成泰股份
CHENG TAI SHARES

CHENG TAI SHARES

Integrated Solutions Provider for PCB & Semiconductor Intelligent Equipment and Customized Production Lines

Greater Precision | Higher Efficiency | Smarter Manufacturing



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2 Product Solutions

3 Partnership Support

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CHENG TAI SHARES

01 COMPANY OVERVIEW



COMPANY BRIEF

Founded in 2016, Guangdong Chengtai Automation specialises in intelligent equipment for the PCB and semiconductor industries, integrating design, R&D, manufacturing, sales and service. The company is recognised as a High-Tech Enterprise, a National Intellectual Property Advantage Enterprise and a national-level "Little Giant" enterprise. It also works with Xiamen University, Guangdong University of Technology and other universities.

Chengtai holds 500+ intellectual property rights, including 120+ invention patents. Its team includes 80+ R&D specialists and 500+ employees. It has developed 100+ types of custom automation equipment, used by leading industry companies.

Chengtai Shares: A National-Level "Little Giant" Enterprise



2016	30000㎡	80+	500+	500+
Year established	Production facility	R&D team members	Employees	Patented technologies

BRAND CULTURE

Corporate Mission

To empower the global semiconductor industry with independently developed intelligent equipment, making manufacturing more precise, efficient and intelligent.

Corporate Vision

To become a driving force in global high-end intelligent equipment manufacturing.

Corporate Values

To support employees' growth, strengthen customers' competitiveness and advance China's manufacturing industry.



2016

2026

CORE TEAM

成泰股份
CHENG TAI SHARES

He MaoShui | Chairman

- EMBA, Peking University
- MBA, Anglia Ruskin University, UK
- 16 years of experience managing automation equipment companies
- Extensive business management and operations experience
- Named first inventor on 200+ patents



CORE TEAM



Professor
Xiamen University

Xu Yong

Major: Mechanical Manufacturing and Automation

- Master's in Optics, Fujian Normal University
  Ph.D. in Condensed Matter Physics, Xiamen University
- Computer Engineering, City University of Hong Kong
  Assistant Researcher, Department of Computer Engineering and Informationa and Technology



Ph.D.
HUST

Zou Tengyue

Major: Mechatronic Engineering

- National Natural Science Foundation of China
  Embedded Hardware and Software Expert
- Published **9** SCI/EI papers
- Expert in AI and Pattern Recognition



Ph.D.
Jilin University

Fan Kuangang

Major: Instrument Science and Technology

- Visiting Scholar, University of California, Davis
- Participated in **30+** provincial-level and national science and technology projects
- **20+** granted patents



Master's Degree
JXUST

Yang Jian

Major: Mechanical Engineering

- **8** years of R&D experience in customized automation
- **15** patents
- Developed **10+** intelligent automation equipment models

80+ R&D professionals; over 45% hold a master's degree or higher

HONORS & QUALIFICATIONS

- 50+ honours and awards
- 130+ invention patents
- 300+ utility model patents
- 20+ international patents
- 70+ software copyrights

Key Corporate Honors

National-Level "Little Giant" Enterprise

National Intellectual Property Demonstration Enterprise

Guangdong Engineering Technology Research Center

National Intellectual Property Advantage Enterprise

Huizhou Key Laboratory

Standardised Management System Certifications

ISO 9001
Quality Management System

ISO 45001
Occupational Health and Safety Management System

ISO 14001
Environmental Management System

GB/T 29490
Intellectual Property Management System



HONORS & QUALIFICATIONS

Craftsmanship Drives Quality. Credentials Prove Our Strength.





























CAPABILTIES

Factory-wide Automation

- Six-Axis Inclined-Cart Board Loader/Unloader
- Six-Axis L-Frame Board Loader/Unloader
- Separator-Sheet Loader/Unloader
- Vertical Magazine-Type Board Loader/Unloader
- High-Speed Small-Panel Loader
- BOX Loader/Unloader
- TRAY Loader/Unloader
- Tray-Cleaning Loader/Unloader
- Custom Inline Automation

Drilling/Routing Automation

- Fully Automatic Pin Insertion & Taping Machine
- Fully Automatic Pin Removal & Tape Cutting Machine
- Automatic Tape Peeling Machine
- CNC Board Stacking Machine
- Semi-Automatic Pin Insertion Machine
- Semi-Automatic Pin Removal Machine

Integrated Environmental Solutions

- Developer Solution Nano-Ultrafiltration System
- Electrochemical Cooling Water Treatment System
- Chengtai Intelligent Descaling System
- Fully Automatic Mechanical Scale Removal System
- Integrated Waste Liquid and Hazardous Waste Reduction Solution

Intelligent Systems

- Vision Systems
- Equipment IoT Management
- Logistics and CIM Integration
- Intelligent Production Line Units
- Material and Inventory Identification System
- MES Software Integration

PARTNERS

成泰股份 CHENG TAI SHARES

50+ Corporate Partnerships

In-Depth Partnerships with 20+ Listed and leading companies

25% market share in Our Segment for Two Consecutive Years

Industrial leading sales!



CATL 宁德时代 | KINWONG 景旺电子 | 胜宏科技 | 世运电路 OLYMPIC CIRCUIT | IFOUND 方科

兴森科技 FASTPRINT | SCC 深南电路 | SUE 生益电子 | 依顿电子 | ASKPCB 奥士康

科翔股份 | ASCENT CIRCUITS | 崇达 | DELTON TECHNOLOGY 广合科技 | 广合科技

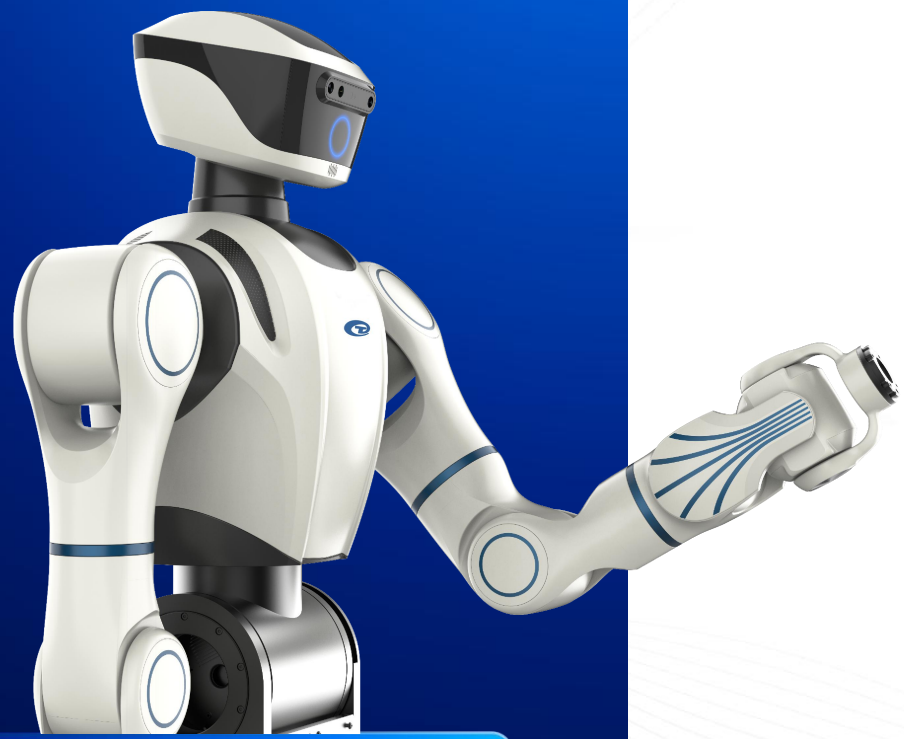
GLORYSKY PCB 特创科技 | TECHIGH 泰和电路 | TTM Technologies | ZXHPCB | KB®

mks Atotech | BIEL 伯恩 | Elec & Eltek 依利安達 | 兴科半导体 | dynamic

成泰股份
CHENG TAI SHARES

02 PRODUCT SOLUTIONS

PRODUCT SOLUTIONS



Four Core Business Areas

Integrated Solutions for Intelligent Equipment and Custom Production Lines (Standalone units or complete-factory solutions)

Connected intelligent equipment and MES systems support customers in building smart factories.

Intelligent Operation Robots (Embodied robots and dual-arm robots)

Adaptable to diverse production environments for flexible, intelligent operation.

High-Precision Inspection Equipment (High-speed 3D CT inspection machines and thermal warpage inspection machines)

3D modelling, non-destructive inspection and precise defect identification.

Comprehensive Environmental Solutions (Developer solution filtration systems and intelligent descaling systems)

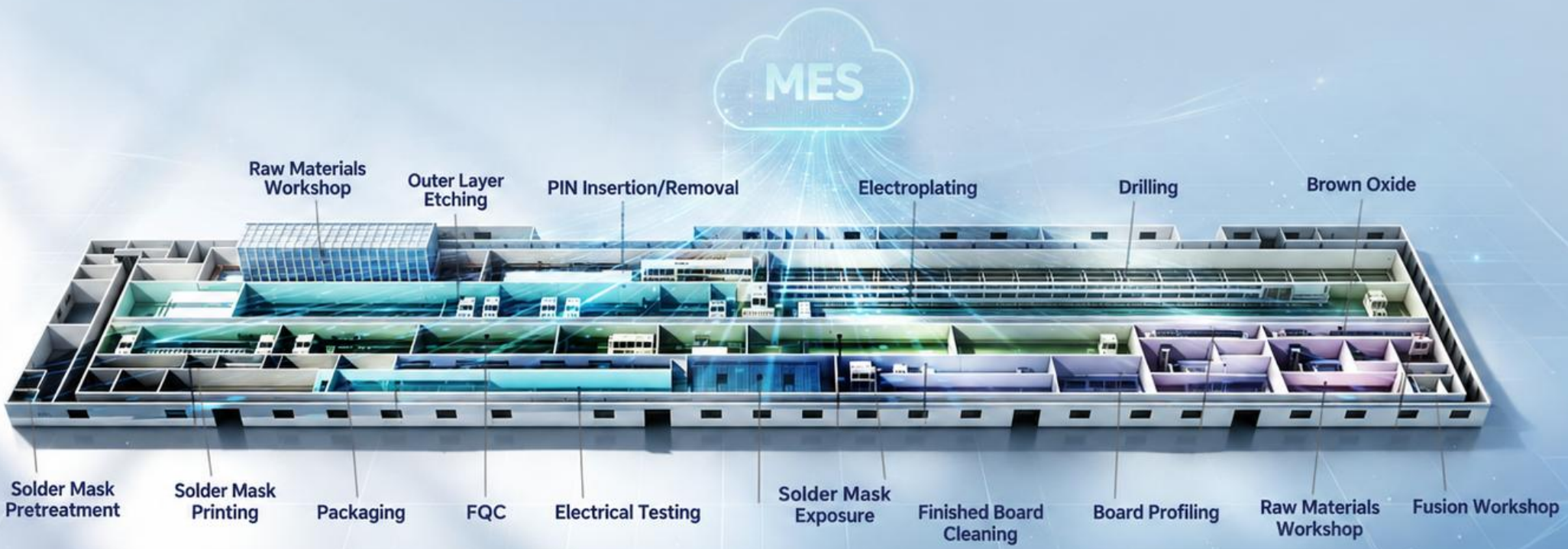
Improve process conditions, reduce costs and increase efficiency.

Integrated Solutions for Intelligent Equipment and Custom Production Lines (Single-Point or Full-Plant Solutions)

Connected intelligent equipment and MES systems support customers' smart factories.

Integrated Smart Factory Solution for the Entire PCB Manufacturing Process

Connected intelligent equipment and MES systems empower customers' smart factories.



PRODUCT SOLUTIONS

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CHENG TAI SHARES

Factory-wide Customized Automation

Integrated Fully Automatic TWO-PIN Insertion and Removal Equipment, Intelligent Board Handling Equipment, Intelligent Transfer Equipment...

No need to replace the entire line—reduce retrofit costs!

Reduce manual handling to improve yield and efficiency!



INNOVATIVE TECH

Whole-Plant Custom Automation Equipment

PCB Drilling: Chengtai Integrated Solution for Fully Automatic TWO-PIN Insertion and PIN Removal

Compatible with existing production lines: No need to replace the entire line, reducing retrofit costs.

Unmanned intelligent transfer: Reduces manual handling and board-surface scratches, improving yield and efficiency.

01

Routing/Grinding Line Integration

Connects to the existing routing/grinding line and transfers boards directly to the pin insertion unit.

02

Fully Automatic Pin Insertion

Automatically stacks boards, inserts pins, applies tape and loads magazines, replacing manual stacking and pinning.

03

AGV Intelligent Transfer

AGVs transport magazines from the pin insertion machine to the drilling workshop buffer area.

04

Automated Loading / Unloading at Drilling Stations

AGVs work with drilling machines to feed boards from magazines and return finished boards to the magazines.

05

Fully Automatic Pin Removal

AGVs transfer magazine fixtures to the pin removal unit for automatic pin removal, tape peeling & finished-board collection.

Carrier Options for Fully Automatic TWO-PIN Insertion and PIN Removal

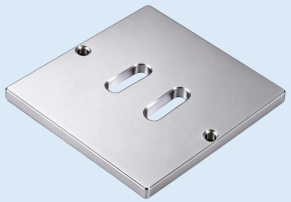
Automatic Drilling Machine Magazine



Inclined Rack Cart



Flat Carrier



L-Shaped Carrier



INNOVATIVE TECH

Whole-Plant Custom Automation Equipment

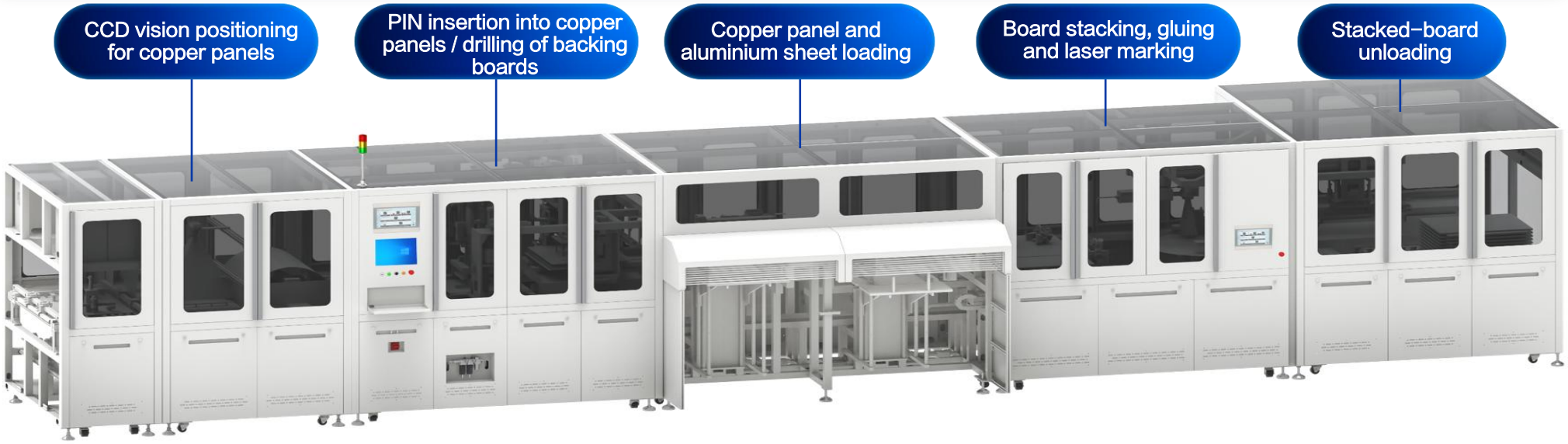
Fully Automatic TWO-PIN Gluing and Insertion Machine

1. Taping and pin insertion in one machine; 3 stacks/min, with daily output exceeding 3,000 boards.
2. Automatic AGV integration for loading/unloading replaces repetitive multi-operator tasks.
3. CCD detects board orientation to prevent misloading and scratches caused by manual handling.
4. Suitable for PCBs, IC substrates, large-format PCBs, multilayer server boards and HDI boards.

50% Less Labor

90% Higher Yield

150+ Units Sold



INNOVATIVE TECH

Whole-Plant Custom Automation Equipment

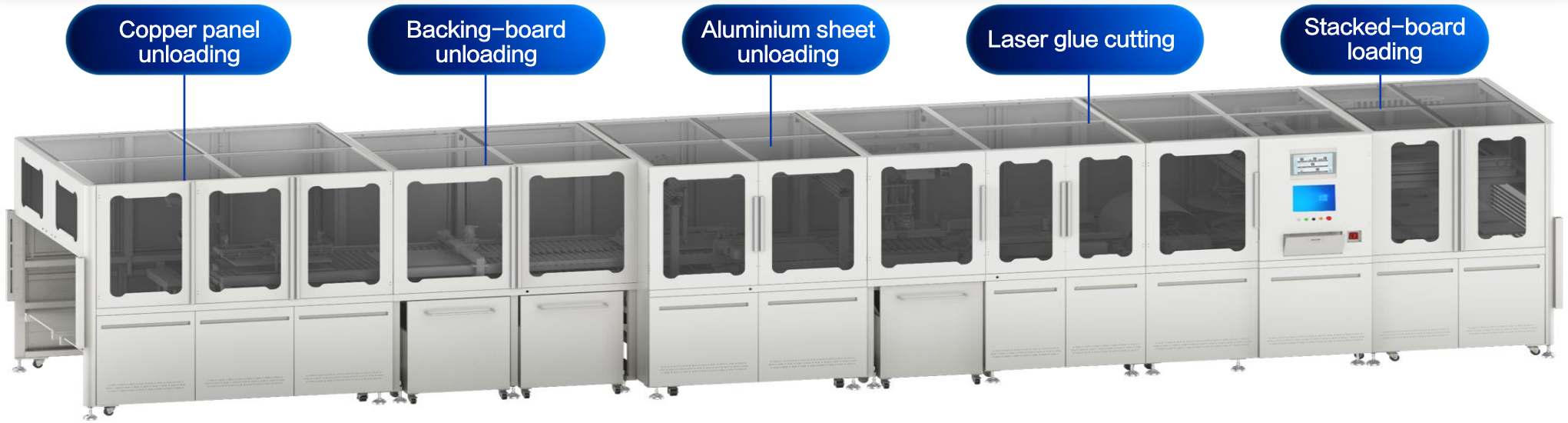
Fully Automatic Pin Removal Machine

1. Tape cutting and pin removal in one machine; 3 stacks/min, with daily output exceeding 3,200 boards.
2. Automatic AGV integration for loading/unloading replaces repetitive multi-operator tasks.
3. CCD detects board orientation to prevent misloading and scratches caused by manual handling.
4. Suitable for PCBs, IC substrates, large-format PCBs, multilayer server boards and HDI boards.

50% Less Labor

90% Higher Yield

100+ Units Sold



INNOVATIVE TECH

Whole-Plant Custom Automation Equipment

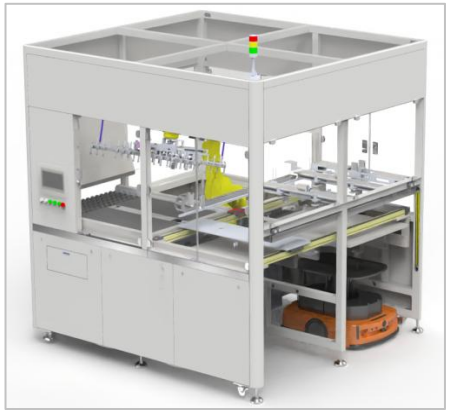
Six-Axis Inclined-Rack Board Loader/Unloader



Six-Axis L-Frame Board Loader/Unloader



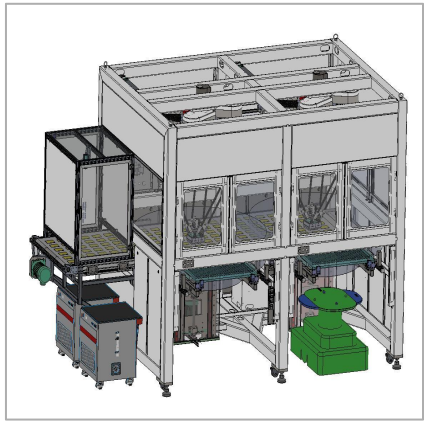
Separator-Sheet Loader/Unloader



Vertical Magazine-Type Board Loader/Unloader



High-Speed Small-Panel Unloader



Key advantages: Fully intelligent | Energy-efficient and quiet | High stability | Safe and reliable

Fully intelligent: The handling unit automatically locates board edges and identifies board position. It supports AGV loading and unloading and MES code scanning, enabling full production traceability.

Energy-efficient and quiet: An integrated vacuum generator keeps operating noise below 30 dB. Zoned suction-cup control activates only the areas needed, making efficient use of the air supply.

High stability: The system measures board width automatically and has a repeat positioning accuracy of ±0.5 mm. Adaptive servo adjustment coordinates the suction cups and grippers for stable board handling.

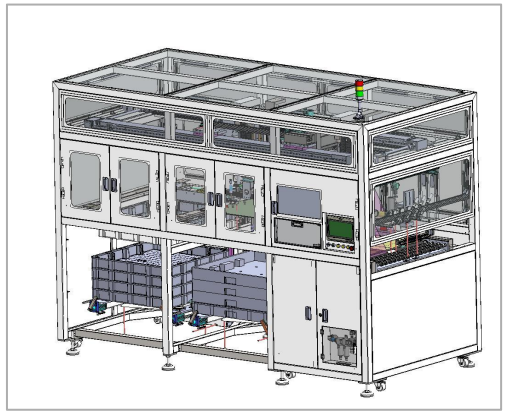
Safe and reliable: Gentle handling reduces board damage. A misoperation prevention mechanism helps protect production-line safety.

INNOVATIVE TECH

Whole-Plant Custom Automation Equipment

BOX Loader/Unloader

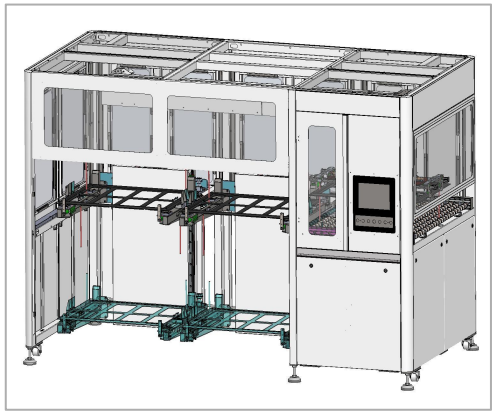




TRAY Loader/Unloader



Tray-Cleaning Loader/Unloader



Key advantages: Fully intelligent, energy-efficient and quiet, highly stable, safe and reliable

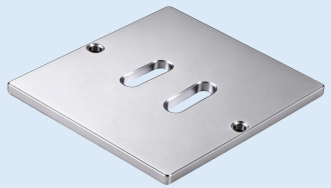
INNOVATIVE TECH

Whole-Plant Custom Automation Equipment

Plant-Wide Automated Board-Handling Carriers (Selected models for transferring and buffering boards across key PCB processes)

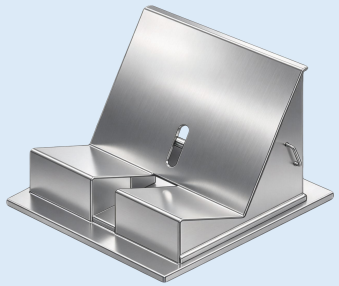
Flat Carrier

1. Compatible with AGVs and hand-pushed carts.
2. Supports various PCB panel types.
3. Maximum buffer depth: 300 mm.



45°/65° Board Rack

1. Compatible with AGVs and hand-pushed carts.
2. Designed for storing thick boards.
3. Maximum buffer depth: 300 mm.



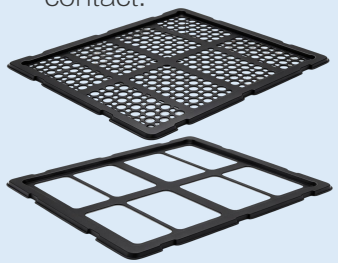
Board Storage BOX

1. Compatible with AGVs and hand-pushed carts.
2. Designed for storing PCB core layers.
3. One box can hold one or more lots of core boards.



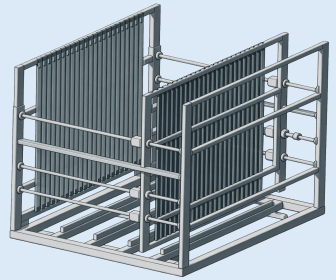
Tray Carrier

1. Compatible with AGVs and hand-pushed carts.
2. Replaces traditional separator film.
3. Separates and stores boards individually to prevent damage from board-to-board contact.



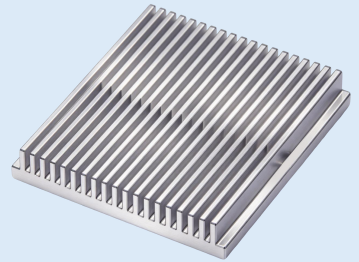
Vertical Magazine Rack

1. Compatible with AGVs and hand-pushed carts.
2. Suitable for dry-film, development, pattern-plating, solder-mask and legend-printing processes.
3. Holds 24 panels, with no contact between panels.



Flat Buffer Plate

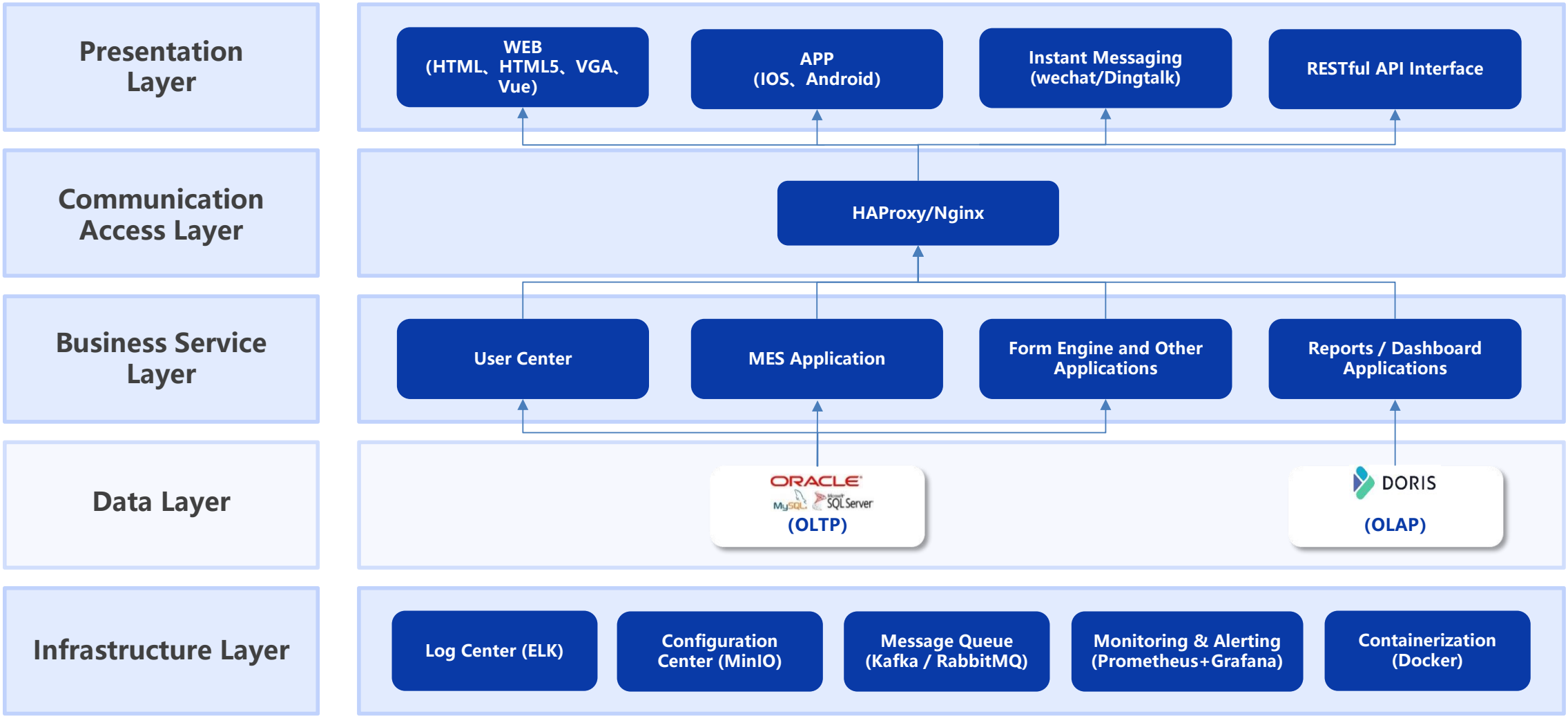
1. Compatible with AGVs and hand-pushed carts.
2. Buffers single or multiple small panels stacked together.



INNOVATIVE TECH
Smart Factory System

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Smart Factory System Software Architecture



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Smart Factory System

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Smart Factory System Software Architecture

High Performance

- OLTP is responsible for transaction processing and requires fast and accurate data processing.
- OLAP is used for large-scale data analysis and requires strong computing and storage capabilities.
- By combining OLTP and OLAP, the system improves data processing performance and analysis efficiency.
- Supports processing billions of data records within seconds.

Message Queue

- Asynchronous communication effectively reduces coupling between sending and receiving systems.
- Improves system scalability and stability.
- Before processing, messages can be stored temporarily in the queue, allowing high-concurrency requests to enter the queue first and avoiding system overload.

Monitoring & Alert System

Functions:

- Quickly detect problems and reduce business impact.
- Locate issues quickly and shorten troubleshooting time.
- Improve system availability.
- Optimize system performance and improve stability.

Log Center

Supports processing structured log data, including:

- System logs
- Application logs
- Network device logs

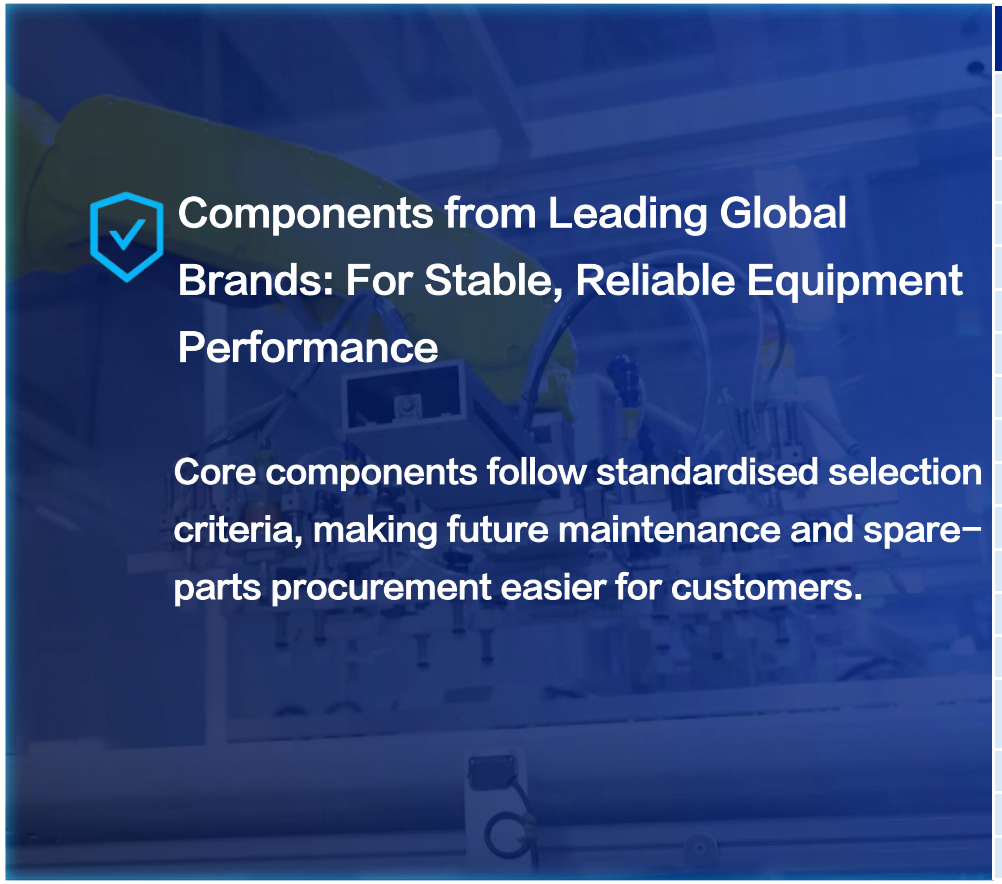
Automation, Containerization & Cluster Deployment

Advantages: Lightweight, Flexible, Fast deployment, Easy management

Development Technology Stack:- Frontend: Vue 3.0 + TypeScript | Backend: .NET Core 6.0 C# | Platform: Cross-platform support

INNOVATIVE TECH

Key Component Brands



Components from Leading Global Brands: For Stable, Reliable Equipment Performance

Core components follow standardised selection criteria, making future maintenance and spare-parts procurement easier for customers.

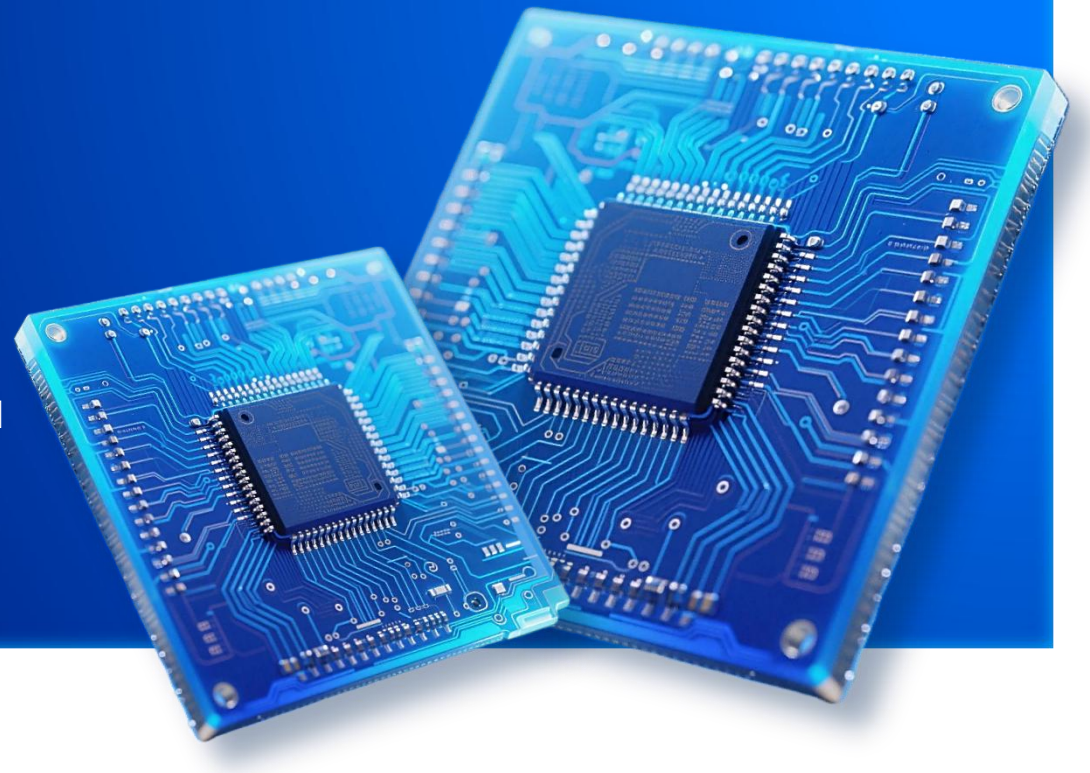
Name	Brand	Country of Origin
Six-Axis Robot	FANUC / Yaskawa / KUKA	Japan / Germany
Linear Guide / Ball Screw	HIWIN	Taiwan
Linear Motion Module	SATA	Taiwan
Cylinder / Floating Platform	SMC / AIRTAC	Japan / Taiwan
Servo Motor	Mitsubishi	Japan
Induction Motor	Jingyan	China
Vacuum Generator	ALBIS	China
Suction Cup	SCHMALZ	Germany
Cleanroom Cable Carrier	igus	Germany
Sensor	Panasonic / Omron	Japan
Vision System	Hikvision	China
Touch Screen	Pro-face	Japan
PLC	Mitsubishi	Japan
Industrial PC	Advantech	Taiwan
Air Switch, Leakage Protector, Contactor	Schneider Electric	France
Relay, Push Button	Schneider Electric	France
PCB Panel Code Reader	Hikvision	China
Carrier Code Reader	Newland	China

CASE STUDY

mSAP Process Solutions

Class 100 Cleanliness | ESD Protection | Damage-Free Transfer of Ultra-Thin Boards

Designed for fine line/space manufacturing
Enables mass production of IC substrates for AI servers and high-speed optical modules



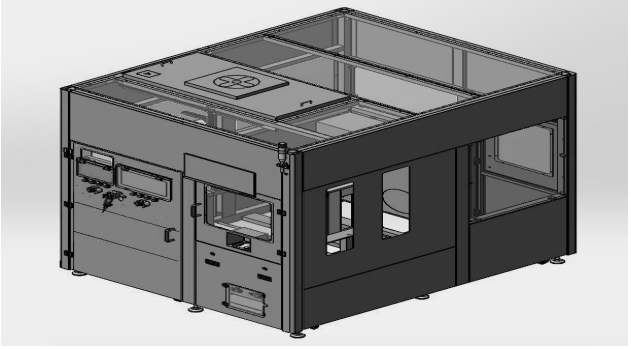
CASE STUDY

成泰股份 CHENG TAI SHARES

mSAP Process Solutions —— Class 100 Cleanliness | ESD Protection | Damage-Free Transfer of Ultra-Thin Panels

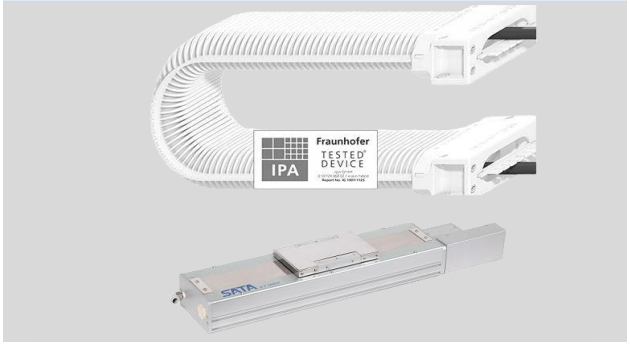
Frame Structure

1. A top-mounted FFU supplies clean air, creating a clean operating area around the equipment.
2. The precision exposure area uses mirror-finish SUS304 stainless steel, which resists dust and is easy to clean.
3. The pretreatment and etching areas use SUS201 stainless steel sheet metal.
4. The machine is fully sealed, with openings only for AGV access and panel infeed/outfeed, helping keep external dust out.



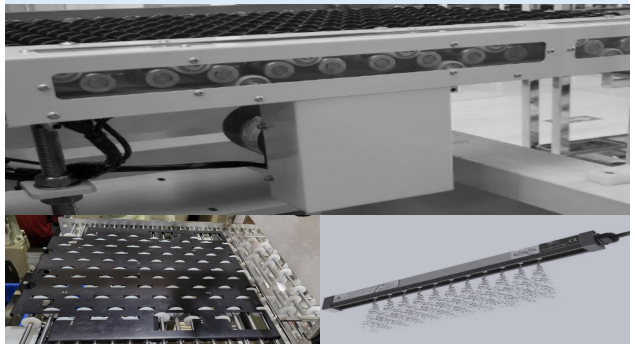
Module and Cable Carrier Structure

1. A closed, dust-free transfer module prevents dust from accumulating during operation.
2. A fully enclosed igus cable carrier protects the cables and prevents particles from being generated during movement.



Conveying Mechanism

1. Non-contact magnetic ring drive operates without friction and produces no dust particles.
2. UPE antistatic rollers prevent static build-up.
3. Ionising air bars at the infeed and outfeed neutralise static on the panel surface in real time.



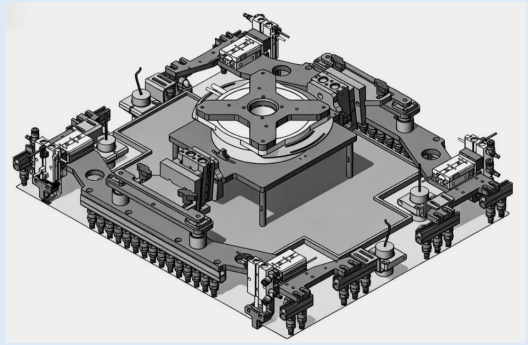
CASE STUDY

成泰股份 CHENG TAI SHARES

mSAP Process Solutions —— Class 100 Cleanliness | ESD Protection | Damage-Free Transfer of Ultra-Thin Panels

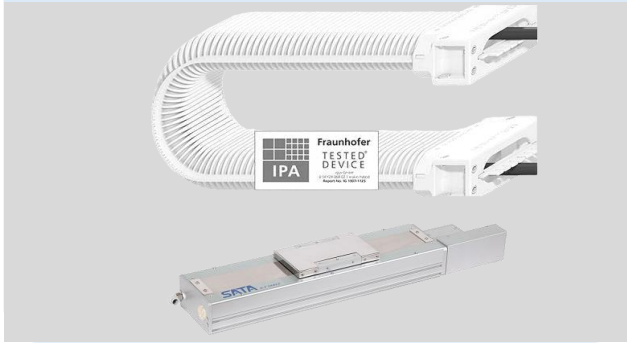
Actuation Mechanism

1. Edge-gripping design avoids contact with fine circuits on the panel surface, preventing scratches.
2. An overhead debris-catching structure prevents foreign objects from falling onto and contaminating panels.
3. Supports automatic width adjustment in both MES and manual modes to accommodate different panel sizes.
4. Optional 90° or 180° rotation supports flexible production across multiple processes.



Module AGV Docking Mechanism and Cable Carrier Structure

1. A floating transfer platform receives the load without relative friction during positioning, helping prevent debris.
2. The lift fork has carrier-presence detection, an obstacle sensor for lowering, and carrier-orientation detection to prevent incorrect loading.
3. Pneumatic clamping and positioning provide ±0.5 mm accuracy and compensate for incoming-position variation.

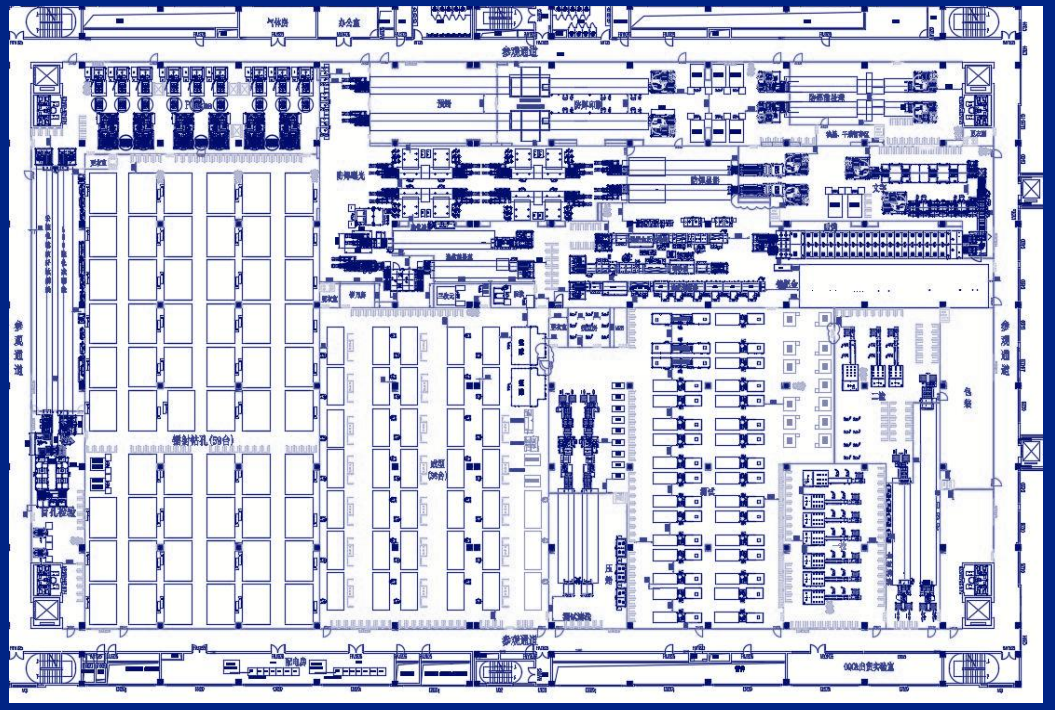


CASE STUDY

Thick Server Compute Boards (0.5 – 12 mm) Factory-wide Customized Automation Solution

Solve heavy-board automation challenges for efficient, high-quality thick-board production!

Handles 0.5 – 12 mm heavy boards with copper thickness 20% – 40% above standard,
and fine line/space processes!



CASE STUDY

Thick Server PCBs (0.5 – 12 mm) — Plant-Wide Custom Automation Solution

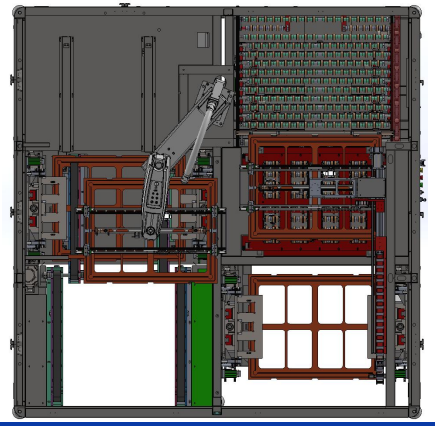
Technical Highlights

Intelligent composite board handling: The robot payload has increased from 25 kg to 35 kg. The suction cups are arranged in two rows, and an energy-efficient vacuum generator is used. The board-handling end has an added blower and mechanical clamp. For boards 5 mm or thicker, the blower starts automatically to assist handling. These features help address instability when moving heavy boards.

Non-contact feeding at the handling end: For oversized, heavy boards that suction cups may not grip securely, a conveyor feeds the board directly into a TRAY. This prevents unstable suction, dropped boards and misalignment.



Overall Equipment View



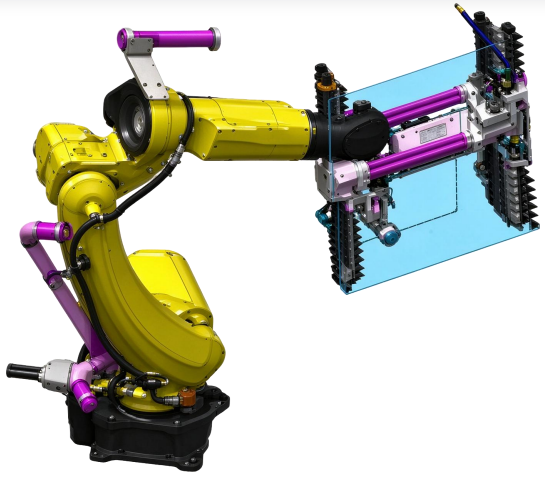
Equipment Top View

CASE STUDY

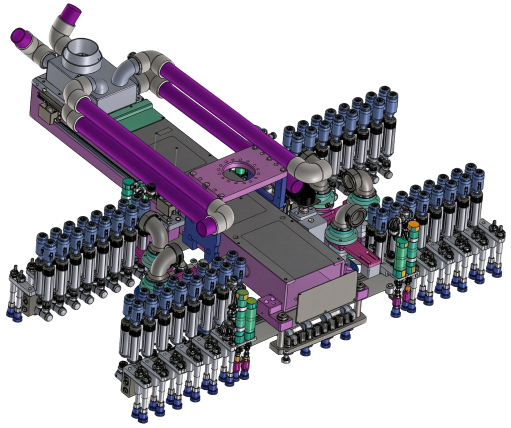
Thick Server PCBs (0.5 – 12 mm) — Plant-Wide Custom Automation Solution

Contact-free protection between board surfaces: TRAYs hold the PCB panels and can be stacked while leaving space for the boards. This prevents panels from pressing and rubbing against one another, protecting fine circuit traces.

Smart drive system for lower costs and greater efficiency: The board-handling unit has an intelligent edge-guiding system that automatically detects board position, removing the need for manual calibration. An integrated, energy-efficient vacuum generator is also fitted. For boards 5 mm or thicker, the blower starts automatically to assist handling and reduce energy consumption.



Six-Axis Industrial Robot Arm



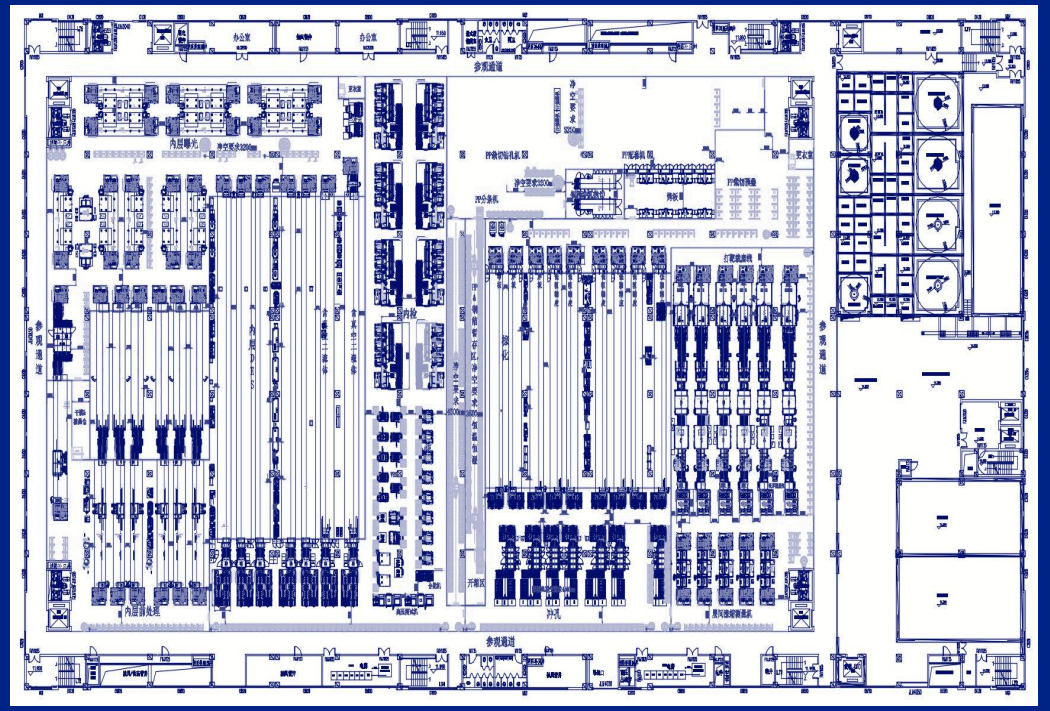
End-Effector Gripper Fixture

CASE STUDY

Inner-Layer Thin Boards (0.05 – 2 mm) Factory-wide Customized Automation Solution

Upgrade end-to-end automation to overcome AI compute-substrate manufacturing challenges!

Handles inner-layer boards in mixed-orientation panel layouts, down to 0.05 mm thick;
supports differentiated processes and multiple inner-layer board types in the oxide-treatment stage;
meets stringent cleanroom contamination-control standards.



CASE STUDY

Inner-Layer Thin Panels (0.05 – 2 mm) – Plant-Wide Custom Automation Solution

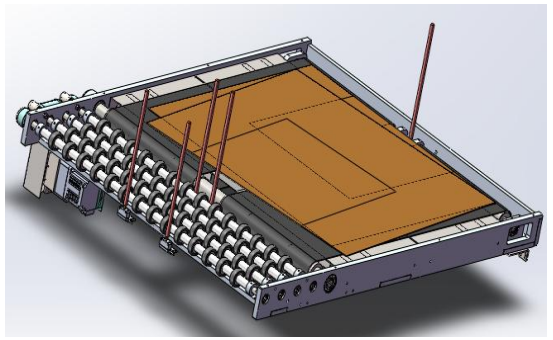
Flexible belt-conveyor design: Uses a belt conveyor suited to thin panels, helping prevent warping, jamming and edge chipping while ensuring smooth, reliable transport.

Flexible mixed-model production: Programs can be changed to suit different processes. A separator-sheet process can be added as needed, making the production line more versatile.

Vision positioning to prevent scratches: AI vision locates each panel, replacing traditional lift-and-press positioning and avoiding pressure or scratches on the panel surface.



Overall Equipment View



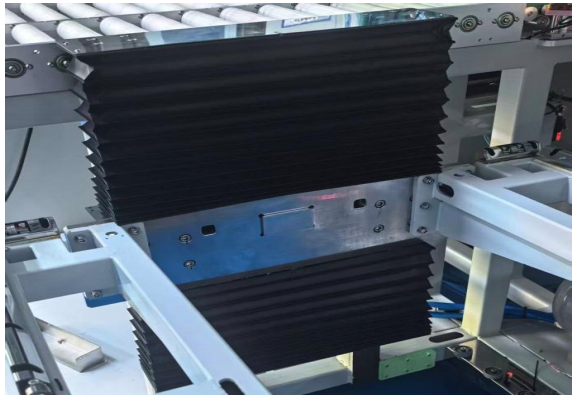
Dedicated Inner-Layer Conveyor

CASE STUDY

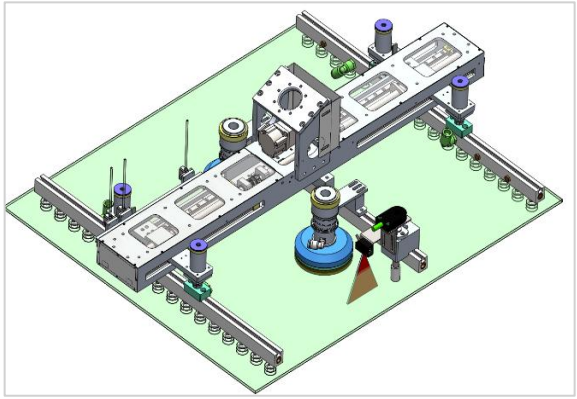
Inner-Layer Thin Panels (0.05 – 2 mm) – Plant-Wide Custom Automation Solution

Dust protection and long-term cleanliness: Bellows covers seal the transmission components that require lubrication, preventing grease from contaminating products. Moving parts inside the end-effector suction rods use highly wear-resistant PEEK to support stable, long-term operation.

Energy-efficient, low-noise vacuum operation: The end-effector uses an integrated vacuum generator with low energy consumption and noise.



Bellows-Cover Protection Structure



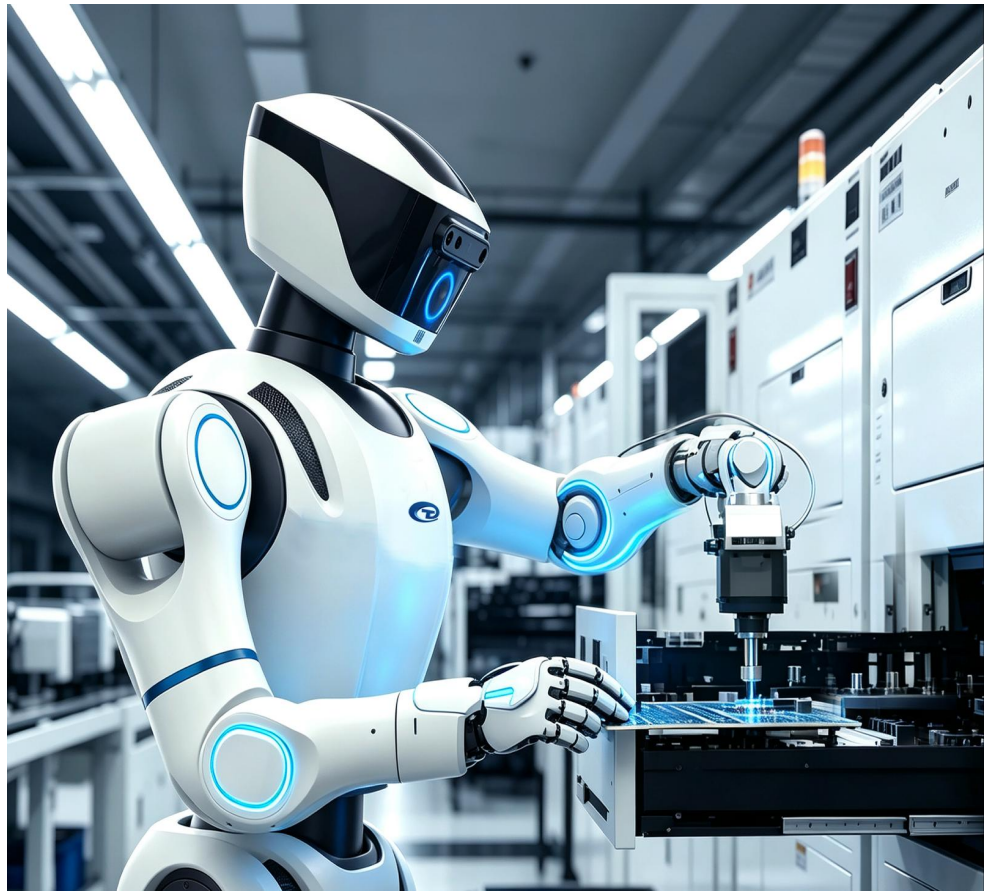
End-Effector Tooling

Intelligent Work Robots (Embodied Robots / Dual-Arm Robots)

Adaptable across production scenarios | Seamless workstation integration

INNOVATIVE TECH

Intelligent Robotics



Embodied Robot — Intelligent Flexible Operation

Adaptable across production scenarios · Seamless workstation integration

Efficient changeovers for customized, multi-product production

AI vision enables flexible handling of PCB and FPC panels, reducing manual machine adjustments and supporting customized production needs.

Precision force control improves yield

Performs insertion, cable alignment and connection with precision. Force control helps prevent scratches, while AI vision reduces missed defects.

Takes over hazardous tasks and supports round-the-clock operation

Replaces operators in hazardous processes such as electroplating and impedance testing. AGV integration enables fully automated material handling and continuous 24-hour operation, reducing reliance on manual labor.

Closed-loop process data optimizes production

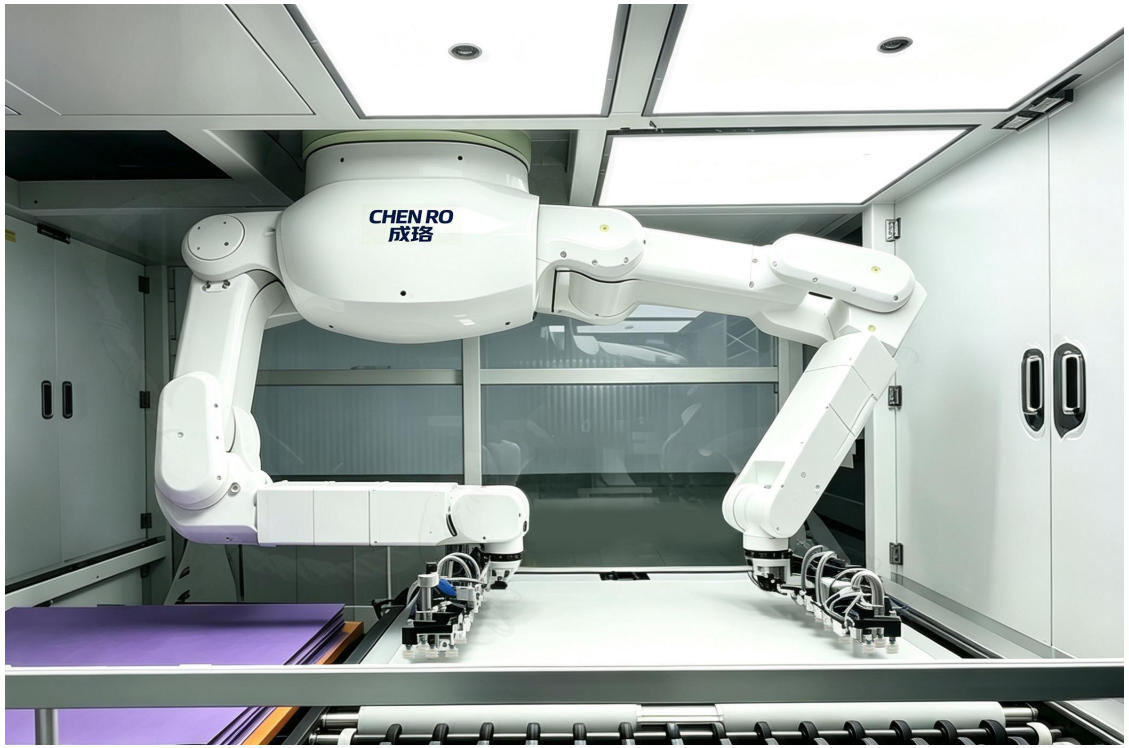
Records production data, including gripping force and motion paths, to support PCB/FPC layout improvements and process updates.

Quick-change end effectors >>>



INNOVATIVE TECH

Intelligent Robotics



Dual-Arm Robot — Improving Quality and Efficiency

High-precision alignment · Scratch-free handling

Coordinated dual-arm operation for precise board loading

The two arms work together to load PCB/FPC panels smoothly and steadily, helping prevent scratches and damage during handling.

High-precision vision positioning improves yield

AI vision positioning achieves an accuracy of ±0.02 mm, enabling precise alignment and preventing board impacts and scratches.

Continuous operation for greater productivity

Supports uninterrupted operation 24 hours a day, significantly reducing reliance on labor and the risk of human error.

One-touch program switching for different panel types

Switch operating programs quickly to handle different PCB/FPC specifications and meet the needs of varied production runs.

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High-Precision Inspection Equipment

(High-Speed 3D CT Inspection System / Thermal Warpage Inspection System)

3D modelling · Non-destructive inspection · Accurate defect identification

INNOVATIVE TECH

High-Precision Inspection Equipment



High-Speed 3D CT Inspection System

3D modelling · Non-destructive inspection · Precise defect identification

3D tomographic imaging detects hidden defects

CT scanning inspects the inside of panels without damaging them, accurately identifying issues such as hole-position deviations, hole-wall defects and inner-layer misalignment.

High-speed online inspection keeps pace with production

Supports high-speed, full-dimensional online inspection. It replaces manual sampling and microsection verification, improving inspection efficiency and enabling tighter quality control.

AI-powered defect assessment reduces human error

Deep-learning algorithms automatically identify defects and deliver stable, consistent inspection results without relying on an inspector’s experience.

Closed-loop data traceability supports continuous process improvement

Records inspection data in real time for in-depth analysis, providing feedback to guide drilling-process parameter optimisation and improve yield.

INNOVATIVE TECH

High-Precision Inspection Equipment



Thermal Warpage Measurement System (Offline / Online)

Catch defects early · Ensure consistent quality

Micron-level shadow moiré measurement captures subtle deformation

Uses proprietary shadow moiré optical measurement technology, with height-measurement resolution of up to 0.85 μm.

Variable-temperature simulation tests product stability

Simulates temperatures up to 300° C to reproduce the heating conditions of finished products. Measures panel deformation at high temperatures and assesses product reliability in service.

Flexible offline and online deployment for R&D and production

The offline benchtop system supports process development and validation, providing precise warpage assessments of samples. The online system automates loading, unloading and OK/NG sorting for 100% inspection in production.

MES data loop optimises material selection and processes

Connects inspection data to the factory MES system to track warpage curves and optimise material selection and manufacturing processes.

Comprehensive Environmental Treatment

(Developer Solution Fine Filtration System / Intelligent Descaling System)

Optimise process conditions · Improve quality and reduce losses

INNOVATIVE TECH

Comprehensive Environmental Treatment



1μm
Primary filtration: 1 μm

30nm
Secondary filtration: 30 nm

Developer Solution Fine Filtration System

30 nm ultrafiltration · Continuous circulation and purification

Nanofiltration keeps developing solution clean & stable

A two-stage composite ultrafiltration system for dry-film and wet-film processes. The first-stage filter has a precision of up to 1 μm and handles a high volume of residue; an automatic scraper removes the residue. The second-stage filter reaches 30 nm and continuously removes resin and colloidal particles.

The treated solution is colourless and clear, helping maintain the cleanliness and stable activity of the developing tank over time. Suitable for various developing processes.



Left: untreated, turbid green solution
Right: clear, filtered solution

Optimised process conditions improve quality and reduce losses

Addresses defects such as incomplete developing, residual-copper short circuits and ink adhesion. Helps reduce PCB scrap, slow solution deterioration and extend solution life, controlling production costs at the process level.

Intelligent linked control simplifies operation and maintenance

Supports custom timing settings for the main tank and coordinated operation with the production line. Reduces manual intervention and helps ensure stable, continuous operation.

INNOVATIVE TECH

Comprehensive Environmental Treatment







20–30%
reduction in circulating system electricity consumption

90%+
water savings

0
No chemical additives
No hazardous waste

Intelligent Descaling System

Physical descaling · No chemical additives · No pollution

Electrochemical descaling with automatic cleaning and residue removal
Removes calcium and magnesium deposits from cooling water. An automatic scraper clears the cathode plates and helps prevent pipe scaling.

Protective film helps prevent corrosion and extend equipment life
A dense protective film forms on the inner pipe walls, helping prevent rust and under-deposit corrosion. Cooling tower fill life can increase from 5 - 8 years to 8 - 15 years.

Electrolysis controls bacteria and algae, reducing maintenance costs
No biocides are added. Electrolysis treats bacteria and algae in the cooling water, helping prevent biological sludge from forming at its source.

Lower energy and water consumption improves overall efficiency
By preventing scale on pipe walls, the system helps maintain heat-transfer efficiency. Pump and fan energy consumption can fall by 20 - 30%. It removes calcium and magnesium ions by electrolysis, reducing the need for make-up water and blowdown for scale control. Overall water savings exceed 90%.

Automated operation reduces manual intervention
PLC-controlled operation, remote monitoring and data traceability. The system can operate year-round without shutdowns for pipe cleaning, helping maintain continuous production.

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03 PARTNER GUARANTEE

PARTNER GUARANTEE

Delivery Capability

We manage every stage of delivery and honour every commitment with expertise.!

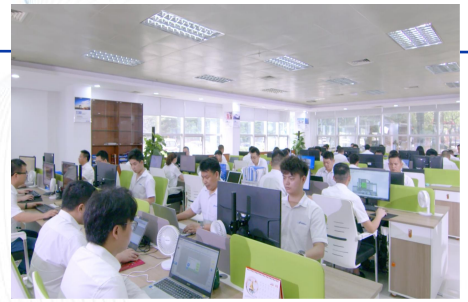
01 On-site assessment

Our R&D engineers visit the customer’ s production line to identify process challenges and automation needs, then determine the most suitable solution.



02 Tailored R&D and Solutions

We customise equipment to meet specific process requirements, helping customers improve yield, productivity and competitiveness.



03 Three-stage quality control

Our Huizhou headquarters has a 30,000m² standardised production facility. Three inspection stages ensure quality: incoming inspection (IQC), in-process quality control (IPQC) and outgoing inspection (OQC). Equipment is shipped only after passing full-machine testing.



04 On-site delivery support

Our engineers install and commission the equipment on site until the production line runs smoothly. We provide hands-on staff training and support during trial production until the required yield is achieved and the line is stable.



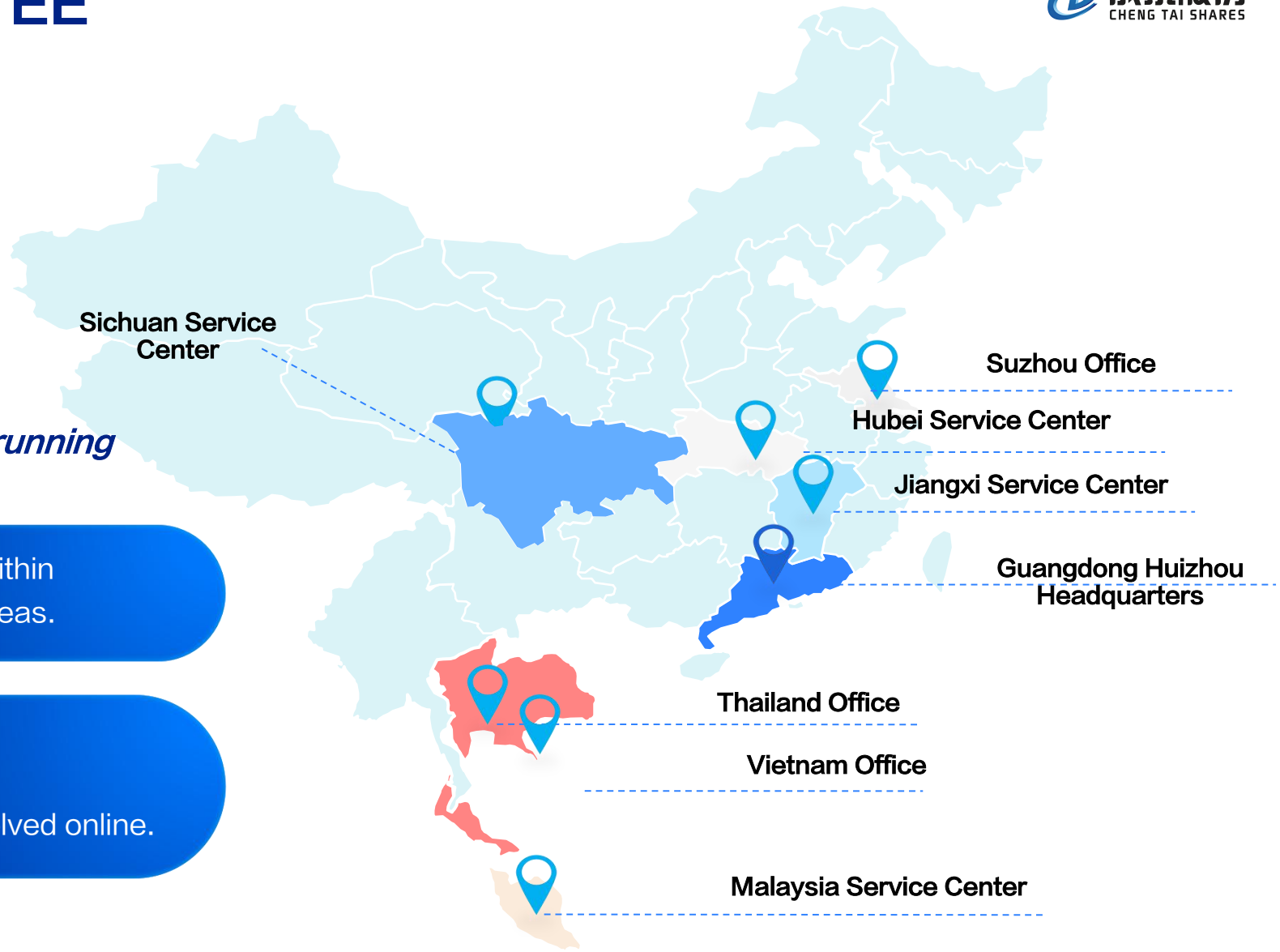
PARTNER GUARANTEE

After-Sales Capability

Eight service locations worldwide
Rapid response to keep production running

On-site support: Engineers arrive within 8 hours in China and 12 hours overseas.

24/7 online support:
Remote diagnostics available;
90% of common issues can be resolved online.



Thank you

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