



# NIMOTION SOFTWARE HANDBOOK ▶▶

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## COMPANY PROFILE



Beijing NiMotion Control Technology Co., Ltd. (hereinafter referred to as "Beijing NiMotion") was founded in 2015. It is a national high-tech enterprise specialized in the R&D, production, sales, and service of motion control systems and related auxiliary products. Its headquarters is located in Daxing District, Beijing.

Nanjing NiMotion Robot Co., Ltd. (hereinafter referred to as "Nanjing NiMotion") is an affiliated enterprise under the NiMotion brand. Beijing NiMotion and Nanjing NiMotion operate under unified technology, unified products, and unified services.

The company's product portfolio includes intelligent controllers, industrial software, integrated stepper motors, integrated servo motors, integrated brushless motors, transmission components, industrial robots, and a full range of other motion control products.

## AWARDS & RECOGNITION



NiMotion has been successively recognized as a "Specialized, Refined, Distinctive, and Innovative" (SRDI) small and medium-sized enterprise in Beijing, a national high-tech enterprise, and a pilot unit for intellectual property rights, holding over 70 independent intellectual property rights. The company has obtained ISO 9001 quality management system certification, and its products have received the German TUV CE certification. With strict quality control and a comprehensive product portfolio, NiMotion has formed a strong competitive edge in the industry.

## BUSINESS & SALES



Currently, NiMotion's business covers multiple sectors including medical automation, intelligent manufacturing, semiconductors, mobile robotics, warehousing and logistics, new energy, smart retail, and automotive industries. Its products are widely used in various types of automation equipment, exported to over 30 countries worldwide, and have provided professional solutions and technical services to more than 2,000 domestic enterprises..

**32+** Countries Served

**2000+** Core Clients

**5000+** Applications

## VISION & VALUES

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### NiMotion Corporate Culture: Driving Intelligent Innovation

At NiMotion, we believe technology should empower progress. Our culture is built on a shared passion for innovation, excellence, and human-centric solutions—bridging cutting-edge automation with real-world impact.

### Corporate Vision

"Make machines more intelligent to better serve humanity."

In an era of rapid technological advancement, smart devices are no longer optional—they're essential. We relentlessly innovate to meet rising demands for smarter, faster, and more intuitive machines, ensuring technology evolves with and for people.

### Corporate Mission

"Deliver professional motion control platforms & automation solutions."

Backed by years of industrial automation expertise, our dynamic, young team combines technical mastery with bold creativity. From R&D to real-world applications, we craft precision-driven, efficient products that redefine industry standards.

### Core Values

Professionalism | Efficiency | Integrity  
Dedication | Innovation | Growth  
Pragmatism | Collaboration | Win-Win

### Working Principles

User First – Your needs drive our designs.  
Continuous Innovation – Breaking boundaries daily.  
Pursuit of Excellence – Good isn't enough; we aim for flawless.

## FACILITIES & DELIVERY

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### Warehouse & Material Management

Automated Storage Systems: Equipped with barcode/RFID tracking for real-time inventory visibility.  
Strict Quality Checks: All incoming materials undergo 3-step inspections to guarantee compliance.  
Lean Inventory Control: Optimized stock levels to reduce waste while ensuring fast turnaround.

### Fast & Reliable Shipping

Global Partnerships: Collaborations with DHL, FedEx, and leading freight forwarders for air, sea & land transport.  
Express Options: Expedited shipping available for urgent orders, with door-to-door tracking.

24/7 Security Monitoring: Fireproof cabinets, humidity control, and AI-powered surveillance.

### Why Choose NiMotion?

Faster lead times with streamcabled workflows  
Zero-defect mindset from storage to shipment  
Scalable solutions for bulk/custom orders

## Motor Debugging Software

The motor tuning software is used for tuning NiMotion's integrated stepper motors, integrated servo motors, and integrated brushless motors. With a simple and user-friendly interface, it allows users to operate easily and complete motor tuning and setup.

## NiMStudio Motor Debugging Software

NiMStudio Motor Debugging Software is a host computer application used for debugging NiMotion integrated motors. It simultaneously supports the company's integrated stepper motors, integrated servo motors, and integrated brushless motors. The software offers the following functions and features:

- Compatible with CANopen, EtherCAT, and Modbus protocols
- Enables convenient and rapid hardware configuration and motion setup for motors
- Allows viewing of all parameters and real-time parameter curves during motion
- Supports multiple motor motion modes
- Features configuration wizard, command debugging, vibration suppression, and other functions



## NiMotionCanIDE CAN Motor Debugging Software

NiMotion CanIDE: CAN Motor Debugging Software is a full-featured debugging software developed by our company for CAN interface integrated stepper motors. The software offers the following functions and features:

- Simple and intuitive user interface
- Supports various commonly available CAN converters on the market
- Enables full-featured motor operations, including firmware upgrades
- Helps users quickly familiarize themselves with motor functions and communication protocols
- Special users can request access to the source code for reference on design concepts



## NiMotion ModbusIDE Motor Debugging Software

NiMotion ModbusIDE: Modbus Motor Debugging Software is a full-featured debugging tool developed by our company for Modbus interface integrated stepper motors. The software offers the following functions and features:

- Simple and intuitive user interface
- Supports various commonly available Modbus protocol converters (such as Moxa, etc.)
- Achieves communication speeds of up to 3Mbps when used with our company's converters
- Enables full-featured motor operations, including firmware upgrades
- Helps users quickly familiarize themselves with motor functions and communication protocols
- Special users can request access to the source code for reference on design concepts



## NIM-Suite Electric Gripper Debugging Software

### • Software Introduction

NiMSuite debugging software is primarily used to configure Nimotion integrated electric gripper products and other transmission components. Integrating five core functions—connection, configuration, monitoring, diagnosis, and analysis—it provides users with powerful and convenient tools for debugging, optimizing, and maintaining electric grippers. Its multi-bus support ensures broad applicability, parameter configuration capabilities maximize gripper performance, and fault diagnosis and message monitoring functions significantly improve problem identification and resolution efficiency, making it a key software for ensuring stable and reliable operation of electric grippers.

### 1. Powerful Communication Compatibility

Supports communication with multi-bus products: The software can adapt to and connect electric grippers using various industrial field buses (e.g., CANopen, Modbus), offering flexible connection options for integration into different automation systems.

### 2. Convenient Motion Parameter Configuration

Target position (opening/travel); Motion speed (opening/closing speed); Gripping force/clamping force Acceleration/deceleration; Allows users to fine-tune parameters based on specific application requirements (workpiece size, weight, material, cycle time, etc.).

### 3. Efficient Fault Diagnosis and Troubleshooting

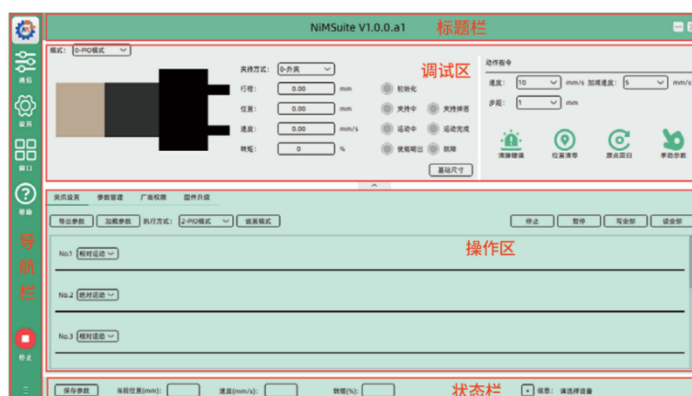
Travel limit settings

Supports fault diagnosis and troubleshooting: The software includes built-in diagnostic functions that can:

- Monitor the gripper's real-time operating status (position, speed, current, temperature, error status, etc.).
- Identify and display specific fault codes or error messages (e.g., overcurrent, overheating, over-limit, communication interruption, drive failure).
- Provide possible causes and solutions for faults.
- Record historical fault information for traceability and analysis.
- Significantly reduce equipment debugging and maintenance time, improving production line efficiency.

### 4. In-Depth Communication Monitoring and Analysis

- Message monitoring: Provides underlying bus communication message monitoring (message listening/capture/analysis). Users can:
  - Capture and display raw data messages transmitted between the software and the gripper (or on the bus network) in real time.
  - Use this for advanced debugging, communication protocol validation, troubleshooting complex communication issues, or third-party device integration.





## Intelligent Manufacturing Software

The Intelligent Manufacturing Software is independently developed by Limkaichong as an industrial software solution. It enables programming, debugging, and control of intelligent manufacturing equipment.



## CODESYS Software

CODESYS is a powerful PLC (Programmable Logic Controller) programming tool that supports six PLC programming languages under the IEC 61131-3 standard, including IL, ST, FBD, LD, CFC, and SFC. Below is a detailed introduction to CODESYS software:

**Openness:** As an open software platform, CODESYS allows third-party developers to create customized solutions on it. This enables compatibility with PLC devices from different manufacturers, offering high flexibility and scalability.

**Cross-Platform Compatibility:** CODESYS can run on various operating systems, including Windows, Linux, and embedded systems. This allows developers to use the same development tools across different hardware platforms, improving development efficiency and portability.

**Real-Time Performance:** The official version of CODESYS is a real-time computer control system, where the execution program part has high requirements for real-time performance. To maintain real-time performance on mainstream CPUs (such as ARM, X86, PowerPC, TriCore, DSP, etc.) and operating systems (such as Windows, Linux, etc.), CODESYS adopts a real-time extension solution.

**Programming Language Support:** CODESYS supports six programming languages under the IEC 61131-3 standard. Users can select different languages to edit subroutines, function modules, etc., within the same project.

**Editing and Debugging Features:** CODESYS provides a powerful system editor and debugger, built on the foundation of high-level programming languages (such as Visual C++), offering users a convenient programming and debugging experience.

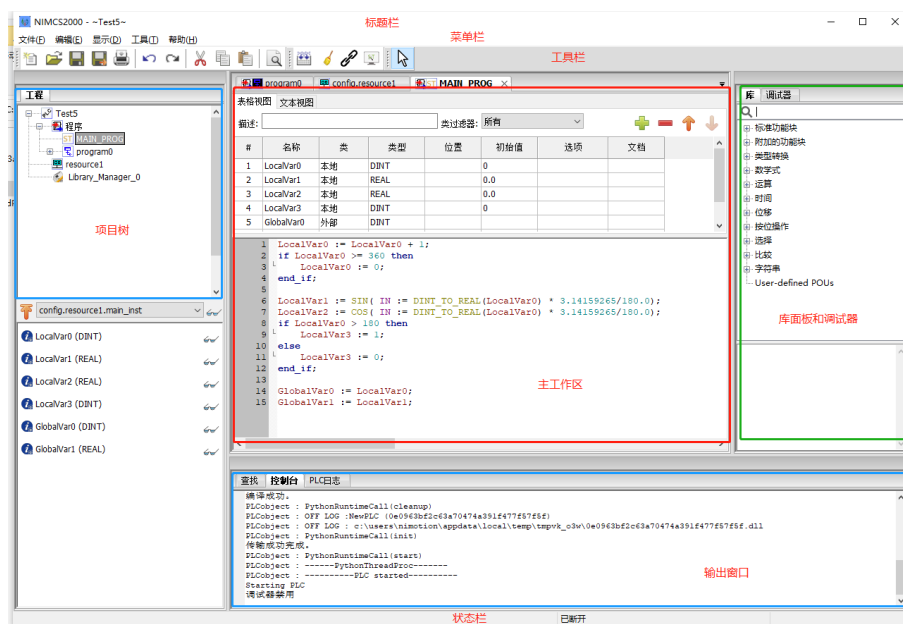


## NIMCS2000 Motion Controller & PLC Programming Software

NIMCS2000 Motion Controller & PLC Programming Software is a motion control programming software independently developed by Beijing Nimotion Control Technology Co., Ltd. It integrates motion controller & PLC programming, debugging, downloading, and motion control functions, providing users with a simple, economical, and advanced solution.

The [NIMCS2000](#) software development environment is based on the [IEC 61131-3](#) international standard for PLC programming and supports Windows, Linux, and customized embedded controllers. It accommodates five PLC languages: Ladder Diagram (LD), Sequential Function Chart (SFC), Function Block Diagram (FBD), Structured Text (ST), and Instruction List (IL). PLC programs are compiled into binary code before being downloaded to the controller for execution, significantly improving operational efficiency compared to traditional PLCs.

NIMCS2000 software is compatible with Nimotion's controller models such as NIMC301, NIMC302, NIMC2000N-B10, and NIMC2000N-C10, as well as the NIMC2400 series of high-end motion controllers. It also incorporates Nimotion's self-developed NIM\_SML lightweight single-axis motion control library and NIM\_SMB standard single-axis library. The software supports both synchronous and asynchronous axis control, along with complex synchronous motion functions such as electronic gearing and electronic camming.

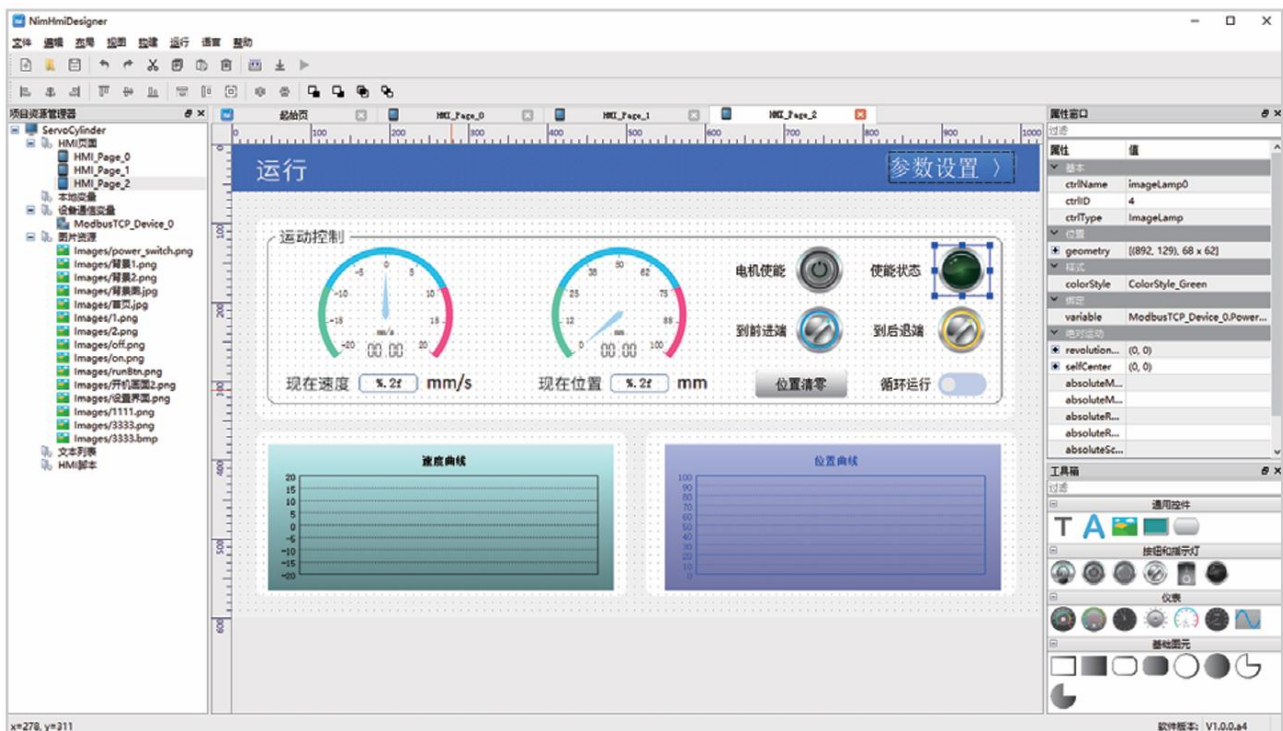


## NimHmiDesigner programming software

NimHmiDesigner is an HMI configuration software independently developed by Beijing Nimotion Control Technology Co., Ltd. It is powerful, user-friendly, and features an intuitive interface. Users can customize the appearance of the interface by adding various elements such as buttons, graphics, and gauges. Additionally, the software supports HMI scripting, enabling the implementation of computational logic and other functions. It also facilitates real-time communication with PLC devices, allowing for data acquisition, processing, display, and remote monitoring and control.



## Supports HMI Screen Configuration Functionality



## Motion Control Library

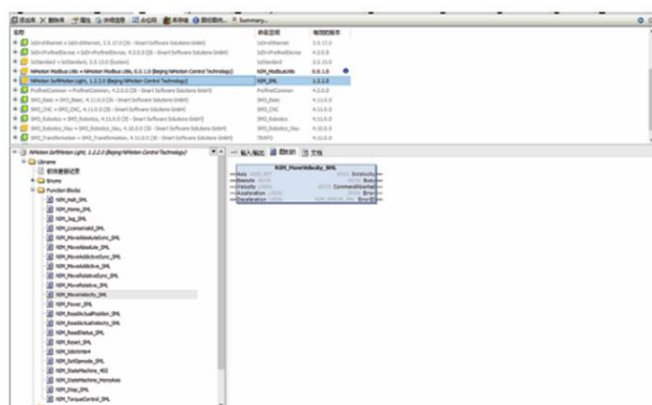
The NiMotion Motion Control Library is a key component of the motion control system, providing developers with convenient and efficient motion control functionalities.

## SML-SoftMotion Light: Lightweight Single-Axis Motion Control Library

The custom lightweight motion control library is a single-axis motion control library developed for the CoDeSys environment. Designed for applications where small controllers manage a large number of axes, the controller only sends motion commands via the bus and updates axis statuses, while the motion command data planning and calculations are handled by the motor servo itself.

This motion control library primarily includes *17 function blocks*:

NIM\_Halt\_SML、NIM\_Home\_SML、NIM\_MoveRelative\_SML、NIM\_MoveAbsolute\_SML、NIM\_MoveVelocity\_SML、NIM\_Power\_SML、NIM\_Reset\_SML、NIM\_SetOpmode\_SML、NIM\_StateMachine\_402、NIM\_Stop\_SML、NIM\_StateMachine\_MonoAxis、NIM\_ReadActualPosition\_SML、NIM\_ReadActualVelocity\_SML、NIM\_ReadStatus\_SML、NIM\_Jog\_SML、NIM\_MoveAdditive\_SML、NIM\_TorqueControl\_SML、NIM\_MoveRelativeSync\_SML、NIM\_MoveAbsoluteSync\_SML 和 NIM\_MoveAdditiveSync\_SML



## SMB- SoftMotion Basic\_Standard single-axis motion control library

The customized standard single-axis motion control library is designed based on CODESYS software and developed with reference to the PLCopen motion control specifications. It is programmed using the ST language and complies with the IEC 61131-3 standard. Using the standard single-axis motion control library, motion commands are issued via the controller bus to update the axis status. The motion command data is first calculated by the controller and then sent to the motor for execution.

This motion control library mainly includes the following function blocks:

NIM\_StateMachine\_402、NIM\_StateMachine\_MonoAxis、NIM\_Power、NIM\_MoveVelocity、NIM\_MoveAbsolute、NIM\_MoveRelative、NIM\_Jog、NIM\_Inch、NIM\_Halt、NIM\_Stop、NIM\_MoveContinuousRelative、NIM\_MoveContinuousAbsolute、NIM\_MoveAdditive、NIM\_MoveSuperimposed、NIM\_HaltSuperimposed、NIM\_GearIn、NIM\_GearOut、NIM\_GearInPos、NIM\_Phasing、NIM\_PhasingRelative、NIM\_PhasingAbsolute、NIM\_CombineAxes、NIM\_Home、NIM\_Homing、NIM\_SetPosition、NIM\_CamIn、NIM\_CamOut、NIM\_CamTableSelect、NIM\_Reset、NIM\_PosVelProfile、NIM\_PositionProfile、NIM\_VelocityProfile、NIM\_AccelerationProfile、NIM\_ReadMotionState、NIM\_ReadStatus、NIM\_ReadActualPosition、NIM\_ReadActualVelocity、NIM\_RegisteLicense、NIM\_FollowPosition、NIM\_FollowPositionVelocity、NIM\_FollowSetValues、NIM\_FollowVelocity。

## NiM\_Robotics multi-axis motion control library

The multi-axis motion control library is widely used in fields such as mechanical processing, robot control, and automated production lines. For example, in the field of robot control, the multi-axis motion control library can be used to control the motion of multiple robot joints, enabling complex trajectory planning and operations.

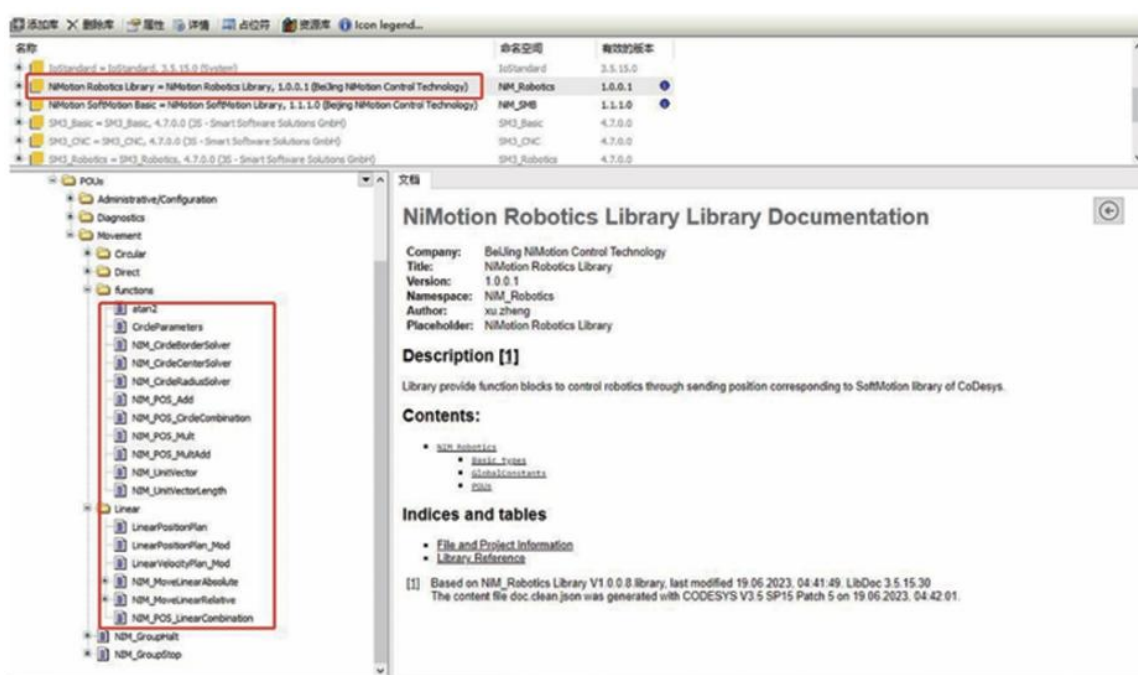
The NiM\_Robotics multi-axis motion control library is designed based on CODESYS software, programmed using the ST language, and complies with the IEC 61131-3 standard. This motion control library mainly includes the following function blocks:

**\*\*Management function blocks:**

NiM\_AddAxisToGroup, NiM\_RemoveAxisFromGroup, NiM\_UngroupAllAxes, NiM\_GroupEnable, NiM\_GroupDisable, NiM\_GroupReset, NiM\_StateMachine\_AxisGroup, NiM\_GroupPower, NiM\_GroupSetPosition, NiM\_SetCoordinateTransform, NiM\_ReadCoordinateTransform.

**\*\*Motion control function blocks:**

NiM\_GroupHalt, NiM\_GroupStop, NiM\_GroupReadActualPosition, NiM\_MoveDirectAbsolute, NiM\_MoveDirectRelative, NiM\_MoveLinearAbsolute, NiM\_MoveLinearRelative, NiM\_MoveCircularAbsolute, and NiM\_MoveCircularRelative.



## Secondary Development Software

The secondary development toolkit is a software toolkit independently developed by Beijing NiMotion Control Technology Co., Ltd. for standard communication motor control and management development.



## NiMServo SDK

The NiMServo SDK secondary development toolkit is a software toolkit independently developed by Beijing Nimotion Control Technology Co., Ltd. for standard communication motor control and management development.

It provides a series of programming interfaces (APIs), library files, documentation, and sample code, enabling developers to integrate and control motor hardware more efficiently. The toolkit is powerful, easy to integrate, user-friendly for development, reduces development time, and ensures stable and efficient execution. It is cross-platform, supporting Windows, Linux, and other platforms.

- Powerful functionality: Covers complete motor control, parameter read/write, motion control, status monitoring, and more.
- Easy integration: Simple API that abstracts underlying protocol details, with unified packaging for multiple interfaces.
- Cross-platform: Supports Windows x86/x64, Linux x64, Arm\_v7a, Arm\_aarch64, and other platforms.
- Multi-language: Provides C/C++ interfaces that can be called by Python, C#, C, QTC++, and other languages.
- Reduces development time: Provides control examples in multiple languages for different modes.

## NiMUSBCAN SDK

The NiMUSBCAN SDK secondary development toolkit is a software toolkit independently developed by Beijing Nimotion Control Technology Co., Ltd. for USBCAN converter control and management development.

It provides a series of programming interfaces (APIs), library files, documentation, and sample code, enabling developers to integrate and control motor hardware more efficiently. The toolkit is powerful, easy to integrate, user-friendly for development, reduces development time, and ensures stable and efficient execution. It is cross-platform, supporting Windows, Linux, and other platforms.



## NiMCAN SDK

The NiMCAN SDK secondary development toolkit is a software toolkit independently developed by Beijing Nimotion Control Technology Co., Ltd. for custom CAN motor control and management development.

It provides a series of programming interfaces (APIs), library files, documentation, and sample code, enabling developers to integrate and control motor hardware more efficiently. The toolkit is powerful, easy to integrate, user-friendly for development, reduces development time, and ensures stable and efficient execution. It is cross-platform, supporting Windows, Linux, and other platforms.

## NiMModbus SDK

NiMModbus SDK is a secondary development software toolkit independently developed by Beijing NiMotion Control Technology Co., Ltd., specifically designed for motors based on the Modbus protocol. It only supports the STM series of motors.

- Programming Interface (API):\*\* Encapsulates core operations such as initialization, motion control, parameter read/write, and status monitoring for Modbus motors.
- Library Files:\*\* Provides dynamic and static libraries for Windows x86/x64, Linux x64, and Arm\_v7a platforms.
- Development Documentation:\*\* Includes API reference manual, function descriptions, data type definitions, and error code tables.
- Example Code:\*\* Covers typical usage scenarios for quick start.



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