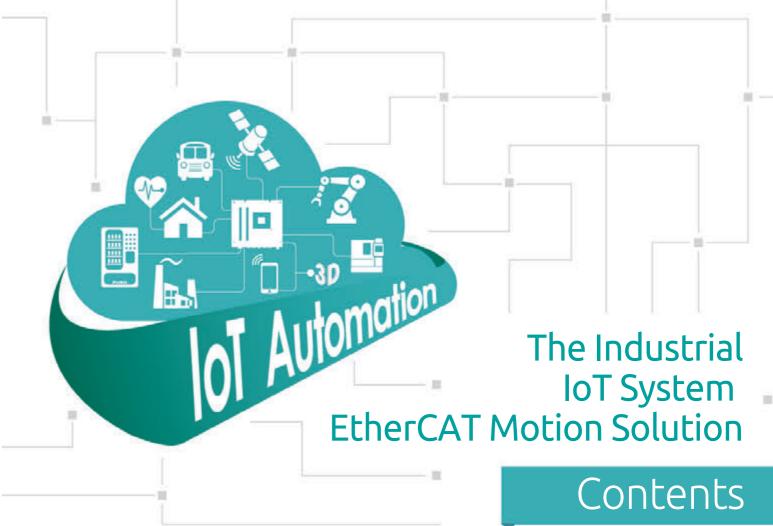




Robot & Machine Automation Product Selection Guide





Robot & Machine Automation Product Selection Guide

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IoT Automation Systemes, The Solutions to Industry 4.0

NEXCOM maps out a solution blueprint for Industry 4.0, which seamlessly integrates connected manufacturing and big data cloud computing.

NEXCOM IoT Automation Solutions (IAS) Business Group has broadened its Industry 4.0 solutions to include cyber-physical system (CPS) ready solutions (iAutomation), robot solutions (NexROBO), EtherCAT motion solutions (NexMotion), and industrial network & cloud solutions. All solutions leverage NEXCOM IoT Studio and IoT gateways to stream field data to cloud services powered by world-renowned cloud services such as Microsoft Azure, IBM Bluemix™ and iSAP etc.

The integrated cloud-enabled services such as remote management, big data

Azure

O Custom SaaS

analytics, machine learning, and business intelligence (BI) can provide benefits such as remote monitoring to enable exception management and advanced process control.

For instance, operators can benefit by getting an accurate measure of machine status and factory operations in real-time, as well as integrating enterprise resource planning (ERP) and manufacturing execution systems (MES) systems to optimize supply chain management. Based on live field data, big data analytics and machine learning can establish predictive models that assist operators in managing factory operations, identifying causes for abnormal conditions, and taking corrective actions. Preventive maintenance can be executed prior an equipment failure to ensure production efficiency and yield rate.

Positioning itself as an industrial IoT forerunner, NEXCOM has broadened its Industry 4.0-ready iAutomation solutions, including cyber-physical system (CPS) ready solutions, robot solutions, EtherCAT motion solutions, and industrial network & cloud solutions for smart manufacturing. Mirroring the ambition for Industry 4.0, a connected factory will enable raw data to be exchanged over the network and translated into valuable information, helping enterprises make insightful decisions and therefore increase competiveness in fastpaced industries. Our best-in-class solution topology has new technological breakthroughs and innovative convergence of data communications technology. It can better serve customers in an increasingly competitive global marketplace and lead manufacturers to smart factory automation.

Application Layer

Communication Laver

Device Networking

Device

Layer



Edge Gateway

IIoT Gateway Builder

IoT Studio Software

Cloud Configurator

Device Configurator

Cloud Protocols

Field Protocols

NISE Series

Factory Automation



IIoT Gateway

O CPS Series











Automation

IBM Bluemix

0 14.0 War Room Big SCADA

Automation I/O VIPA SI IO





Machine Automation





NEXMotion



NET Series Robot Solution Pack 6R Robot

Robot Controller

Robot Control

Delta Robot SCARA Robot

IoT Automation Solution Brochures



IoT Automation Solutions Master e-Catalog



NEXCOM provides a wide range of IoT Automation solutions for increasing demands of industrial applications. NEXCOM IoT Automation Solutions Master e-Catalog covers NEXCOM's most up-to-date and completed solutions, detailed product datasheets, and selection guides of high-performance industrial fanless computers, different-size industrial panel PCs, machine and robot automation lineups, PC-based factory automation families IoT solutions, industrial wireless solutions, and embedded computing and customization services.



IoT Automation Solution **Product Selection Guide**

The convergence of physical and digital worlds is giving rise to the smart factory and a new generation of industrial machinery. This new era, known as Industry 4.0, focuses on using the IoT and CPS to streamline manufacturing and business processes, improve versatility and precision, and boost quality and capacity.



Robot & Machine Automation **Product Selection Guide**

NEXCOM EtherCAT robot solutions, NexROBO, unleash possibilities for in-house development, add-on functionality, and reconfiguration of robots. Based on an open and modular architecture, NexROBO delivers development flexibility and expandable functions with a variety of EtherCAT Master controllers, pre-validated thirdparty EtherCAT slaves, and NEXCOM EtherCAT Master development stack, aimed to stimulate the broad use of robotic systems and industrial robots.



Industrial Network and Cloud **Product Selection Guide**

The industrial IoT (IIoT) network lay the important foundation for Industry 4.0. It includes three pillars— Cyber-Physical System (CPS), Industrial Wireless Solution, and Industrial Firewall for IoT Security. NEXCOM provides the IIoT network with complete product solutions which cover all three scopes. The product solutions are designed with the concepts of "ready to use" and "click to connect" so users can easily establish the IIoT network that can encompass existing automation systems in their Industry 4.0 and IIoT applications.

Machine Automation in IIoT

Total EtherCAT Motion Solution

Industrial IoT (IIoT) enables smart factories, smart machines, and smart products to connect to each other in order to communicate directly between devices and share information to promote instant business decision making.

To lay the groundwork for IIoT, NEXCOM's leading machine automation solutions combine advanced embedded computing and automation technology to bolster the capabilities of smart machines. Based on an open architecture, the solution lineup features integrated and decentralized designs to meet the application requirements of a host of industrial automation applications ranging from general motion control, CNC machines, and industrial robots to EtherCAT-based distributed control systems.

Industry 4.0

- Smart Manufacturir
- Human Robot Collaboration
- Florible Droduction



General Motion Control

- Standalone Machines
- Vision Inspection Systems
- Semiconductor Testina



EtherCAT Distributed Control System

- Assembly Lines
- Bending Machines
- Packing Machines



CNC Machine

- 2.5D or 3D Machining
- CAD/CAM Conversion
- Mills, Lathes, Plasma Cutters



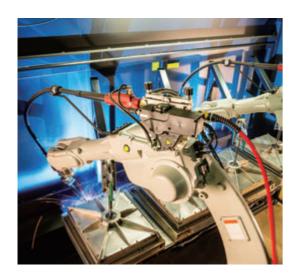
Industrial Robot

- Articulated Robo
- Delta R
- SCARA Robots

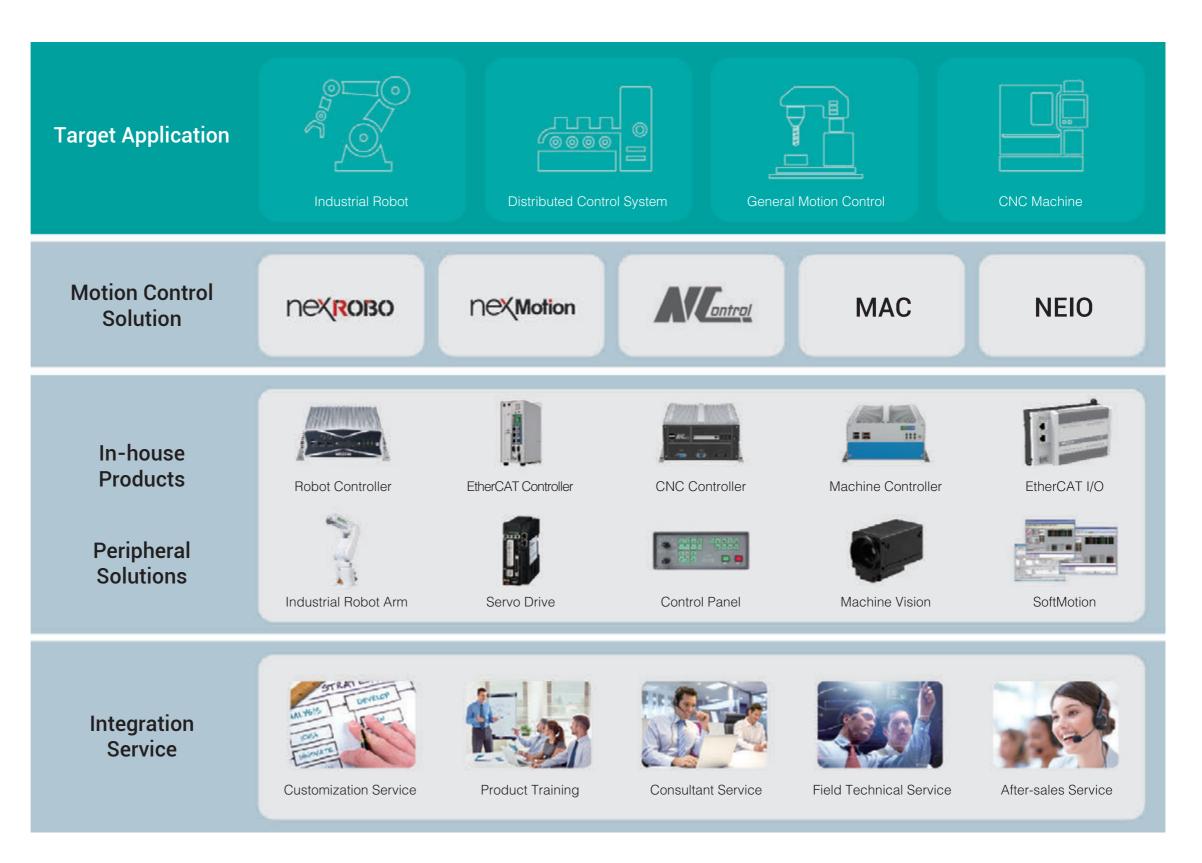


NEXCOM Machine Automation Solution

NEXCOM machine automation solutions comprise of NexROBO, NexMotion, NControl, MAC, and NEIO series. Each of the product series is developed with state-of-art technologies to satisfy the changing demands for IIoT market. NEXCOM's total machine automation solutions integrate NEXCOM's products and third-party solutions such as robot bodies, servo motors, control panels, machine vision, and SoftMotion software with full compatibility tests. NEXCOM also provides quality services, such as customization, product training, direct technical support, and after-sales service to ensure the success of your projects.







 Θ 10

Robot Solutions for Smart Manufacturing

Smart Manufacturing

Robots are a perfect example of the move towards computerized industrial manufacturing and the smart factory vision put forward by Industry 4.0 and the Internet of Things (IoT). Almost all aspects of these next generation devices are digitized and span machine control, monitoring, management, data reporting and analysis. Even operators interact with machines digitally using a human machine interface (HMI). Smart factories provide many benefits, including reduction in operator hours and opportunities to increase throughput, boost yields, improve efficiency, and reduce downtime through insights gained from advanced data analytics.

Simplifying the Design of Robotic Systems

Robots play a major role in making manufacturing processes more productive and less labor intensive, which is especially important in China, where, in some regions, there is a labor shortage. But impeding many manufacturers is the complexity of robotic system design, which is made more difficult by the need to identify and integrate subsystems from multiple vendors.

Greatly simplifying the robotic design process, NEXCOM, working closely with various solution providers, has developed open modular solutions for a range of robotic applications. With pre-integrated and pre-validated robotic control modules, NexROBO, NEXCOM's EtherCAT robot solutions perform precise robotic control and run essential industrial application software.

Although industrial robot systems come in all shapes and sizes, they will typically include the types of subsystems shown and described below:

Robot Body

Made of high-strength materials and designed for harsh environments, the robot body plays a "hands on" role in the manufacturing of goods by performing tasks such as welding, painting, packaging, inspecting, etc.

Robotic Control

Robotic control systems are typically responsible for sensing, motor driving, and movement functions that require sophisticated algorithms. The design of these rather complicated systems also requires vast experience in remote teaching, application expertise and networking technology suited to industrial environments (eg. EtherCAT). Control system components may include: Controller: PC-based system to control the robot body. Algorithms: Application software running on the controller. Teach pendant: Input device (HMI) enabling process control customization. Communications: Devices supporting advanced communications capabilities (eg. EtherCAT).

Device and Equipment

Addition to the robotics, other system are needed to complete the production line, and some examples are:

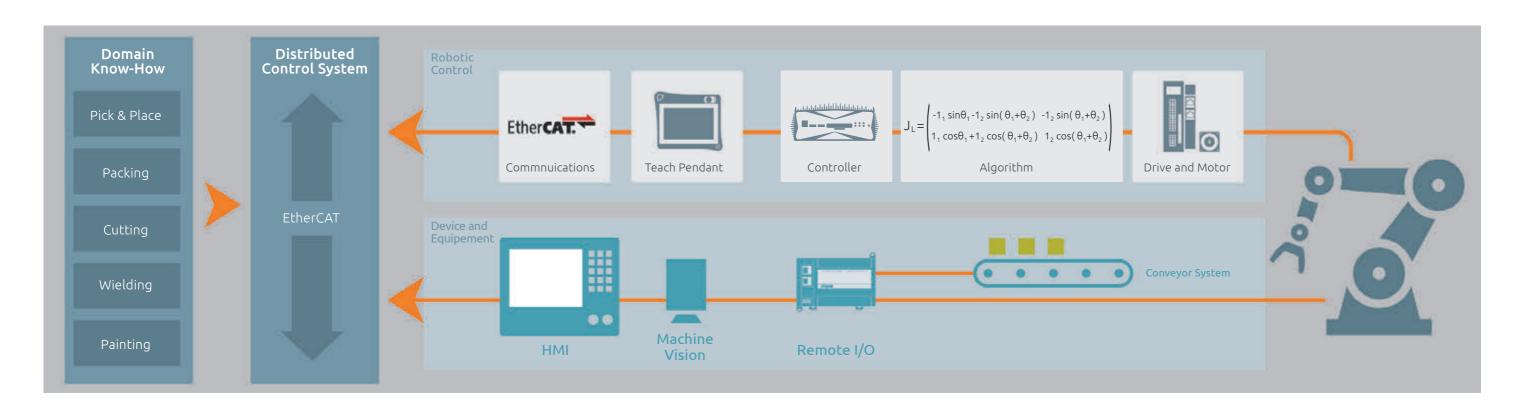
- 1. Remote I/O: Peripheral devices communicating with sensors, actuators, networks, etc.
- 2. HMI: Panel PCs enabling operators to interact with production equipment.
- 3. Conveying System: A variety of equipment for moving goods along the production line.

Distributed Control System

This architecture is used to flexibly connect distributed I/Os, sensors, and drives so developers can implement robot design without concerns for signal wiring length limitations.

Domain Know-how

In addition to robotics, production lines may require special functions, such as vision inspection, that require particular expertise.



Open and Modular Robot Solutions

Open Architecture Controller to Develop Your Own Robotic Control System

NexROBO, NEXCOM's robot solution, has an open development environment in which users can freely develop their own EtherCAT-based robotic control programs. The Windows-based environment makes it easy to integrate applications such as machine vision, simulation software, and other peripherals into the control system. It also opens the possibility for users to develop time-deterministic programs by providing accessibility to an RTX-based real-time execution kernel.

Complete Robotic Control Libraries to Fasten Development

NexROBO also provides C/C++ libraries of General Robotic Control (GRC) for basic types of industrial robots, including 6-axis articulated robots, 4-axis SCARA robots and 3/4-axis Delta robots. For those wanting to build a robotic control system, these APIs are handy to use and perform point-to-point movement, jog teaching, linear or circular movement of robots, which tremendously reduces development time. Users can leverage APIs in the Windows layer or in the RTX layer to easily build programs for their robotic applications.

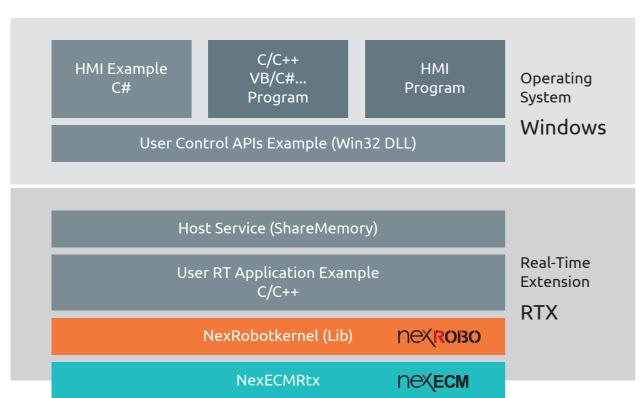
Operation System
 Win 7 / WES 7
 Development Tool
 Visual Studio 2010/2015

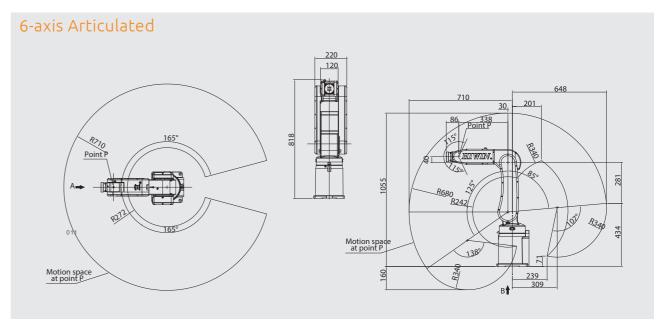
- Supported Robot Type 6-axis Articulated 4-axis SCARA 3/4-axis Delta Robotic Control Functions (GRC)
 Jog
 PTP

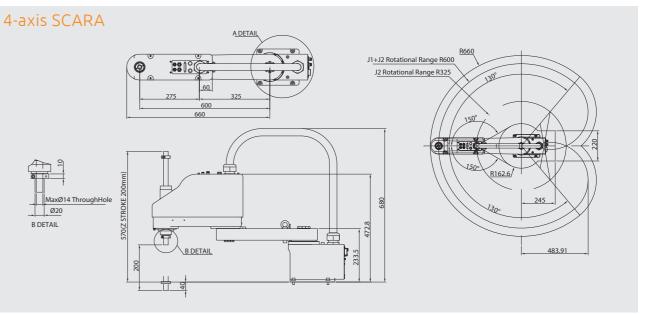
Linear interpolation
Circular interpolation
Blending movement

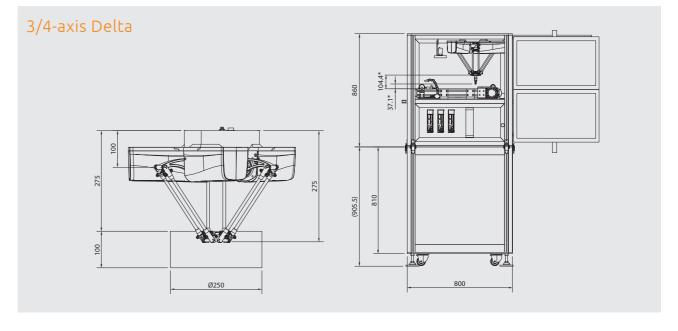
-Built-in Utility

Parameter Setting Limit Setting I/O Control Axis Control Robotic Move Position Monitor





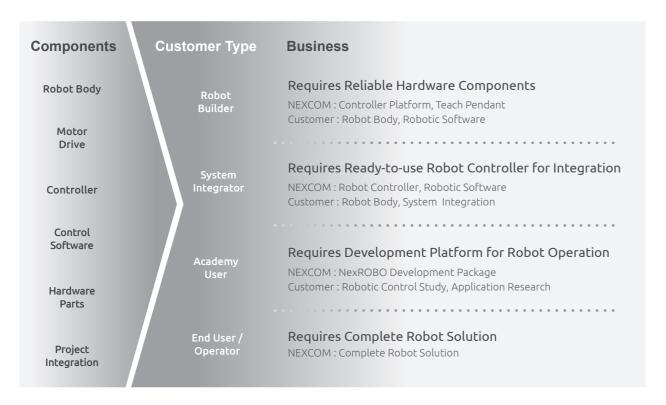




Open and Modular Robot Solutions

Flexible Building Blocks to Meet Various EtherCAT-based Robot Applications

As the need for industrial robots continues to rise, so do the demands for components to complete a robotic solution. However, these components may vary between customers. To address the various requirements of different users, NexROBO presents a modular solution by offering separating components. The following table illustrates how different types of robot customers can be categorized, what components they may need, and how NexROBO provides modular solution to satisfy these needs.



Robot Application Examples

Subsystem	Component	Auto Pasting Machine	Assembly Line	Industrial Robot	Academic Development Platform
Domain Knowledge		Auto Giving and Paste on-the-fly	Picking and Placing	Robotic	
Robot Body		HIWIN RD403	HIWIN RA605	Third-party	HIWIN RA605
Robotic	Controller	NEXCOM NET101	NEXCOM NET3600E	NEXCOM NISE 104/105	NEXCOM NET3600E
Control	Algorithm	NEXCOM	NEXCOM	Customer's	NEXCOM
	Communications	EtherCAT	EtherCAT	Third-party	EtherCAT
	Application	Conveying System and ME Partner	Conveying System and Air Compressor	N/A	N/A
Device and Equipment	НМІ	NEXCOM IPPC 1632P	NEXCOM	Teach Pendant	Customer's
	Remote I/O	NEXCOM AXE-9200	VIPA SLIO	N/A	NEXCOM AXE-9200



Development Package

NexROBO has released a series of robot development packages that consist of an industrial robot body, NEXCOM's open robot controller, related circuits and wiring in a control cabinet. NexROBO is an open robot platform which allows users to save time and effort as they focus their attention on robotic application studies and robotic control development. All the hardware installation and circuit integration of a robot, including motors, drives, speed reducers etc., are done by NEXCOM. To further reduce development time, it also comes with C/C++ robot APIs which save users' needs to create their own. The real-time environment further enables users to perform programs required for time-deterministic tasks. By adding joint limits, mechanical safety is also implemented to prevent damage from the robot body's mechanical constraints.



Articulated

NexROBO 6R Edu Package

Open Robot Package for Articulated Robot

- ♦ Articulated Robot Body
- ♦ Servo Motors and Wiring Circuit
- ♦ Control Cabinet
- ♦ Open Robot Controller

EtherCAT-based NexROBO Edu package provides an open programming environment for users to develop their own robot control. It consists of a six-joint articulated robot and a robot controller in the control cabinet. Motor drives, I/O signals and related circuits are all integrated based on EtherCAT control network. Single-axis movement for every axis can be easily operated by provided examples. This package is suitable for academy study and R&D research of basic robotic control.



NexROBO SCARA Edu Package

Open Robot Package for SCARA Robot

- ♦ SCARA Robot Body
- Servo Motors and Wiring Circuit
- ♦ Control Cabinet
- ♦ Open Robot Controller

EtherCAT-based NexROBO Edu package provides an open programming environment for users to develop their own robot control. It consists of a 4-axis SCARA robot and a robot controller in the control cabinet. Motor drives, I/O signals and related circuits are all integrated based on EtherCAT control network. Single-axis movement for every axis can be easily operated by provided examples. This package is suitable for academy study and R&D research of basic robotic control.



Delta

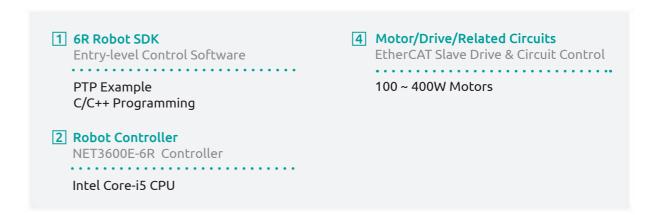
NexROBO miniDelta Edu Package

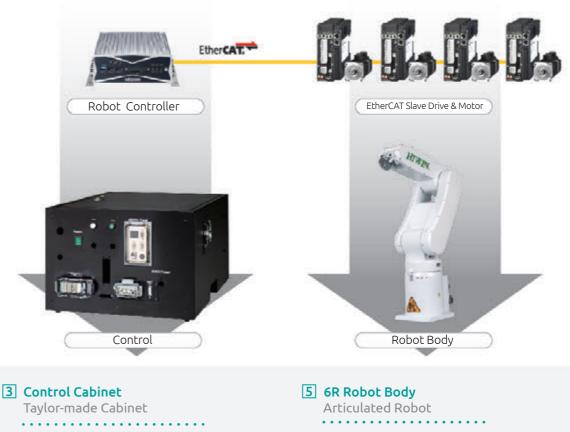
Open Robot Package For Delta Robot

- ♦ Delta Robot Body Mounted in a Cupboard
- ♦ Servo Motors and Wiring Circuit
- ♦ Open Robot Controller

EtherCAT-based NexROBO Edu package provides an open programming environment for users to develop their own robot control. A three-joint delta is mounted in the cupboard along with robot controller. Motor drives, I/O signals and related circuits are all integrated based on EtherCAT control network. Point-to-point movement can be easily operated by provided examples. This package is suitable for academy study and R&D research of basic robotic control.

Package Contents of an Articulated Robot Development Package





622 x 470 x 315 mm Military-grade Connector

* The robot system is based on EtherCAT

6-axis Operation 5 kg Load

* Robot stand & teach pendent are optional

Production Line Integration

Since the integration of robots requires planning for mechanical, electrical and control schemata, as well as high-level software integration, NEXCOM, with their years of experience developing automation systems, can collaborate with customers and devise a plan for project implementation. As a robotics system integrator, we can:

- Perform a feasibility study on projects
- Provide helpful cost-saving tips
- Provide and program an industrial robot and workcell
- Produce tooling and part fixturing
- Incorporate systems into existing factory settings

Service with NexROBO

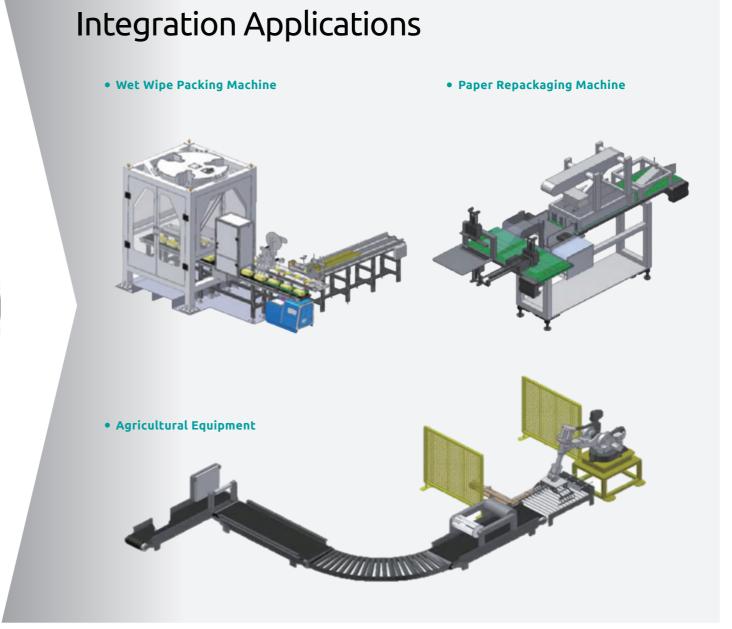
The NEXCOM Integration Team is committed to be the most valued supplier of innovative industrial automation and information products, services and solutions by working closely with its robot-vendor partners, OEMs and system integrators. We provide a preferred level of integration focused on saving design, development and delivery time. Preferred integration starts with using modular design and EtherCAT communication technology which means robots connect through EtherCAT with predefined

software and service interfaces that simplify design, operation and maintenance efforts to improve machine and overall line.

Below are examples of our successful application cases: wet wipe packing machine, paper repackaging machines and a stack of agricultural equipment.

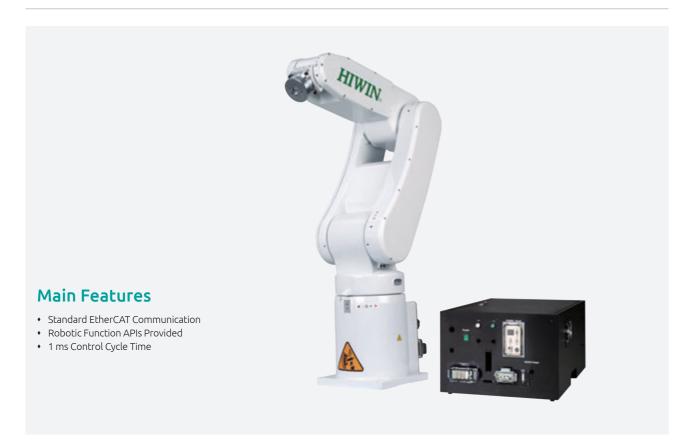
In these examples we have integrated NEXCOM products including Machine Vision, Delta Robot Controller, conveyor control and product loading and unloading.





Articulated Robot Solution

Open and Modular Solution
For Articulated Robot



Product Overview

NexROBO solution provides an open programming environment for users to develop their own robot applications. It consists of robot body and NEXCOM's robot controller in the control cabinet. Motor drives, I/O signals and related circuits are all integrated based on EtherCAT control network. I/O and motor control can easily be expanded through EtherCAT communication. Beside general system configuration, NexROBO solution always allows the flexibility to change components in the robot system for unlimited possibilities.

Specifications

Robot

- Degree of freedon: 6
- Nominal load capacity: 5kg
- Motion Range
 Maximum reach radius: 710mm (Point P)

J1: ±165°

J2: +85°~-125°

J3: +185°~-55°

J4: ±190°

J5: ±115° J6: ±360°

- Position repeatability: ±0.02 mm
- Cycle time: 0.5 s
- Weight: 40 kg
- Installation: Floor, ceiling, wall-mounting

Controller

- Intel® Core™ i5-3610ME processor pre-installed
- 2 x 2GB DDR3 SDRAM, pre-installed
- 500GB HDD
- 1 x EtherCAT port (Intel® 82574L)
- 1 x Intel® GbE LAN port
- 2 x Display Ports and 1 x VGA or 2 x Display Ports and 1 x DVI-D
- 4 x USB 3.0 & 2 x USB 2.0 ports
- 1 x CFast socket
- 5 x RS232 & 1 x RS232/422/485 with Auto Flow Control

Programmin

- Language: Visual C/C++
- Command Set: Positon Command, Velocity Command, Torque Command
- Parameters: position, velocity, torque
- RT Example (RTX project)
- User API Example (win32 dll project)
- GUI Example (C# project)

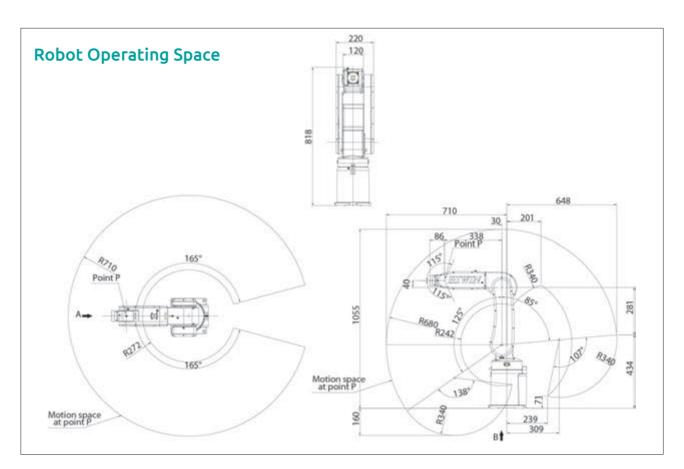
Ordering Information

Robot Package

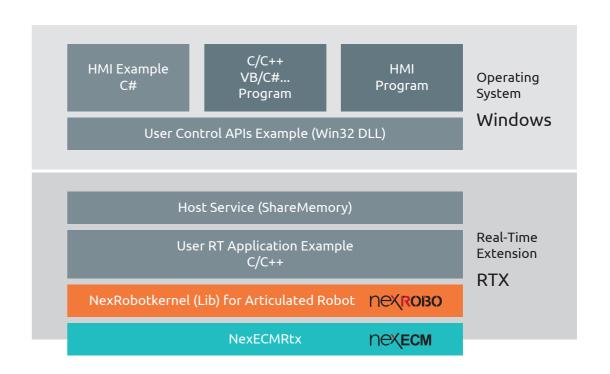
• NexROBO 6R Edu Package (P/N: 7900000115X00)

)ptional

- Robot Stand (P/N: 7900000160X00)
- Teach Pendant (P/N: 10IH0010001X0)



Software Architecture



Delta Robot Solution



Main Features

- Standard EtherCAT Communication
- Robotic Function APIs Provided
- 1 ms Control Cycle Time

Product Overview

NexROBO solution provides an open programming environment for users to develop their own robot applications. It consists of robot body and NEXCOM's robot controller in the control cabinet. Motor drives, I/O signals and related circuits are all integrated based on EtherCAT control network. I/O and motor control can easily be expanded through EtherCAT communication. Beside general system configuration, NexROBO solution always allows the flexibility to change components in the robot system for unlimited possibilities.

Specifications

Robot

- Degree of freedon: 3
- Nominal load capacity: 0.5kgMotion Range
- Horizontal stroke: 250mm
- Vertical stroke:100mm

 ◆ Position repeatability: ±0.02 mm
- Operation Speed: 2m/s (unloaded)

Controller

- Intel® Atom™ processor E3826 Dual Core 1.46 GHz processor preinstalled
- 4GB DDR3 SDRAM, pre-installed
- 128GB SSD
- 1 x EtherCAT port
- 1 x Intel® GbE LAN port
- 1 x DVI display output
- 1 x VGA display output (converted from DVI-I to VGA adapter)
- 1 x USB 3.0 & 1 x USB 2.0 ports
- 1 x CFast socket
- 1 x SIM card holder
- 2 x RS232/422/485 with 2.5KV isolation protection, support auto flow control

Programming

- Language: Visual C/C++
- Command Set: Positon Command, Velocity Command, Torque Command
- Parameters: position, velocity, torque
- RT Example (RTX project)
- User API Example (win32 dll project)
- GUI Example (C# project)

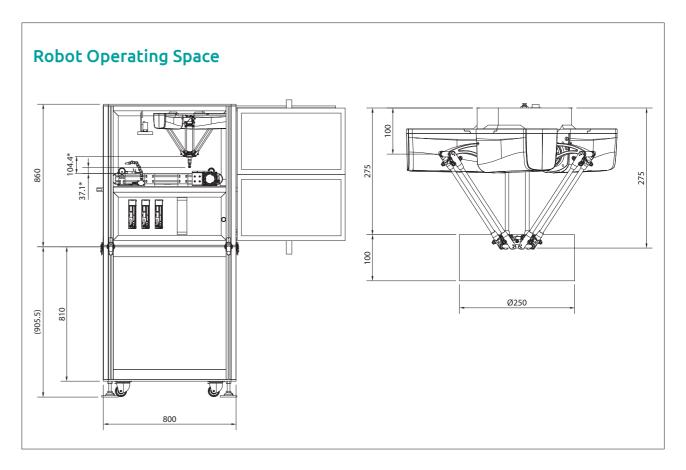
Ordering Information

Robot Package

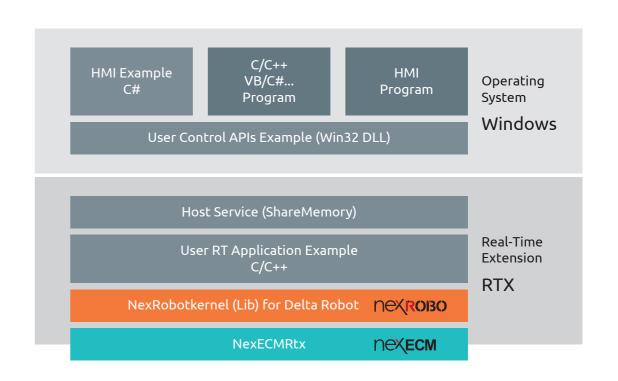
NexROBO miniDelta Edu Package (P/N: TBC)

Optional

- Conveyor System (P/N: TBC)
- Vision Inspection System (P/N: TBC)
- Teach Pendant (P/N: 10IH0010001X0)



Software Architecture





Product Overview

NexROBO solution provides an open programming environment for users to develop their own robot applications. It consists of robot body and NEXCOM's robot controller in the control cabinet. Motor drives, I/O signals and related circuits are all integrated based on EtherCAT control network. I/O and motor control can easily be expanded through EtherCAT communication. Beside general system configuration, NexROBO solution always allows the flexibility to change components in the robot system for unlimited possibilities.

Specifications

Robot

- Degree of freedon: 4
- Nominal load capacity: 6kg
- Motion Range

Maximum reach radius: 600mm

J1: ±130°

J2: ±150°

J3: 200mm J4: ±360°

 Position repeatability J1+J2: ±0.02 mm

J3: ±0.01 mm

- J4: ±0.01 mm

 Cycle time: 0.5 s
- Weight: 20 kg
- J3 (Z-axis) Push Force: 100N
- Installation: Floor, wall-mounting

Controller

- Intel® Core™ i5-520M processor pre-installed
- 2 x 2GB DDR3 SDRAM, pre-installed
- 500GB HDD
- 1 x EtherCAT port
- 1 x Intel® GbE LAN port

- Dual VGA or VGA/DVI Independent Display
- 6 x USB 2.0 ports
- 3 x RS232 and 1 x RS232/422/485 with Auto Flow Control
- 1 x PCI expansion (10W max./ per slot, 169mm max. length)

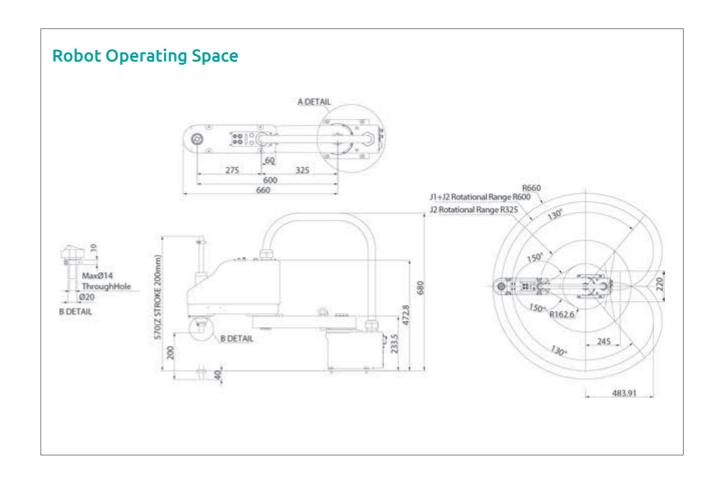
Programming

- Language: Visual C/C++
- Command Set: Positon Command, Velocity Command, Torque Command
- Parameters: position, velocity, torque
- RT Example (RTX project)
- User API Example (win32 dll project)

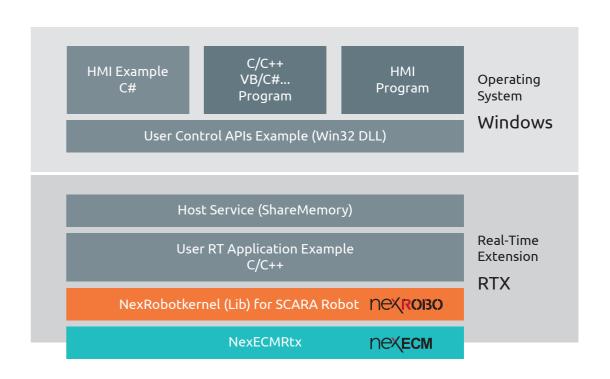
Ordering Information

Robot Package

- NexROBO SCARA Edu Package (P/N: 7900000163X00)
 Optional
- Robot Stand (P/N: 7900000164X00)
- Teach Pendant (P/N: 10IH0010001X0)



Software Architecture



NexMotion

EtherCAT Machine Automation

EtherCAT – The Real-time Ethernet Fieldbus

EtherCAT (Ethernet for Control Automation Technology) is a high-performance fieldbus protocol which allows automation equipment such as servo drives, intelligent sensors and I/O devices to be connected using Ethernet. Because it offers higher accuracy and throughput at a lower cost, EtherCAT has been widely adopted in the automation industry as the mainstream real-time Ethernet protocol for machine automation.

NexMotion – Comprehensive EtherCAT Solution

NEXCOM has been investing R&D resources in developing its own EtherCAT master core architecture. Leveraging industrial grade Ethernet technology, NexMotion, NEXCOM's EtherCAT Solution, offers a complete solution, ranging from EtherCAT master platforms to a series of EtherCAT slave modules. Compared to legacy pulse and voltage commands, EtherCAT commands are digitized to improve its immunity from electrical noise in machine automation environments. Furthermore, the Ethernet-based wiring design allows NexMotion products to add greater flexibility and expandability to control systems.



Pre-Verified EtherCAT Slaves

EtherCAT, as a high-speed fieldbus protocol, is supported by many vendors to provide related slave module products. NEXCOM's EtherCAT controller, NET Series controllers, has performed strict tests with a numbers of EtherCAT slaves. Users can ensure compatibility between NET Series controllers and EtherCAT slaves by choosing from the verified slave list to construct an EtherCAT system with guaranteed performance.

Drive

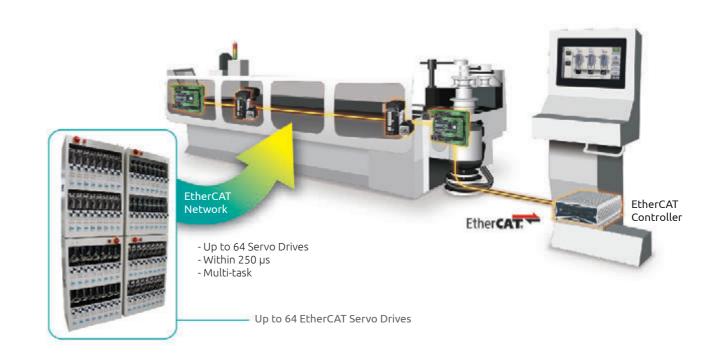
- ♦ Yaskawa Sigma 5/7
- ♦ Hiwin D2, D1
- ♦ Omron R88D
- ♦ Delta A2F
- ♦ Servotronix CDHD
- ♦ Sanyo PB4D, R Series
- ♦ Panasonic MINAS A5B
- ♦ Mitsubishi MR J3-T04
- ♦ Schneider LXM32
- ♦ MiControl mcDSA-E65
- ♦ Maxon MAXPOS

1/0

- ♦ NEXCOM NEIO Series, AXE-5904, AXE-9801
- ♦ Prima C1, E1, E2 Series
- ♦ VIPA SI IO Series
- ♦ Beckhoff EL1, EL2, EL4, EL30, EK1100
- ♦ SYN-TEK ESC5500, ESC6022
- ♦ WAGO 750 Series

Guaranteed Performance

Based on Microsoft's Windows OS and well-known real-time extensions, NEXCOM's EtherCAT master software, NexECM, executes high-performance EtherCAT. It supports a maximum of 64 slaves and has as communication cycle time of up to 250 µs. The performance of NexECM has been tested in NEXCOM's laboratory where more than one hundred EtherCAT slaves are configured for function validation of NEXCOM's EtherCAT master. The CiA 402 standard protocol is also supported by NexECM which makes it easy to control EtherCAT slave drives.



NexMotion

Professional EtherCAT Motion Control

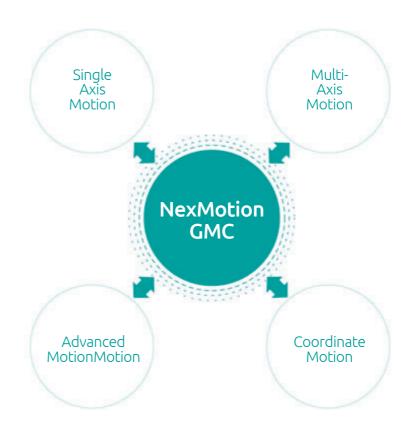
Powerful IDE Tool – NexMotion IDE

As an integrated development tool, NexMotion IDE, allows users to set/configure and test EtherCAT systems, compose real-time programs, and even select parameters for monitoring and data analysis. The setup and simulation of EtherCAT-based robot systems is also built in to the development tool for users to easily construct a multi-axis robot system.

Advanced Motion Control Functions

NEXCOM's EtherCAT controller,NET Seriesprovides up to 64-axis motion control with advanced functions. As well as point-to-point movement for single axis, it also supports multi-axis linear/circular interpolation, continuous moving, PT/PVT, T/S curve velocity profiles, E-gearing, E-CAM etc. Advanced applications such as gantry and fly-cut can be accomplished by the use of the motion control functions NET controller provides.

Set up / Test of **EtherCAT** Configurator **EtherCAT System** Set up / Test of **Motion Group Motion System** Configurator Real-Time **Motion Builder** Program Development All MIAN TOP Jonices **Motion Analyzer Data Analysis** try Dated Set

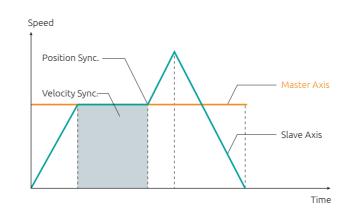


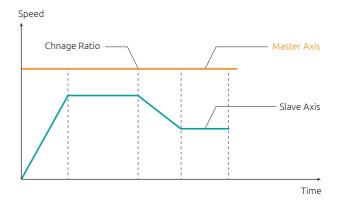
- Multiple Axis PTP, Jog and Synchronization Move
- Position and Speed on the Fly Change
- Master-Slave E-GEAR, E-CAM and Gantry
- User-defined Profile with PT and PVT Motion
- 3D Contouring with Look-ahead and Path Blending
- Dynamic Coordinate Change Conveyor Tracking
- User-defined Standard Robot Kinematics (Delta, SCARA, 6 Axis Robot)

Electronic Gearing & Electronic Cam

In some systems, where different rotating drums must turn at a given ratio to each other, Electronic Gearing and Electronic Cam are necessary. NET controller supports these functions so that the position of a slave axis can be mathematically linked to the position

of a master axis. A more advanced case of Electronic Gearing is Electronic Camming. With Electronic Camming, a slave axis follows a profile that is related to the master position. This profile does not need to be salted, but it must be an animated function.





Robot & Machine Automation Product Selection Guide

NexMotion

Selection Guide

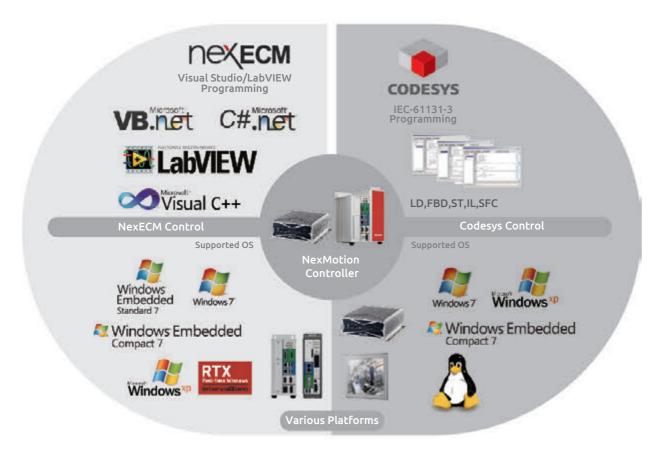
Satisfy both C/C++ & IEC-61131 Users

NEXCOM's EtherCAT controller NET series supports C/C++ and IEC-61131-3 programming languages to simplify the development of motion control applications. Featuring programming flexibility, the NET series controller enables machine builders and automation control engineers to fully leverage its powerful PC architecture and functional libraries by using a programming language that best serves the control purpose. Aimed at modernizing production lines, NEXCOM EtherCAT controllers allow close collaboration of PLC systems, industrial machines, and robots, taking factories one step closer to Industry 4.0.

To modernize production lines,NET EtherCAT controllers offer design flexibility and integration with C/C++ and IEC 61131-3 support. The multi-language feature makes NET series an ideal platform for motion control, robot applications, and PLC automation cases. With an unified controller like NET series, engineers can build highly automated production lines where CNCs, high-speed pick-and-place robots, conveyor systems, and other industrial machines all work together.

For complex motion control and robot applications, the NexECM-bundled solution makes an ideal choice. The solution includes a powerful EtherCAT Master controller and the programming software NexECM. Supporting C/C++, NexECM features high level functionality, EtherCAT Master Library, and CiA 402 Motion Control Library. The software can automatically detect EtherCAT slaves, such as EtherCAT servo drives and EtherCAT I/O modules, connected to the EtherCAT Master controller. More importantly it simplifies the building of advanced kinetic control and enables smooth movement of coordinated axes required for individual CNCs and robots.

As for PLC control systems, the CODESYS-bundled solution integrates an EtherCAT Master controller pre-installed with CODESYS SoftMotion. The solution provides SoftPLC functions with support for IEC-61131-3 standard programming languages including Ladder Diagram (LD), Instruction List (IL), Function Block Diagram (FBD) Engineers can easily devise and maintain motion sequence for sophisticated coordination of axes used in sorting, packing, material handling, and other sequential operations.



Model					
	NET101-ECM	NET200-ECM	NET300-ECM	NET3500-ECM	NET3600E-ECM
CPU	Intel [®] Atom™ E3826 Dual Core 1.46GHz	Intel [®] Celeron [®] J1900 Quad Cord 2.0GHz	6th Gen. Intel [®] Core™ i7 (Skylake-S)	Intel [®] Core™ i5-520M	Intel [®] Core™ i5-3610ME
Chipset	Intel [®] Bay Trail-I	Intel [®] Bay Trail-D	Intel [®] Q170	Intel [®] QM57	Intel [®] QM77
OS	WES 7	WES 7	WES 7	WES 7	WES7
Memory	4GB DDR3L	2 x 2GB DDR3L	4GB DDR4	2 x 2GB DDR3	2 x 2GB DDR3L
NVRAM	Onboard 1Mb	Optional	Optional	Optional	Optional
HDD/SSD	128GB SATAIII SSD	500GB HHD	128GB SATAIII SSD	2.5" SATA 500GB	500GB HHD
CFast	1 (External)	-	1 (External)	-	1 (External)
Display	1 x DVI-I	1 x DVI-I	1 x DVI-I	Dual LVDS 1 x VGA 1 x DVI-I	Dual LVDS 1 x VGA 1 x DVI-I
USB	1 x USB2.0 1 x USB3.0	3 x USB2.0 1 x USB3.0	2 x USB2.0 4 x USB3.0	6 x USB2.0	2 x USB2.0 4 x USB3.0
PS/2	-	1 (Internal)	1 (Internal)	1	-
Audio	Line-out	-	Mic-in & Line-out	Mic-in & Line-ou t	Mic-in & Line-out
Serial Port	2	2	2	4	6
Mini-PCle	1	2	2	+	1
LAN Ports	2 (1 x EtherNet , 1 x EtherCAT)	2 (1 x EtherNet , 1 x EtherCAT)	3 (2 x EtherNet , 1 x EtherCAT)	2 (1 x EtherNet , 1 x EtherCAT)	2(1 x EtherNet , 1 x EtherCAT)
SIM Card Holder	1	1	1	-	1
Expansion	mini-PCle	2 x mini-PCle	2 x mini-PCle	1 x PCI	1 x PClex4
GPIO		4-in/4-out (Internal)	4-in/4-out (Internal)	4-in/4-out (Internal)	4-in/4-out (Internal)
Control Axis No.	up to 64	up to 64	up to 64	up to 64	up to 64
Programming Language	VC/C++	VC/C++	VC/C++	VC/C++	VC/C++
Power Input	24V DC +/-20%	24V DC +/-20%	24V DC +/-20%	ATX, DC +9 ~ 30V	ATX, +9 to 30VDC
Operation Temperature	-20°C to 70°C	-5°C to 55°C	-5°C to 55°C	-5°C to 55°C	-5°C to 55°C
System Dimension (WxDxH)(mm)	58 x 135.5 x 192.5	85 x 157 x 214	90 x 185 x 251	195 x 268 x 80	215 x 272 x 93
Net Weight (kg)	2	2.5	3.7	4.7	5.2



- EtherCAT technology with NexECM, Class A EtherCAT Master
- $\bullet~$ EtherCAT communication cycle up to 250 μs
- Support high-level API for CiA 402 profile
- Onboard Intel® Atom™ processor E3826 Dual Core 1.46GHz
- 1 x DVI display output or 1x VGA converted from DVI-I
- 1 x USB 2.0 & 1 x USB 3.0
- 2 x RS232/422/485 with 2.5KV isolation protection
- 1 x Mini-PCIe socket for optional Wi-Fi/3.5G/4G LTE/Fieldbus module
- Support -20 ~ 70 °C extended operating temperature

Product Overview

Powered by Intel® Atom™ processor E3826 (formerly codenamed "Bay Trail-I"), NET101-ECM presents intelligent PC-based EtherCAT controller for machine automation. It integrates NEXCOM's EtherCAT master, NexECM, to perform real-time communication with cycle time up to 250 µs. NET101-ECM also provides API for CiA 402 profile and built-in EtherCAT configuration tool to speed up development time for automation users.

Beside EtherCAT communication, NET101-ECM has high integration ability with optional Mini-PCIe module and 2 x COM ports with Isolation 2.5kv protect, which makes it a flexible controller to connect with optional GbE LAN, Wi-Fi, 3.5G/4G LTE module. NET101-ECM is a compact yet powerful controller for your EtherCAT control system.

Specifications

EtherCAT Master

- Slave module no.: up to 64
- Cycle time: up to 250µs
- Synchronization Error: +/-50ns
- Support CiA 402 standard protocol

CPU Support

• Onboard Intel® Atom™ processor E3826 Dual Core 1.46GHz

Main Memory

• 1 x DDR3L 4GB RAM

Display Option

- 1 x DVI display output
- 1 x VGA display output (converted from DVI-I to VGA adapter)

I/O Interface-Front

- ATX power on/off switch
- LEDs for power status, HDD access, battery Low, 2 x programing LEDs, 4x Tx/Rx LEDs
- 1 x External CFast socket
- 1 x SIM card holder
- 1 x EtherCAT port, 1 x Intel® I210IT GbE LAN port
- 1 x DVI-I display output
- 1 x USB 3.0 (900mA per each)
- 1 x USB 2.0 (500mA per each)

- 2 x RS232/422/485 with 2.5KV isolation protection, support auto flow control
- Jumper-free setting on RS232/422/485
- Support RI function on COM2
- 1 x 2-pin remote power On/Off switch
- 1 x 3-pic DC input, Typical 24V DC input with +/-20% range

Storage Device

- 1 x CFast (SATA 2.0)
- 1 x 2.5" SSD (SATA 2.0)

Expansion Slot

• 1 x Mini-PCIe socket for optional Wi-Fi/3.5G/4G LTE

Power Requirement

- Typical 24V DC input with +/-20% range
- 1 x optional 24V, 60W power adapter

Dimensions

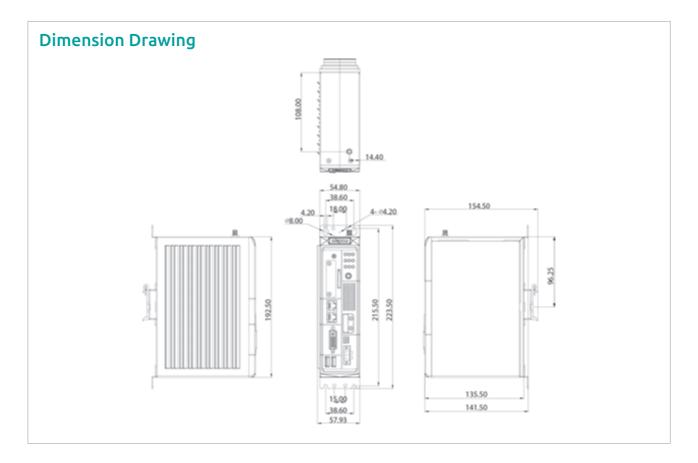
• 58mm (W) x 135.5mm (D) x 192.5mm (H)

Construction

Aluminum and metal chassis with fanless design

Environment

Operating temperature:
 Ambient with air flow: -20°C to 70°C with industrial grade device



(According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)

- Storage temperature: -30°C to 85°C
- Relative humidity: 10% to 95% (non-condensing)
- Shock protection:
- SSD: 20G, half sine, 11ms, IEC60068-2-27
- CFast: 50G, half sine, 11ms, IEC60068-2-27
- Vibration protection w/ CFast & SSD condition:
- Random: 2Grms @ 5 ~ 500Hz, IEC60068-2-64
 Sinusoidal: 2Grms @ 5 ~ 500Hz, IEC60068-2-6

Certifications

- CE
- FCC Class A

Operating System

• Windows Embedded Standard 7, 32-bit, with RTX2012

Ordering Information

- NET101-ECM (P/N: 10J10010100X0)
 Front-access Compact EtherCAT Controller
- 24V, 60W AC/DC power adapter w/ o power cord (P/N: 7400060024X00)

Optional Wi-Fi/GSM Module

. ,		
88J70010100X0	NIFE101 3.5G Module Kit SIERRA: MC8705	-
88J70010101X0	NIFE101 Wi-Fi Module Kit INTEL: 7260.HMWWB.R	Dual Band Wireless-AC 7260, 2x2 AC+BT,HMC
88J70010102X0	NIFE101 Wi-Fi Module Kit INTEL: 7260.HMWBNWB.R	WLAN+ Bluetooth Combo Module

Optional Din Rail Kit

•		
88J70010000X0	NIFE100/101 Series Din Rail kit	@Shock 20G





- EtherCAT technology with NexECM, Class A EtherCAT Master
- EtherCAT communication cycle up to 250 µs
- Support high-level API for CiA 402 profile
- Onboard Intel® Celeron® processor J1900 Quad Cord 2.0GHz
- Dual independent display from DP and DVI-I

- 3 x USB 2.0 & 1 x USB 3.0
- 2 x RS232/422/485
- 2 x Mini-PCIe socket for optional Wi-Fi/3.5G/4G LTE/Fieldbus
- modules
- Support -5 ~ 55 °C operating temperature

Product Overview

Powered by Intel® Celeron® processor J1900 (formerly codenamed "Bay Trail-D"), NET200-ECM presents intelligent PC-based EtherCAT controller for machine automation. It integrates NEXCOM's EtherCAT master, NexECM, to perform real-time communication with cycle time up to 250 µs. NET200-ECM also provides API for CiA 402 profile and built-in EtherCAT configuration tool to speed up development time for automation users.

Beside EtherCAT communication, NET200-ECM has high integration ability with two optional Mini-PCIe modules and two COM ports, which makes it a flexible controller to connect with optional GbE LAN, Wi-Fi, 3.5G/4G LTE module or other fieldbus devices. With the provided features, NET200-ECM is an ideal controller for your EtherCAT control system.

Specifications

EtherCAT Master

- Slave module no.: up to 64
- Cycle time: up to 250µs
- Synchronization Error: +/-50ns
- Support CiA 402 standard protocol

CPU Support

Onboard Intel® Celeron® processor J1900 Quad Cord 2.0GHz

Main Memory

• 4GB RAM (2 x DDR3L)

Display Option

- Dual independent display
- DVI-I and DP

I/O Interface-Front

- ATX power on/off switch
- LEDs for HDD LED, Batty LEDs, Power LED, COM port TX/RX, 5x programmable GPO LEDs
- 1 x External SD Card
- 1 x SIM card holder
- 1 x EtherCAT port, 1 x Intel® I210IT GbE LAN port
- 1 x DP display output
- 1 x DVI-I display output
- 1 x USB 3.0 (900mA per each)

- 3 x USB 2.0 (500mA per each)
- 2 x RS232/422/485 support auto flow control
- Jumper-free setting on RS232/422/485
- Support 2.5KV isolation protection on COM1
- + 1×3 -pic DC input, Typical 24V DC input with +/-20% range

Storage Device

- 1 x 2.5" SSD/HDD(SATA 2.0) -- front accessible
- 1 x SD card (Data storage only)
- 1 x mSATA

Expansion Slot

• 2 x Mini-PCIe socket for optional Wi-Fi/3.5G/4G LTE/Fieldbus modules

Power Requirement

- Typical 24V DC input with +/-20% range
- 1 x optional 24V, 60W power adapter

Dimensions

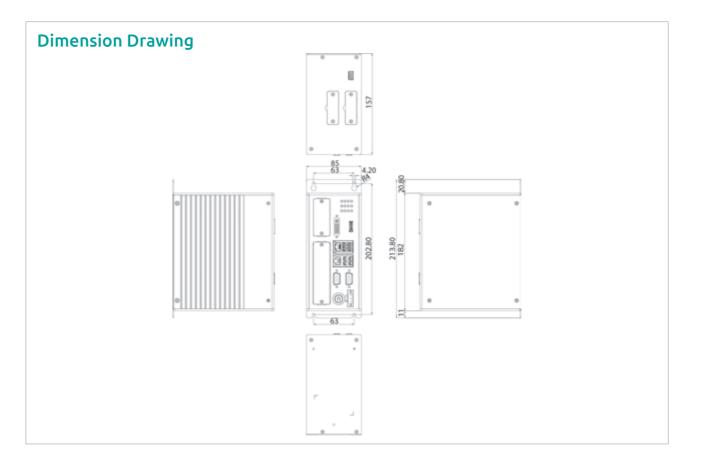
• 85mm (W) x 157mm (D) x 214mm (H)

Construction

Aluminum and metal chassis with fanless design

Environment

Operating temperature:
 Ambient with air flow: -5°C to 55°C



(According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)

- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 95% (non-condensing)
- Shock protection:
- SSD: 20G, half sine, 11ms, IEC60068-2-27
- CFast: 50G, half sine, 11ms, IEC60068-2-27
- Vibration protection w/ CFast & SSD condition:
- Random: 2Grms @ 5 ~ 500Hz, IEC60068-2-64
 Sinusoidal: 2Grms @ 5 ~ 500Hz, IEC60068-2-6
- Certifications
- CE
- FCC Class A

Support OS

• Windows Embedded Standard 7, 32-bit, with RTX2012

Ordering Information

• NET200-ECM (P/N: 10J10020000X0) Front-access EtherCAT Controller

 24V, 60W AC/DC power adapter w/ o power cord (P/N: 7400060024X00)

NET300-ECM





Main Features

- EtherCAT technology with NexECM, Class A EtherCAT master
- EtherCAT communication cycle up to 250 µs
- Support high-level API for CiA 402 profile
- Support 6th generation Intel® Core™ i7-6700TE processor
- Intel® Q170 PCH

- 1 x DVI-D, and 1x HDMI for dual independent display support
- 4 x USB 3.0, 2 x USB 2.0 and 2 x RS232/422/485 auto
- 1 x front access 2.5"SATA HDD tray
- 2 x Mini-PCIe socket support optional modules and mSATA device
- 1 x external CFast socket and 1 x SIM card socket

Product Overview

NET300-ECM is a high-performance EtherCAT controller, built in 6^{th} generation Intel[®] CoreTM i7-6700TE processor (Skylake-S). Based on a real-time operating system, NET300-ECM's communication cycle time can be up to 250 µs, and also offers EtherCAT distributed clocks functions. The EtherCAT controller supports up to 64 slave modules which could be a wide variety of third-party devices, such as servo motors/drives and I/O modules.

NET300-ECM is the ideal intelligence system for machine applications. Its front-access I/O Design simplifies the wiring, and it provides expansion mini-PCIe slot which can integrate other fieldbus devices for more application possibilities.

Specifications

CPU Support

• Support 6th generation Intel® Core™ i7-6700TE, Quad Core, 2.4GHz, 8M cache

Main Memory

• 1 x 4GB DDR4 SO-DIMM

Display Option

Dual independent display

- HDMI + DVI-D

Front I/O Interface

- 1 x ATX power on/off switch
- 1 x HDMI and 1 x DVI-D
- 4 x USB 3.0 ports (900mA per each)
- 2 x USB 2.0 ports (500mA per each)
- 1 x Line-out and 1 x Mic-in
- 2 x Antenna holes for WI-FI/ GSM
- 1 x Front access 2.5" HDD tray
- 1 x Mini-PCIe expansion support optional modules
- 2 x RS232/422/485 auto with 2.5KV Isolation
- 3 x Intel® I210IT GbE LAN ports, support WoL, teaming and PXE

Top I/O Interface

- 1 x 3-pin remote switch
- 1 x CFast expansion • 1 x SIM card

Storage Device 1 x CFast (SATA 3.0)

- 1 x 2.5" HDD (external, SATA 3.0)
- 1 x 2.5" HDD (internal, SATA 3.0)
- 1 x mSATA (via internal Mini-PCIe socket)

Expansion Slot

• 2 x mini-PCIe socket for optional Wi-Fi/3.5G/4G LTE/Fieldbus modules

Power Requirement

- AT/ ATX power mode (default with ATX power mode)
- Power input: typical +24VDC +/- 20%, with reverse polarity protection
- Power adapter: optional AC to DC power adapter (+24Vdc, 120W)

Dimensions

• NET300-ECM: 90 mm(W) x 185mm (D) x 251mm (H)

Construction

• Aluminum and metal chassis with front access design

Environment

- Operating temperature: Ambient with air flow: -5°C to 55°C (according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 85°C
- Relative humidity: 10% to 93% (non-condensing)

Dimension Drawing

- Shock protection:
- HDD: 20G, half sine, 11ms, IEC60068-27
- CFast: 50G, half sine, 11ms, IEC60068-27
- Vibration protection w/HDD condition:
- Random: 0.5Grms @ 5~500 Hz, IEC60068-2-64 - Sinusoidal: 0.5Grms @ 5~500 Hz, IEC60068-2-64

Certifications

- CE approval
- EN61000-6-2
- EN61000-6-4
- FCC Class A
- LVD

OS Support Lists

Windows Embedded Standard 7, 32bit, RTX2012

Ordering Information

- NET300-ECM (P/N: 10J10030001X0) Front-access high-performance EtherCAT controller
- 24V, 120W AC to DC power adapter w/o power core (P/N: 7400120015X00)

NE(COM



- Support Intel® Core™ i7/i5 socket processor
- EtherCAT technology with NexECM, Class B EtherCAT Master, and RTX2012
- EtherCAT communication cycle up to 250 µs
- Support CoE protocol
- Support high-level API for CiA 402 profile

- Build-in full function EtherCAT application configurator, NexCAT
- Dual VGA or VGA/DVI Independent Display
- 3 x RS232 and 1 x RS232/422/485 with Auto Flow Control
- 5th RS232 (option: 4 x digital input, 4 x digital output)
- Support +9 to 30VDC power input; Support ATX power mode

Product Overview

Utilizing 32nm Intel® Core™ i7/i5 processor, NET3500-ECM features Intel® Turbo Boost and Intel® Hyper-Threading technologies (2 cores, 4 threads), as well as on-processor graphics and two DDRIII 800/1066 memory modules up to 4GB. In addition, NET3500-ECM provides a wide variety of display I/O configurations and rich I/O interfaces including two Intel® GbE Ethernet ports, 5 x COM ports, 6 x USB, 8 x GPIO, 2 x SATAII, 2 x eSATA, audio interfaces. NET3500-ECM is designed for a broad range of applications which demand an EtherCAT controller to handle advanced motion & I/O control.

Specifications

Main Board

- NISB 3500
- OnBoard Mobile Intel® QM57 Platform Controller Hub
- Support Intel® Core™ i5-520M PGA Processor (2.66GHz, 4M Cache)
- Support Intel® P4500 PGA Processor (1.86GHz, 2M Cache)

Main Memory

 2 x 240-pin memory DIMM, up to 4GB DDR3 800/1066MHz SDRAM, un-buffered and non-ECC

I/O Interface-Front

- ATX power on/off switch
- HDD Access/Power status LEDs
- 2 x USB 2.0 ports
- 2 x eSATA ports

I/O Interface-Rear

- 2-pin Remote Power on/ff switch
- +9 to 30VDC input
- 1 x PS/2 for Keyboard/Mouse
- 1 x DB9 for COM5, RS232 (option: 4 x GPI and 4 x GPO)
- 1 x DB44 Serial Port for 4 x RS232
- (COM2: RS232/422/485 with auto flow control)
- + $2 \times \text{GbE}$ LAN ports; Support WoL and PXE
- 4 x USB 2.0 ports
- 1 x DB15 VGA port
- 1 x DVI-I port

• 1 x Line-out and 1 x Mic-in

Pre-installed Software Package

- Operating System: Windows Embedded Standard 7
- Windows Extension: RTX 2012
- EtherCAT Master: NexECM
- EtherCAT Configurator: NexCAT

Device

1 x 2.5" HDD driver bay

Expansion

- 1 x PCI expansion (10W max./per slot)
- Add-on card length: 169mm max.

Power Requirements

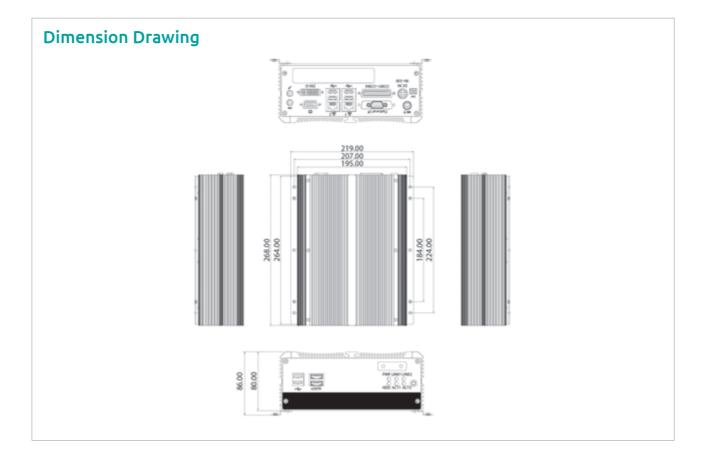
- ATX power mode
- OnBoard DC to DC power support from +9 to 30VDC
- Optional power adapter

Dimensions

• 195mm (W) x 268mm (D) x 80mm (H) (7.7" x 10.5" x 3.1")

Environment

- Operating temperature:
 Ambient with air flow: -5°C to 55°C
- (According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 93% (non-condensing)
- Shock protection:



- HDD: 20G, half sine, 11ms, IEC60068-2-27
- Vibration protection:
- Random: 0.5Grms @ 5 \sim 500 Hz according to IEC68-2-64
- Sinusoidal: 0.5 Grms @ 5 ~ 500 Hz according to IEC68-2-6

Certifications

- CE approval
- FCC Class B
- UL/cUL
- e13

Ordering Information

EtherCAT Controller

- NET3500-ECM (P/N: 10J10350000X0)
 EtherCAT Controller with one PCI Expansion Slot
- 19V, 120W AC/DC Power Adapter w/ o power core (P/N: 7410120002X00)

EtherCAT Support Table

EtherCAT Sup		
Feature Name	Short Description	NexECMRtx
Basic Features		
Service Commands	Support of all commands	V
IRQ field in datagram	Use IRQ information from Slave in datagram header	V
Slaves with Device Emulation	Support Slaves with and without application controller	V
EtherCAT State Machine	Support of ESM special behavior	V
Error Handling	Checking of network or slave errors, e.g. Working Counter	V
Process Data Exch	ange	
Cyclic PDO	Cyclic process data exchange	V
Network Configura	ation	
Reading ENI	Network Configuration taken from ENI file	V
Compare Network configuration	Compare configured and existing network configuration during boot-up	V
Explicit Device Identification	Explicit Device Identification used for Hot Connect and	
Station Alias Addressing	Support configured station alias in slave, i.e. enable 2nd Address and use it	V
Access to EEPROM	Support routines to access EEPROM via ESC register	V
Mailbox Support		
Support Mailbox	Main functionality for mailbox transfer	V
Mailbox polling	Polling Mailbox state in slaves	V
CAN application la	yer over EtherCAT (CoE)	
SDO Up/ Download Normal and expedited transfer		V
Complete Access Transfer the entire object (with all sub- indices) at Once		V
Distributed Clocks		
DC	Support of Distributed Clock	V

bot & Machine Automation Product Selection Guide Robot & Machine Automation Product Selection Guide Robot & Machine Automation Product Selection Guide



- Support 3rd generation Intel® Core™ i5-3610 processor with Intel® OM77 PCH
- EtherCAT technology with NexECM, Class A EtherCAT Master, and RTX2012
- EtherCAT communication cycle up to 250 µs
- Support CoE protocol

- Support high-level API for CiA 402 profile
- Support DC (Distributed Clocks) technology
- Build-in full function EtherCAT application configurator, NexCAT
- Management of real time task SDK
- I/O access API for Windows user mode and RTX subsystem

Product Overview

NET3600E-ECM is an open real-time EtherCAT controller over Windows real-time extension, RTX, allowing integrating users' algorithm and I/O control with communication cycle up to 250 µs. Not only does NET3600E-ECM support CoE protocol, but provide advanced API for CiA 402 profile, enabling seamless integration with servo drivers. Distributed Clocks function support allows synchronization of all slave modules. In addition, NET3600E-ECM offers comprehensive and easy-to-use application configurator, NexCAT, for system development and debugging to speed up development period.

Specifications

System

- Intel® Core $^{\text{\tiny TM}}$ i5-3610ME processor pre-installed
- 1 x 4GB DDR3 SDRAM, pre-installed
- 160GB or above HDD pre-installed
- 1 x EtherCAT port (Intel® 82574L)
- 1 x Intel® GbE LAN port
- 2 x Display Ports and 1 x VGA or 2 x Display Ports and 1 x DVI-D
- 4 x USB 3.0 & 2 x USB 2.0 ports
- 1 x CFast socket
- 5 x RS232 & 1 x RS232/422/485 with Auto Flow Control
- One PCIe x4 slot (10W max. per slot)
- 169mm max. with HDD installed
- 240mm max. without HDD installed

Pre-installed Software Package

- Operating System: Windows Embedded Standard 7
- Windows Extension: RTX 2012
- EtherCAT Master: NexECM
- EtherCAT Configurator: NexCAT

Power Requirements

• DC input range: +9 to 30VDC input

Dimensions

• 216mm (W) x 270mm (D) x 93mm (H)

Environment

• Operating temperature:

Ambient with air flow: -5°C to 55°C (According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)

- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 93% (non-condensing)
- Shock protection: 20G, half sine, 11ms, IEC60068-2-27
- Vibration protection:

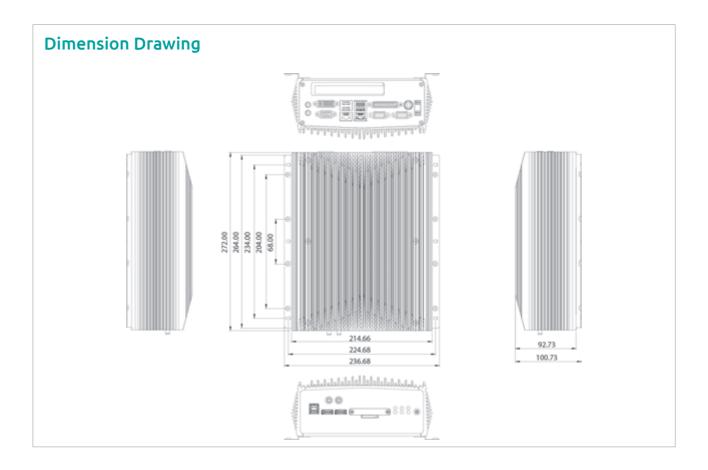
Random: 0.5Grms @ 5 ~ 500 Hz according to IEC68-2-64 Sinusoidal: 0.5 Grms @ $5 \sim 500$ Hz according to IEC68-2-6

Certifications

- CE
- FCC Class A

EtherCAT Support Table

	Short Description	NexECMRtx		
Basic Features				
Service Commands	I Support of all commands			
IRQ field in datagram	Use IRQ information from Slave in datagram header	V		
Slaves with Device Emulation	Support Slaves with and without application controller	V		
EtherCAT State Machine	Support of ESM special behavior	V		
Error Handling Checking of network or slave errors, e.g. Working Counter		V		
Process Data Exchange				
Cyclic PDO Cyclic process data exchange		V		



Network Configura	Network Configuration				
Reading ENI	Reading ENI Network Configuration taken from ENI file				
Compare Network configuration	Compare configured and existing network configuration during boot-up	V			
Explicit Device Identification	Identification used for Hot Connect and prevention against cable swapping	V			
Station Alias Addressing	Support configured station alias in slave, i.e. enable 2nd Address and use it	V			
Access to Support routines to access EEPROM via ESC register		V			
Mailbox Support					
Support Mailbox	Support Mailbox Main functionality for mailbox transfer				
Mailbox polling	Polling Mailbox state in slaves	V			
CAN application la	yer over EtherCAT (CoE)				
SDO Up/ Download Normal and expedited transfer		V			
Complete Access Transfer the entire object (with all sub- indices) at Once		V			
Distributed Clocks					
DC	Support of Distributed Clock	V			

Ordering Information

EtherCAT Controller

- NET3600E-ECM (P/N: 10J10360002X0) High performance EtherCAT controller with NexECM and RTX
- 19V, 120W AC/DC Power Adapter w/ o power core (P/N: 7410120002X00)

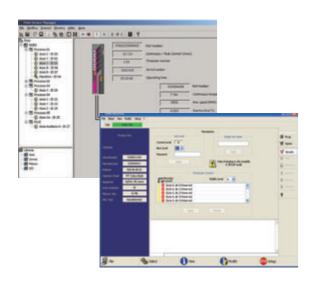
NE(COM

NControl

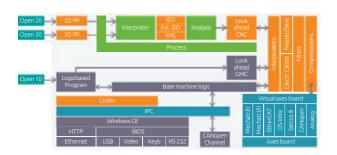
Comprehensive CNC Solutions for 2D/3D Machining

Open Yet Robust

The open software architecture of the NControl series allows flexible programming of various CNC functions, such as enabling CNC machine makers to customize the HMI screen using the built-in editor or Windowsbased programming tools.



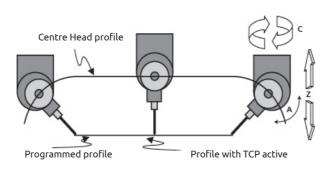
The graphical suite WinNBI (Windows™ Network Based Interface) offers a simple development environment and a range of pre-configured objects that CNC makers can use to develop graphical interfaces, without the need to code. Available in versions for both Windows XP/7 and Windows CE, WinNBI also includes many other graphical tools such as MachinePlot, DigiCAD and PathView to facilitate development.



Premium CNC Features

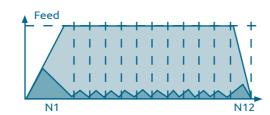
3D Axes Motion

- Circular 3D interpolation
- Tool Centre Point (TCP)
- TCP for double twist and prismatic heads with 2 or 3 rotary axes
- TCP for non standard kinematics
- Tool direction axis movement
- TCP on rotated planes
- PathView to facilitate development



High-speed Machining

- Look ahead speed planning
- 5-degree polynomial trajectory planning
- TCP with 5-degree polynomial trajectory planning



Multi-channel of Machining

- 2 channels of machining work simultaneously
- Up to 24 channels can be customized



Specifications





Motion Control NControl 20 NControl 30 Number of Interpolated Axes 3 5 PLC Axes 10 14 Control Spindle 1 1 TCP Function N/A Yes Calculation Resolution 0.1 um 0.01 um Number of Control Channel 1 1 Block Ahead 1024 1024 Constant Jerk Control Yes 1 Corner Deceleration Yes 1 Smooth Surface Function Yes 1 Control Cycle Time 1 ms 1 CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2 Dimension of Controller 219x268x107(mm)		•			
PLC Axes 10 11 Control Spindle 1 1 TCP Function N/A Yes Calculation Resolution 0.1um 0.01um Number of Control Channel Block Ahead 1024 Constant Jerk Control Yes Corner Deceleration Yes Smooth Surface Function Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 1	Motion Control	NControl 20	NControl 30		
Control Spindle 1 1 1 TCP Function N/A Yes Calculation Resolution 0.1um 0.01um Number of Control Channel 1 Block Ahead 1024 Constant Jerk Control Yes Corner Deceleration Yes Smooth Surface Function Yes Control Cycle Time 1 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Number of Interpolated Axes	3	5		
TCP Function N/A Yes Calculation Resolution 0.1um 0.01um Number of Control Channel 1 Block Ahead 1024 Constant Jerk Control Yes Corner Deceleration Yes Smooth Surface Function Yes Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	PLC Axes	10	14		
Calculation Resolution O.1um O.01um Number of Control Channel Block Ahead 1024 Constant Jerk Control Yes Corner Deceleration Yes Smooth Surface Function Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Control Spindle	1	1		
Number of Control Channel Block Ahead 1024 Constant Jerk Control Yes Corner Deceleration Yes Smooth Surface Function Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 1 1 1 1 1 1 1 1 1 1 1 1 1	TCP Function	N/A	Yes		
Block Ahead Constant Jerk Control Yes Corner Deceleration Yes Smooth Surface Function Yes Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Calculation Resolution	0.1um	0.01um		
Constant Jerk Control Corner Deceleration Yes Smooth Surface Function Yes Control Cycle Time Ins CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port Z	Number of Control Channel		1		
Corner Deceleration Yes Smooth Surface Function Yes Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Block Ahead	10	24		
Smooth Surface Function Yes Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Constant Jerk Control	Yes			
Control Cycle Time 1ms CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Corner Deceleration	Yes			
CPU Intel Core 2 Duo P8400 Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Smooth Surface Function	Yes			
Storage SSD 32G LCD Size N/A Operating System Win CE 6.0 LAN Port 2	Control Cycle Time	1ms			
LCD Size N/A Operating System Win CE 6.0 LAN Port 2	CPU	Intel Core 2	Duo P8400		
Operating System Win CE 6.0 LAN Port 2	Storage	SSD	32G		
LAN Port 2	LCD Size	N/A			
	Operating System	Win CE 6.0			
Dimension of Controller 219x268x107(mm)	LAN Port	2			
	Dimension of Controller	219x268x107(mm)			

NControl

5-Axis Milling Machine Solutions

5-axis machines combine three linear axes and two rotary axes. Three axes determine the position of the tool and two axes determine the direction of tool. Since 5-axis machines can reach any location from all directions, they can work on spiral curved surfaces. Also they increase machining precision and reduce loading and unloading time.

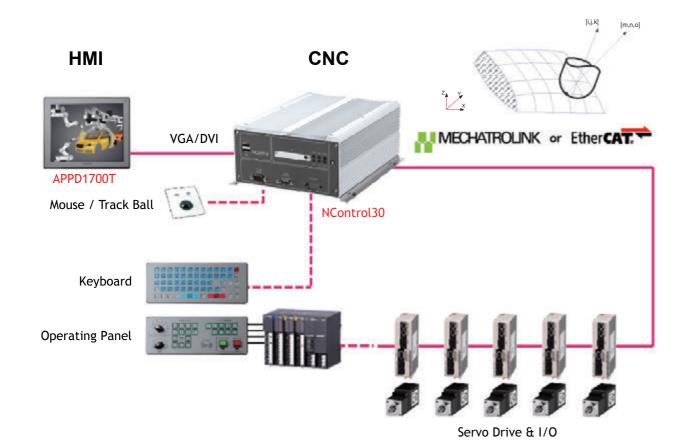
Machine Features

- B axis tilt angle (spindle) + 120° ~ -90°
- C axis (table) rotation angle 0° ~ 360°
- Lightweight aluminum structure
- 50,000 rpm spindle speed, with Tapping function
- Automatic tools managment, with 6 Tools
- Linear scale (Option)

Applications

Working on small mechanical components, watches, clocks, jewelry and enabling tooth die casting for rapid prototyping.

System Architecture



5-Axis Milling Machine



Finished Products





- Support 2D1/2 & 3D CNC machining
- Support EtherCAT and MechatrolinkIII protocols
- G/M Code supported
- Tool Center Point (TCP) Support
- Look ahead speed planning (up to 1024 blocks)
- High speed machining with polynomial interpolation
- TCP with high speed machining
- Multiple CNC channels supported
- Up to 24 channels can be customized

Product Overview

NControl series provides a comprehensive CNC solution to 2D and 3D machining. Providing high level CNC functionalities, such as TCP for 5-axis machining and high speed machining with look ahead and polynomial, NC ontrol series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed. Derived from Nex Motion cloud and polynomial in the control series ensures high machining precision with high speed and polynomial in the control series ensures high machining precision with high speed and polynomial in the control series ensures high machining precision with high speed and polynomial in the control series ensures high machining precision with high speed and polynomial in the control series ensures high machining precision with high speed and polynomial in the control series ensures high machining precision with the control series and the control series ensures high machining precision with the control series and the cand open feature, NControl series can upgrade its function without changing any hardware and can easily integrate with 3rd party hardware and software.

Specifications

System

- Intel® Core™ 2 Duo P8400 processor pre-installed
- 2GB DDR3 SDRAM, pre-installed
- 32GB SSD pre-installed
- Windows CE 6.0 pre-installed
- VGA/DVI-I independent display
- 2 x Intel® GbE LAN ports (support WoL & LAN teaming)
- 1 x DB44 Serial Port for 4 x RS232
- (COM2: RS232/422/485 with Auto Flow Control)
- 6 x USB 2.0 ports
- 1 x PS2 Connector supporting KB/MS
- Fast I/O: 4 digital in/4 digital out
- Analog I/O: 1 in (16-bit)/1 out (16-bit)
- Encoder: 1 in (A/B/Z phase)

CNC Control

- Axes Management
- Circular 3D interpolation
- Rollover Axes
- Gantry Axes
- Dynamic follower axes
- Canned Cycles
- Spot-facing (G82)
- Deep drilling with chip take out (G83)
- Tapping (G84)
- Reaming or tapping by Tapmatic (G85)
- Boring with spot facing (G89)
- Motion control types

- G code ISO 6983 programming
- M, S, T functions programming
- Look Ahead (up to 1024 blocks)
- Velocity Feed Forward (VFF)
- Tool Centre Point (TCP)
- TCP for Double Twist and Prismatic Heads with 2 or 3 rotary axes
- TCP for non-standard kinematics
- Special Feature
- Bidirectional pitch compensation

Optional Remote I/O

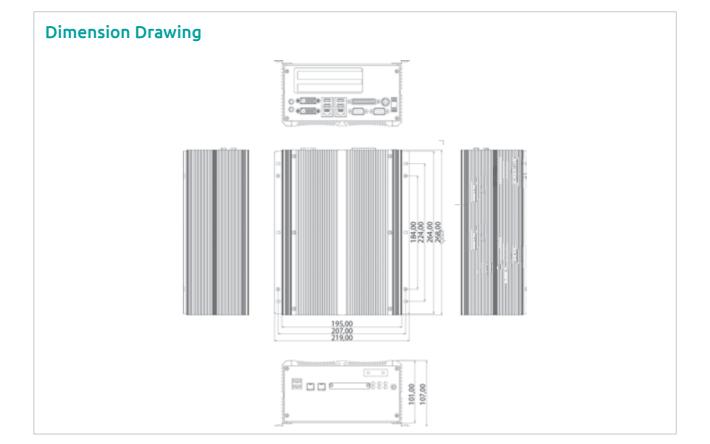
- Modular type
- Coupler: C-101
- Digital I/O module: E-101/E-201/E-202
- Analog I/O module: E-501
- Terminal type
- Digital I/O module: AXE-9200

Power Requirements

• DC input range: +16 to 30VDC input ATX Power mode (Optional AC/DC 120W power adapter)

Environment

- Operating temperature:
- Ambient with air flow: -5°C to 55°C
- (According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 93% (Non-Condensing)
- Shock protection:



- HDD: 20G, half sine, 11ms, IEC60068-2-27
- CF: 50G, half sine, 11ms, IEC60068-2-27
- Vibration protection w/ HDD Condition
- Random: 0.5Grms @ 5 ~ 500 Hz according to IEC60068-2-64 - Sinusoidal: 0.5Grms @ 5 ~ 500 Hz according to IEC60068-2-6

Certifications

- CF
- FCC Class A

Ordering Information

CNC Controller

• NControl20

 $2\,\!\text{D}\frac{1}{2}$ CNC Controller for Machining and Turning Center with Win CE 6.0

NControl20D

2D½ CNC Controller for Machining and Turning Center with Win CE 6.0 and WE2009

NControl30

3D CNC Controller for Machining and Turning Center with Win CE 6.0

NControl30D

3D CNC Controller for Machining and Turning Center with Win CE 6.0 and WE2009

• 19V, 120W AC/DC Power Adapter w/ o power core (P/N: 7410120002X00)







- IP65 compliant plastic front bezel with flush panel by 5-wire touch
- Dual display input interface: analog VGA and DVI-D
- Shares identical appearance with APPC series
- Dual touch screen interface: RS232 and USB
- Ultra slim in depth
- OSD Multilanguage function

Product Overview

17" 4:3 LCD display APPD 1700T is based on a 5-wire resistive touch screen. It has 380 nits brightness and can support resolutions up to 1280 x 1024.APPD 1700T is ideal for space-critical environments where systems and displays are kept apart. In addition, APPD 1700T adopts a flush panel design and has IP65 front panel. APPD 1700T provides prevailing video interfaces: VGA and DVI, supporting both digital and analog signals; touch screen can be connected with RS232 or USB ports. Moreover, APPD 1700T supports 12~24VDC power input and offers panel mount and VESA mount, allowing users to choose the mounting method that meets their situation. APPD 1700T is the best solution for NEXCOM NISE fanless computer, NViS security surveillance series and APPC panel PC when a second display is required.

Specifications

Panel

- LED Size: 17", 4:3
- Resolution: SXGA 1280 x 1024
- Luminance: 380cd/m²
- Contrast ratio: 1000
- LCD color: 16.7M
- Viewing Angle: 80(U), 80(D), 85(L), 85(R)
- Backlight: CCFL

Touch Screen

- 5-wire resistive (flush panel type)
- Light transmission: 81%
- Interface: USB and RS232

Rear I/O

- Touch interface port: RS232 (1 x DB9)/USB Type A
- Video port: VGA (1 x DB15)/DVI-D (1 x DVI-I connector)
- DC power input connector: 3-Pin Phoenix terminal Blocks

OSD Function

- OSD keypad
- Multilanguage OSD

Mechanical & Environment

- Color: pantone black
- IP protection: IP65 front
- Mounting: panel/wall/stand/VESA 100mm x 100mm
- Power input: 12V~24VDC
- Power adapter: optional AC to DC power adapter (+12V, 60W)
- Vibration:
- IEC 68 2-64

2Grms @ sine, 5~500Hz, 1hr/axis (Operating) 2.2Grms @ random condition, 5~500Hz, 0.5hr/axis (Non-operating)

- Shock:
- IEC 68 2-27

20G@wall mount, half sine, 11ms

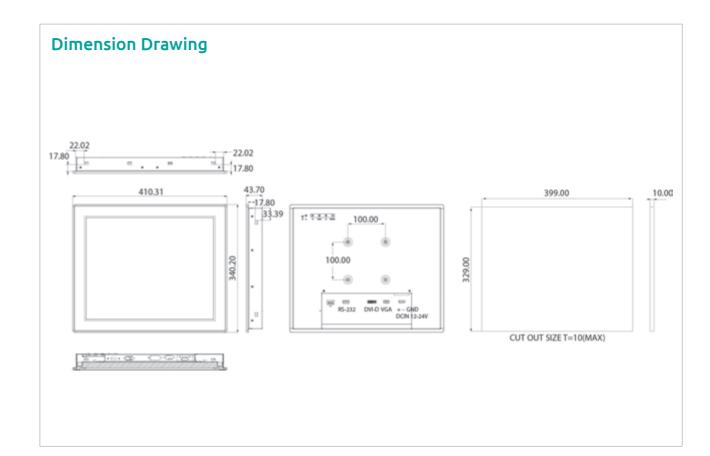
Operating temperature: -5°C to 50°C

Storage temperature: -20°C to 75°C

- Operating humidity: 10%~90% relative humidity, non-condensing
- Dimension: 410.4 x 340.4 x 43.7mm
- Weight: 5.3 Kg

Certifications

- CE approval
- FCC Class B



Ordering Information

 APPD 1700T (P/N: 10IAD170000X0) 17" SXGA industrial 4:3 LCD flush touch monitor with VGA and DVI-D input, 12~24VDC input, RS-232 and USB touch screen

• 1.8m DVI-D male to DVI-D male Cable (P/N: 60233DVI28X00)

• 12V, 60W AC/DC power adapter w/o power cord (P/N: 7400060019X00)

NE(COM



- High-performance EtherCAT communication
- All-in-one board design
- 22 function keys, 2 knobs and 2 push buttons for CNC machine applications
- On module LEDs for diagnosis monitoring
- Typical 24V DC input with±10% range
- Support 0 ~ 60°C operating temperature

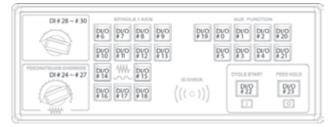
Product Overview

AXE-9801 is an EtherCAT-based control panel for CNC machine, with 22 function keys, 2 knobs and 2 push buttons for Cycle Start/Feed Hold. It controls 31-channel digital inputs, and 24-channel digital outputs, based on EtherCAT protocol, for interface operation. AXE-9801 provides enhanced performance and users can integrate it into their CNC control system easily.

Specifications

I/O Information

- Numbers of D/I channel: 31
- Numbers of D/O channel: 24
- DI/O function key mapping table



Power Requirements

• DC input range: DC 24V±10% range

Common Section

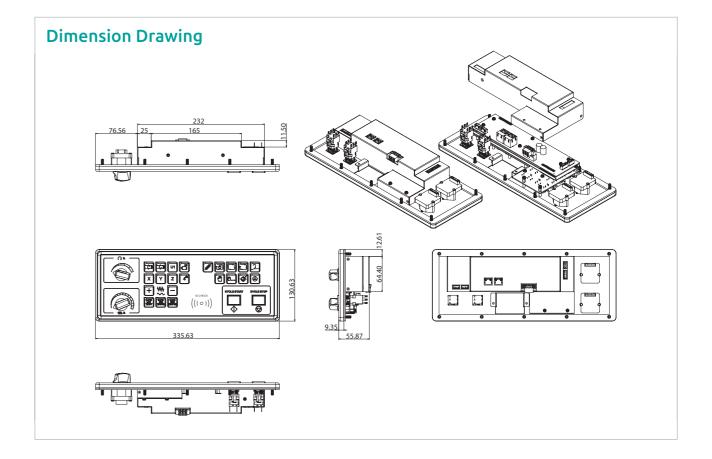
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- · Relative humidity:
- 35~85%, non-condensation, operating
- 10~90%, non-condensation, non-operating
- Dimensions (mm): 335.63 (W) x 130.63 (H) x 55.87 (D)

Certifications

- CE
- FCC Class A

Communication

- Protocol: EtherCAT
- Bus interface: 2 x RJ-45 • Media: Ethernet cable (min. CAT5), shielded
- Distance between stations: maixmum. 100m (100BASE-TX)
- Data transfer rate: 100M baud



Ordering Information

- AXE-9801 (P/N: 90J40980100X0) EtherCAT-based control panel
- 19V, 120W AC/DC Power Adapter w/ o power core (P/N: 7410120002X00)

MAC

Purpose-built Machine Control Solutions

MAC Meets Your Machine Control Needs in a Single Platform

NexMotion's MAC Controller is an all-in-one machine automation controller that integrates functions of motion control, input/output and vision in a single platform. With all related drivers and software pre-installed, this readyfor-application controller allows users to jump right into application development.

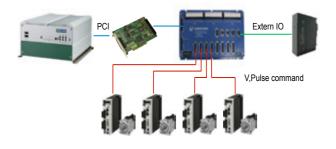
Vertical Motion Functions

The MAC controller provides up to 8-axis close-loop motion control with advanced functions. Besides point-to-point movement for single axis, it also supports multi-axis linear/circular interpolation, continuous moving, PT/PVT, T/S curve velocity profiles, E-gearing, etc. Advanced applications such as gantry and fly-cut can be accomplished by the motion control functions the MAC controller provides. Adding machine vision control with triggering I/O also enables the MAC controllers to handle vision inspection in assembly lines or inspection machines.



All-in-one Motion Controller

System Architecture

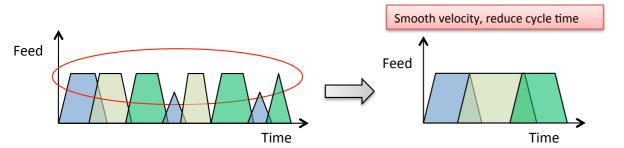




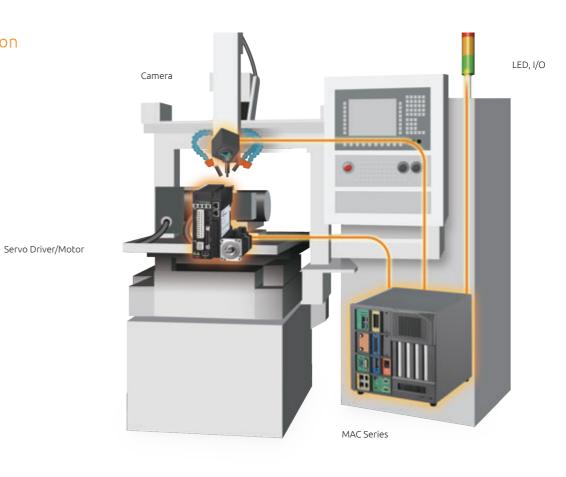
Glass Grinding Machine

System Performance

- 1. Speed smoothing can reduce the machine vibration and smooth surface
- 2. Reduce the process cycle time
- 3. Control for brittle materials processing speed

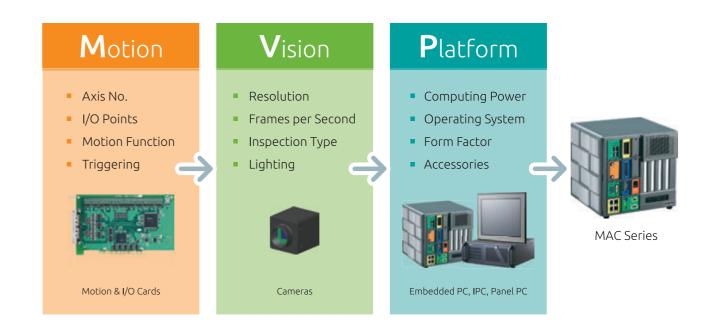


Application



MVP Configuration Process

NEXCOM's 3-step MVP process aims to offer the best-fit controller solution for customers' applications. By consolidating the Motion, Vision and Platform needs of customers, NEXCOM can provide a configuration setup that's most efficient and effective for customers. The proposed configuration will be tested beforehand so that customers can enjoy the benefits of verified system compatibility and cost-effectiveness provided by MAC controllers.



MAC

Glass Grinding Machine Solutions

Glass Processing Characteristics

- Strict machine performance
- Motion control conditions
- Tool wear

- Long processing timesHigh production costs

Glass Processing Requirements

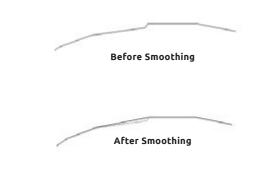
- Strict machine performance
- Motion control conditions
- Tool wear

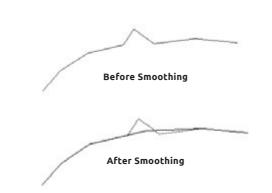
- Long processing time
- High production costs

For Glass grinding machine MAC Series support those application-specified functions which greatly lift machine performance

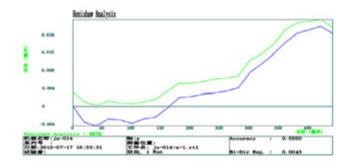
Glass Grinding Function				
Pitch Error Compensation	Tool Management			
Tool Radius Compensation	Authority Management			
Tool Length Compensation	Tool Path Simulation			
Vibration Suppression	Operator Log			
Smoothing Path	Macro Function			
Friction Compensation	Tool Changing			

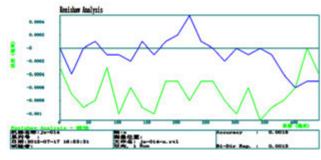
Smoothing Path



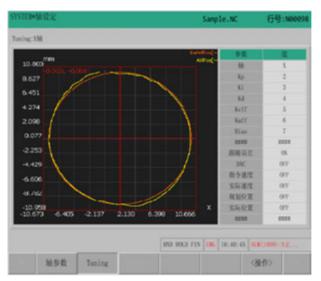


Pitch Error Compensation

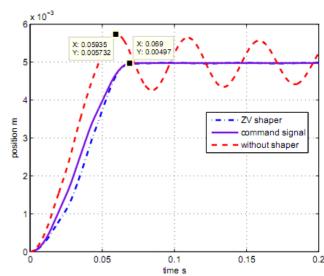




Friction Compensation



Vibration suppression



Specifications

Motion Control	
Control Axis	4 axes
Control Command	Pulse / Analog
Special Function	PID + Feed Forward + Acceleration Forward
Control Cycle Time	200 us
Pulse Frequency	1MHz
Analog Command	-10V ~ +10V 16bit
Encoder	ABZ phase differential
System	
CPU	Intel [®] Core [™] 2 Duo/Celeron [®] Fanless Bare-Bone System with One PCI Expansion
Dimensions	195mm (W) x 268mm (D) x 80mm (H)
Power	24 Vpc (3A min)
Temperature	-5 °C to 55 °C



Product Overview

MAC is a series of coordinated motion controllers dedicated to specified machines such as glass grinding machine. Featuring application-related functions and advanced motion control, MAC controllers T/S-Curve, PT (Position-Time profiling), E-Gear and E-CAM functions for machine automation applications requiring more accuracy and excellent performance. Equipped with uncommitted DI/O up to 32 channels DI and 32 channels DO in total, MAC 4000P4E-GTS series reduces the number of add-on cards and thus reduces the controller size. When working on machine vision applications, data from industrial cameras can be transmitted via GbE LAN ports, USB 3.0 ports or add-on cards depending on the interfaces of the camera. MAC 4000P4E-GTS series is designed for modern machine automation applications and ensures the shortest integration and development period.

Specifications

System

- Intel® Core™ 2 Duo P8400 processor pre-installed
- 2GB DDR3 SDRAM, pre-installed
- 32GB SSD pre-installed
- Windows CE 6.0 pre-installed
- VGA/DVI-I independent display
- 2 x Intel® GbE LAN ports (support WoL & LAN teaming)
- 1 x DB44 serial port for 4 x RS232 (COM2: RS232/422/485 with auto flow control)
- 6 x USB 2.0 ports
- 1 x PS2 connector supporting KB/MS
- Fast I/O: 4 digital in/4 digital out
- Analog I/O: 1 in (16-bit)/1 out (16-bit)
- Encoder: 1 in (A/B/Z phase)

Motion Control

- ±10V 16-bit control output with 4 x AB phase encoder input
- Dedicated home, limits and alarm for every single axis
- Dedicated SVON and clear for every single axis
- Intelligent look-ahead trajectory planning
- Support PID plus feed forward gain control (PID+Vff+Aff)
- Support E-CAM, E-Gear, PT and PVT control
- Support standalone procedure access up to 32 tasks

Optional I/O

- System: Uncommitted DI/O up to 16-channel DI and 16-channel DO
- Terminal board: Uncommitted DI/O up to 16-channel DI and 16-channel DO

Power Requirements

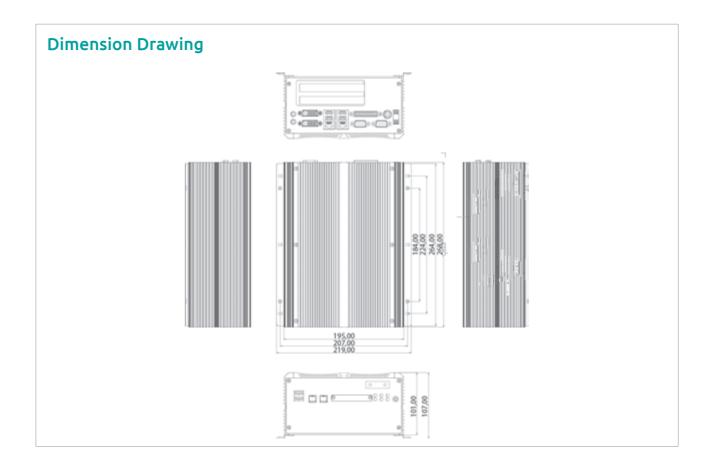
• DC input range: +16 to 30VDC input ATX power mode (optional AC/DC 120W power adapter)

Environment

- Operating temperature: Ambient with air flow: -5°C to 55°C
- (according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 93% (non-condensing)
- Shock protection:
- HDD: 20G, half sine, 11ms, IEC60068-2-27
- CF: 50G, half sine, 11ms, IEC60068-2-27
- Vibration protection w/ HDD condition
- Random: 0.5Grms @ 5 ~ 500 Hz according to IEC60068-2-64
- Sinusoidal: 0.5Grms @ 5 ~ 500 Hz according to IEC60068-2-6

Certifications

- FCC Class A



Ordering Information

- MAC1000 (P/N: TBD) Machine controller for glass grinding machine
- 19V, 120W AC/DC Power Adapter w/ o power core (P/N: 7410120002X00)

NE(COM



- OS-Independent HMI platform
- Online and mobile access
- Remote monitoring of equipment
- Scalable and standardized system

- Multiple communication protocol support
- Drag-and-drop interface development
- Configure system and communication
- Reduce development time

Product Overview

JMobile is a modern & innovative software solution for the design of HMI applications in a simple and intuitive way. A powerful and versatile tool set allowing for the rapid design of tailored applications crafted for a better, more modern user experience. Designed for simplicity, flexibility, and efficiency, JMobile and its advanced graphics engine is based on SVG technology with full object-oriented design properties. These Modern and flexible widgets allow for tailoring a truly better, more intuitive "User Experience" Better "Usability" for operators with modern widgets and navigation, better "Visibility" for management with remote tools and reporting, and better Serviceability both locally and from afar.

JMobile client-server architecture is based on current web technologies providing users with advanced control and remote supervision a, from any browser, any device (smartphone, tablet, or computer). In addition, the ability to capture, store and share data in higher-level structures make it an effective tool for integration across the entire enterprise. A rich set of symbols, widgets and advanced functions (e-mail, RSS, PDF Reporting Scheduler, HTML5 Browser) allows JMobile deployment in a wide variety of applications and industries, from industrial to building and marine automation.

Specifications

- JMobile Suite installation contains
- JMobile Studio: an application for designing custom HMI projects in a user-friendly manner, along with a variety of objects in its built-in library, the Widget Gallery
- JMobile Client: a light-weight application that can be used on Windows computers to remotely view and manage a project running on an HMI device
- JMobile HMI Runtime: a standalone application that runs on the HMI devices (eTOP/ eSMART series). The HMI Runtime is installed via JMobile Studio
- JMobile PC Runtime: a standalone application that runs on Win32 platforms (computers instead of HMI devices)
- Support for all industrial communication protocols, up to 4 simultaneous

- On-line and off -line simulation
- Rich set of symbols, widgets and advanced functions (e-mail, RSS, PDF Reporting Scheduler, HTML5 Browser)
- Rich symbol library and project templates
- dynamic objects, data acquisition, alarm handling, Multilanguage, applications, recipes, tag editor and tag database, user and password, scripting
- Multiple Communication Protocols support
- Integrated PLC Support
- CODESYS V2 and V3 runtime available as options
- Multilanguage for JMobile Studio, JMobile HMI Runtime and JMobile PC Runtime

Operating Environment

JMobile Studio has the Following System Requirements

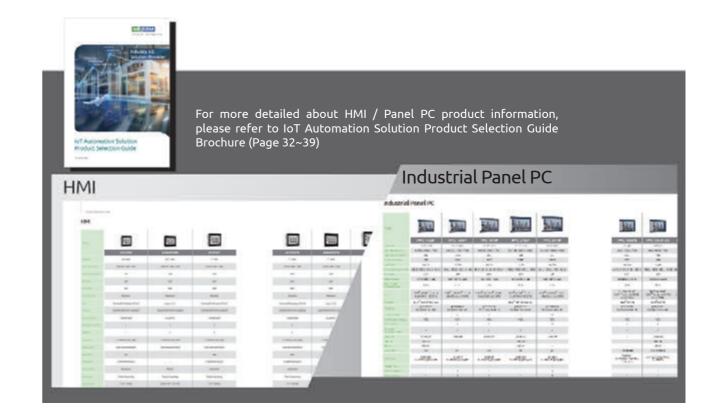
- Operating System: Windows XP (SP2 or SP3)/ Windows Vista Business/ Ultimate/ Windows 7/ Windows 8
- Storage: 500 MB minimum
- RAM: 512 MB
- Other: one Ethernet connection/ support virtual machine environment

JMobile PC Runtime as the following Minimum System Requirements

- Operating System: Windows XP Professional/ Windows XP Embedded/ Windows Embedded Standard (WES 2009)/ Windows Vista Business/Ultimate/ Windows 7 Professional/ Windows Embedded Standard 7/ Windows 8/ Windows Server 2003
- Storage: 256 MB Min
- RAM: 512 MB
- CPU: min. 300 MHz Pentium III or similar processors with 500 MHz
- Graphic: min. SVGA
- Other: One Ethernet connection

Ordering Information

- JMobile Studio License (P/N: 6014500029X00)
 HMI development software JMobile Studio License one license for ten active development PCs
- JMobile PC Runtime License (P/N: 6014500020X00)
 HMI PC Runtime License for x86 windows PC one license for one active HMI up to 4000 Tags
- * Note: "JMobile Studio" and "JMobile Runtime PC" have 30-days free trial fully functional, "trial period" is not allowed on Virtual Machine environment



bot & Machine Automation Product Selection Guide Robot & Machine Automation Product Selection Guide Robot & Machine Automation Product Selection Guide

NEIO

EtherCAT I/O Systems

The Ideal I/O for EtherCAT Control Systems

NEIO is a series of EtherCAT slave I/O modules for distributed industrial applications. Each module is equipped with high density I/O (up to 32 points) and powerful features in a compact size. DIN-rail design and daisy-chain wiring powered by EtherCAT technology make it easy to install NEIO modules in the field. NEIO provides wide variety of I/O combinations with standard ESI file so that users can always find suitable I/O modules for their high-speed EtherCATbased applications.

Features

- High-Density I/O Points
- Ease-of-maintenance
- State-of-art Design
- Standard EtherCAT Communications
- Rich I/O Selections



Smart latch design for easy opening/closing



- Flexibility to be installed in control cabinets
- Safe operation when connecting to I/O circuits

On-module LED indicators

LEDs for module status and I/O information

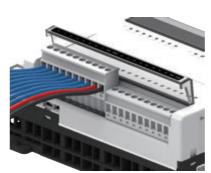


- Clear I/O status indication
- Quickly diagnose faults with multiple LEDs

Multiple mounting methods DIN-rail mounting and

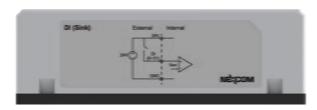
wall mounting





User-friendly wiring labels

Professional wiring instructions



- Detailed wiring diagram
- Instantly operate the I/O module with the given wiring information

OR code for ESI file

QR code sticker on module



- Quick access to ESI download link
- Also link to related product information

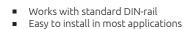
Rotational pin-assignment marks

Self-explanatory pin-assignment information



- No blind spots when checking pin assignments
- Easy maintenance even when the module is installed in a cabinet





Detachable screw terminals Secure screw connection technology Flexible wiring to terminals on-module or off-module ■ Easy to switch modules while keeping existing wiring

Selection Guide

EtherCAT Digital I/O

	Model Name	NEIO-B1101	NEIO-B1102	NEIO-B1201	NEIO-B1202	NEIO-B1811	NEIO-B1812
	Туре	DI Module (Sink)	DI Module (Sink / Source)	DO Module (Sink)	DO Module (Source)	DI/O Module (Sink)	DI/O Module (Source)
٧	Viring Diagram	External Internal 24V DI Viscal GND Viscal	External Internal COM Va (2) (0-31)	External Internal 24V 1 DO (0-31) GND	External Internal 24V O(0-31) GND	External Internal External Internal 24V DO (0-15) VINET GND GND	External Internal COM V _n DO (0-15) GND O O O O O O O O O O O O O
	Number of Channels	32	32	-	-	16	16
	Input Voltage	24 Vdc	24 Vdc	-	-	24 Vdc	24 Vdc
Digital Input	On-State Voltage, "1"	9~30 Vdc	9~24 Vdc / 0~15 Vdc	-	-	9~30 Vdc	8~24 Vdc (Sink) / 16~24 Vdc (Source)
	Off-State Voltage, "0"	0~5 Vdc	0~8 Vdc / 16~24 Vdc	-	-	0~5 Vdc	0~7 Vdc (Sink) / 0~15 Vdc (Source)
	Input Filter	3 ms	1 ms	-	-	3 ms	1 ms
	Number of Channels	-	-	32	32	16	16
	Output Voltage	-	-	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Digital Output	Load Type	-	-	Resistive , Inductive	Resistive , Inductive , Capacitive	Resistive , Inductive	Resistive , Inductive , Capacitive
- Output	Max. Output Current	-	-	500 mA/ch	500 mA/ch	500 mA/ch	500 mA/ch
	Switching Time	-	-	Off to On : 100 us On to Off : 150 us	Off to On : 100 us On to Off : 150 us	Off to On : 100 us On to Off : 150 us	Off to On : 100 us On to Off : 150 us
F	Power Input	24 Vdc (±20%)	24 Vdc (±20%)	24 Vdc (±20%)	24 Vdc (±20%)	24 Vdc (±20%)	24 Vdc (±20%)

EtherCAT Analog I/O

Model Name		NEIO-B1831		
Туре		AI/O Module (Voltage / Current)		
Input Type		Voltage Input	Current Input	
Analog Input	Wiring Diagram	External Internal	External Internal	
	Number of Channels	6	2	
	Input Range	±10 V	0 ~ 20 mA	
	Resolution	16 bit	16 bit	
Number of Channels 2		2		
Analog Output	Input Range	0 ~ 10 V		
	Resolution	12 bit		
Power Input		24 Vdc (±20%)		

EtherCAT COM Port

Model Name	NEIO-B1601
Туре	COM Module
Number of Channels	2
COM 1	RS232 / 422 / 485
COM 2	RS422 / 485
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
Parity	none , odd , even , space , mark
Baud Rate	0.3 ~ 115.2 kbps
Power Input	24 Vdc (±20%)

EtherCAT Pulse-output

Model Name	AXE-5904
Туре	Pulse-output Module
Number of Axes	4
Pulse Output	CW/CCW,OUT/DIR,4xAB
Encoder Feedback	4xAB
Dedicated I/O	LIM/HOME/INP ALM/ARST/SVON
Digital Input	12
Power Input	24 Vdc (±10%)
·	





- Finger-safe wiring cover
- Detachable screw terminals
- Rotational pin-assignment marks

- On-module LED indicators
- User-friendly wiring label
- Multiple mounting methods

Product Overview

NEIO is a series of EtherCAT slave I/O modules for distributed industrial applications. Each module is equipped with high density I/O (up to 32 points) and powerful features in a compact size. DIN-rail design and daisy-chain wiring powered by EtherCAT technology make it easy to install NEIO modules in the field. NEIO provides wide variety of I/O combinations with standard ESI file so that users can always find suitable I/O modules for their high-speed EtherCAT-based applications.

Specifications

Digital Input

Model Name	NEIO-B1101	NEIO-B1102
Туре	Sink	Sink/ Source
Input Voltage	24 Vdc	24 Vdc
On-State Voltag, "1"	9~30 Vdc	9~24 Vdc / 0~15 Vdc
Off-State Voltag, "0"	0~5 Vdc	0~8 Vdc / 16~24 Vdc
Inpurt Filter	3 ms	1 ms

Communication

- Protocol: EtherCAT
- Bus interface: 2 x RJ-45 (daisy-chain)
- Media: Ethernet cable (min. CAT 5), shielded
- Distance between stations: maximum. 100m (100BASE-TX)
- Data transfer rate: 100M baud

Power Requirements

• DC input range: DC 24V ±20% with over-voltage and reversed-voltage protection

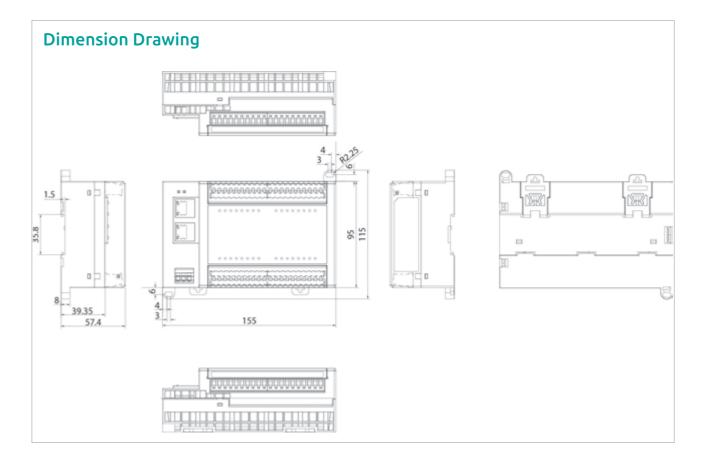
Model Name	NEIO-B1101	NEIO-B1102
Power Consumption	3.2 W	2.6 W
Input current without load	133 mA	68 mA
Input current with full load	133 mA	107 mA

Common Section

- Electrical isolation: 2.5 KV (power contact)
- Operating temperature: 0°C to 55°C
- Storage temperature: -40°C to 85°C
- Relative humidity: 5~95%, non-condensation, non-operating
- Shock: IEC 60068-2-27
- Vibration: IEC 60068-2-6, IEC 60068-2-64
- Enclosure type rating: IP20
- Mounting type: Din-rail (35mm), wall-mount
- Dimesions (mm): 155(W) x 115 (H) x 57.4 (D)

Certifications

- CE
- FCC Class A



Ordering Information

EtherCAT Slave Module

- NEIO-B1101 (P/N:10J80110100X0) 32ch digital input (sink) EtherCAT slave module
- NEIO-B1102 (P/N:10J80110200X0) 32ch digital input (sink/source) EtherCAT slave module
- AC to DC Din Rail Power Supply (P/N: 7440060001X00) 60W 24V/2.5A for NISE





- Finger-safe wiring cover
- Detachable screw terminals
- Rotational pin-assignment marks

- On-module LED indicators
- User-friendly wiring label
- Multiple mounting methods

Product Overview

NEIO is a series of EtherCAT slave I/O modules for distributed industrial applications. Each module is equipped with high density I/O (up to 32 points) and powerful features in a compact size. DIN-rail design and daisy-chain wiring powered by EtherCAT technology make it easy to install NEIO modules in the field. NEIO provides wide variety of I/O combinations with standard ESI file so that users can always find suitable I/O modules for their high-speed EtherCAT-based applications.

Specifications

Digital Output

Model Name	NEIO-B1201	NEIO-B1202
Туре	Sink	Source
Output Voltage	24 Vdc	24 Vdc
Load Type	Resistive, Inductive	Resistive, I nductive, Capacutuve
Max. Output Current	500 mA/ch	500 mA/ch
Switching Times	Off to On: 100 µs On to Off:150 µs	Off to On: 100 µs On to Off: 150 µs

Communication

- Protocol: EtherCAT
- Bus interface: 2 x RJ-45 (daisy-chain)
- Media: Ethernet cable (min. CAT 5), shielded
- Distance between stations: maximum. 100m (100BASE-TX)
- Data transfer rate: 100M baud

Power Requirements

+ DC input range: DC 24V $\pm 20\%$ with over-voltage and reversed-voltage protection

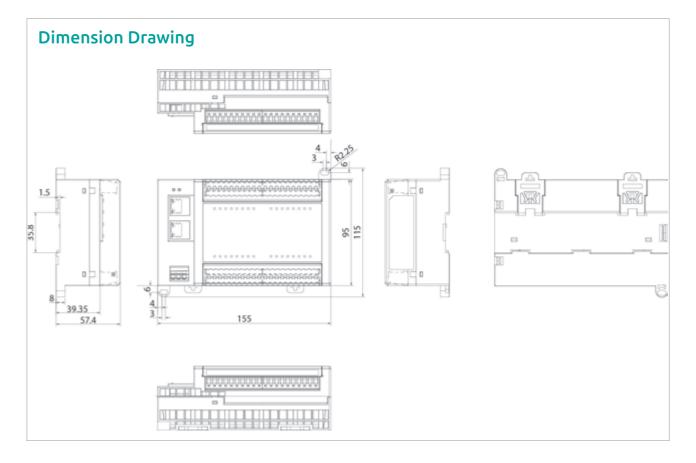
Model Name	NEIO-B1201	NEIO-B1202
Power Consumption	2.6 W	6.6 W
Input current without load	83 mA	83 mA
Input current with full load	109 mA	274 mA

Common Section

- Electrical isolation: 2.5 KV (power contact)
- Operating temperature: 0°C to 55°C
- Storage temperature: -40°C to 85°C
- Relative humidity: 5~95%, non-condensation, non-operating
- Shock: IEC 60068-2-27
- Vibration: IEC 60068-2-6, IEC 60068-2-64
- Enclosure type rating: IP20
- Mounting type: DIN-rail (35mm), wall-mount
- Dimesions (mm): 155(W) x 115 (H) x 57.4 (D)

Certifications

- CE
- FCC Class A



Ordering Information

EtherCAT Slave Module

- NEIO-B1201 (P/N: 10J80120100X0) 32ch digital output (sink) EtherCAT slave module
- NEIO-B1202 (P/N: 10J80120200X0)
 32ch digital output (source) EtherCAT slave module
- AC to DC Din Rail Power Supply (P/N: 7440060001X00) 60W 24V/2.5A for NISE

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- Finger-safe wiring cover
- Detachable screw terminals
- Rotational pin-assignment marks
- On-module LED indicators

- User-friendly wiring label
- Multiple mounting methods
- 16ch digital input
- 16ch digital output

Product Overview

NEIO is a series of EtherCAT slave I/O modules for distributed industrial applications. Each module is equipped with high density I/O (up to 32 points) and powerful features in a compact size. DIN-rail design and daisy-chain wiring powered by EtherCAT technology make it easy to install NEIO modules in the field. NEIO provides wide variety of I/O combinations with standard ESI file so that users can always find suitable I/O modules for their high-speed EtherCAT-based applications.

Specifications

Digital Input

Model Name	NEIO-B1811	NEIO-B1812
Туре	Sink	Sink/ Source
Input Voltage	24 Vdc	24 Vdc
On-State Voltage, "1"	9~30 Vdc	8~24 Vdc/ 16~24 Vdc
Off-State Voltage, "0"	0~5 Vdc	0~7 Vdc/ 0~15 Vdc
Inpurt Filter	3ms	1 ms

Digital Output

Model Name	NEIO-B1811	NEIO-B1812
Туре	Sink	Source
Output Voltage	24 Vdc	24 Vdc
Load Type	Resistive,Inductive	Resistive,Inductive, Capacitive
Max. output current	500 mA/ch	500 mA/ch
Switching Times	Off to On: 100 µs	Off to On: 100 µs

Communication

- Protocol: EtherCAT
- Bus interface: 2 x RJ-45
- Media: Ethernet cable (min. CAT5), shielded
- Distance between stations: maixmum. 100m (100BASE-TX)
- Data transfer rate: 100M baud

Power Requirements

• DC input range: DC 24V ±20% with over-voltage and reversed-voltage protection

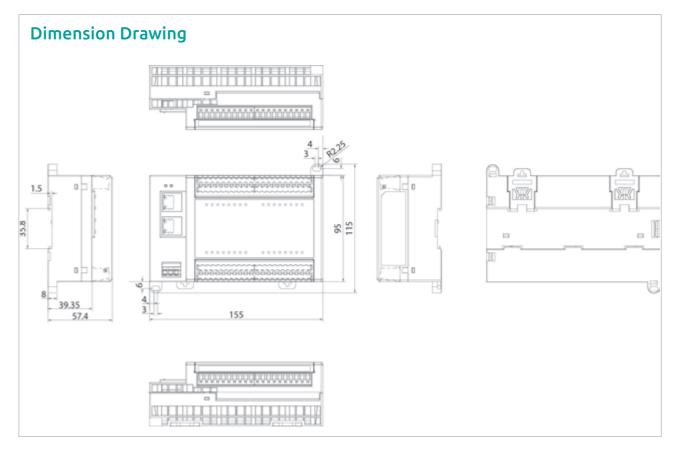
Common Section

- Electrical isolation: 2.5 KV (power contact)
- Operating temperature: 0°C to 55°C
- Storage temperature: -40°C to 85°C
- Relative humidity: 5~95%, non-condensation, non-operating
- Shock: IEC 60068-2-27
- Vibration: IEC 60068-2-6, IEC 60068-2-64
- Enclosure type rating: IP20
- Mounting type: Din-rail (35mm), wall-mount
- Dimesions (mm): 155(W) x 115 (H) x 57.4 (D)

Certifications

CE

FCC Class A



Ordering Information

EtherCAT Slave Module

- NEIO-B1811 (P/N: 10J80181100X0) 16ch digital input/output (sink) EtherCAT slave module
- NEIO-B1812 (P/N: 10J80181200X0) 16ch digital input/output (source) EtherCAT slave module
- AC to DC Din Rail Power Supply (P/N: 7440060001X00) 60W 24V/2.5A for NISE



- Finger-safe wiring cover
- Detachable screw terminals
- Rotational pin-assignment marks
- On-module LED indicators
- User-friendly wiring label

- Multiple mounting methods
- 6 ch voltage type analog input (input range between 0~±10 V)
- 2 ch current type analog input (input range between 0 ~20 mA)
- 2 ch analog outputs

Product Overview

NEIO is a series of EtherCAT slave I/O modules for distributed industrial applications. Each module is equipped with high density I/O (up to 32 points) and powerful features in a compact size. DIN-rail design and daisy-chain wiring powered by EtherCAT technology make it easy to install NEIO modules in the field. NEIO provides wide variety of I/O combinations with standard ESI file so that users can always find suitable I/O modules for their high-speed EtherCAT-based applications.

Specifications

Analog Input (Voltage Input)

- Number of channels:6
- Input range: ±10V
- Resolution: 16-bit
- Accuracy: ±0.5%
- Input impedance: > 10MΩ

Analog Input (Current Input)

- Number of channels:2
- Input range: 0 ~ 20 mA
- Resolution : 16-bit
- Accuracy: ±0.5%
- Input impedance: > 10MΩ

Analog Output

- Number of channels: 2
- Output Range: 0~10V
- Resolution: 12-bit

Communication

- Protocol: EtherCAT
- Bus interface: 2 x RJ-45 (daisy-chain)
- Media: Ethernet cable (min. CAT 5), shielded
- Distance between stations: maximum. 100m (100BASE-TX)
- Data transfer rate: 100M baud

Power Requirements

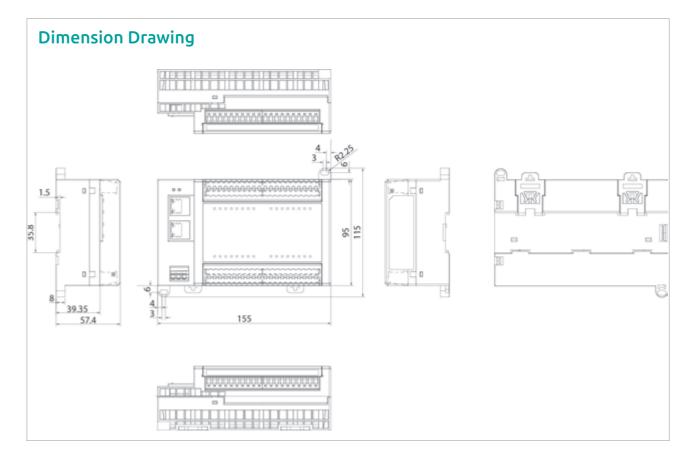
+ DC input range: DC 24V $\pm 20\%$ with over-voltage and reversed-voltage protection

Common Section

- Electrical isolation: 2.5 KV (power contact)
- Operating temperature: 0°C to 55°C
- Storage temperature: -40°C to 85°C
- Relative humidity: 5~95%, non-condensation, non-operating
- Shock: IEC 60068-2-27
- Vibration: IEC 60068-2-6, IEC 60068-2-64
- Enclosure type rating: IP20
- Mounting type: DIN-railDIN-rail (35mm), wall-mount
- Dimesions (mm): 155(W) x 115 (H) x 57.4 (D)

Certifications

- CE
- FCC Class A



Ordering Information

EtherCAT Slave Module

- NEIO-B1831 (P/N: 10J80183100X0 8ch analog input 2ch analog output EtherCAT slave module
- AC to DC Din Rail Power Supply (P/N: 7440060001X00) 60W 24V/2.5A for NISE

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- Finger-safe wiring cover
- Detachable screw terminals
- Rotational pin-assignment marks • On-module LED indicators

- User-friendly wiring label
- Multiple mounting methods
- 1 port RS232/422/485
- 1 port RS422/485

Product Overview

NEIO is a series of EtherCAT slave I/O modules for distributed industrial applications. Each module is equipped with high density I/O (up to 32 points) and powerful features in a compact size. DIN-rail design and daisy-chain wiring powered by EtherCAT technology make it easy to install NEIO modules in the field. NEIO provides wide variety of I/O combinations with standard ESI file so that users can always find suitable I/O modules for their high-speed EtherCAT-based applications.

Specifications

COM Port

- Port Type: 1 x RS232/422/485, 1 x RS422/485
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Parity: none, even, odd, space, mark
- Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
- Baud Rate: 0.3 ~ 115.2 kbps

Communication

- Protocol: EtherCAT
- Bus interface: 2 x RJ-45
- Media: Ethernet cable (min. CAT5), shielded
- Distance between stations: maixmum. 100m (100BASE-TX)
- Data transfer rate:100M baud

Power Requirements

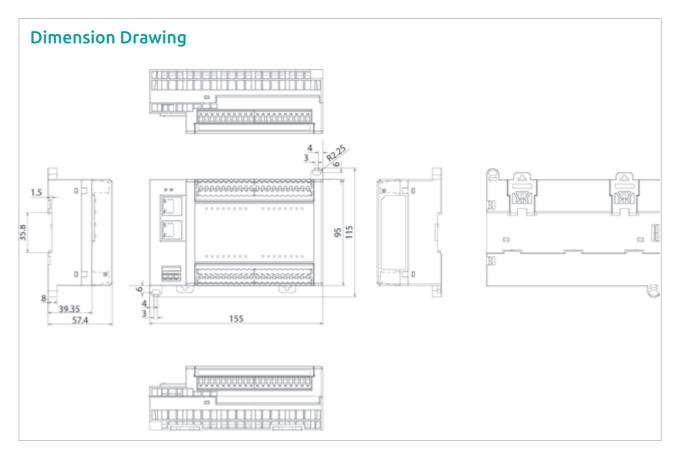
• DC 24V ±20% with over-voltage and reversed-voltage protection

Common Section

- Electrical isolation: 2.5 KV (power contact)
- Operating temperature: 0°C to 55°C
- Storage temperature: -40°C to 85°C
- Relative humidity: 5~95%, non-condensation, non-operating
- Shock: IEC 60068-2-27
- Vibration: IEC 60068-2-6, IEC 60068-2-64
- Enclosure type rating: IP20
- Mounting type: Din-rail (35mm), wall-mount
- Dimesions (mm): 155(W) x 115 (H) x 57.4 (D)

Certifications

- CE
- FCC Class A



Ordering Information

EtherCAT Slave Module

- NEIO-B1601 (P/N: 10J80160100X0) 2 COM ports EtherCAT slave module
- AC to DC Din Rail Power Supply (P/N: 7440060001X00) 60W 24V/2.5A for NISE

NECOM

AXE-5904





Main Features

- 4-axis independent control and pulse output up to 8Mpps
- Pulse output options: CW/ CCW, OUT/DIR
- 4x differential encoder interface, ABZ phase
- EtherCAT slave protocol communication
- Support CiA 402 device profile
- General purpose I/O: 12 DI

Product Overview

AXE-5904 is a 4-axis pulse type point-to-point motion EtherCAT slave module, featuring real-time EtherCAT communication and CiA 402 device profile for machine automation applications requiring high-speed and point-to-points function. With pulse type commands, AXE-5904 supports pulse output rate up to 4MHz and encoder input up to 8MHz in 4 xAB phase mode and build-in dedicated I/O points for servo control and mechanism to facilitate building up whole machines.

Specifications

Pulse Type Motion Control

- Number of axes: 4
- Pulse output rate: up to 8pps
- Pulse command output: CW/ CCW, OUT/DIR, ABZ Phase
- Committed I/O Signal: ±LIM/±CMP/ORG/SVON/RDY/INP/ALM/ ALMCLR/DCLR for each axis

Encoder Input

- Encoder input type: Incremental, 32-bit
- Encoder signal: CW/ CCW, AB/Z
- Positioning Range: -2,147,483,648 through 2,147,483,647 pulse
- Max. input frequency: 4MHz

General I/O

- General-purpose input: 3 channel per axis
- Input type: photo-coupler input (corresponding to current sink output)
- Response time of DI (Max.): 100 µsec
- Response time of DO (Max.): 100 µsec

Power Requirements

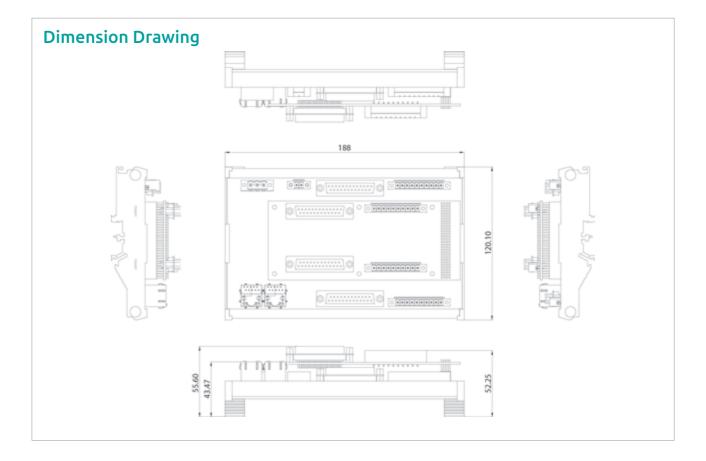
• DC input range: DC 24V ±10% with over-voltage and reversed-voltage protection

Common Section

- Data transfer medium: Ethernet cable (min CAT 5), shield
- Bus interface: 2x RJ-45
- Data transfer rate: 100M baud
- Protocol: EtherCAT
- Device profile: CiA 402
- Operating temperature: 0°C to 50°C
- Relative humidity:
- 35~85%, non-condensation, operating
- 10~90%, non-condensation, non-operating
- Shock: IEC 60068 2-27
- Vibration: IEC 60068 2-64
- Enclosure type rating: IP00
- Mounting type: DIN-rail
- Dimension (mm): 120.1(W) x 188(L) x 55.6(H)

Certifications

- CE
- FCC Class A



Ordering Information

Motion Controller

 AXE-5904 (P/N: 10J40590400X0) Point-to-point 4-axis pulse type motion EtherCAT slave module

NE(COM

Headquarters

NEXCOM International Co., Ltd.

9F, No.920, Chung-Cheng Rd., ZhongHe District, New Taipei City, 23586, Taiwan, R.O.C. Tel: +886-2-8226-7786 Fax: +886-2-8226-7782 www.nexcom.com

America

USA NEXCOM USA

2883 Ba yview Drive, Fremont CA 94538, USA Tel: +1-510-656-2248 Fax: +1-510-656-2158 Email: sales@nexcom.com www.nexcom.com

Asia

Taiwan

NEXCOM Intelligent Systems Taipei Office

13F, No.920, Chung-Cheng Rd., ZhongHe District, New Taipei City, 23586, Taiwan, R.O.C. Tel: +886-2-8226-7796 Fax: +886-2-8226-7792 Email: sales@nexcom.com.tw www.nexcom.com.tw

NEXCOM Intelligent Systems Taichung Office

16F, No.250, Sec. 2, Chongde Rd., Beitun Dist., Taichung City 406, R.O.C. Tel: +886-4-2249-1179 Fax: +886-4-2249-1172 Email: sales@nexcom.com.tw www.nexcom.com.tw

Japan NEXCOM Japan

9F, Tamachi Hara Bldg., 4-11-5, Shiba Minato-ku, Tokyo, 108-0014, Japan Tel: +81-3-5419-7830 Fax: +81-3-5419-7832 Email: sales@nexcom-jp.com www.nexcom-jp.com

China

NEXCOM China

www.nexcom.cn

1F & 2F, Block A, No.16 Yonyou Software Park, No.68 Beiging Road, Haidian District, Beijing, 100094, China Tel: +86-10-5704-2680 Fax: +86-10-5704-2681 Email: sales@nexcom.cn

NEXCOM Shanghai

Room 603/604, Huiyinmingzun Plaza Bldg. 1, No.609 Yunlin East Rd., Shanghai, 200333, China Tel: +86-21-5278-5868 Fax: +86-21-3251-6358 Email: sales@nexcom.cn www.nexcom.cn

NEXCOM Surveillance Technology

Room 209, Floor 2 East, No.2, Science & Technology industrial park of privately owned enterprises, Xili, Nanshan Dist., Shenzhen, 518055, China Tel: +86-755-8364-7768 Fax: +86-755-8364-7738 Email: steveyang@nexcom.com.tw www.nexcom.cn

NEXCOM United System Service

Hui Yin Ming Zun Building Room 1108, Bldg. No.11, 599 Yunling Rd., Putuo District, Shanghai, 200062, China Tel: +86-21-6125-8282 Fax: +86-21-6125-8281 Email: frankyang@nexcom.cn

www.nexcom.cn

Еигоре

United Kingdom NEXCOM EUROPE

10 Vincent Avenue, Crownhill Business Centre, Milton Keynes, Buckinghamshire MK8 0AB, United Kingdom Tel: +44-1908-267121 Fax: +44-1908-262042 Email: sales.uk@nexcom.eu www.nexcom.eu

Italy NEXCOM ITALIA S.r.l

Via Lanino 42, 21047 Saronno (VA), Italia Tel: +39-02-9628-0333 Fax: +39-02-9625-570 Email: nexcomitalia@nexcom.eu www.nexcomitalia.it



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