

High-Precision Motion Control System

- Integrated Drive & Motion Controller
- Integrated Drive & Motion Controller
- PWM Drive
- Stand-alone Motion Controller
- High-performance Linear Drive
- Supporting Modules
- Nano-precision Motion Controller
- Gmotion Debugging Software



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High-Precision Motion Control System Ver 2.0

Providing Professional Solutions for High-Performance Precision Motion Control Systems



Wuhan Glory Road Precision Technology Co., Ltd.

PREFACE

Driven by structural opportunities from China's manufacturing transformation, upgrading and the development of emerging industries, the application boundaries of motion control technology are rapidly expanding, extending from traditional industrial automation to emerging intelligent scenarios. This transformation not only broadens the market space of the industry but also places diversified demands on the performance of motion control systems.

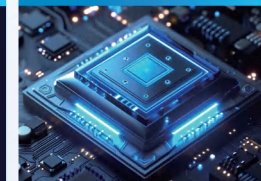
Against this backdrop, Glory Road Precision Motion Control focuses on the core pain points of high-end equipment. We provide professional solutions featuring nano-to-sub-nano precision, vibration suppression, and multi-axis high real-time synchronization, specifically tailored for the semiconductor, precision machining, life sciences and other high-end sectors in China. With independently controllable core technologies, we break through bottlenecks in high-end precision motion control and provide critical support for the R&D and upgrading of domestic high-end equipment.

Semiconductor Industry



Semiconductor Metrology & Inspection, Ion Implantation, Laser Annealing, Hybrid Bonding

3C Manufacturing Industry



Precision Assembly, Dispensing & Coating, Vision Inspection, Component Mounting

Precision Machining Industry



Ultra-precision Machining, Laser Processing, Micro-nano Additive Manufacturing

Life Sciences



Microscopy Imaging, Biological 3D Printing, Gene Sequencing

Optics Industry



Optical Device Manufacturing, Precision Optical Testing, Fiber Coupling

COMPANY PROFILE

2018

Established

500⁺

Number of

32000⁺

Area of R&D Building and

Wuhan Glory Road Intelligent Technologies Co., Ltd. was established in March 2018 and is located in the East Lake High-Tech Development Zone (also known as "China's Optics Valley") in Wuhan. The company has branches in Beijing and Nanjing. As a National High-Tech Enterprise, it positions itself as an integrated solution provider specializing in precision motion control and intelligent sensing technologies. Leveraging Industry-Academia-Research collaboration models and artificial intelligence technologies, the company supports semiconductor industry development and new power system construction. Its main products and services include precision active vibration isolation systems, precision motion control systems, excitation/absorption systems, vibration measurement, as well as condition monitoring for power measurement equipment, together with advanced technologies, equipment and software platforms.

The company currently employs over 500 staff members, with more than 80% holding bachelor's degrees or higher. Research and development personnel constitute over 50% of the workforce, including a team of 70-plus master's and doctoral degree holders.



Corporate Vision

Striving to become a top-tier high-tech company in China.



Corporate Mission

Serve the national high-tech strategy and achieve dual development of the enterprise and its employees.



Core Values

Diligence, Responsibility, Focus, and Sharing.

The company has long focused on R&D of core technologies in precision motion control, with a keen insight into customers' core demands and industry pain points. It has developed technically advanced products and solutions, establishing a comprehensive product portfolio including PWM drives, linear drives, motion controllers and supporting modules.

These precision motion control products are highly adaptable to high-precision, high-real-time applications such as semiconductor manufacturing, precision machine tools, laser processing, and life sciences. They enable precise control of mechanical motion and trajectories, empowering self-reliance and high-quality development of high-end equipment, and helping high-end manufacturing achieve stability and precision.

Leveraging its core technology platform, the company has also expanded its product lines to include active vibration damping, excitation/absorption, and vibration measurement. It has formed a synergistic development pattern with precision motion control as the core, and is committed to becoming a comprehensive solution provider for precision motion control.

INTELLECTUAL PROPERTY



8项发明专利

Patent Type	Patent Name	Patent Number
◆ US Patent	一种六自由度微振动抑制平台及其控制方法	US9777793B1
◆ Chinese Patent	一种压电陶瓷致动器驱动方法及驱动电路	ZL202110380078.0
◆ Chinese Patent	一种三相交流电机的数模混合控制高频开关功率变换系统	ZL202211686383.3
◆ Japanese Patent	一种高精度的传递函数采样方法	ZL201710081416.4
◆ Chinese Patent	一种三相交流电机的数模混合控制高频开关功率变换系统	ZL202211686383.3
◆ Chinese Patent	一种双电流环控制的开关线性混合功率变换系统	ZL202310682700.2
◆ Chinese Patent	一种重心位置测量方法及系统	ZL201910068383.9
◆ Chinese Patent	一种质量测量方法及系统	ZL201910068237.6
◆		



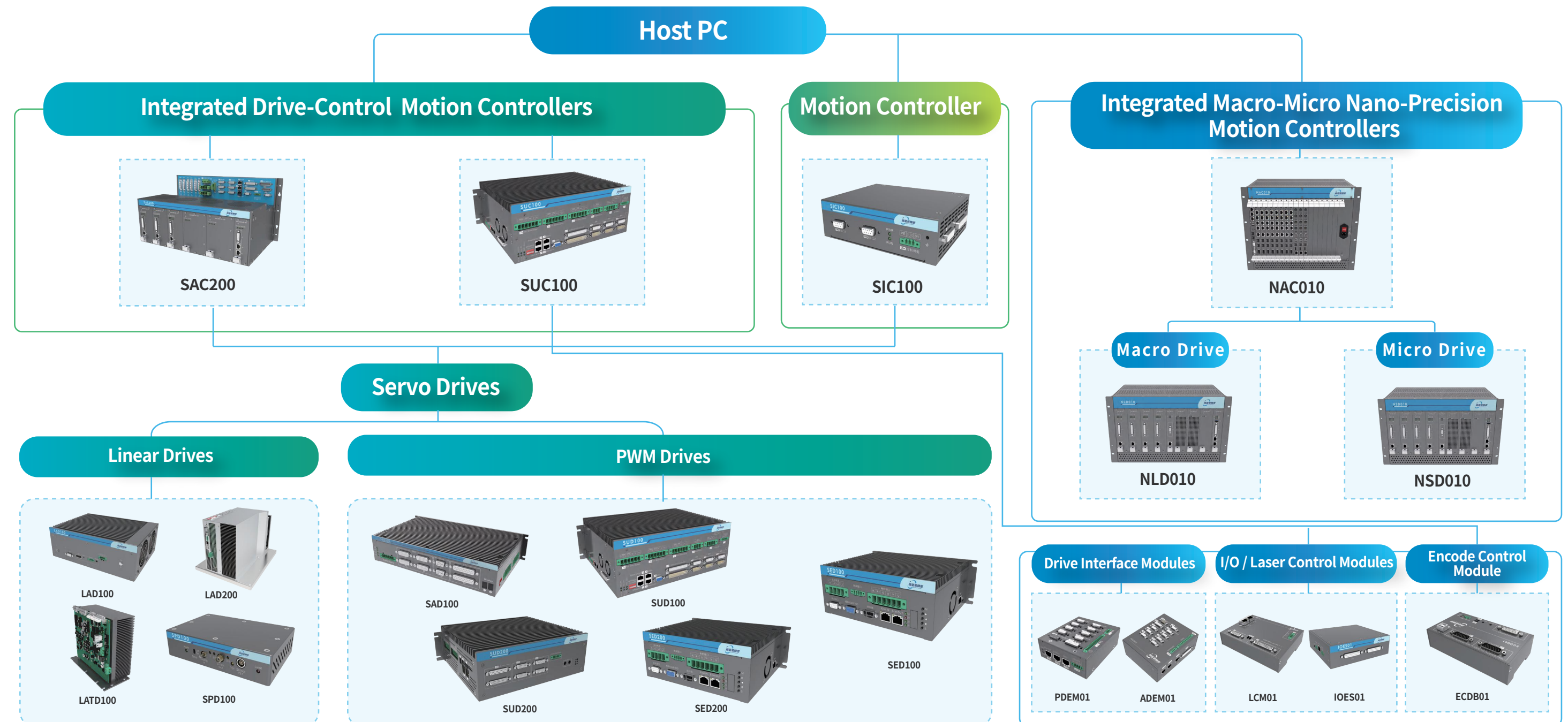
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Software Copyright Name	Certificate Number
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PRODUCT OVERVIEW

Glory Road precision motion control is committed to providing core motion control solutions for industrial scenarios with high precision and high real-time performance. The product portfolio covers integrated drive-and-control motion controllers, standalone motion controllers, high-performance servo drives, as well as a complete set of motion control solutions including digital I/O, analog, laser and other supporting modules. It can fully meet the demands ranging from general automation to ultra-precision fields such as semi-conductors and laser processing, helping customers achieve equipment performance improvement, production line upgrading and domestic substitution.



CORE FEATURES

Core Control Algorithms and Servo Control Technology

One-Touch Auto-Tuning

Upgraded algorithm supports gantry, multi-axis coupling and flexible load scenarios. AI-powered dynamic parameter optimization enables faster response, lower steady-state error and better disturbance rejection.

Measurement System Switching

Supports seamless feedback source switching with stable control, enhancing adaptability and reliability under complex conditions.

Multi-Axis Coupling & Decoupling

Self-developed multi-axis decoupling algorithm realizes precise control for multi-DOF systems, suppresses cross-axis coupling, and stably adapts to ZTT and other complex multi-axis applications.

Adaptive Disturbance Rejection Technology

Real-time detection and dynamic compensation for external disturbances and load fluctuations. Ensures stable trajectory and positioning accuracy with high consistency under complex conditions.

Agile Servo Technology

Increases loop bandwidth and response speed, improves tracking accuracy and real-time performance. Achieves ultra-low-latency closed-loop control for precise positioning and minimal tracking error, ideal for high-speed, high-precision motion control.

Fine PWM Control Technology

Ensures smooth, low-ripple motor current, suppresses torque ripple and vibration, improves low-speed stability and positioning accuracy for quieter, more stable operation.

Superior Gantry Control Algorithm

Supports dual-loop gantry, master-slave following, and cross-axis MIMO control. Effectively suppresses coupling disturbances from dual-drive synchronization errors, mechanical deviation and load eccentricity. Improves synchronization, smoothness and positioning accuracy.

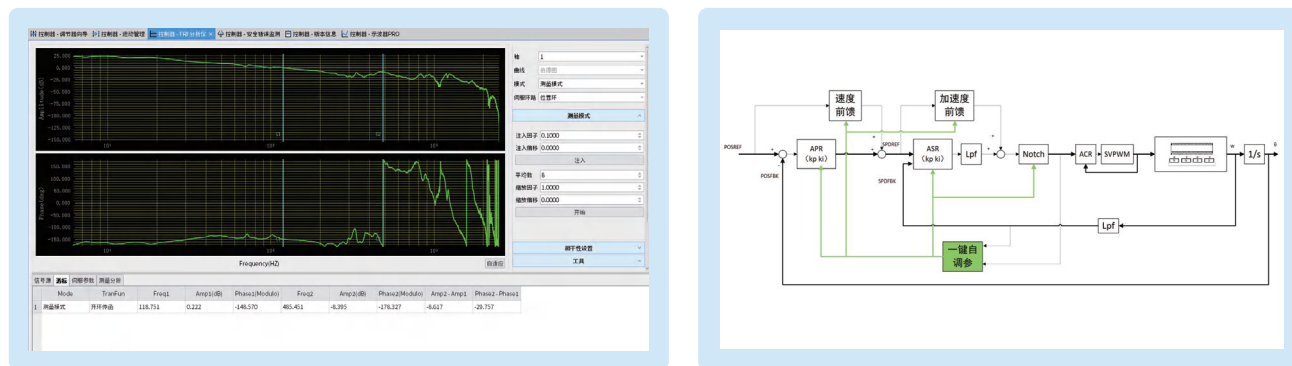
PERFORMANCE ADVANTAGE

01 Simple & Easy to Debug, Greatly Improved Efficiency

One-Touch Auto-Tuning: Automatically identifies resistance, inductance, inertia and friction compensation; configures notch and feedforward parameters, reducing debugging time by 50%.

Built-in Frequency Response Analysis: Measures system frequency response function quickly without external excitation, providing data for parameter optimization.

Full-State Visualization: Displays all state variables and control variables on a single page. The equipment operating status is clear at a glance, making debugging and maintenance more efficient.

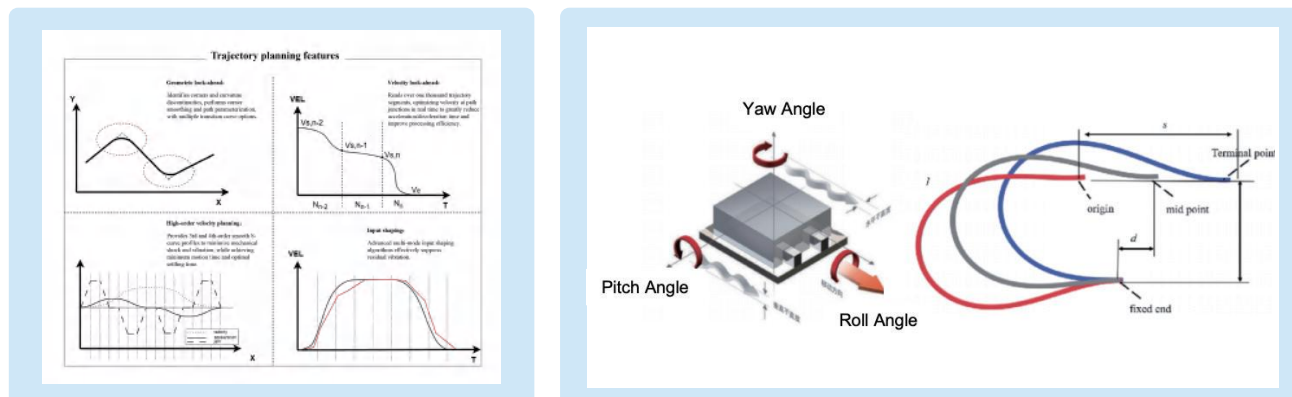


02 Advanced Algorithms, Industry-Leading Performance

Proprietary High-Order Trajectory Algorithm: Supports multiple velocity profiling, ensuring smooth, stable trajectories and minimized dynamic errors in high-speed, high-precision applications.

Ultra-High-Frequency Control: Up to 200kHz PWM switching frequency, 10kHz current control bandwidth, static jitter within 2nm, delivering world-class response and precision.

Comprehensive Compensation: Integrates feedforward, dynamic error and friction compensation, significantly enhancing static and dynamic system performance.

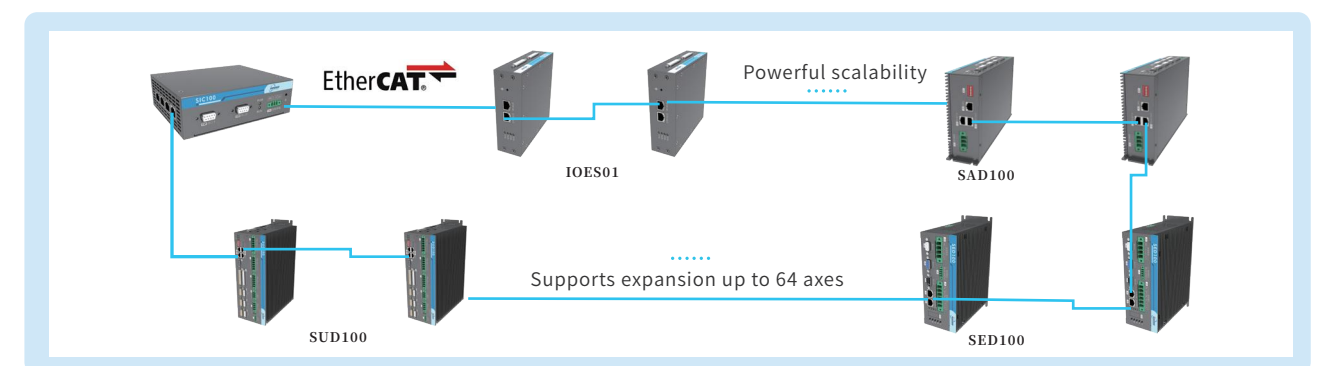


03 Strong Scalability, Full-Scenario Adaptation

Multi-axis Expansion: Supports up to 64 axes, covering applications from single axis to large-scale production lines.

Abundant Interfaces: Compatible with ABZ, Sin/Cos, BiSS-C, Endat and other encoder interfaces, supporting mainstream sensors and actuators.

Integrated Resources: Built-in digital/analog I/O, MARK, PEG and functional signals. Supports gantry control, feedforward compensation, dynamic error compensation, ring network redundancy and high-order trajectory planning, fully meeting the demands of ultra-precision equipment.

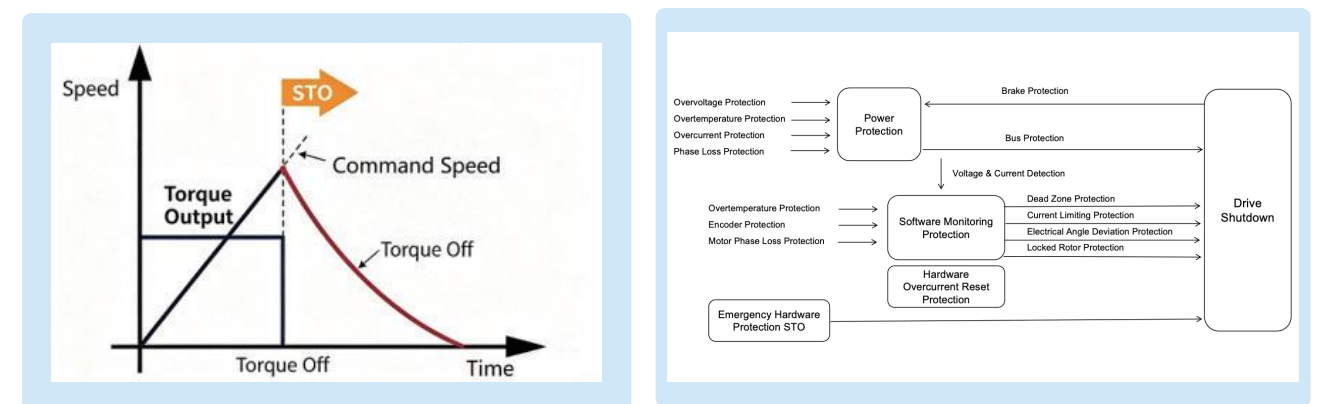


04 Safety & Reliability, Stable & Durable

Hardware-Level Safety: The full series supports STO (Safe Torque Off). When triggered, the power tubes are forced to shut down by hardware, ensuring the safety of personnel and equipment.

High-Reliability Design: Complies with industrial EMC standards (CE/CS/EFT/Surge/ESD), ensuring stable operation in complex industrial environments.

Wide Voltage Adaptation: Supports 12-320V DC bus voltage, covering both low-voltage and high-voltage application scenarios, with strong compatibility.





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01

Drive-Control Integrated Motion Controllers

The drive-control integrated series products are positioned as high-precision, modular equipment integrating servo drive and motion control. Adopting a multi-processor heterogeneous architecture, combined with powerful servo control and motion control algorithms, it significantly improves the performance of motion systems, suitable for high-precision, high-real-time fields such as semiconductor and laser cutting. It is designed to meet the needs of equipment manufacturers with high multi-axis motion control requirements. Its universal servo drive technology enables system designers to control almost any type of motor or motion platform.

- SAC Series High-Performance Drive-Control Integrated Controller
- SUC Series Universal Drive-Control Integrated Controller

SAC Series High-Performance Drive-Control Integrated Controller



◆ 9-inch: 1~2 Axes

◆ 11-inch: 1~4 Axes

◆ 19-inch: 1~6 Axes

◆ 21-inch: 1~8 Axes



Core Positioning

Modular, high-performance multi-axis drive-control integrated equipment, specially built for ultra-precise scenarios such as semiconductor and laser processing.



Core Capabilities

Adopts EtherCAT communication protocol, supporting up to 8 drive axes and 64 control axes. Equipped with advanced functions including gantry algorithm, dynamic error compensation and ring network redundancy.

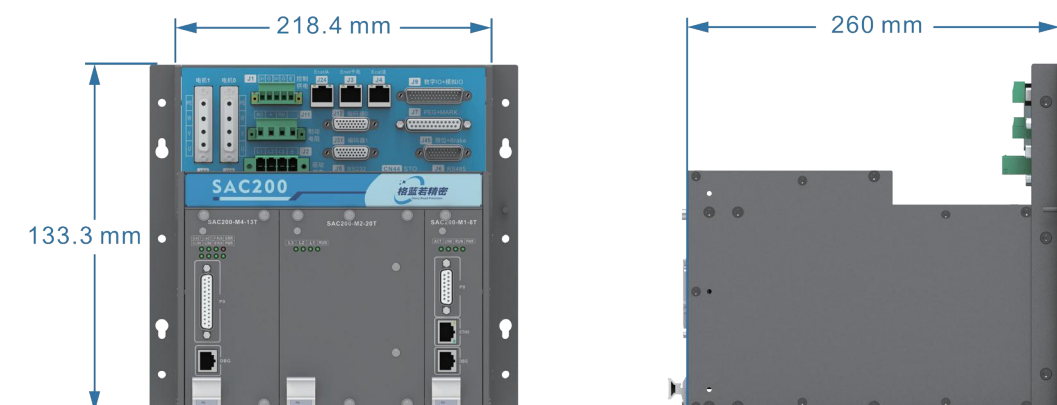
Features multi-processor architecture with self-developed servo algorithms, achieving 200kHz PWM switching frequency, 10kHz current control bandwidth, and leading response performance in the industry.



Typical Applications

Semiconductor equipment, laser processing, high-precision automated assembly lines.

Dimension Drawing (Example: 9-inch)

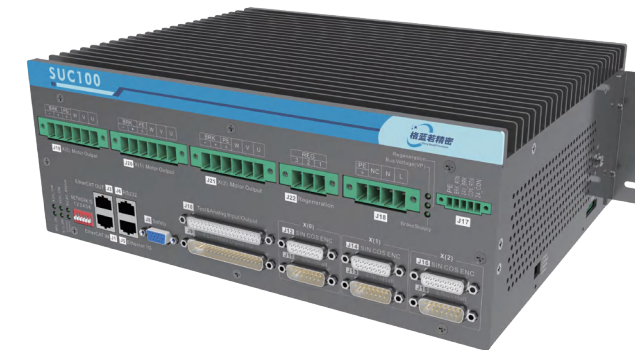


Drive-Control Integrated Motion Controller

Technical Parameters

Parameters	 SAC200
Axis Control Capability	Up to 8 drive axes and 64 control axes
EtherCAT Cycle Time	5kHz
Drive Power Supply	85-265VAC
Bus Voltage	48/96/320VDC
Continuous/Peak Current	3.3/10A, 6.6/20A, 10/30A
Current Control Bandwidth	Up to 10kHz
PWM Switching Frequency	Up to 200kHz
Digital I/O Channel	8 inputs and 8 outputs
Analog I/O Channel	4 inputs and 4 outputs
Encoder Protocol	Supports ABZ/AqB/ABS/BISS, sine-cosine and Hall
Sin-Cos Frequency	Up to 10MHz
PEG Signal	Up to 8 channels
STATE Signal	Up to 8 channels
STO Signal	Supports
Serial Communication	Communication interfaces such as RS232/485
Dimensions	9-inch, 11-inch, 19-inch, 22-inch

SUC Series Universal Drive-Control Integrated Controller



Core Positioning

Integrated multi-axis drive-control integrated equipment, focusing on industrial scenarios with sub-micron to nanometer-level precision.



Core Capabilities

Built-in 3 drive axes and 64 control axes.

20kHz PWM switching frequency and 5kHz current control bandwidth, balancing precision and cost.

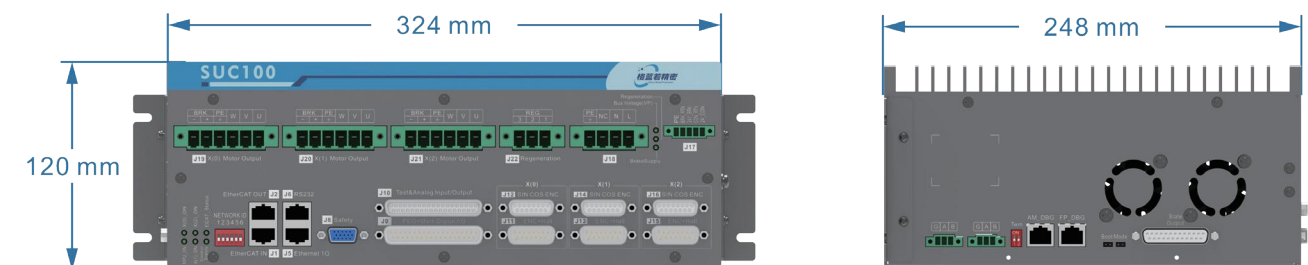
Integrated overcurrent/overvoltage/overtemperature protection, supporting STO (Safe Torque Off) to ensure the safety of equipment and personnel.



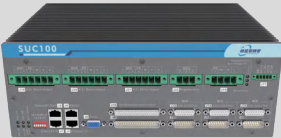
Typical Applications

Measurement equipment, laser processing, precision alignment platforms, 3C electronic manufacturing.

Dimension Drawing



Technical Parameters

Parameters	 SUC100
Axis Control Capability	Built-in 3 axes, maximum support for 64 axes
EtherCAT Cycle Time	5kHz
Input Voltage Range	85-265VAC
Bus Voltage	Equal to Vin*1.414
Continuous/Peak Current	5/10A, 15/30A
PWM Control Frequency	20kHz
Current Control Bandwidth	Up to 5kHz
Communication Interface	Ethernet TCP/IP, EtherCAT, RS-232, etc.
Encoder Protocol	Supports ABZ/AqB/ABS/BISS, sine-cosine and Hall
STO Function	Supports
Analog I/O	Supports 6 channels of +/-10V differential analog input
Digital I/O	Supports 8 channels of digital input with optocoupler isolation
Protection Function	Supports overcurrent, overvoltage and overtemperature protection
Motor Interface	R, S, T, PE, supporting Y-connection and star connection
Dimensions	324mm*248mm*120mm
EMC	CE/CS/EFT/Surge/ESD

02

Independent Motion Controller

As an EtherCAT motion controller, it adopts a multi-processor architecture and a compact design, equipped with powerful parameter tuning algorithms and motion control algorithms to maximize the performance of the motion system. Meanwhile, it features excellent compatibility and scalability, and can use distributed clocks to ensure that the synchronization accuracy between all axes is better than 0.1 microseconds, making it very suitable for high-precision and high-real-time fields such as the semiconductor field and laser processing.

- SIC Series Universal Motion Controller

SIC Series Universal Motion Controller



Core Positioning

A high-performance EtherCAT master controller, focusing on multi-axis synchronization and complex trajectory planning.



Core Capabilities

Adopting a multi-processor architecture, EtherCAT cycle time is up to 5kHz, and the inter-axis synchronization accuracy is better than 0.1 microseconds. It supports a maximum of 64 axes, compatible with various EtherCAT servo drives and I/O modules.

It provides GL+ dedicated scripts, G-code hybrid programming, and C#/C++/Python APIs, enabling flexible and efficient development.



Typical Applications

Semiconductor backend processing, laser processing, and multi-axis linkage automation equipment.

Dimension Drawing



Independent Motion Controller

Technical Parameters

Parameters	 SIC100
Input Voltage Range	12-24VDC
Number of Axes	Maximum support for 64 axes
EtherCAT Cycle Time	5kHz
Communication Interface	Ethernet (TCP/IP), EtherCAT, RS-232, etc.
Analog I/O	Supports 8 channels of $\pm 10V$ differential analog input and 8 channels of $\pm 10V$ differential analog output
Protection Function	Supports overcurrent, overvoltage and overtemperature protection
Dimensions	151.4mm*45mm*119mm
EMC	CE/CS/EFT/Surge/ESD

03

Pulse Width Modulation (PWM) Drives

The PWM driver is an EtherCAT high-performance servo drive system designed to meet the strict motion control requirements of semiconductor equipment, precision instruments and high-end automation equipment. Relying on independent servo algorithms, ultra-high bandwidth control and advanced power electronic technology, the product achieves breakthroughs in positioning accuracy, dynamic response, vibration suppression and multi-axis synchronization; it provides single-axis/dual-axis/multi-axis and other multi-form modules, supports wide voltage and wide current specifications, and can flexibly match different load scenarios. Combined with Glory Road precision multi-axis motion controller, it can build a high-synchronization and high-reliability full-link motion control system, uniformly coordinating the functions of EtherCAT slave stations such as I/O, measurement and laser, to meet the extreme performance needs of high-end equipment.

- SAD Series High-Performance PWM Drive
- SUD Series Universal PWM Drive
- SED Series Economic PWM Drive

SAD Series High-Performance PWM Drive



Core Positioning

EtherCAT Bus PWM Driver adopting high-precision PWM technology, suitable for multi-scenario applications.



Core Capabilities

Achieves 10 kHz current control bandwidth and 200 kHz switching frequency.

Supports one-click auto-tuning (resistance & inductance identification, inertia identification, friction compensation, etc.), greatly reducing commissioning time.

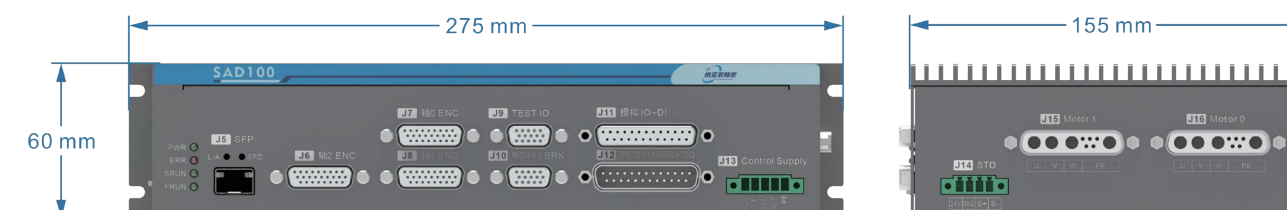
Integrates STO (Safe Torque Off) function with hardware-level forced power device shutdown for enhanced safety.



Typical Applications

High-end semiconductor equipment, laser processing, precision motion stages.

Dimension Drawing



Pulse Width Modulation (PWM) Drives

Technical Parameters

Parameters	 SAD100
Axis Control Capability	2 drive axes
Input Voltage Range	12–100 VDC
Bus Voltage	Equal to Vin
Continuous/Peak Current	3.3/10 A, 6.6/20 A, 10/30 A
PWM Control Frequency	Up to 200 kHz
Communication Interface	Ethernet TCP/IP, EtherCAT, RS-232, etc.
Encoder Protocol	Supports ABZ/AqB/ABS/BISS, sine-cosine and Hall
Sin/Cos Encoder Sampling Frequency	Configurable: 1 MHz, 5 MHz, 10 MHz, 500 kHz
Analog I/O	4 channels ± 10 V single-ended analog input 4 channels ± 10 V single-ended analog output
Digital I/O	4 channels optically isolated digital input 4 channels optically isolated digital output
STO Function	Supported
Protection Functions	Over-current, over-voltage, over-temperature protection
Motor Interface	R, S, T, PE; supports Y-connection and star connection
Dimensions	155 mm*275 mm*60 mm
EMC	Meets CE / CS / EFT / Surge / ESD requirements

SUD Series Universal PWM Drive



Core Positioning

EtherCAT bus PWM driver adopting high-precision PWM technology, suitable for both low-voltage and high-voltage applications.



Core Capabilities

Achieves 5 kHz current control bandwidth and 20 kHz switching frequency.

Supports one-click auto-tuning (resistance & inductance identification, inertia identification, friction compensation, etc.), greatly reducing commissioning time.

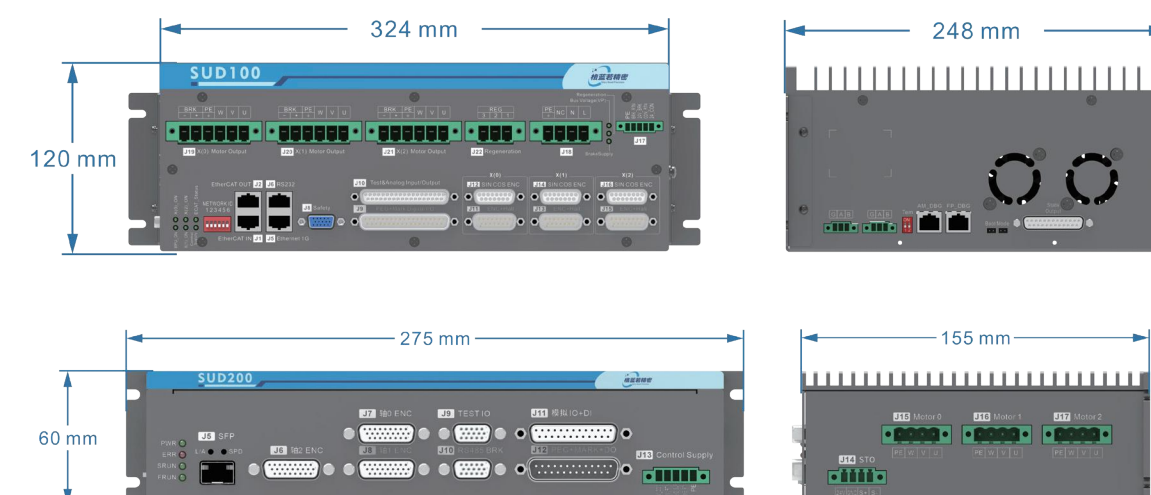
Integrates STO (Safe Torque Off) function, which forcibly turns off power switches at the hardware level to ensure operational safety.



Typical Applications

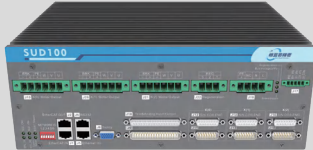
High-end semiconductor equipment, laser processing, precision motion stages.

Dimension Drawing

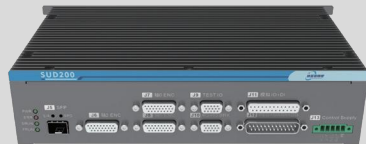


Pulse Width Modulation (PWM) Drives

Technical Parameters

Parameters	 SUD100
Axis Control Capability	3 drive axes
Input Voltage Range	85–265 VAC
Bus Voltage	Equal to $V_{in} \times 1.414$
Continuous/Peak Current	Up to 15/30A
PWM Control Frequency	20 kHz
Communication Interface	Ethernet TCP/IP, EtherCAT, RS-232, etc.
Encoder Protocol	Supports ABZ/AqB/ABS/BISS, sine-cosine and Hall
Sin/Cos Encoder Sampling Frequency	500 kHz
STO Function	Supported
Analog I/O	Supports 6-channel $\pm 10V$ differential analog inputs Supports 6-channel $\pm 10V$ differential analog outputs
Digital I/O	8 channels optically isolated digital input 8 channels optically isolated digital output
Motor Interface	R, S, T, PE; supports Y-connection and star connection
Dimensions	324 mm × 248 mm × 120 mm
EMC	CE / CS / EFT / Surge / ESD

Technical Parameters

Parameters	 SUD200
Axis Control Capability	3 drive axes
Input Voltage Range	12-150 VDC
Bus Voltage	Equal to V_{in}
Continuous/Peak Current	3.3/10A, 6.6/20A, 10/30A
PWM Control Frequency	20 kHz
Communication Interface	Ethernet TCP/IP, EtherCAT, RS-232, etc.
Encoder Protocol	Supports ABZ/AqB/ABS/BISS, sine-cosine and Hall
Sin/Cos Encoder Sampling Frequency	500 kHz
STO Function	Supported
Analog I/O	2 channels $\pm 10 V$ single-ended analog input 2 channels $\pm 10 V$ single-ended analog output
Digital I/O	4 channels optically isolated digital input 4 channels optically isolated digital output
Motor Interface	R, S, T, PE; supports Y-connection and star connection
Dimensions	155 mm × 275 mm × 60 mm
EMC	CE / CS / EFT / Surge / ESD

SED Series Economic PWM Drive



Core Positioning

Compact single-axis EtherCAT PWM driver, designed with focus on miniaturization and energy efficiency.



Core Capabilities

Achieves 20 kHz PWM switching frequency.

Supports one-click auto-tuning (resistance and inductance identification, inertia identification, friction compensation, etc.), greatly reducing commissioning time.

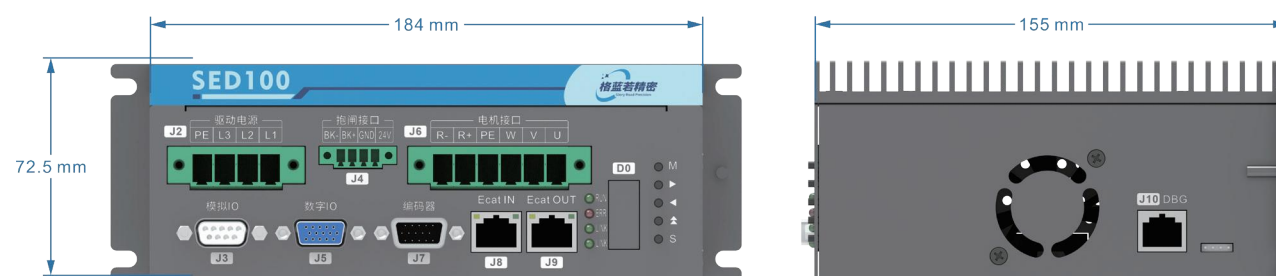
Integrates STO (Safe Torque Off) function with hardware-level forced power device shutdown to ensure safety.



Typical Applications

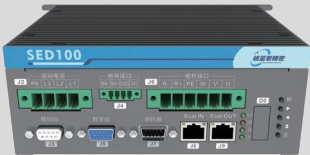
Automated production lines, robotics, precision machine tools.

Dimension Drawing



Pulse Width Modulation (PWM) Drives

Technical Parameters

Parameters	 SED100
Input Voltage Range	85-265VAC or 120-375VDC
Bus Voltage	Equals $V_{in} \times 1.414$ for AC input; Equals V_{in} for DC input.
Continuous/Peak Current	15/30A
PWM Control Frequency	Up to 20 kHz
Communication Interface	Ethernet TCP/IP, EtherCAT, RS-232, RS485 etc.
Encoder Protocol	Supports ABZ/AqB/ABS/BISS, sine-cosine and Hall
STO Function	Supported
Analog I/O	4 channels ± 10 V single-ended analog input 4 channels ± 10 V single-ended analog output
Digital I/O	4 channels optically isolated digital input 4 channels optically isolated digital output
Motor Interface	R, S, T, PE; supports Y-connection and star connection
Dimensions	184 mm*155 mm*73 mm
EMC	CE / CS / EFT / Surge / ESD

04

High-Performance Linear Drives

Glory Road high-performance linear drivers are the ideal solution for systems demanding low radiated noise and zero distortion in drives electronics. These high-power, current-mode linear amplifiers are well-suited for driving low-inductance / low-resistance loads such as brushless motors, brushed servo motors, and voice coils. Featuring a true Class AB linear output stage, they are designed for pure analog control from input to output.

- Product Overview
- Product Features
- Product Specifications

Overview of High-Performance Linear Drives

Glory Road Precision provides high-performance linear drives including LAD100, LAD200, LATD100. These Class-AB linear amplifiers feature a pure analog control architecture, linear power stage, integrated micro-processor, and thermally controlled variable-speed forced-air cooling. They deliver high-precision, low-distortion signal-to-force conversion with high accuracy, low noise, versatility and reliability, serving as a core drive solution for high-end precision motion control.

Widely applied in ultra-high-resolution stages, linear motor stages and high-inertia-mismatch platforms. Ideal for precision inspection, optical manufacturing, medical devices and other demanding applications requiring superior motion accuracy, low noise and EMC performance. Compatible with three-phase linear motors, dual VCMs, small/medium brushed/brushless servos and other low-L / low-R loads.

Product Features of High-Performance Linear Drives

01 High-Precision Linear Output, Zero-Distortion Control

Pure analog control architecture with Class AB linear output stage eliminates crossover distortion. Current control bandwidth up to 10 kHz, static ripple current < 100 μ A, linearity < 0.1%, delivering stable linear power for high-precision position and speed control.

02 Low Radiation & Low Noise, High EMC Compatibility

No high-frequency PWM noise. Optimized layout and low-noise components minimize electromagnetic radiation. Current-mode control reduces current interference to external circuits and sensitive equipment.

03 Multiple Intelligent Protection, High Reliability

Onboard high-speed processor enables real-time monitoring. Over-current, over-voltage, under-voltage, over-temperature, short-circuit and SOA (Safe Operating Area) protection ensure safe operation. Real-time fault feedback extends service life.

04 Flexible Commutation, Multi-Scene Reusability

Supports 3-phase linear motors, 2-channel single-phase voice coil motors, Hall encoder trapezoidal commutation, and small/medium brushed/brushless servos. Compatible with delta and wye connections for PMLSMs. High reusability reduces system cost.

High-Performance LAD Series Linear Drives

The LAD Series is a high-performance Class AB linear driver designed specifically for high-precision motion control applications. It accurately drives low-inductance / low-resistance loads (e.g., voice coil motors, linear motors) and covers a full range of power ratings, serving as an ideal power core for precision positioning stages and inspection instruments.



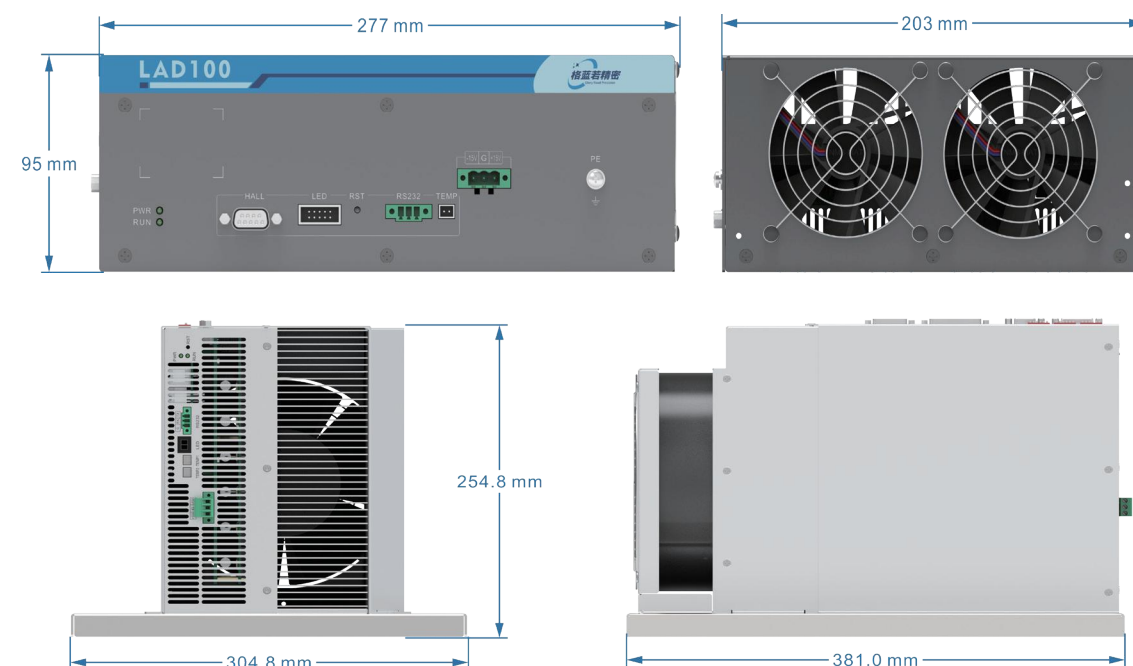
Key Features

Precise Output: 16-bit AD sampling, continuous current ≥ 10 A, peak current ≥ 25 A, current ripple ≤ 100 μ A, linearity $< 1\%$.

Low Noise & EMC Compliance: PWM-free operation, compliant with CE/CS and other EMC standards, suitable for medical, metrology and other noise-sensitive environments.

Flexible Control: Supports single/dual current loops, capable of driving two voice coil motors, compatible with delta / wye connections.

Dimension Drawing



High-Performance Linear Drives

Technical Parameters

Parameters	LAD100	LAD200
Control Power Supply	± 15 VDC	
Bus Voltage	± 12 V ~ ± 75 V	± 12 V ~ ± 150 V
Safety Protection	Over-temperature, over-current, over-voltage, under-voltage protection	
Input	Differential, Single-ended	
Output	MOSFET	
Operating Temperature	0 ~ 45 °C	
Safety Protection	Supports dual current loop mode; enables independent control of two single-phase voice coil motors	
Resolution	AD ≥ 16 bits	
Continuous Current (Ic)	Ic ≥ 10 A	
Peak Current (Ip)	Ip ≥ 25 A	Ip ≥ 30 A
Bandwidth	≥ 10 kHz	Ip ≥ 55 A
Linearity	$< 1\%$	
Ripple Noise	Current loop current ripple ≤ 100 μ A (configuration-dependent)	
Phase Delay	Phase delay $< 45^\circ$ up to 10 kHz	
Frequency-Domain Gain Slope	0-100Hz, $\leq +0.05$ dB; 100Hz-1kHz, $\leq +1$ dB	
Motor Interface	R, S, T, PE	
Dimensions	277*203*95 mm	381*304.8*254.8mm
Weight	3.7kg	12.5kg
Debug / Commissioning Interface	RS232 etc.	
EMC	CE / CS / EFT / Surge / ESD	

High-Performance LATD100 Linear Drives

The LATD100 is a low-temperature-drift linear drives specifically designed for ultra-precision applications. It is a linear motion drive system with nearly zero performance drift under temperature variations. Positioning, thrust, speed, and current remain highly stable against temperature fluctuations, making it ideal for precision equipment requiring both high accuracy and load capacity.



Key Features

Precise Output: Wide voltage range $\pm 12\text{ V} \sim \pm 150\text{ V}$, continuous current $\geq 15\text{ A}$, peak current $\geq 40\text{ A}$, balancing accuracy and load capability.

Low Noise & Compatibility: Current ripple $\leq 100\text{ }\mu\text{A}$, linearity $< 0.1\%$, compliant with EMC standards, stable and interference-free operation.

Flexible Control: Supports dual current loops and dual voice coil motor control, compatible with permanent magnet synchronous linear motors and AVM motors.

Dimension Drawing



High-Performance Linear Drives

Technical Parameters

Parameters	 LATD100
Control Power Supply	$\pm 15\text{VDC}$
Bus Voltage	$\pm 12\text{V} \sim \pm 150\text{V}$
Operating Mode	Over-temperature, over-current, over-voltage, under-voltage protection
Input	Differential, Single-ended
Output	MOSFET
Operating Temperature	$0 \sim 70\text{ }^{\circ}\text{C}$
Operating Mode	Supports dual current loop mode; enables control of two voice coil motors
Resolution	$\text{AD} \geq 16\text{ bits}$
Continuous Current (I_c)	$I_c \geq 15\text{A}$
Peak Current (I_p)	$I_p \geq 40\text{A}$
Bandwidth	$\geq 10\text{ kHz}$
Linearity	$< 1\%$
Ripple Noise	Current loop current ripple $\leq 100\text{ }\mu\text{A}$ (configuration-dependent)
Phase Delay	Phase delay $< 45^{\circ}$ up to 10 kHz
Frequency-Domain Gain Slope	$0\text{-}100\text{Hz}, \leq +0.05\text{dB}; 100\text{Hz-}1\text{kHz}, \leq +1\text{dB}$
Motor Interface	R、S、T、PE
Dimensions	$277*203*95\text{ mm}$
Weight	3.7kg
Debug / Commissioning Interface	RS232 etc.
EMC	CE / CS / EFT / Surge / ESD

05

Nano-Precision Motion Control System

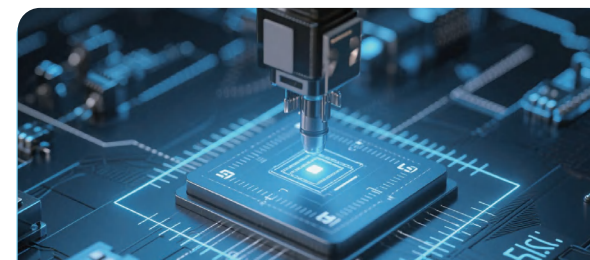
The NAC Series nano-precision motion controller is a fully self-developed nano-scale motion control system based on the VME bus. It achieves 0.5–5 nm positioning accuracy and millisecond-level settling time even at high speed and high acceleration, providing ultra-precision motion control solutions for wafer stages and reticle stages in core semiconductor manufacturing equipment.

- NAC Series Ultra-Precision Motion Controller

NAC Series Ultra-Precision Motion Controller

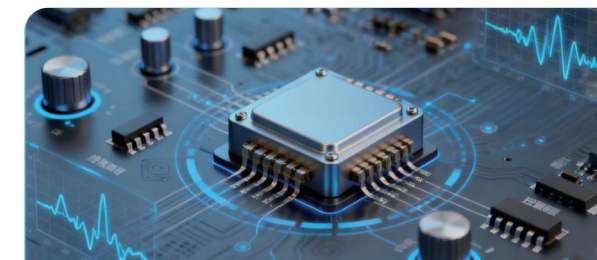


Product Features



01 Nano-scale Positioning Accuracy

Achieves ultra-high positioning accuracy of 0.5–5 nm under high-speed and high-acceleration motion, meeting the extreme precision requirements of semiconductor manufacturing.



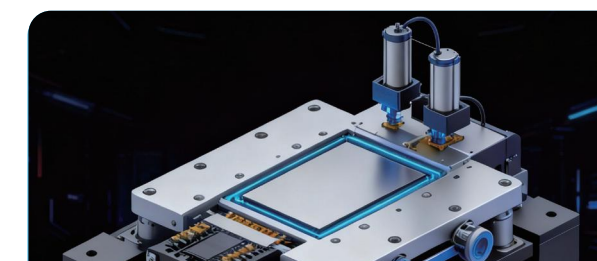
02 Fully Proprietary Hardware Platform

The complete hardware system is independently engineered with a 200 kHz control frequency and 10 kHz control bandwidth, enabling cross-scale measurement and control as well as low-ripple, high-bandwidth drive design.



03 Microsecond-level Synchronization Accuracy

Through parallel servo control and VME/SBC/HSSL bus architecture, multi-axis synchronization accuracy is better than 10 ns, ensuring coordinated complex motion.



04 Localized Core Application

Provides ultra-precision motion control for wafer stages and reticle stages in core semiconductor manufacturing equipment, supporting independence and controllability of high-end equipment.

06

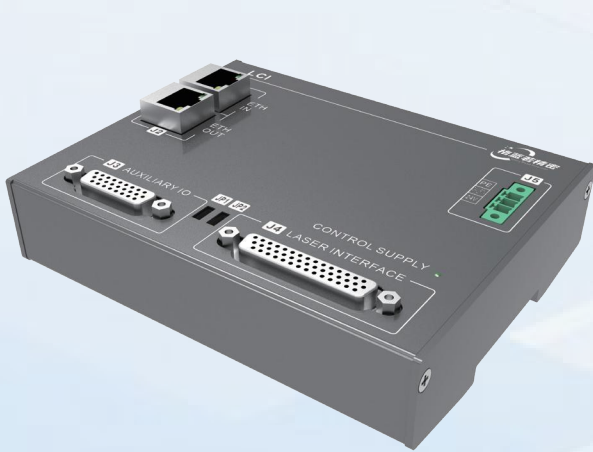
APPENDIX

Glory Road Precision auxiliary modules are EtherCAT distributed I/O and function expansion units for high-end precision equipment. They work seamlessly with motion controllers and servo drives, providing rich signal interfaces and expansion for semiconductor and precision inspection applications. Modules include digital I/O, analog I/O, pulse/encoder interfaces, laser control, etc., meeting requirements for multi-signal acquisition, precise control and high synchronization in ultra-precision equipment.

Glory Road Precision GMotion Commissioning Software provides full-process debugging and management for ultra-precision motion control systems. With a visual interface, it supports fast controller configuration, motion programming, multi-axis synchronization and real-time monitoring. Core functions include one-click auto-tuning, frequency response analysis, dynamic error compensation and full-state visualization, greatly reducing commissioning time and enabling nanometer-level positioning and high-stability operation in semiconductor and precision inspection applications.

- Auxiliary Modules
- GMotion Commissioning Software

Appendix I Auxiliary Modules



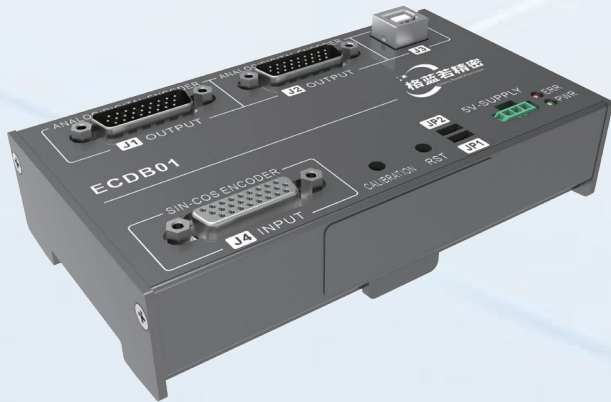
◆ LCM01 Laser Module



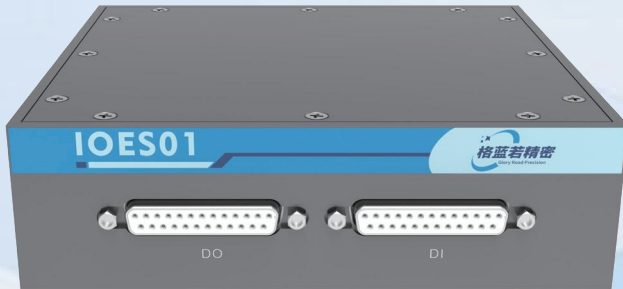
◆ PDEM01 Pulse Drive Module



◆ PDEM01 Pulse Drive Module



◆ ECDB01 Encoder Multiplication Module



◆ IOES01 Digital I/O Extension Module

APPENDIX

Technical Parameters

Parameters	 IOES01 Digital I/O Extension Module
Supply Voltage	24 VDC $\pm$ 10%
Number of Digital Input Channels	8
Number of Digital Output Channels	8
Input Differential 0 Signal Voltage	-7 V to -0.2 V
Input Differential 1 Signal Voltage	0.2 V to 7 V
Output Differential 0 Signal Voltage / Current	-3.1 V to -2 V @ 10 mA
Output Differential 1 Signal Voltage / Current	2 V to 3.1 V @ 10 mA
Number of Analog Input Channels	8
Number of Analog Output Channels	8
Analog Input Voltage	$\pm$ 10 V differential analog input
Analog Output Voltage	$\pm$ 20 V differential analog output
Dimensions	145 mm*135 mm*1.6 mm
EMC	CE / CS / EFT / Surge / ESD

Technical Parameters

Parameters	 PDEM01 Pulse Drive Module
Supply Voltage	24 VDC $\pm$ 10%
EtherCAT Interface	2 channels (IN/OUT)
Pulse / Direction Output	2/4 axes
Incremental Encoder Input	2/4 axes
Absolute Encoder Input	0-2 axes (optional)
Digital I/O	4 inputs / 2 outputs
Power Consumption	<5 W (2-axis version); <8 W (4-axis version)
Operating Temperature	0 °C ~ 45 °C
Protection Class / IP Rating	IP20
Dimensions	21 mm $\times$ 100 mm $\times$ 48 mm (same for 2/4 axes)
EMC	CE / CS / EFT / Surge / ESD

APPENDIX

Technical Parameters

Parameters	 ADEM01 High-Precision Analog Drive Module
Supply Voltage	24 VDC $\pm$ 10%
EtherCAT Interface	2 channels (IN/OUT)
Analog Input	3-channel differential ADC input, $\pm$ 10 V
Analog Output	6-channel differential DAC output, $\pm$ 10 V (max. 2 channels per axis, total 6 channels)
Encoder Input	3-channel ABZ & ABS encoder interface, 3-channel Sin/Cos encoder interface
Digital I/O	4-channel digital input / 4-channel digital output
Positioning Input	Limit input: 9 channels; MARK input: 3 channels
Operating Temperature	0 °C ~ 45 °C
Protection Class / IP Rating	IP20
Dimensions	128.2 mm $\times$ 61.5 mm $\times$ 157 mm
EMC	CE / CS / EFT / Surge / ESD

Technical Parameters

Parameters	 ECDB01 Encoder Multiplication Module
Supply Voltage	24 VDC $\pm$ 10%
Analog Output	2/4 axes, 1/2 channels per axis
Encoder Input	3-channel Sin/Cos, 3-channel ABZ
Analog Encoder Rate	700 kHz
ABZ Output Frequency	12.5 MHz
Communication Interface	USB, RS-232, etc.
Dimensions	148 mm $\times$ 83 mm $\times$ 22 mm
EMC	CE / CS / EFT / Surge / ESD

APPENDIX

Technical Parameters

Parameters	 LCM01 Laser Module
Supply Voltage	24 VDC $\pm$ 10%
Laser Control Interface	8-channel RS-422 / 50 MHz
SYNC Input	1-channel RS-422 / 50 MHz
Communication Interface	EtherCAT, RS-232, etc.
Analog I/O	Supports 2-channel 0–10 V single-ended analog input; Supports 2-channel 0–10 V single-ended analog output
Digital I/O	Supports 8-channel digital input, opto-isolated; Supports 8-channel digital output, opto-isolated
Dimensions	105.4 mm*134 mm*28.1 mm
EMC	CE / CS / EFT / Surge / ESD

Appendix II GMotion Commissioning Software

Glory Road GMotion Commissioning Software is a unified development platform for ultra-precision motion control, integrating full-process debugging tools and core functions. It enables equipment engineers to rapidly deploy, debug, and maintain motion control systems for high-end equipment, providing full-lifecycle technical support for semiconductor manufacturing, precision inspection, and other applications.

01 Full-Featured Integrated Control

GMotion integrates controller configuration, program development, error compensation, diagnostics, and monitoring in a single platform, eliminating the need for multiple tools and enabling full-lifecycle management of motion controllers.

02 High-Precision Motion Tuning

Equipped with a professional Controller Tuning Wizard and FRF Analyzer, it supports refined axis parameter configuration, servo loop optimization, and frequency response analysis, precisely meeting the calibration requirements of precision motion control and ensuring equipment accuracy.

03 Flexible Programming & Development Support

Supports multi-application buffer programming via the Program Manager, with GL+ commands, auto-completion, and breakpoint debugging. Custom axis names and global variables in D-Application areas enable adaptation to diverse motion control scenarios.

04 Real-Time Diagnostics & Monitoring

Features Oscilloscope Pro, Variable Manager, and Safety & Fault Monitoring. It collects motion variables, monitors fault status, analyzes signal data, and supports multi-dimensional visualization for fast troubleshooting.

05 Intelligent Error Compensation

Built-in dynamic error compensation tool supports import, processing, and compensation command generation for 1D/2D error data. Filtering and curve fitting optimize compensation data, effectively reducing motion errors and improving control accuracy.

06 Secure Authorization & Protection

The Protection Wizard defines, updates, and removes controller protection modes. It supports application program encryption, combined with safety error configuration and monitoring, ensuring full protection of controller software and equipment operation.

07 Convenient Device Interaction & Management

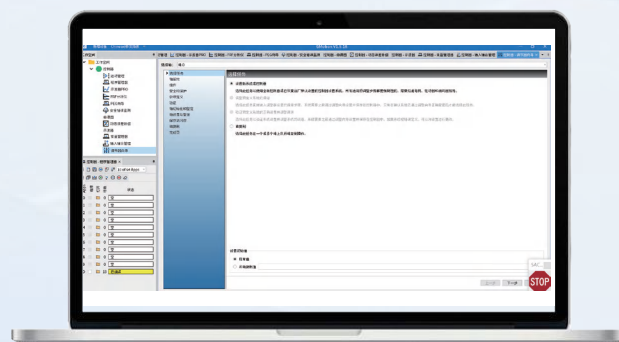
Supports multi-controller addition, connection, and management via Ethernet. The communication terminal sends commands and receives real-time feedback; system version and program files can be exported to improve operation and data management efficiency.

08 Multi-System Compatibility & Easy Deployment

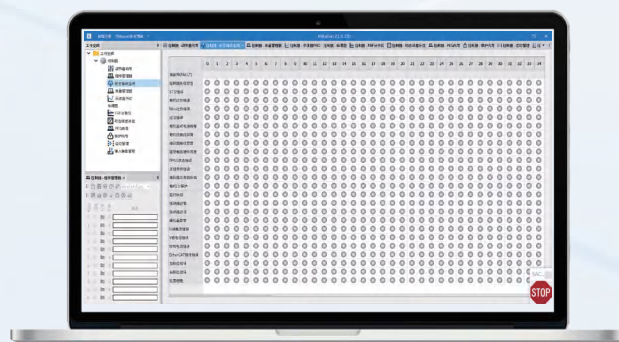
Compatible with Windows 7/10/11 (x64) and multiple Windows Server editions. The user interface supports window splitting, docking, and tab switching, aligning with user habits and reducing operational complexity.



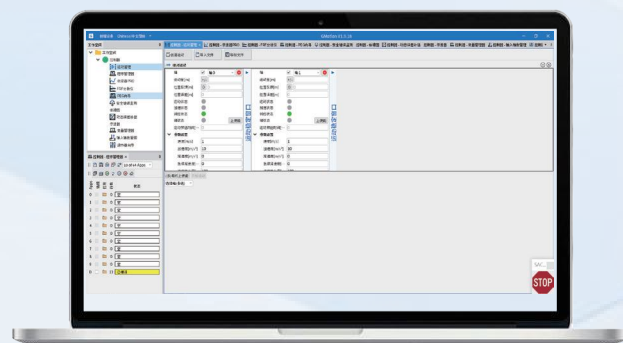
◆ Oscilloscope



◆ Controller Tuning Wizard



◆ Motion Management



◆ Safety & Fault Detection



◆ FRF Analyzer



Twenty years of theoretical and technical accumulation.



Professional-level demand docking and consultation.



Customized precise matching and design.



Comprehensive unit and system testing.



Robust after-sales maintenance and support system.