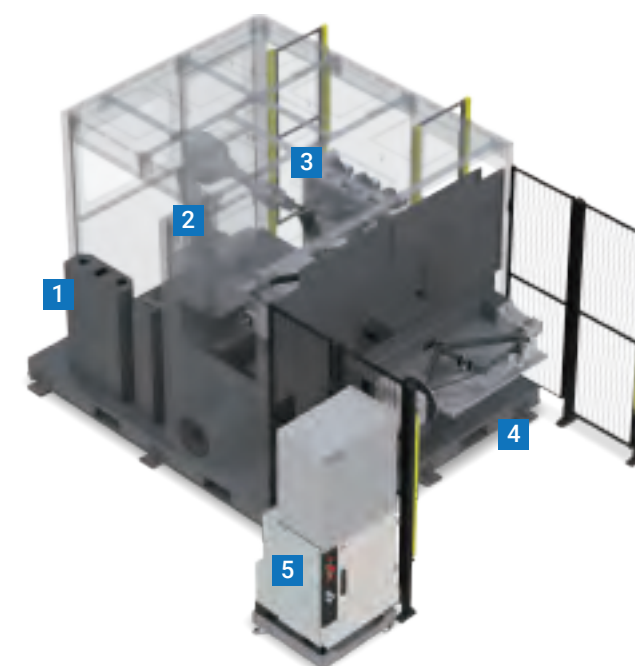
Robotic Grinding System

- AR integration enhances efficiency:
Tool Center Point (TCP) calibration
and the offline programming system
save time and stabilize quality
- Robotmaster off-line programming software
requires much less human intervention
- Optional auto sandpaper changer:
AI sandpaper changing reduce waste with
consistent performance
- Collect information with Smart Machine
Box (SMB), mastering the production and
facility status



Layout of Robotic Grinding System

- Auto Sandpaper Changer
- Robot
- Grinding Tool
- Base
- Electric Cabinet



Deburring / Grinding Tools					
	AC200	AC300	LC100	LC200	LC300
	Angle	Angle	Linear	Linear	Linear
	Pneumatic File	Pneumatic Mini Die Grinder	Air Spindle	Pneumatic Mini Die Grinder	
	5mm	6mm	3"	6mm	
	9k bpm	35k rpm	2500 rpm	35k rpm	
	0.1-0.5MPa	0.1-0.5MPa	0.2-0.5 MPa	0.1-0.5MPa	0.1-0.5MPa
	+/-5.5 degrees	5.5 degrees (one-sided)	12mm (one-sided)	10mm (one-sided)	10mm (one-sided)
Deburring / Grinding Tools					
	LS200	PC100	PC200	RC200	RC250
	Linear	Parallel	Parallel	Radial	Radial
		Pneumatic Angle Grinder	Electric Angle Grinder	Pneumatic Mini Die Grinder	Air Spindle
		4"	4"	3mm	6mm
		12k rpm	10.5k rpm	65k rpm	20000 rpm
	0.2-0.5MPa	0.2-0.5MPa	0.2-0.5MPa	0.1-0.5MPa	0.2-0.5MPa
	40mm (one-sided)	8mm (one-sided)	8mm (one-sided)	+/-3.5 degrees	+/-5 degrees
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
	6mm	5mm	5mm	Belt Width 24.5mm	
	25k rpm	9k bpm	3600 bpm	2800 bpm	
	0.1-0.5MPa	0.1-0.5MPa	0.2-0.5 MPa	-	
	+/-3.5 degrees	+/-3.5 degrees	+/-5 degrees	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	
Deburring / Grinding Tools					
	RC300	RCF200	RCF250	Small Belt Grinder	
	Radial	Radial	Radial	-	
	Pneumatic Mini Die Grinder	Pneumatic File	Air File	-	

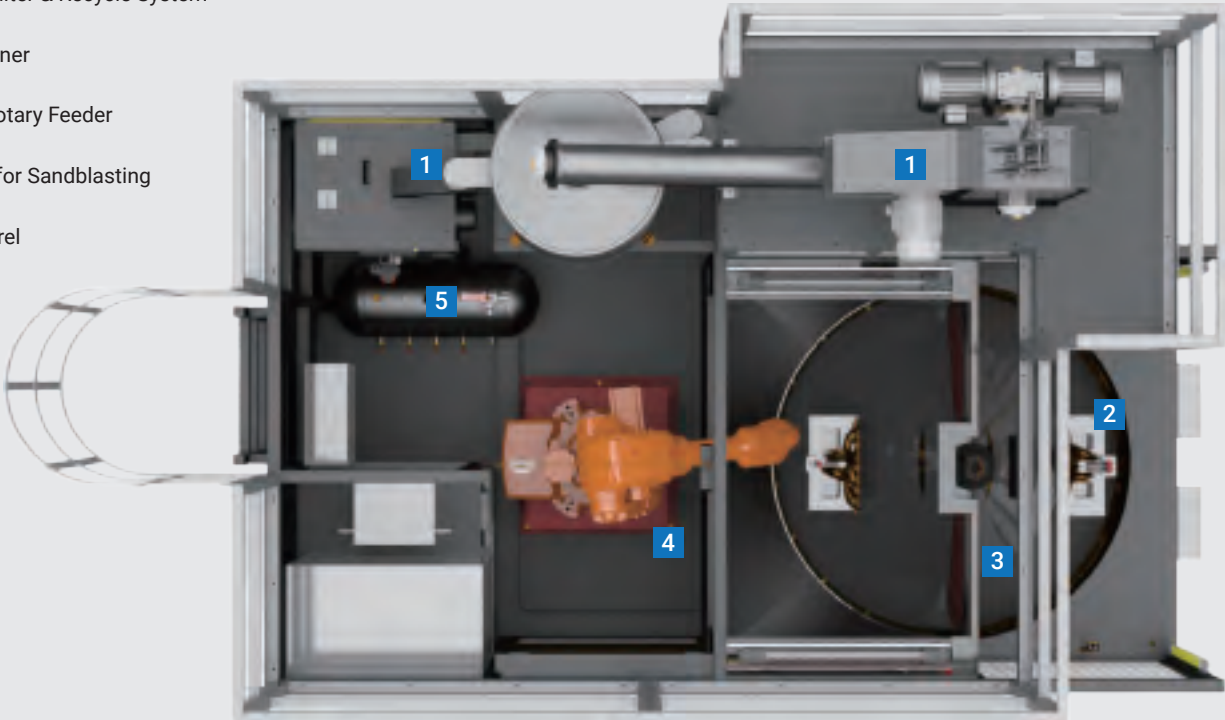


Robotic Sandblasting System

- ▶ Robot integrated with sandblasting system enhances the quality and save labor; it can be also integrated with 2nd robot for load / unload to approach automation production
- ▶ The robot system unlimited sandblasting working range and enhance the quality
- ▶ The sandblasting system modulized to approach the goal of moving and adjustment easily
- ▶ The system adjust the pressure of spraying gun and the spraying rate to position accurately by programing
- ▶ Friendly interface, monitor work and error status

Layout of Robotic Sandblasting System

- 1 Sand Filter & Recycle System
- 2 Positioner
- 3 Dual Rotary Feeder
- 4 Robot for Sandblasting
- 5 Air Barrel



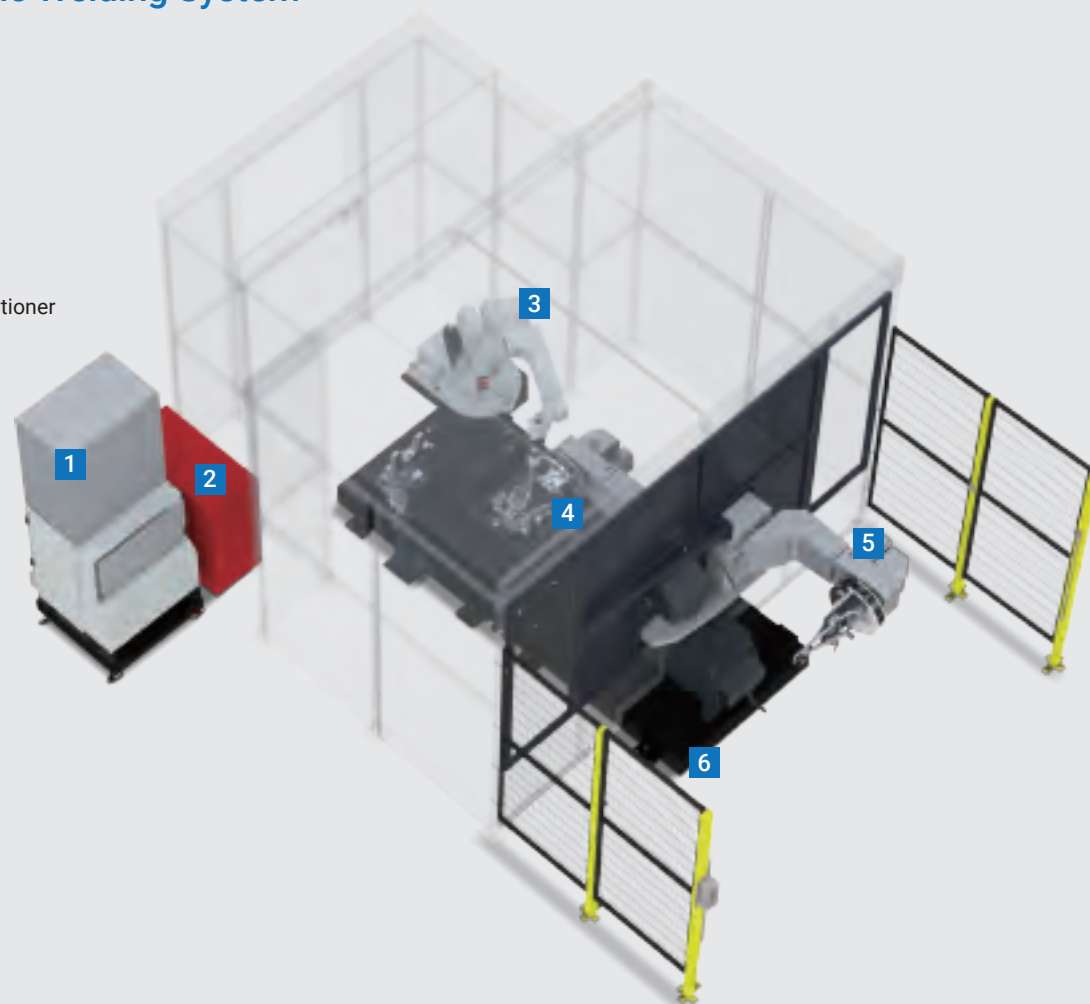


The Robotic Welding System for Aluminum Alloys

- ▶ Integrated with robot and Robotmaster as cyber physical system for preview the simulation. Not only time saving for programming adjustment and increasing efficiency but also making quality more stable. Added TCP auto adjustment system that DSA self-developed software to enhance the efficiency for robot and off-line program software synchronization.
- ▶ Integrated multiple axis turntable can do machining by different angles mean while without blind spot.
- ▶ The 2 stations positioner design will speed up the loading and unloading operations

Layout of Robotic Welding System

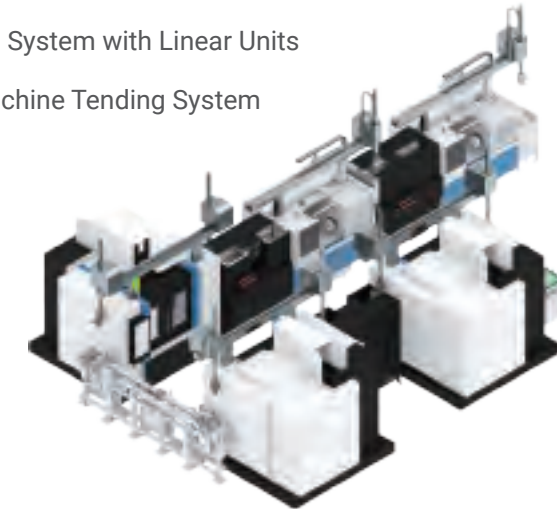
- 1 Electric cabinet
- 2 Welding machine
- 3 Robot
- 4 Fixture
- 5 Duplexed rotary positioner
- 6 Modular base



DSA provides turnkey and complete solution for machining automation

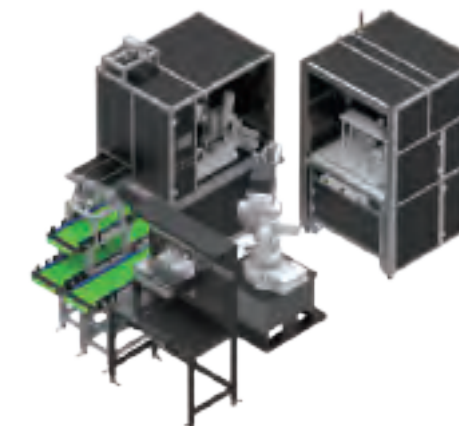
Machine Tending

- CNC Machine Tending System
- Machine Tending System with Linear Units
- Modular CNC Machine Tending System
- Gantry Robot



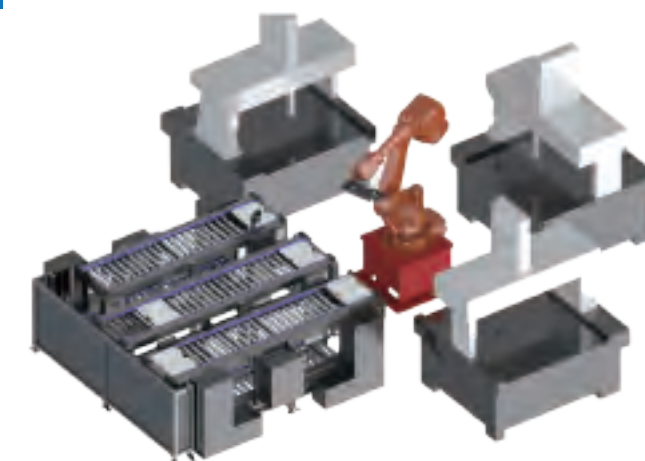
End of Line Machining Automation

Ended-line



Coordinate Measuring

CMM Automation System



CNC Machine Tending System

- ▶ CNC process automation
- ▶ Customized gripper
- ▶ Integrated with storage feeder system makes production flexible
- ▶ Labor & cost saving
- ▶ Integrated with different robots in machine tending



Storage Feeder

- ▶ Saving space
- ▶ Switch lifter, saving feeding time
- ▶ The modularized cart is not only convenient to move but also easy to integrate with AGV
- ▶ Function: Customized conveyor of suitable size according to conveying demand
- ▶ Application: All kinds of medium and small sizes object



Layout of CNC Machine Tending System

- 1 Robot
- 2 CNC Machine
- 3 Storage Feeder
- 4 Unloading Belt Conveyor



Machine Tending System with Linear Units

- ▶ Enhance productivity by automation
- ▶ Automation design and turnkey project
- ▶ Wide working range with external axis
- ▶ Providing appropriate automation solution
- ▶ Approaching real-time monitor and equipment status analysis by adding on DSA SCADA SMB system
- ▶ Introducing automatic production scheduling to achieve the best production efficiency



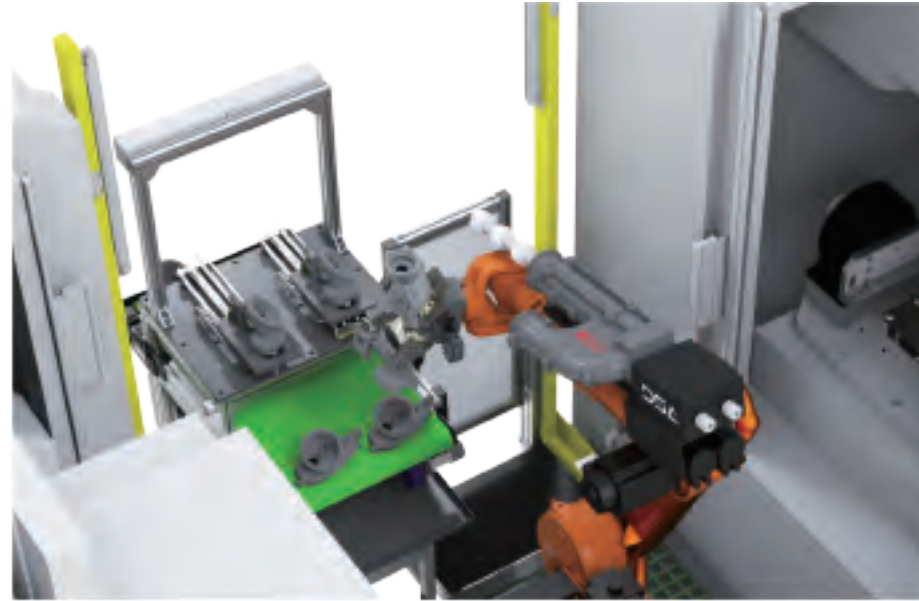
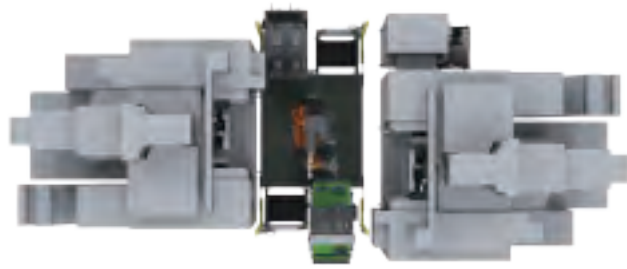
Layout of Machine Tending System with Linear Units

- 1 Machine Tending Robot
- 2 Cleaning, Air Blowing Tank
- 3 Inspection Station
- 4 Unload Belt Conveyor
- 5 CNC Machine
- 6 Transfer Station
- 7 Storage Feeder



The Modular CNC Machine Tending Design

- ▶ The 2-ton cast base can be set and move flexibly according to the production
- ▶ Support small quantity and diversified production
- ▶ The friendly interface makes it easy to use
- ▶ It is easier to duplicate the production
- ▶ Gain advantage on pricing
- ▶ Safety design for robots: Including safety light curtains, fences, switches, and other safety components.



- ▶ Standard :
Feeder, inspection station, unload belt conveyor, and safety components.
- ▶ Optional :
1. Grippers and upload fixtures can be designed by the customer or DSA
2. Automatic machine and customized fixtures

The Modular Machine Tending Design

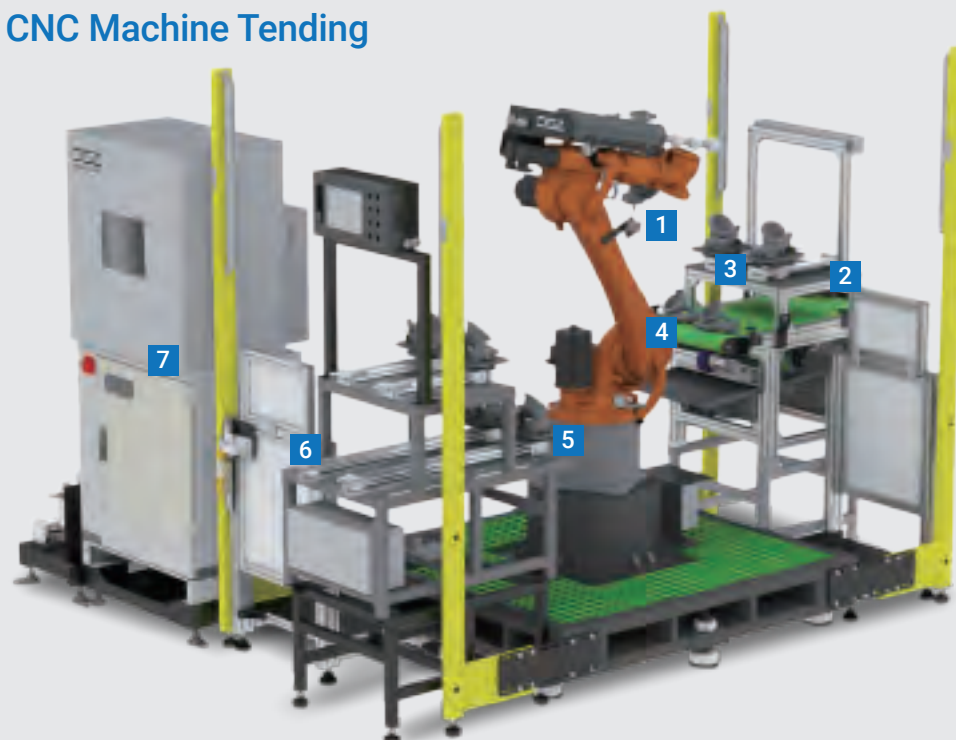
- ▶ The 1-ton base can be set and move flexibly according to the production
- ▶ Support small quantity and diversified production
- ▶ The friendly interface makes it easy to use
- ▶ It is easier to duplicate the production
- ▶ Gain advantages on pricing
- ▶ Safety design for robots: Including safety fences, lidar sensors, and other safety components



- ▶ Standard :
Modular loading cart (multi-layer rack to place workpieces) and safety components.
- ▶ Optional:
1. Vision system for faster calibration of the robot position
2. Automatic machine and customized fixtures
3. Gripper can be designed by the customer or DSA
4. With AGV for automated material handling, making operation more efficient

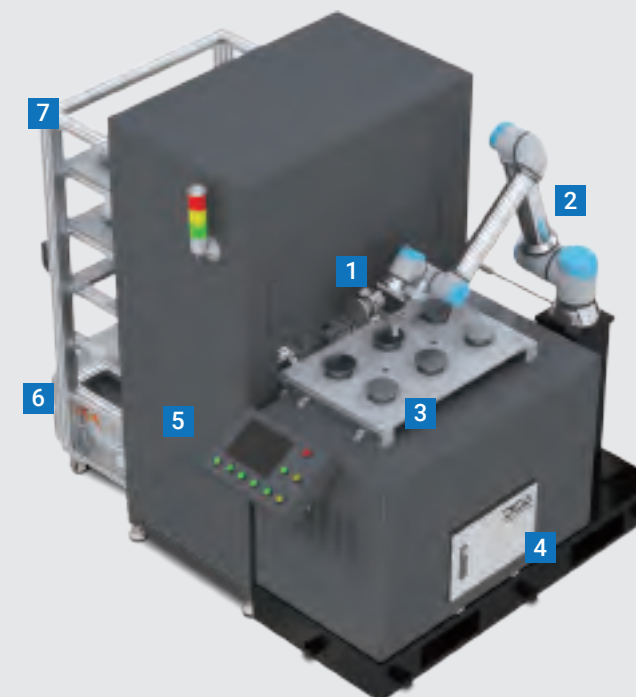
Layout of Modular CNC Machine Tending

- 1 Gripper
- 2 Upload Feeder
- 3 Fixture
- 4 Unload Belt Conveyor
- 5 Robot
- 6 Inspection Station
- 7 Electric Cabinet



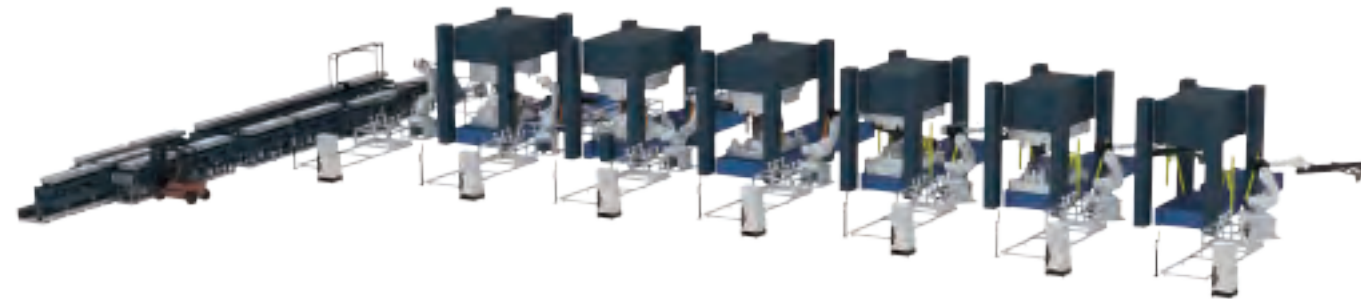
Layout of Modular Machine Tending

- 1 Gripper
- 2 Robotic
- 3 Fixture
- 4 Electric cabinet
- 5 Automatic tray dispenser
- 6 AMR
- 7 Modular loading trolley

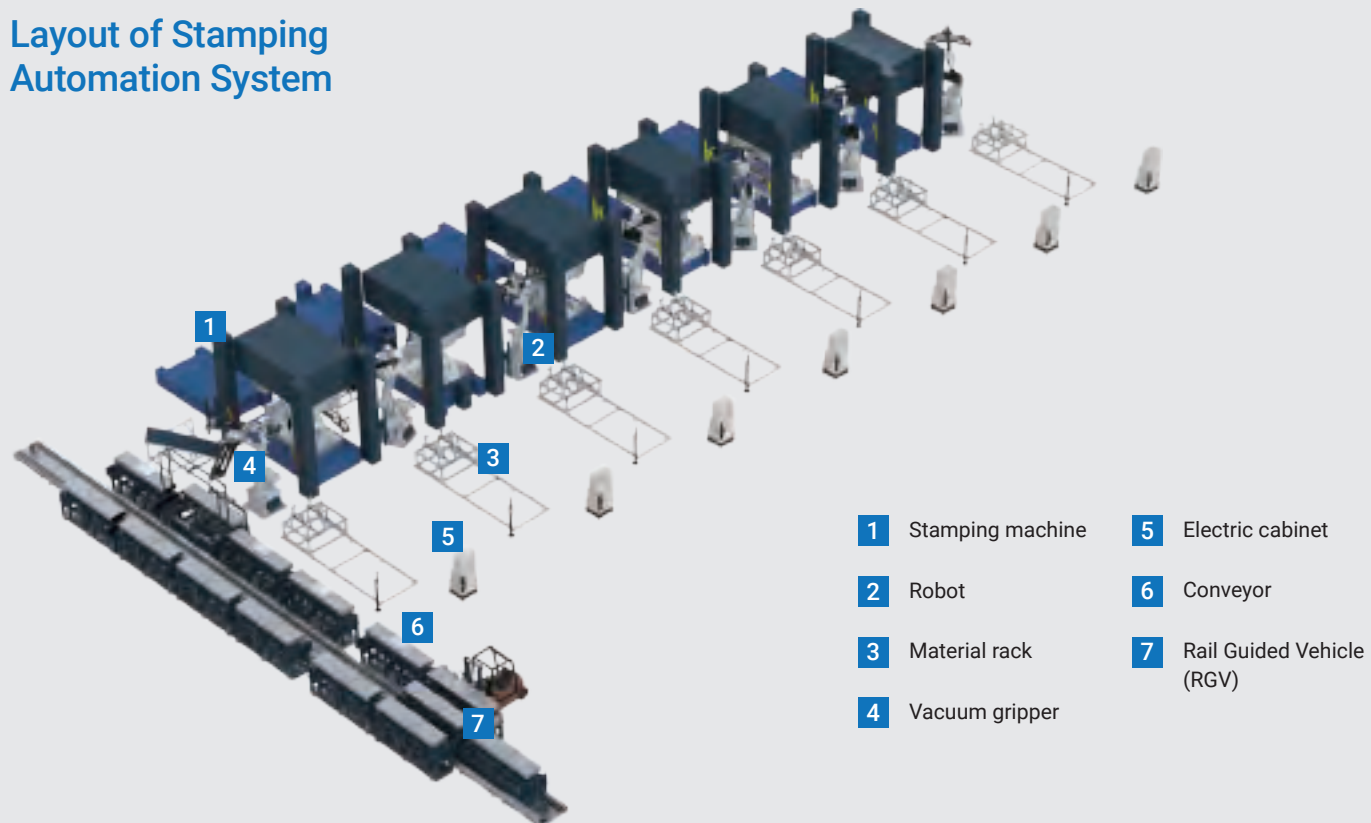


Automated Loading and Unloading Stamping System for Sheet Metal

- ▶ The system integrates stamping machines, molds, and peripheral conveyors through robots to automate common stamping processes, helping customers increase productivity, reduce labor, and improve production line safety
- ▶ AI-monitored system analyzes production and equipment data to improve efficiency, quality, and cost by managing molds, sheet metal inventory, and avoiding supply chain interruptions



Layout of Stamping Automation System



Gantry Robot

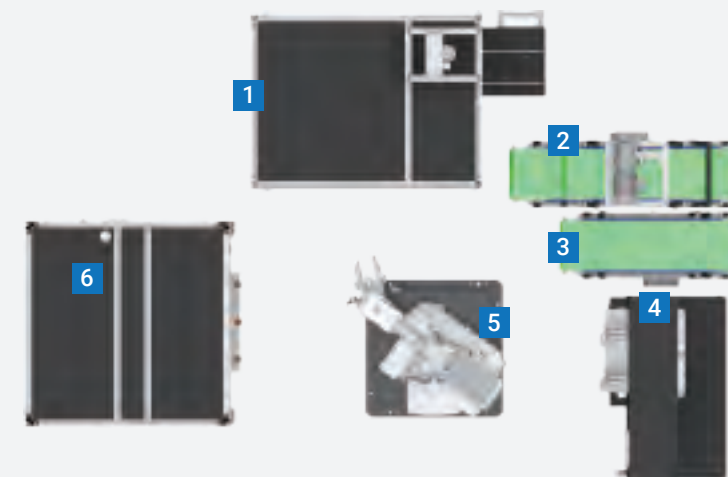
- ▶ Customized X, Y, Z Axis work range
- ▶ Payload 40kg
- ▶ C-Axis is optional
- ▶ Automatic oil injection system
- ▶ Mitsubishi servomotor
- ▶ Teach panel is optional
- ▶ Mitsubishi PLC
- ▶ Gantry robot can be integrated with load / unload, storage and transfer modules

End of Line Machine Automation

- ▶ Integrating after machining process such as deburring, measurement, leak detection, cleaning, assembly, and laser marking
- ▶ Design and plan ended-line automation
- ▶ Integrating the vision system to reduce fixture using to approach production flexibility
- ▶ Deburring system with DSA/Booster tools control the floating force precisely and avoid overcutting



Layout of End of Line Machine Automation



- | | |
|------------------------|-----------------|
| 1 Assemble Machine | 4 Upload Feeder |
| 2 NG Belt Conveyor | 5 Robot |
| 3 Unload Belt Conveyor | 6 Leak Detector |

DSA Gantry Robot and Travelling Track for Robot

- ▶ With ±0.02mm repeatability
- ▶ Servo control
- ▶ Rack and pinion drives

DTG Single-beam 3-axis Gantry Robot				
Model	DTG - 15	DTG - 40	DTG - 150	
Max. Payload	15 kg	40 kg	150 kg	
Max. Speed for X, Y, Z Axis	120, 90, 90 m/min.	120, 90, 60 m/min.	60, 60, 42 m/min.	
Max. ACC. Speed for X, Y, Z Axis	2, 3, 5 m/s²	2, 3, 3 m/s²	1, 2, 1 m/s²	
DHG Double-beam 3-axis Gantry Robot				
Model	DHG - 15	DHG - 40	DHG - 150	DHG - 400
Max. Payload	15 kg	40 kg	150 kg	400 kg
Max. Speed for X, Y, Z Axis	150, 150, 120 m/min.	120, 120, 75 m/min.	60, 60, 42 m/min.	60, 60, 36 m/min.
Max. ACC. Speed for X, Y, Z Axis	2, 5, 10 m/s²	2, 4, 3 m/s²	1, 2, 1 m/s²	1, 2, 1 m/s²
DHG Double-beam 3-axis Gantry Robot				
Model	DHG - 1000	DHG - 2500		
Max. Payload	1000 kg	2500 kg		
Max. Speed for X, Y, Z Axis	42, 42, 30 m/min.	42, 42, 30 m/min.		
Max. ACC. Speed for X, Y, Z Axis	1, 1, 0.5 m/s²	1, 1, 0.5 m/s²		
DGT Travelling Track for Robot				
Model	DGT - 300	DGT - 900	DGT - 2000	DGT - 3000
Max. Capacity to Carry Robot	300 kg	900 kg	2000 kg	3000 kg
Max. Speed to Carry Robot	180 m/min.	150 m/min.	150 m/min.	120 m/min.
Max. ACC. Speed to Carry Robot	8 m/s²	4 m/s²	3 m/s²	3 m/s²

CMM Machine Tending Automation System

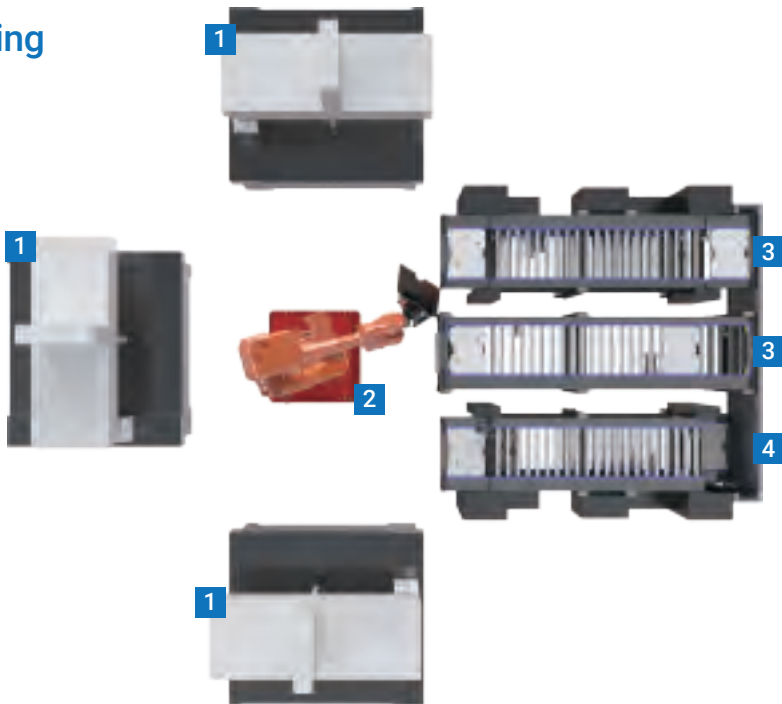
- ▶ Flexible pallet with RFID, barcode or vision system can apply in mixed lines
- ▶ Integrating Mitutoyo or Zeiss's CMM and the main PC can receive measurement results from client CMM
- ▶ PLC system controls the CMM to achieve measurement automatically.
- ▶ The workpiece can be uploaded via conveyor or storage rack by user request

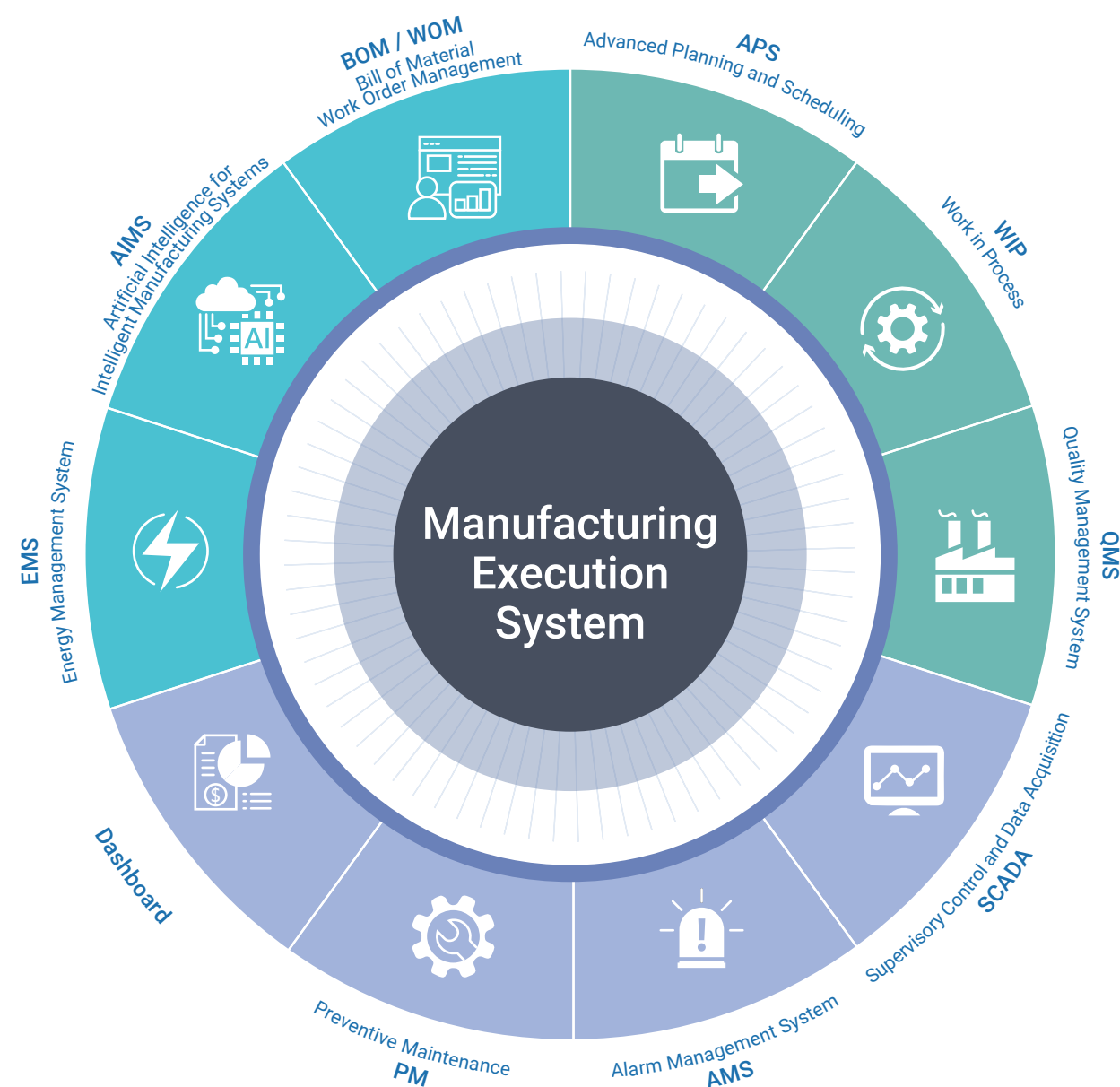


- ▶ Integrating with vision system, Qrcode or RFID reader , the system can select corresponding program to measure different types of products and make CMM more flexible

Layout of CMM Machine Tending Automation System

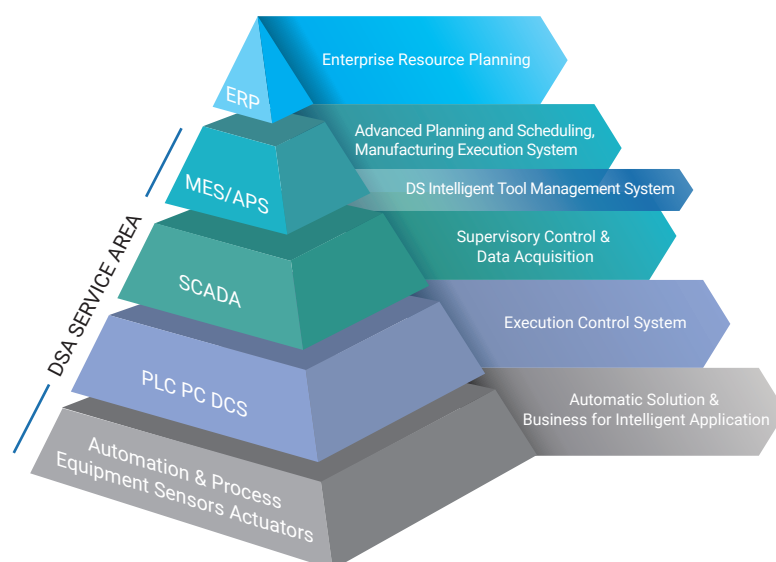
- 1 Coordinate Measuring Machine
- 2 Robot
- 3 Unload Conveyor
- 4 Upload Conveyor





Manufacturing Execution System

- ▶ DSA can integrate automated production line and production equipment status via control units such as SMB, PLC, and DCS
- ▶ HA, High Availability system architecture, offering highly reliable server operation
- ▶ Enhancing productivity and controlling operation status by optimize scheduling and key process monitoring
- ▶ Designing and planning the job report system for operation process helps users monitor and control productivity process
- ▶ Getting important information by real-time monitoring



System Functions

- ▶ **Systematic Management**
 - ◇ Material and warehouse management
 - ◇ Order management
 - ◇ Production recipe management
- ▶ **AI Production Scheduling**
 - ◇ Automatic scheduling
 - ◇ Order and production scheduling
- ▶ **Job Report System**
 - ◇ Designing job report system by user process
 - ◇ Controlling production status according job report system
- ▶ **Tracking WIP Real-time Status**
 - ◇ Input and output statistics
 - ◇ Progress management
 - ◇ Yield statistics
- ▶ **Customized Board with Real-time Display for Factory Production Status**
- ▶ **Real-time Monitoring Equipment Information**
 - ◇ Equipment OEE
 - ◇ Health diagnosis
 - ◇ Important real-time information
- ▶ **Maintenance Reminder**
 - ◇ Maintenance checklist
 - ◇ Maintenance intelligent alarm
- ▶ **Analysis Error and Feedback**
 - ◇ Error alarm and analysis





Power System Monitor

- ◇ Time period energy analysis
- ◇ Peak power consumption statistics
- ◇ Optimal contract capacity suggestion

Smart Machine Box (SMB) Integration Application

Friendly UI design:

Big data are simplified, digitalized, systemized and visualized, easy for users to read and grasp key information

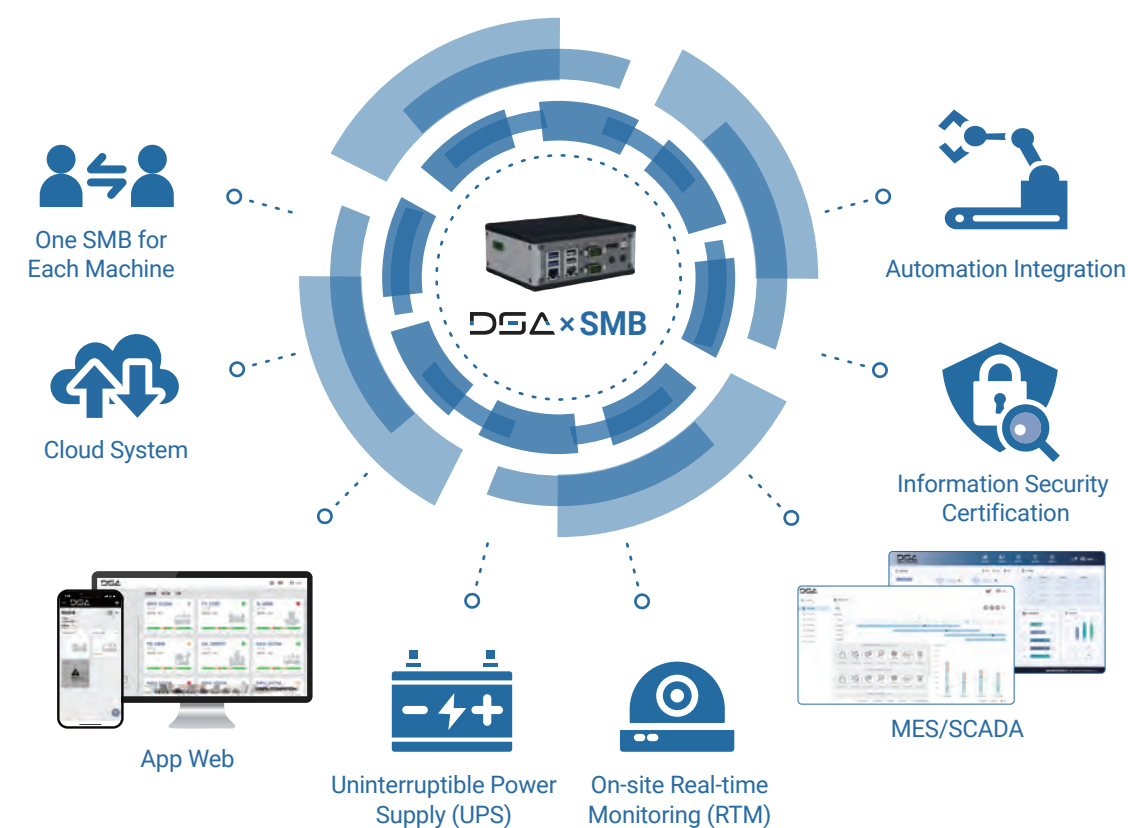
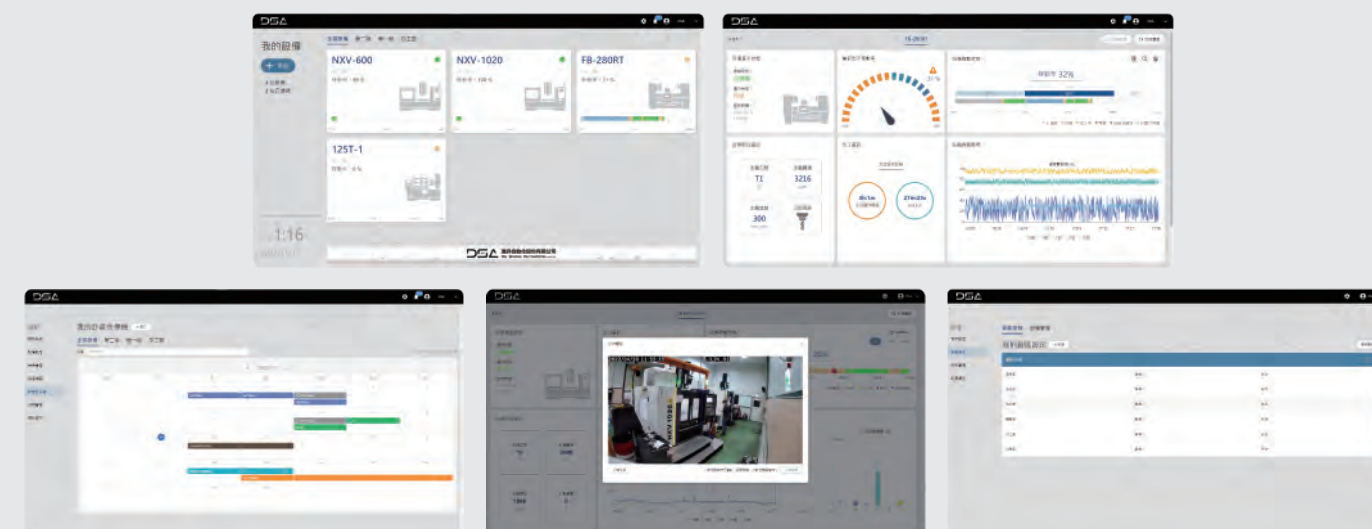
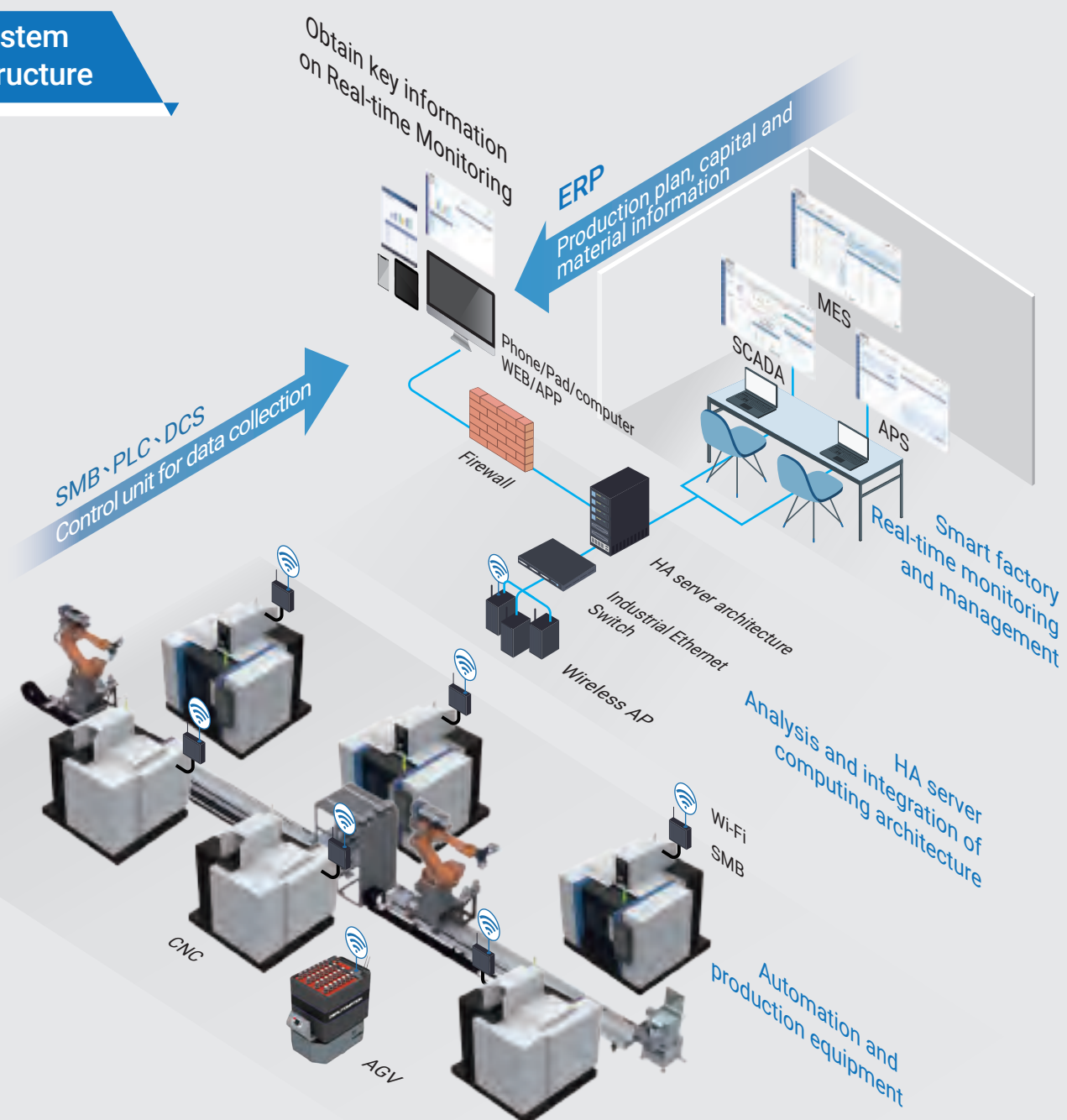
Customizable factory areas and workpiece serial numbers:
Facilities can be grouped with customizable serial numbers for systematic monitoring

Real-time monitoring, effective management:

DSA SMB system provides app/ web monitoring mechanism, to check machine operations and on-site situations through tablets or mobile phones

Amazing solutions, easy to enter Industry 4.0

System Structure



System Effects

- ▶ Effectively manage tool inventory
- ▶ Improve tool lifecycle and reduce the risks of collision by correctly controlling and configuring the tools
- ▶ Labor saving for tool management
- ▶ Configure tools via operation plans and integrate Production Management System (PMS)
- ▶ Reduce the movement of people for changing tools and then achieve the effect for saving the labor cost
- ▶ Reduce the manual works of tool usage record and analyze tools lifecycle via tool usage record



DS Intelligent Tool Management System

- ▶ Tool purchasing information
- ▶ Tool inventory management
- ▶ Machine tool magazine information
- ▶ Configure tools via operation plan
- ▶ Tool and machining process cost calculation
- ▶ Tool usage record
- ▶ Tool inspection system
- ▶ Tool purchase suggestion
- ▶ Automatic correction of machine tools

Intelligent system monitoring and management



DS Intelligent Tool Warehouse

- ▶ Intelligent production tool configuration: Planned production based on automatic configuration of DS Intelligent Tool Warehouse and DITC Warehouse
- ▶ Intelligent tool access and classification: Tools can be automatically classified and stored according to their types, and automatically accessed according to requirement



DS Intelligent Tool Cart (DITC)

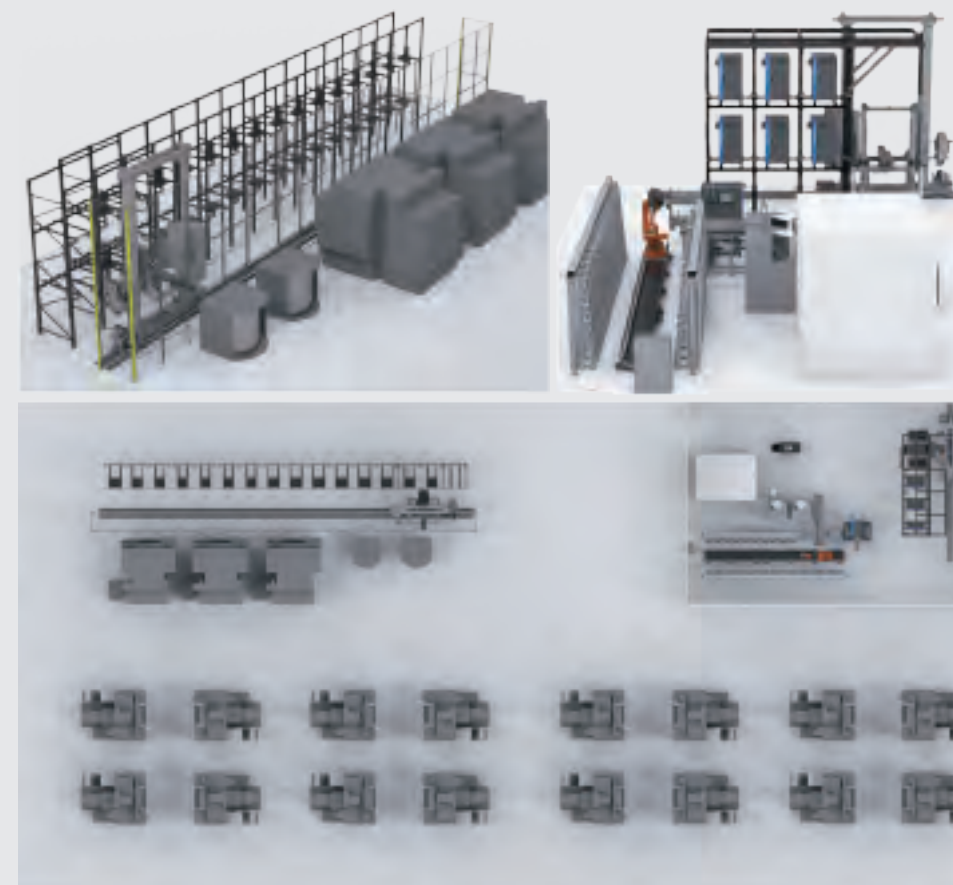
Cloud intelligent management for tool change process flow

- ▶ Cloud system management of tool information
- ▶ Real-time display and search the data of DITC and CNC machine status from PAD
- ▶ Fleet manager for AGV tool cart
- ▶ There is no change in the original usage habits
- ▶ Wi-Fi network architecture



System Flow

- ▶ 1. Tool assembly and measurement
- ▶ 2. RFID data login
- ▶ 3. Tool storage
- ▶ 4. Configure tool to DITC
- ▶ 5. DITC storage
- ▶ 6. Fleet manager
- ▶ 7. Tool change
- ▶ 8. Recycle to storage



Automated Storage-Retrieval System (AS/RS)

- ▶ Crane and fork mechanism provides smart access to goods
- ▶ Better convenience through the AGV and reducing manual work
- ▶ Combined with the warehouse management system (WMS) and control system (WCS), enhancing productivity and efficiency of storage management
- ▶ Vertical storage minimizes space and improves production rate per space
- ▶ Integrated all storage management operations, reducing errors and inventory costs, and brings more advantage
- ▶ Integrated with DSA CNC machine tending system, building flexible manufacturing system (FMS)



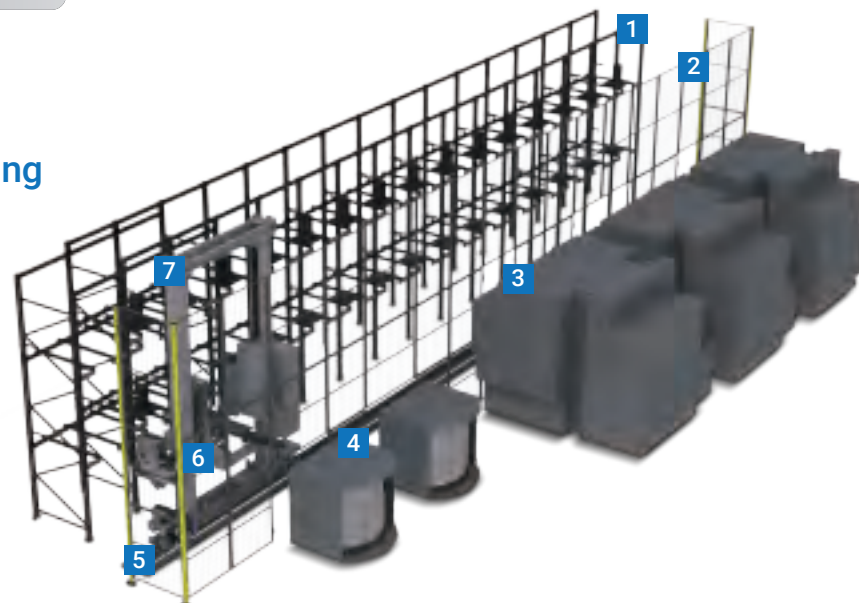
Warehouse Control System (WMS)

- ▶ Monitors the material flow, storage management and dispatcher system with DSA MES, using every last inch of the warehouse
- ▶ Improves performance through web/ APP programming and RFID/ barcode scanning devices
- ▶ Combined with APS and SCADA for real-time status and situation reports, avoiding material interruption




Layout of Flexible Manufacturing System, FMS

- | | |
|-------------------------|---------|
| 1 Vertical Storage Rack | 5 Fork |
| 2 Safety Fences | 6 Crane |
| 3 CNC Machine | |
| 4 Feeding Conveyor | |



Service Point

- ▶ **Taoyuan, Taiwan**
No. 31, Xingbang Road, Guishan District, Taoyuan City
330桃園市桃園區興邦路31號
- ▶ **Tianjin, China**
No. 2 Jin Fa Rd. Shang Ma Tai Industrial Area,
Wu Qing District, Tianjin,P.R.China
中國天津市武清區上馬台鎮金發路2號
- ▶ **France**
21 Av. Gaston Renaud, 25340 Pays-de-Clerval

- ▶ **Binh Duong, Vietnam**
S11- CHUNG CƯ VẠN XUÂN BÌNH DƯƠNG 26 Đại lộ Bình Dương, Khu phố 3, Phường Phú Hòa, Tp.Thủ Dầu Một – Tỉnh Bình Dương
越南平陽省土龍木市富和坊3街平陽大路26號萬春公寓S11房
 Authorized agent in Vietnam
- ▶ **India**
Jayampu Road, Andhra Pradesh 524421
- ▶ **Serbia**
Železnička 44, Barič





智慧工廠的專家 Smart Factory Expert



達詳自動化股份有限公司
DA SHIANG AUTOMATION CO.,LTD

facebook



FB Group



YouTube



Linkedin



T 886-3-3756088

F 886-3-3757086

E service@dsa-auto.com.tw

L No.31,Xingbang Rd.,Guishan Dist.,
Taoyuan City 33370,Taiwan (R.O.C.)