

SINSEGYE



PC based **iComputer** comes
SINSEGYE ●

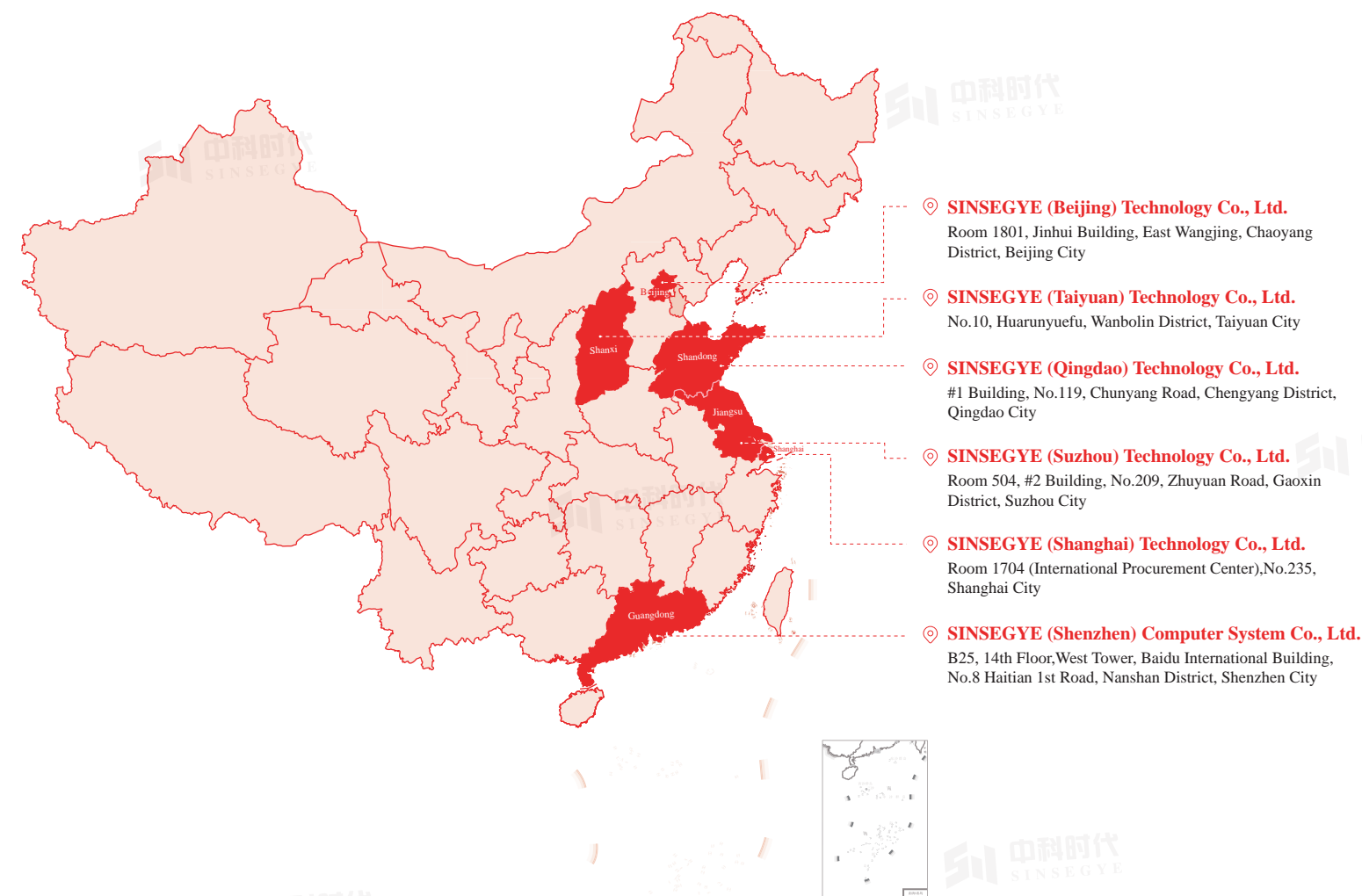
 **中科时代**
SINSEGYE

About Us

Sinsegye is a product-driven company that leverages research and development technologies from the Institute of Computing Technology at the Chinese Academy of Sciences. Our founding team consists of core experts from the Institute of Computing Technology, each with nearly 20 years of experience in industrial intelligent computing and control technology R&D. Our company specializes in PC control, dual-domain operating system development, automation control, and industrial software algorithms, solidifying the foundation for our technological innovation. We have clearly defined its goal of achieving industrial intelligence based on intelligent PC technology and software-defined technology. We have obtained multiple national invention patents and utility model patents due to core technologies. Continuous and intensive PC full technology R&D capabilities are our core competency, covering areas such as motion control chip design, AI chip tool chain, parallel computing, compilers, runtime, real time micro-kernel, operating system isolation, virtualization, motion control acceleration, industrial bus, IDE, and algorithms. With “Industrial intelligent computer” as the driving force and automation as the core, we provide an intelligent industrial automation solution that integrates computing + control of PLC, industrial computers, motion controllers, and edge servers. Our flexible product combination of IO/Motion/Acceleration/Digitization offers efficient, stable, and reliable solutions for industrial scenarios. This solution has been successfully applied in advanced manufacturing, new energy, and process industries.

Meanwhile, we have received support from well-known investment institutions such as Cowin Capital, Z&Y Capital, Shenzhen Qianhai FOF Fund, Lenovo Capital (LCIG), Zhongke Turing Capital, Galaxy Aerospace Investment, Chinese Academy of Sciences Investment, Chinese Academy of Sciences Capital, Tianchuang Venture Capital, Cornerstone Capital, Guozhong Capital, Zhongke (Shenzhen) Advanced Fund, Sugon, Xinhenglida Capital, and Bojiang Capital. The company also benefits from the leadership of two academicians of the Chinese Academy of Engineering from the Institute of Computing Technology, providing sufficient financial support for our development.

As one of the representatives of China's Industry 4.0, We will further realize domestic industrial chip, domestic virtualization dual-domain operating system, domestic industrial software, and other industrial technologies. We aim to build a self-controllable industrial infrastructure centered on "Industrial intelligent computer" and surpass the traditional form of computers with the next-generation computer-controller (algo-controller), supporting China's transformation from manufacturing to smart manufacturing, challenging international competitors, driving national industrial development, and leading the era of computable manufacturing.



Why choose us

Technical skills

The research and development technologies derives from the Institute of Computing Technology at the Chinese Academy of Sciences, and the core technologies have obtained multiple national invention patents and utility model patents.

Team strength

The founding team comes from the Institute of Computing Technology at the Chinese Academy of Sciences and its incubated listed companies. The team members come from Alibaba, Beckhoff, Siemens, Lead Intelligent Equipment, Kyland Technology, Luster, Hollysys, Inovance Technology, Lenovo, Sugon, Li Auto, NIO and other well-known domestic and foreign companies.

Capital guarantee

We have received support from well-known investment institutions such as Cowin Capital, Z&Y Capital, Shenzhen Qianhai FOF Fund, Lenovo Capital (LCIG), Zhongke Turing Capital, Galaxy Aerospace Investment, Chinese Academy of Sciences Investment, Chinese Academy of Sciences Capital, Tianchuang Venture Capital, Cornerstone Capital, Shenzhen Guozhong Capital, Zhongke (Shenzhen) Advanced Fund, Sugon, Shenzhen New Vakue Capital, and Bojiang Capital. The company also benefits from the leadership of two academicians of the Chinese Academy of Engineering from the Institute of Computing Technology.

Wide application

Offer efficient, stable, and reliable solutions for industrial automation and intelligence by providing an intelligent industrial automation solution that integrates PLCs, industrial computers, motion controllers, and edge servers. This solution has been successfully applied in advanced manufacturing, new energy, and process industries.

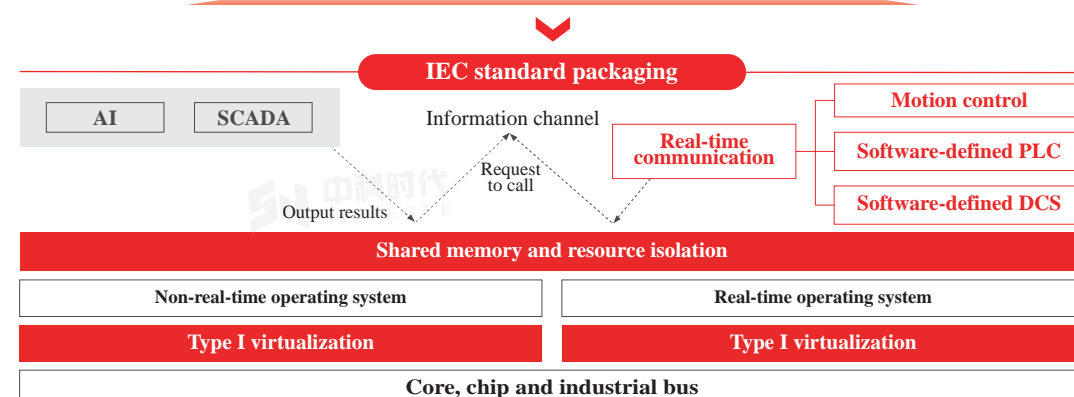
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The very beginning of the new world

Industrial Intelligent Computer Era Change

iphone in industrial automation: Edge AI acceleration + real-time control acceleration + virtualization acceleration.



Application Industry

High-speed motion control and high precision

- Semi-conductor
- Lithium battery
- Printing and packaging
- Laser
- 3C electronics
- AGV
- Maglev

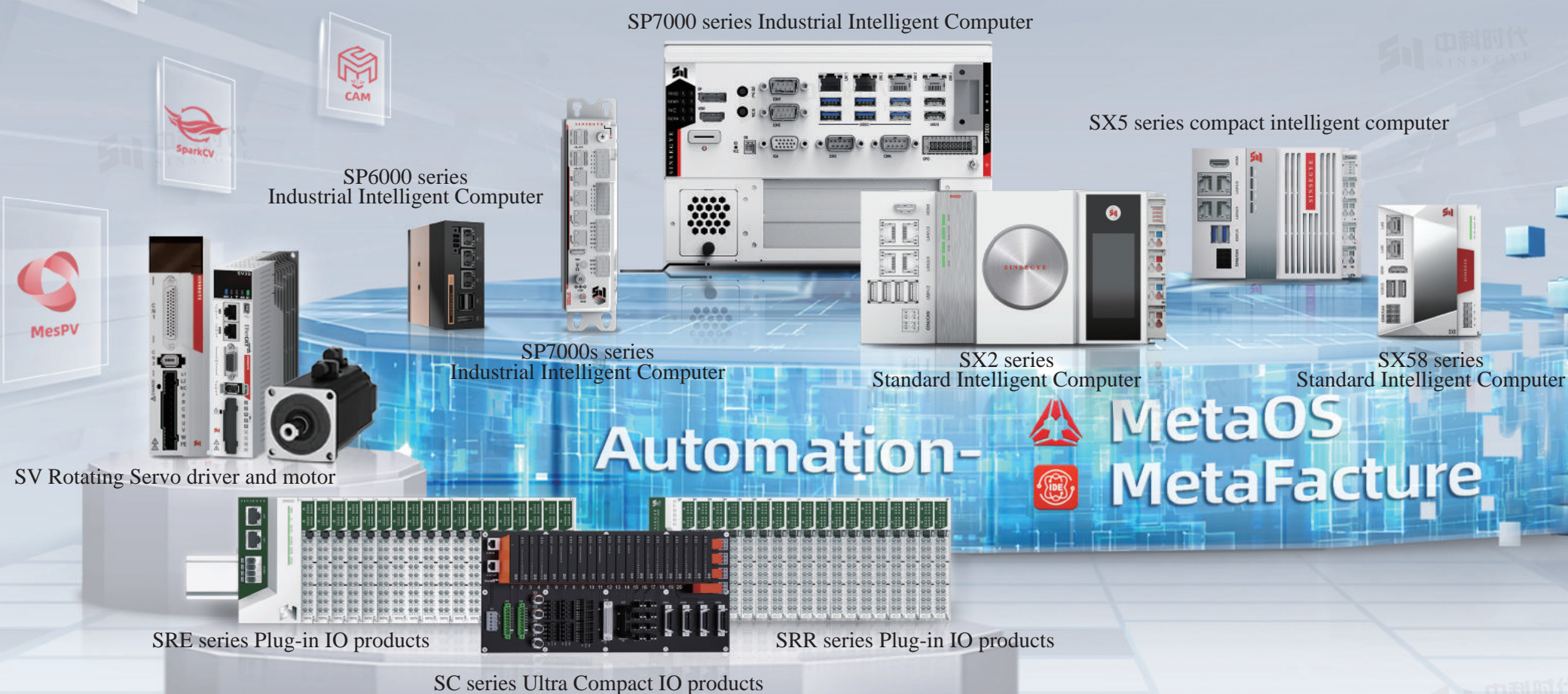
Hybrid application integrated with computation and control

- 3C electronics
- Photovoltaic
- Petrochemical industry
- Iron and steel
- Wind power
- Automobile

Application Scenario

- Equipment development and debugging - Integrated with IOT debugging technology
- Edge computation
- Cloud computation
- Semi-conductor control
- Digital twin
- CNC machine tool
- Machine vision
- Machine learning
- Flying shear

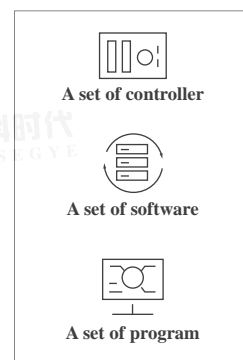
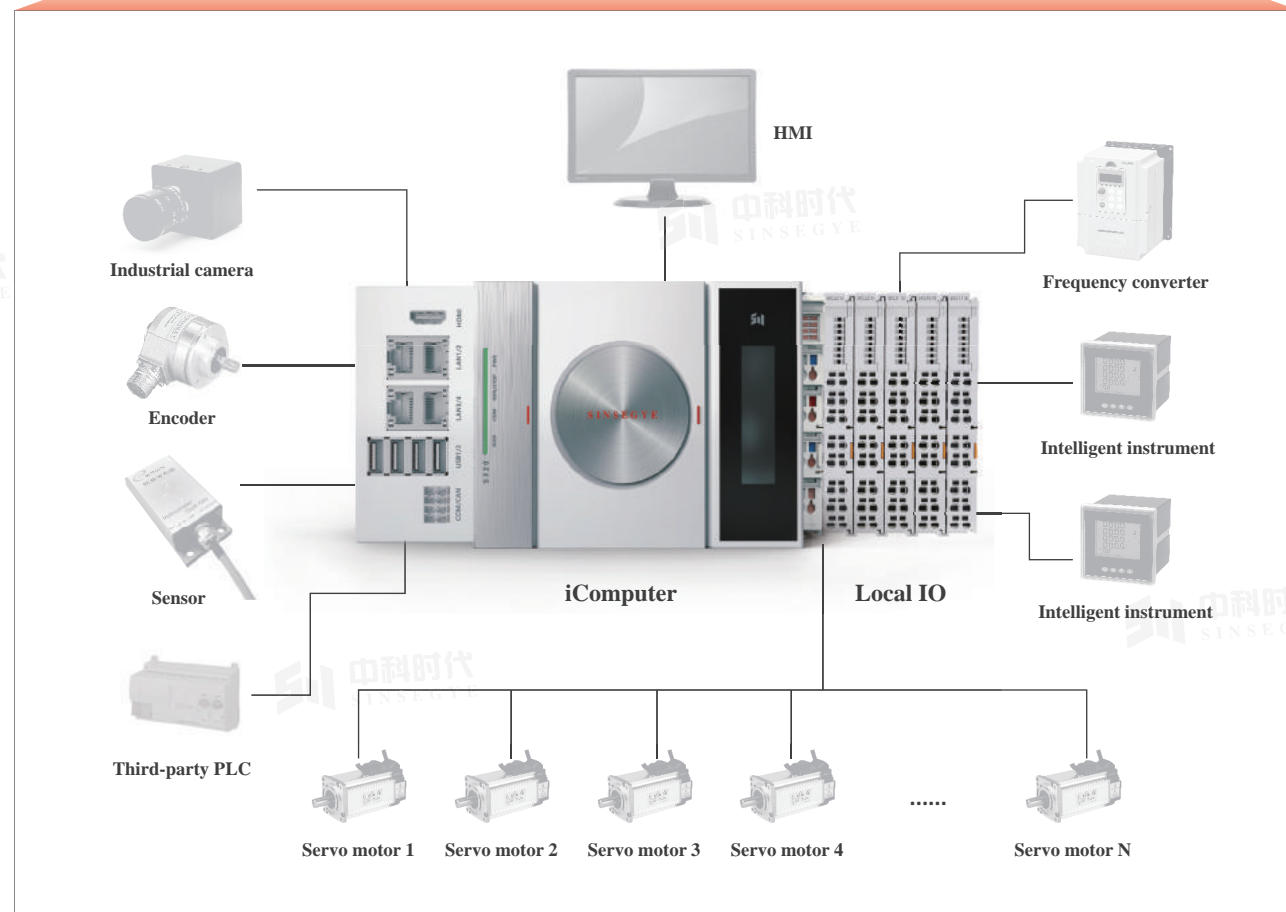
PC based **iComputer** comes SINSEGYE



The very beginning of the new world

Meeting different control requirements in complex industrial environment by one set of iComputer

Push the development of industrial manufacturing towards intelligence and high efficiency



All functions in one iComputer:
Motion control + logic control + machine vision +
configuration display/development/application

Massive computing power
Flexible programmability
Efficient and stable industrial control
Intelligent application support
.....

Can meet the requirements of automation control in the complex industrial environment, and push the development of industrial manufacturing towards intelligence and high efficiency.

Flexible extension, meet diversified requirements.

01

Convergence software can undertake PLC, and it can also easily realize machine vision.

02

Various interfaces and strong interconnection capability.

03

High real time, speed and precision.

04

Various algorithms and simple control.

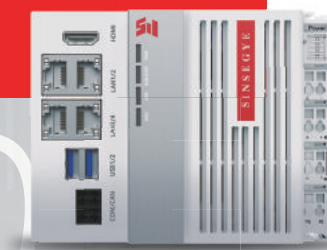
05

Reliable design for industrial application

06

SX series embedded controller

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SX5 series compact iComputer



SX2 series standard iComputer



SX2 series domestic iComputer

01 Computing + control

The functions of motion control, logic control, machine vision, configuration display and edge computation are provided simultaneously in one set of controller. The applications of motion control, logic control, machine vision and configuration display are solved by adopting one set of program.

02 Small form factor and flexible extension

- With compact structure and the standard DIN guide rail installation mode, 75% of the installation space can be saved.
- With modular design, the actual requirements can be met while maintaining scalability and accurate matching, and additional waste in equipment and sources can be avoided.
- Support the local extension module and the remote IO module, so that diversified I/O and process modules can be provided for users during data acquisition, control and transmission.

03 Safe and reliable

- Multiple network interfaces design, and high response axis, realize the independent network card design for EtherCAT ring networking, and isolate the networks in the control layer and the information layer.
- Customize heat dissipation profiles and adopt high-quality heat conductive materials.
- Meeting the requirements of EMC Level 3, IP20 protection level for the front, and harsh industrial application scenarios.

04 Highly real-time performance

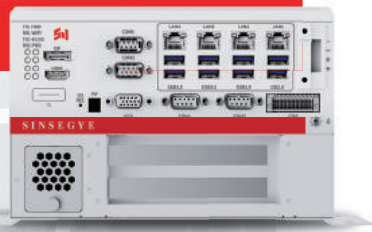
- Minimum control cycle of 125us for a single axle
- Minimum control cycle of 0.8ms for 128 axes
- The command execution efficiency can reach ns level
- Support up to 256 axes connection

05 Various connection and networking modes

- Various programming modes
- Various algorithm modules
- Various applications

SP series IPC controller

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SP70 series fanless iComputer



SP6000 series Industrial Intelligent Computer



SP5040 series 4U Industrial Intelligent Computer

01

Computing + control

A set of controller has the functions of motion control, logic control, machine vision, configuration display, and edge computing at the same time, realizing the functions of motion control soft board (replacing industrial PC+motion control card, saving costs). A set of software is compatible with the development of motion control, logic control, machine vision and configuration display. A set of program simultaneously solve the application of motion control, logic control, machine vision, and configuration display.

02

With rich configurations, satisfy different application scenarios

- With the book type, the fanless type, the tower type/wall-mounted type and the 4U rack-mounted type, it can meet various control needs.
- Some types support the body IO, and the whole series supports remote IO modules, providing users with a variety of I/O and process modules for data acquisition, control and transmission.

03

Reasonable gene, safe and reliable

- Through the design of multiple network interfaces, the EtherCAT ring networking is easily realized while taking high-response axle control into account. With the independent IP of the network interface, the networking in the control layer and the information layer as well as the vision networking can be completed with separate IPs, and they are securely isolated.
- With the delicate design, meeting the requirements of harsh industrial application scenarios.

04

Highly real-time performance

- Minimum control cycle of 125us for a single axle
- Minimum control cycle of 0.8ms for 128 axles
- The command execution efficiency can reach the ns level

05

Rich connection and networking modes

- Rich programming modes

IO/Motion

SRC series new-generation plugged-in remote IO

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Less occupation node

A node consists of a bus coupler, 1 to 32 I/O modules and an end cap.

Flexible configuration

Multiple inserting type I/O modules can be configured randomly.

Small size

Compact structure and small occupation space.

Fast speed

With the adoption of SC-bus for the back-plane: The maximum scanning cycle is 1 ms.

Easy installation

DIN-rail-mountable. With spring type terminal block, the wiring is convenient and quick.

Easy diagnosis

Complete indicator, clear module status and convenient detection and maintenance.

Strong compatibility

The communication interface of the coupler complies with the communication standards and supports the mainstream master stations of PROFINET and EtherCAT.

Rich function extensions

It supports flexible extension and has a complete range of I/O types; and it can integrate a variety of digital modules, analog modules and temperature modules to adapt to the needs of different applications.

Motion control

SV series rotary servo driver and motor

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1 Built-in PLC for multiple equipment customization functions

2 Speed bandwidth: 3.2 KHz, with fast response frequency

3 Multiple input and output points 9DI/8DO

4 Power up to 7.5 KW

5 Support absolute encoder without battery

6 Support EtherCAT, Modbus, Profinet and CANopen

Advantages of product

Built-in PLC function

Built-in rolling-cut function

Built-in flying shear function

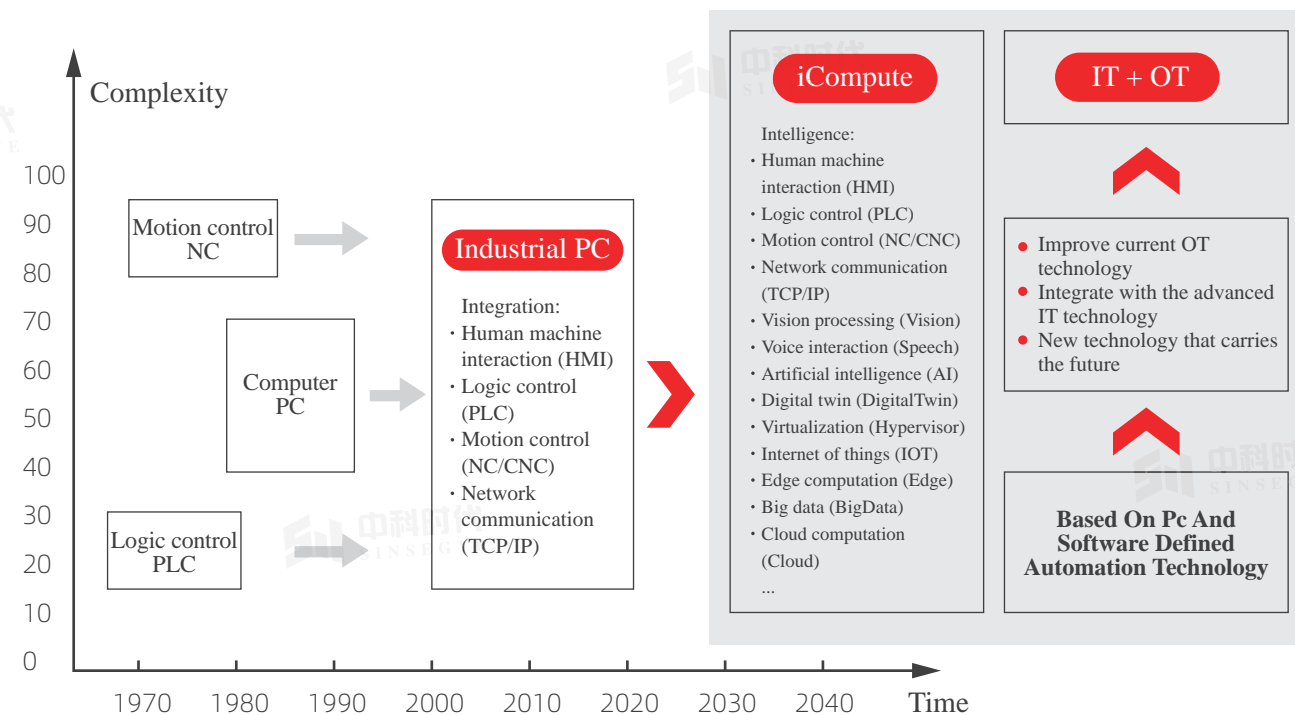
Function of giving communication position

Automation- MetaFactory



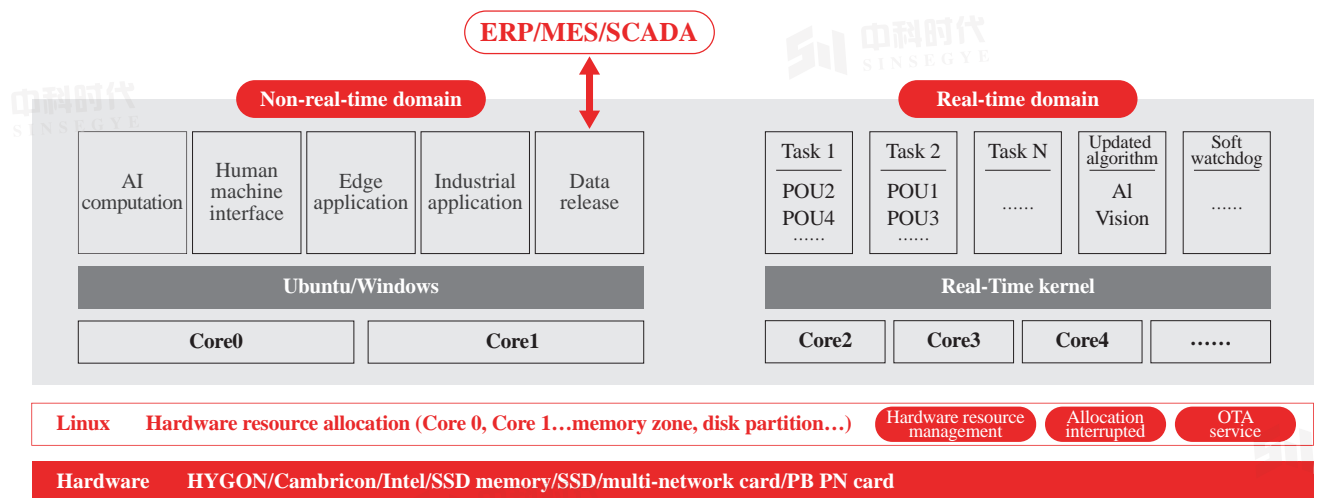
Based On Pc And Soft Ware Defined Automation Technology

Development of OT Technology

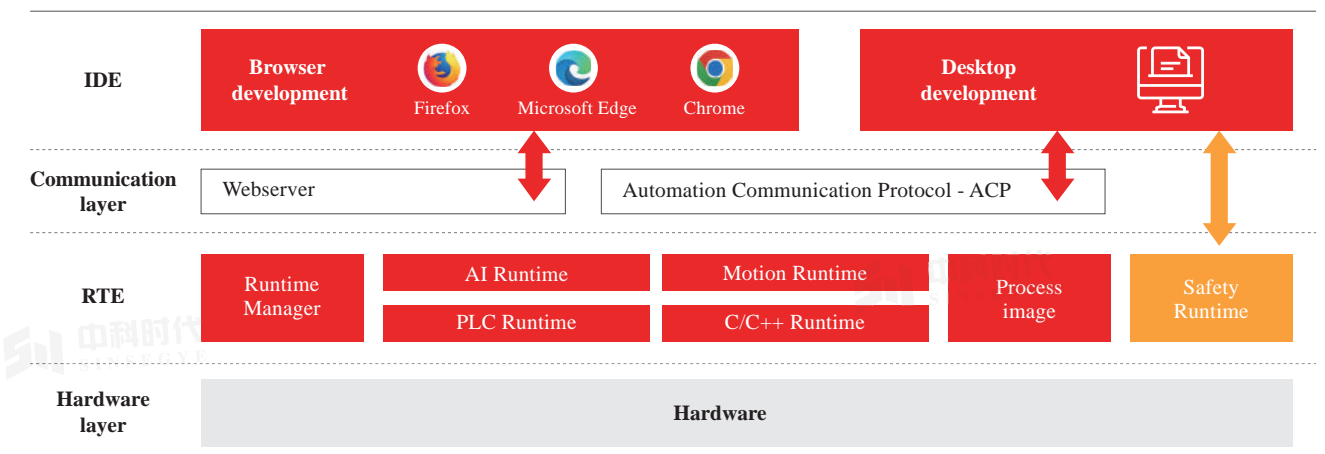


Automation- MetaFactory

MetaFactory so - Dual-domain operating system:



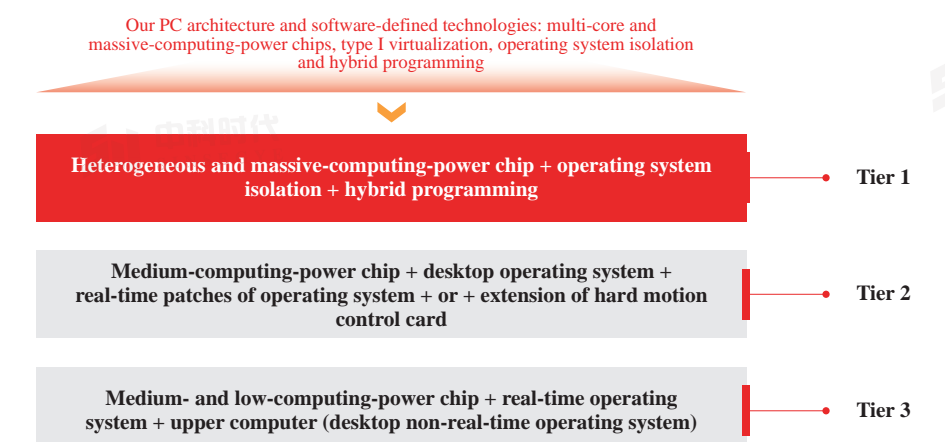
MetaFactory IDE & RTE:



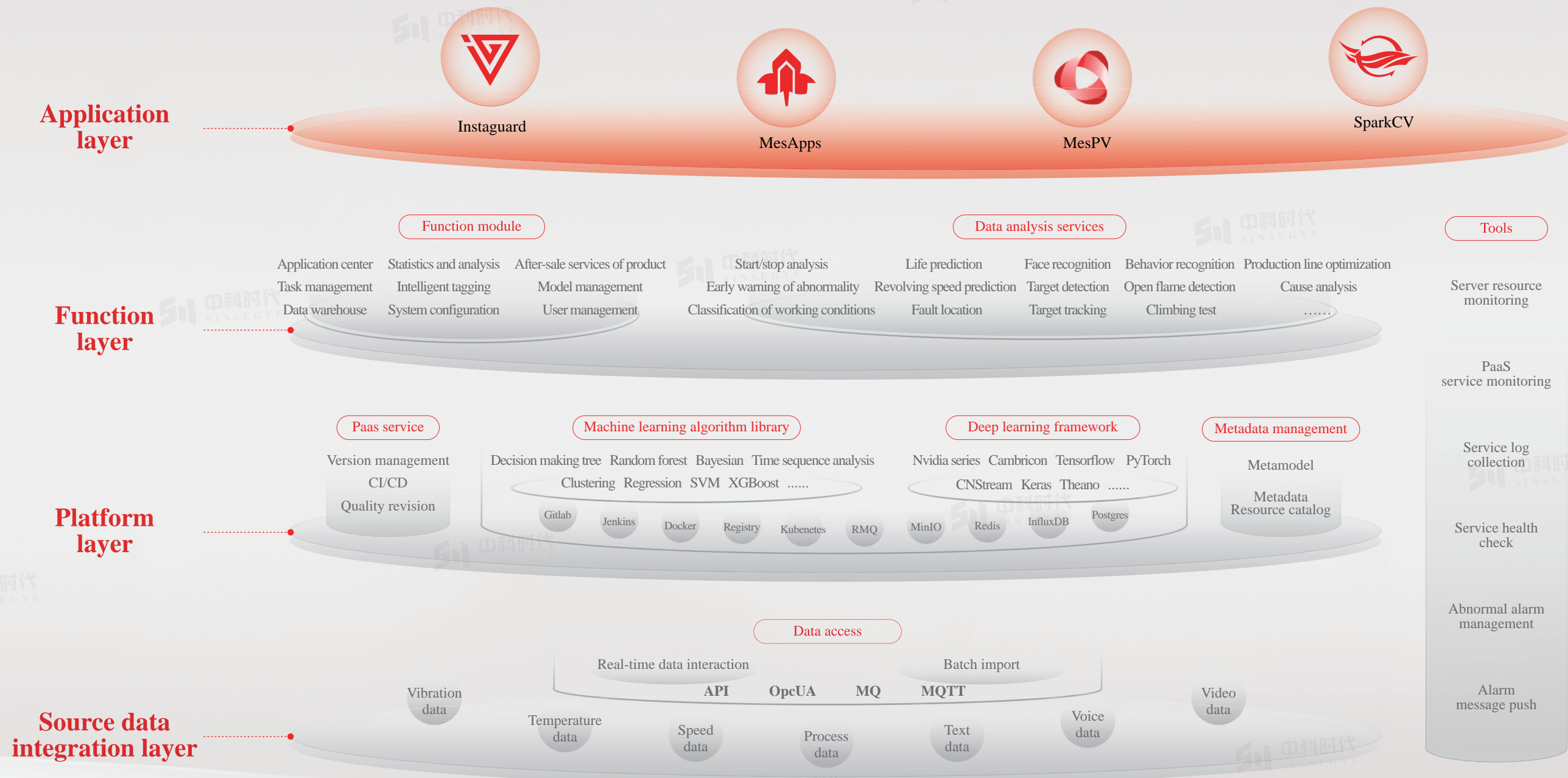
Features:

- Dual-domain operating system
- Type I virtualization technology
- Complete isolation of real-time domain and non-real-time domain
- Cross-platform development of application
- Hard real-time, multi-core and multiple tasks
- Convenient and efficient development
- Modular management and dispatching
- IOT debugging technology
- Seamless integration of IT resources

Domestic mainstream solutions:



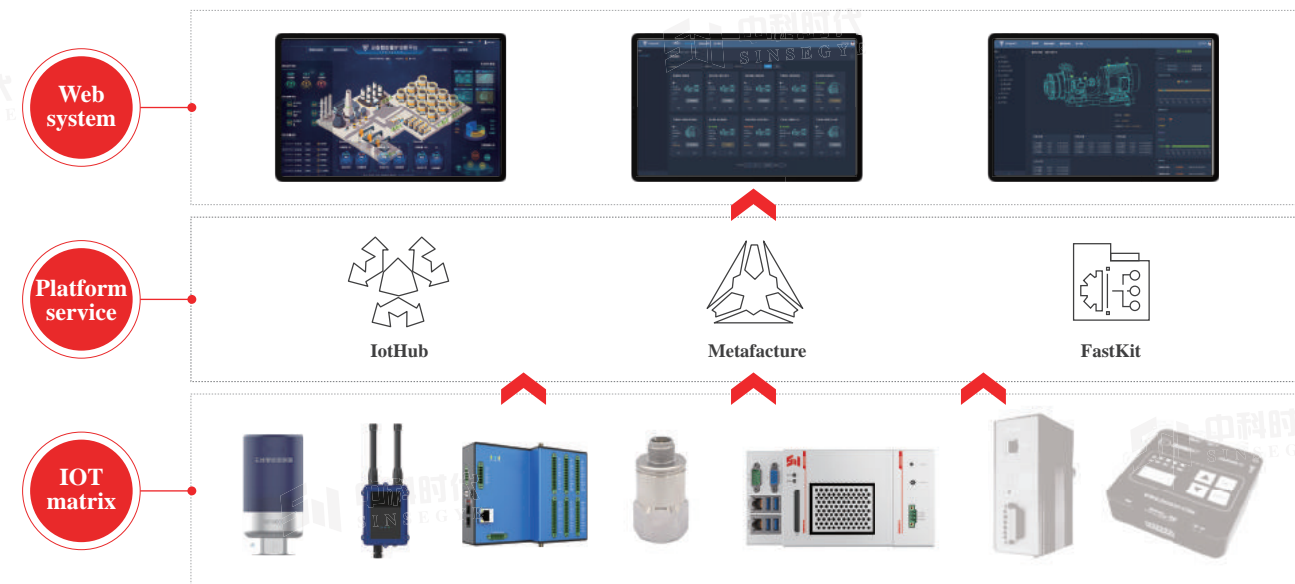
Digitization



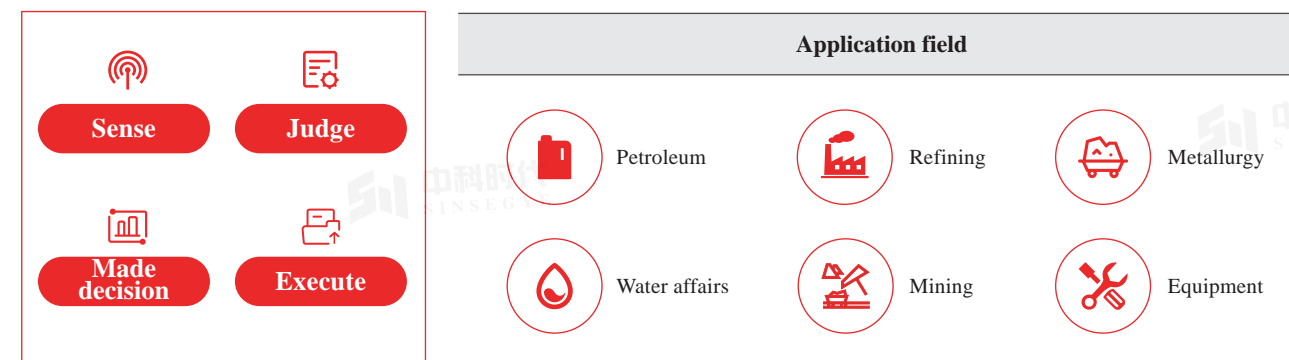
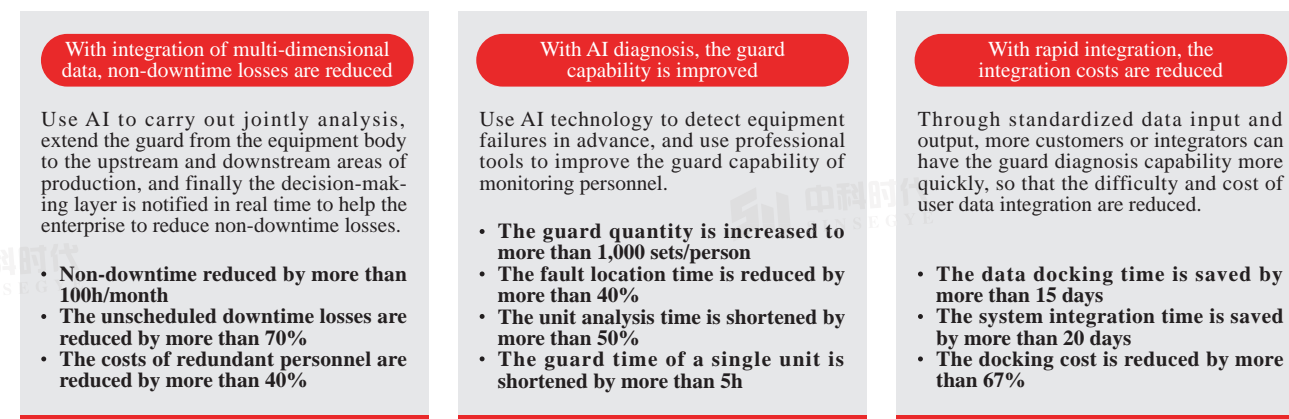
Instaguard intelligent guard and diagnosis system for equipment

The intelligent guard and diagnosis system for equipment is a PHM application system with self-diagnosis, self-learning and self-control. It helps enterprises reduce losses from unscheduled downtime, improve the guard and analysis capability for equipment, and make the guard of enterprise equipment easier.

Product structure:



Product value:

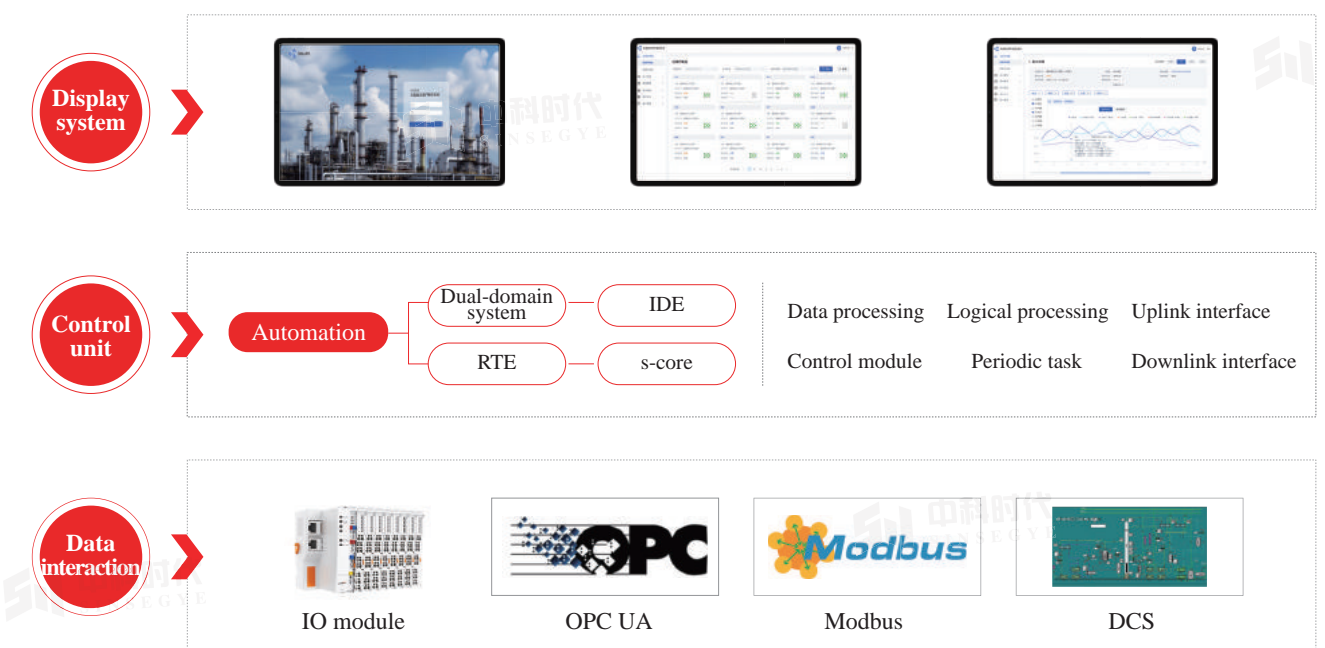


Intelligent control system for MesPV polysilicon reduction furnace

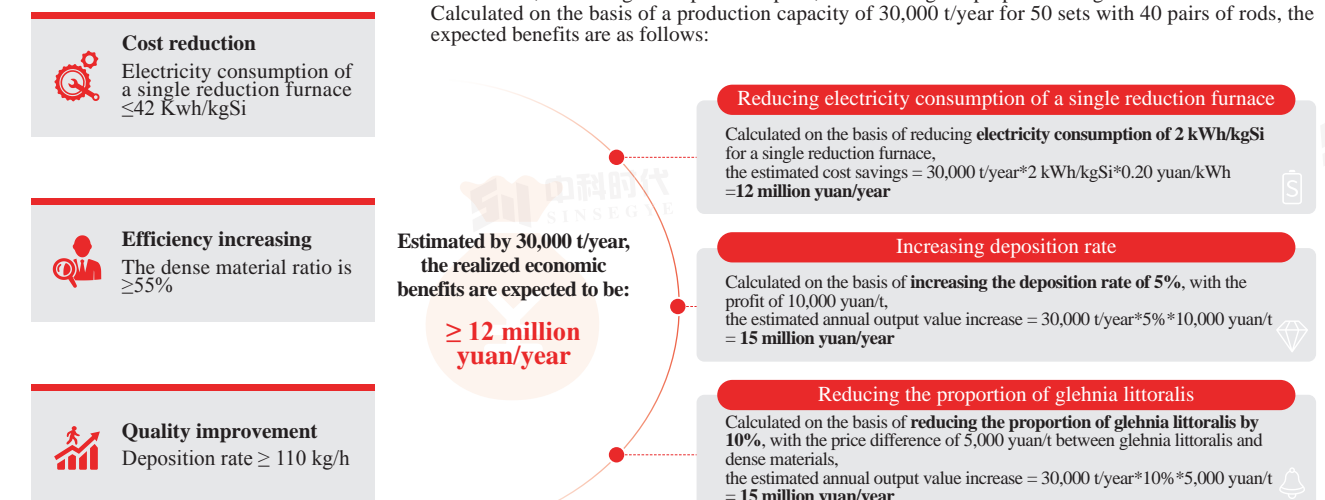
- 1 Process optimization
- 2 Energy consumption optimization
- 3 Integrated computing and control

MesPV integrates multiple tasks such as on-site working condition sensing, intelligent optimization of the reduction furnace, real-time control, production management, etc. to create an innovative industrial system with independent and intelligent decision-making capability. At the same time, the core hardware equipment, underlying operating system, intelligent optimization algorithms, etc. are all independently developed, which fundamentally ensures safety and controllability of the system. Many extra-large new energy enterprise with the annual output value of more than 10 billion in northwest China are configured with the MesPV polysilicon reduction furnace optimization control system. Compared with the traditional control method, the electricity consumption of a single reduction furnace achieves 42 kWh/kgSi or less, with the deposition rate of 2,110 kg/h and a dense material ratio of 255%, helping the enterprise improve quality, reduce costs, increase efficiency and control risks.

Product structure:



Product value:



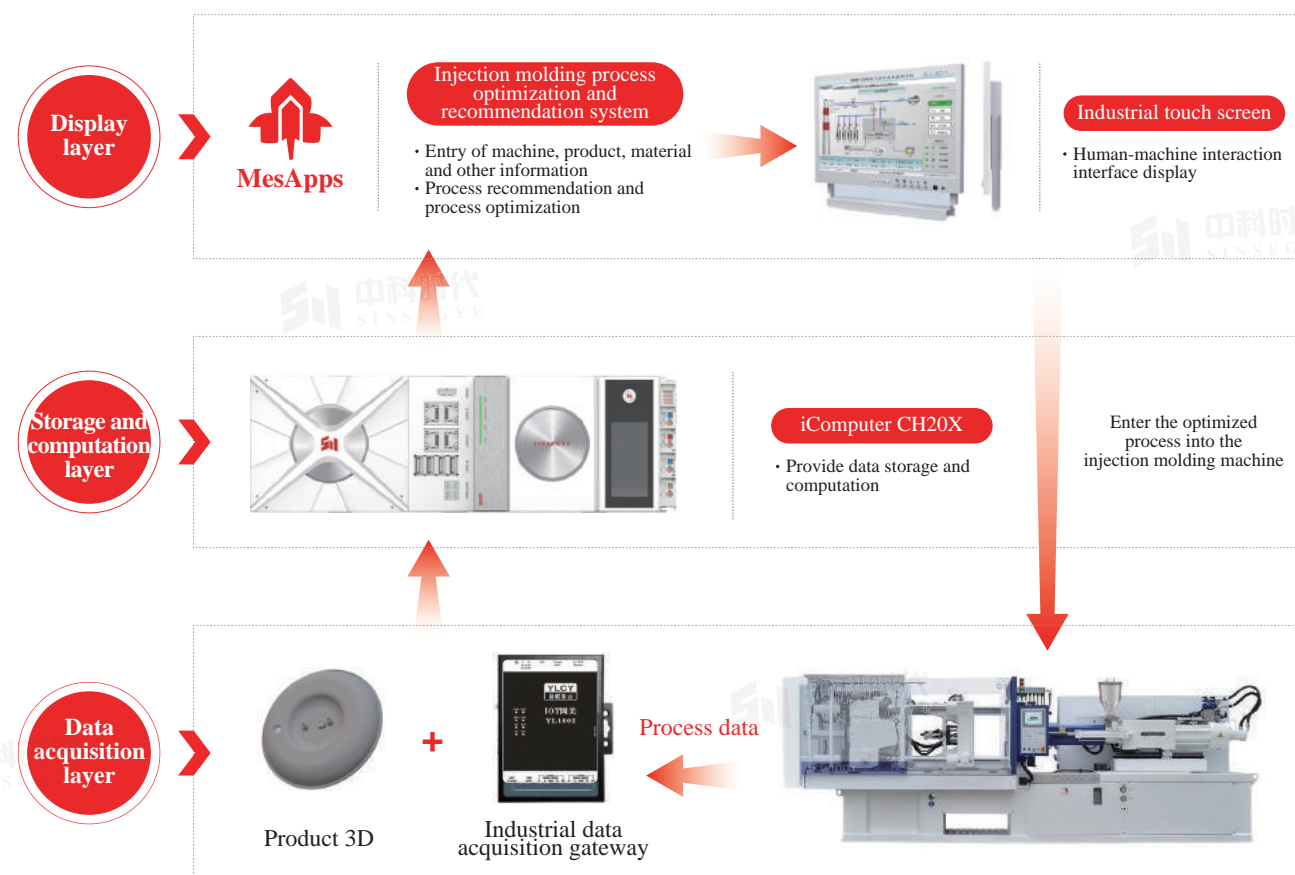


MesApps injection molding process optimization and recommendation system

- 1 Data management
- 2 Process recommendation
- 3 Knowledge graph

The intelligent optimization assistant of injection molding process is an intelligent parameter adjustment tool dedicated to lowering the injection molding parameter adjustment threshold and using intelligent algorithms to help injection molding sites solve process parameter adjustment problems. It can help companies reduce labor costs and production costs, and enable the companies to adapt to the rapidly changing market environment.

Product structure:



**Liberate high-end personnel
Energize junior staff**

Value 1

Automatically generate process parameters and recommend process optimization solutions through intelligent algorithms, shorten parameter adjustment time and lower the parameter adjustment threshold.

Value 2

Track and record each parameter adjustment process and feedback information, build the knowledge graph for parameter adjustment, further shorten the parameter adjustment time, and improve product quality.

Value 3

Provide professional technical support services to solve all parameter adjustment problems of customers.

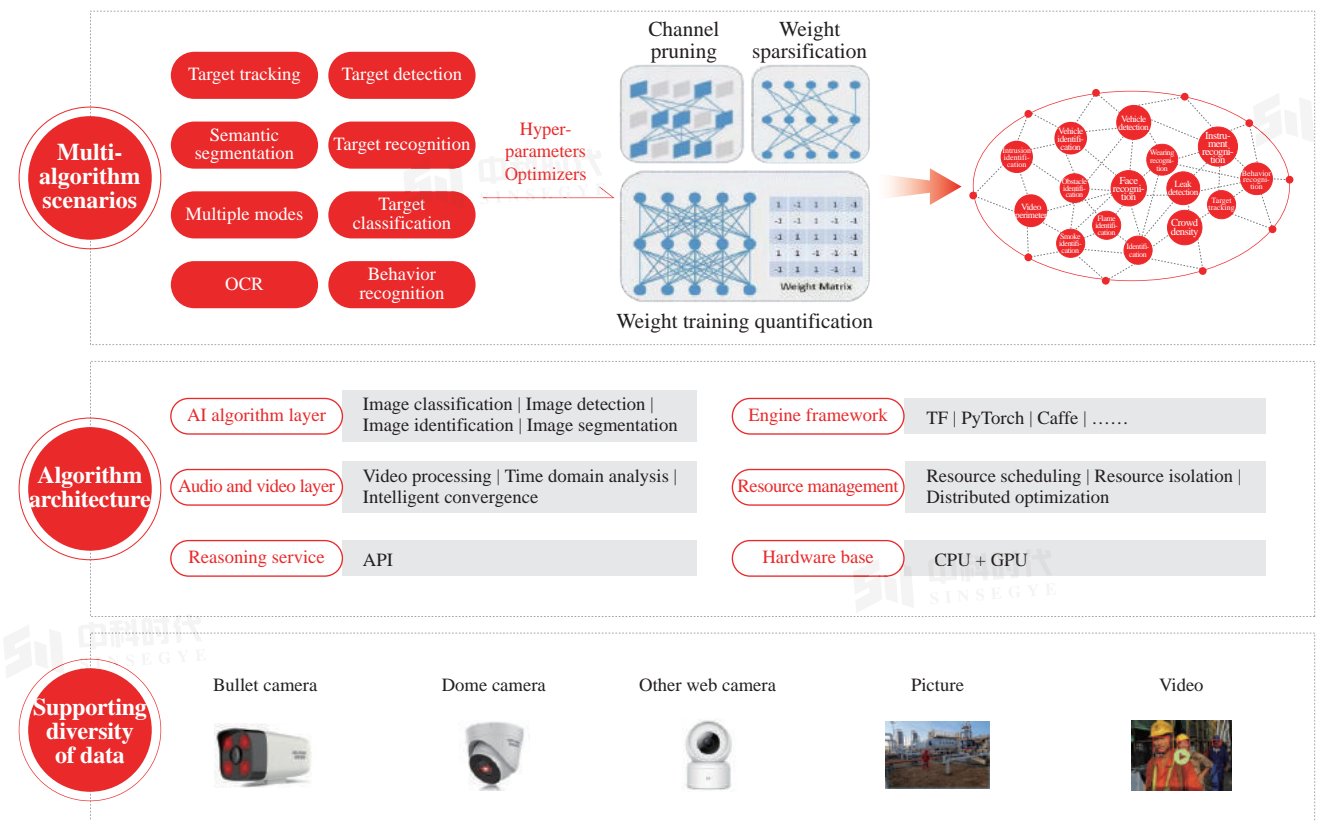


SparkCV visual guard system

- 1 Make visual guard more convenient

The intelligent visual guard system SparkCV changes the traditional monitoring method purely relying on personnel. By building in rich visual recognition algorithms and independently configurable software functions in the whole process, visual guard is more convenient, automation monitoring can be quickly realized, and alarm events can be tracked and backtracked, realizing less-man and unattended guard.

Product structure:



Platform advantages:

Convenient for application

Users can configure independently, and intelligent monitoring can be realized within 5 min.

Agile development

Use the micro-service architecture model to achieve rapid deployment and update of many algorithm services.

Rapid integration

Conveniently and quickly integrate the recognition results into the existing system of the enterprise.

Real-time response

The platform uses efficient interactive protocols to achieve millisecond-level response to algorithm task scheduling

Professional team

The algorithm team wins champion in international industrial algorithm competitions for 5 times.

Universal-class

Provide more than 50 algorithms for target recognition, behavior detection and face recognition.

Automatic optimization

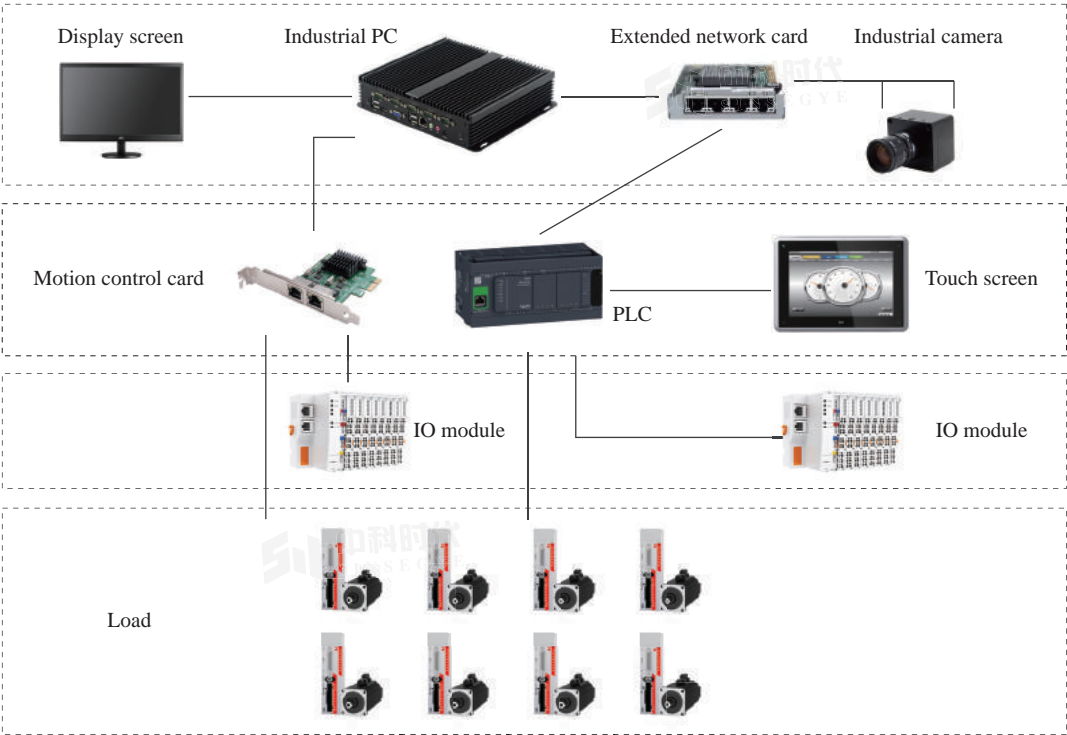
Automatically optimize the model regularly using a self-developed automatic learning framework.

High accuracy

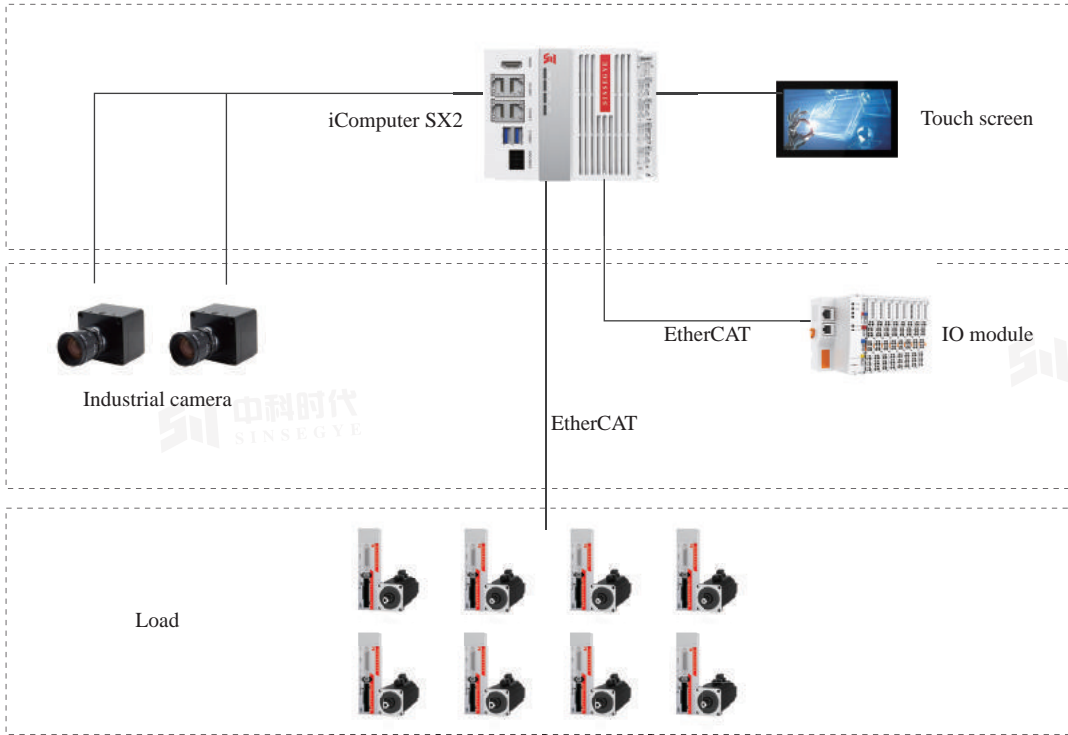
The average accuracy of the algorithms provided by the platform is over 90%.

Comparison Of Control Schemes

Control Architecture Diagram for Conventional Scheme



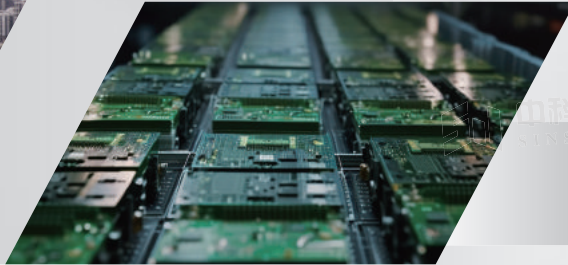
Control Architecture Diagram of SINSEGYE Computable Manufacturing Scheme



VS

Conventional solutions	
The conventional system is of an architecture composed of the industrial PC + PLC and other controllers, it has 2 to 3 layers, and it has a large size	Hardware integration
Distributed architecture, low real-time performance of the system	Real-time performance
The conventional automation equipment requires all-round personnel for upper/lower computer development, and the software shall be deployed in each controller separately	Software integration
Traditionally, the upper computer shall be installed with expansion boards and extension slots are required, resulting in limited extension and rising cost	Flexible extension
Conventional controllers are of only domestic brands	Domestication
Single interface protocol and limited flexibility of protocol docking	Multiple interfaces
The adaptation of the upper and lower computer requires a lot of transfer and adaptation work	Information interaction
Due to limited computing power, the conventional architecture control layer cannot efficiently process large amounts of data	Performance
Digital transformation and intelligent scenario adaptation are not friendly	Scenario adaptation
Due to multiple devices, the purchasing cost, equipment, debugging/labor costs go up	Cost

PC based iComputer comes SINSEGYE	
One set of controller has the functions of motion control, logic control, machine vision and configuration display at the same time, and it is compact in size	Hardware integration
The dual-domain operating system of real-time domain and non-real-time domain share the memory interaction mechanism, and the transmission and control has low delay, ensuring real-time performance	Real-time performance
A set of software is compatible with the development of motion control, logic control and machine vision configuration display, improving programming efficiency and allowing everyone to program	Software integration
Support local and remote I/O extension modules to carry out data acquisition and control for users, transmit and offer a variety of I/O and process modules, simultaneously support the extension modules of graphic cards, network interfaces, serial ports, 4/5GWIFI, and meet on-site functional requirements of customers	Flexible extension
The core chips such as CPU, graphics card, etc. for the product are all made of domestic materials. Product performance is available in high and low configurations. Customers can choose domestic controllers with different performance according to their needs	Domestication
Flexible configuration of interface protocols, support most mainstream control protocols	Multiple interfaces
Through shared memory between operation domains, transmit large amounts of data efficiently and stably	Information interaction
PC-based controller has high computing power and can allocate computing power in real-time domain and non-real time domain in accordance with needs	Performance
Adapt to the digital and intelligent scenarios	Scenario adaptation
Integration facilitates deployment, reduces equipment costs, and improves development and debugging efficiency	Cost



**Provide industrial intelligent
computer integrated solution of
computing and control globally.**

**Widely applied in areas such as
advanced manufacturing, laser,
new energy, processing industry.**



Polycrystalline silicon reduction furnace automatic control project for a top 100 global new energy company in Xinjiang

The integrated solution of computation and control businesses such as MesPV polysilicon process control system optimizes the production process of polysilicon reduction furnace, can save energy, improve quality and efficiency.





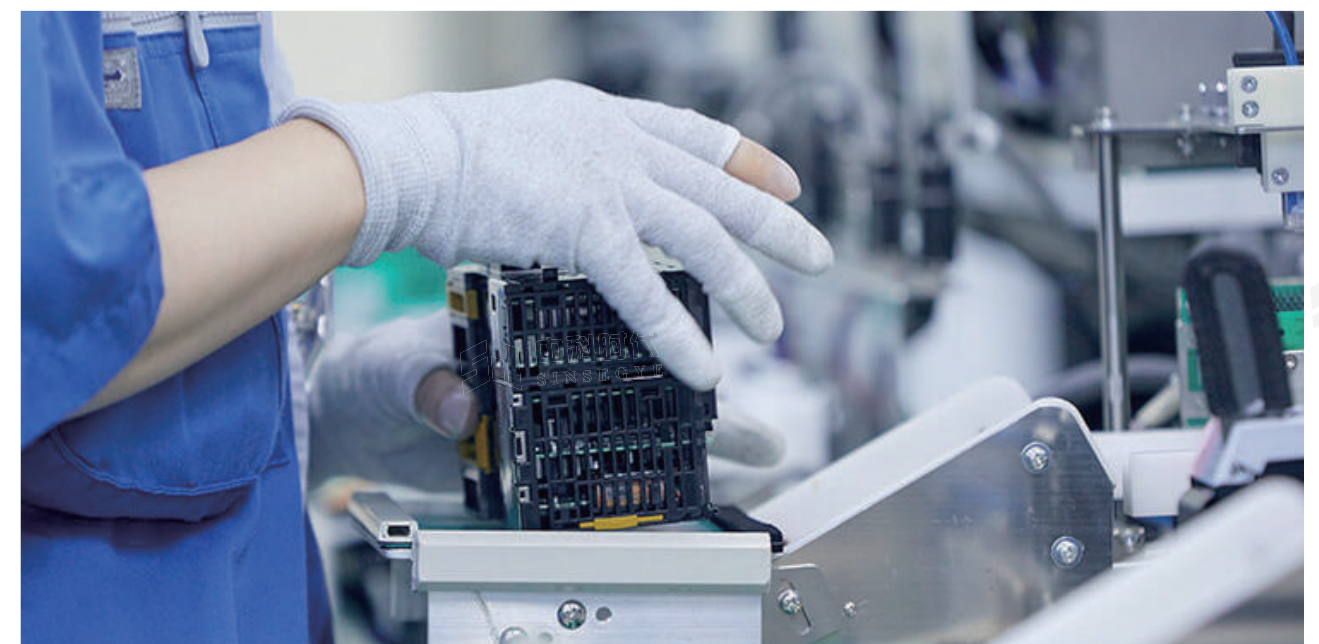
Equipment monitoring project of an intelligent photovoltaic pilot demonstration enterprise in Qingdao

By combining IDE with upper software, realize the calling and application of real-time algorithm functions in non-real-time applications, and enable customers to more flexibly configure their own process requirements.



Well-known brand controller replacement project for a world-leading AI and optoelectronic information company

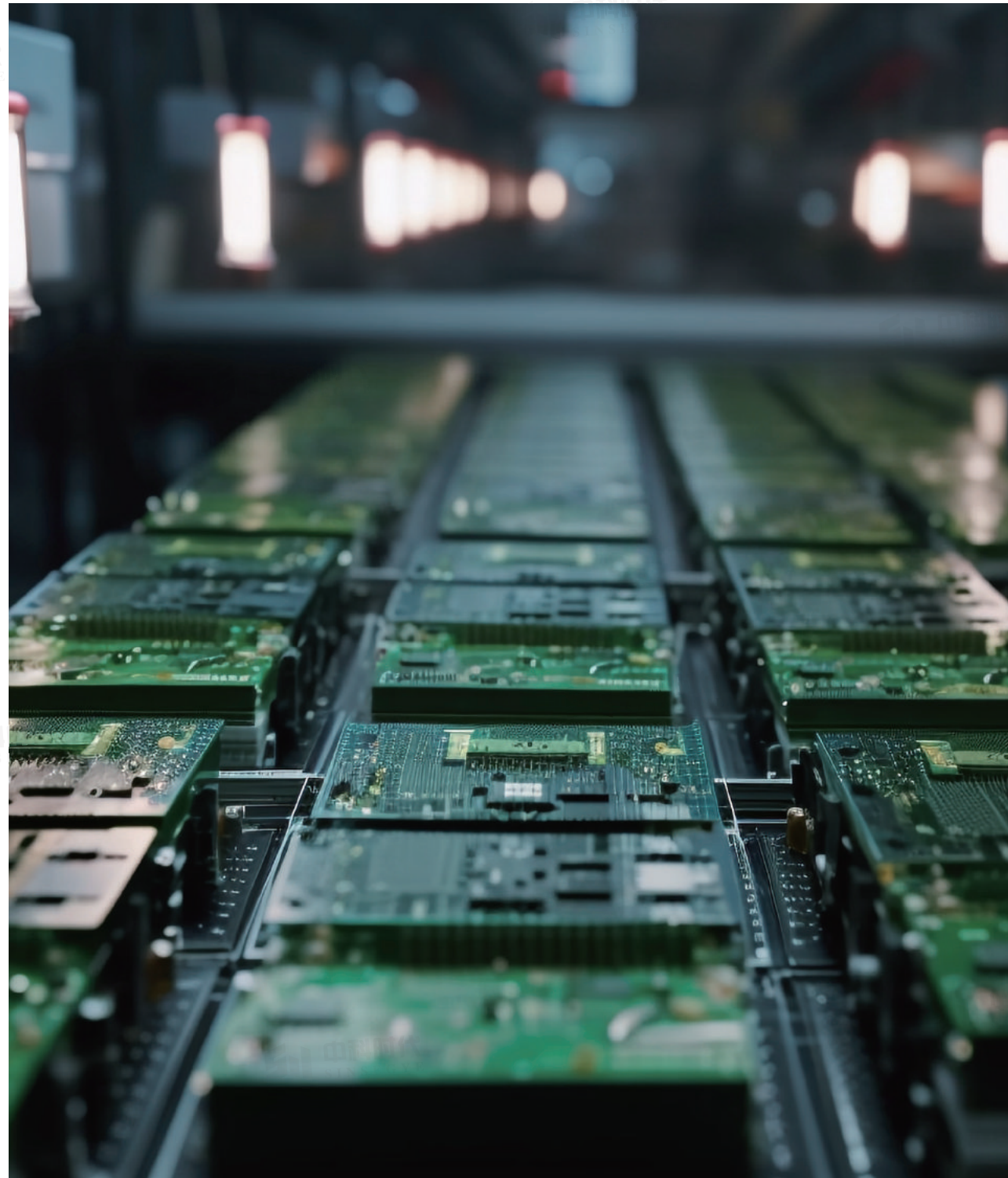
The integration of vision with control greatly saves costs. Improved three-axis interpolation function and communication efficiency between vision and control, increasing the overall beat speed.





Advantech industrial PC and Leadshine motion control card project for a national leading enterprise of intelligent manufacturing equipment

The NC core (soft card processing) application of the iComputer is significantly more stable than the conventional motion control board, and it effectively saves costs by about 20%. The vision + control application improves the data exchange efficiency and the beat through internal communication methods.



Well-known brand controller replacement project for a listed photovoltaic equipment company in Jiangsu

The control cycle of 100 axes in 2MS, and the upper computer screen is integrated, cut down cost by about 30%.

