

Industrial Automation Trusted Provider

Programmable Logic Controller

 Intelligent Control
Product Manuals

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ABOUT NIETZ

Nietz Electric Co., Ltd. is located in Shanghai, China. It is a high-tech enterprise focusing on the research and development, manufacturing and sales of PLC and industrial automation control. It has a modern factory building of 27,000m2 and is one of the most powerful global suppliers of industrial automation equipment.

Since its establishment, the company has always taken technological innovation as its core driving force and has been deeply involved in the field of industrial control. At present, it has formed a complete product system covering simple PLC, operation and control PLC, bus PLC and coupler, IO module and functional module. Among them , PLC products adopt modular design, integrate high-speed computing, multi-axis control, network communication and other functions, support Modbus, CANopen and other industrial protocols, and can accurately realize complex logic control and data interaction. With the advantages of stable performance and strong compatibility, the company's solutions are widely used in intelligent transformation of automated production lines, intelligent warehousing and logistics, energy and environmental protection equipment, as well as special equipment such as printing equipment and textile machinery. With the vision of "becoming a leader in industrial automation", the company continues to provide manufacturing customers with integrated industrial control solutions from hardware to software to promote the automation and digital upgrade of the industry.



CONTENTS

01	ZX300 series PLC
04	ZQ500/600 series PLC
07	QY20 series Coupler Module
09	QY20 series IO Module
12	EC Vertical Integrated IO Module
15	EtherCAT Junction Slave Module

ZX300 series PLC

The ZX300 series PLC is a small PLC system launched by Nietz in response to market demand. Designed to be compatible with the Mitsubishi FX3U series, it features the in-house developed ZX Works programming system (under development, with future support). It supports ladder diagram programming and can implement functions such as pulse commands. It is primarily used for general logic control and, in conjunction with our inverters and pulse servos, can implement logic control and simple motion control. Supporting Modbus RTU communication, it can connect to slave devices such as sensors and inverters via the Modbus bus protocol, enabling data exchange with human-machine interfaces (HMIs).



Advantage

- Diversified function control

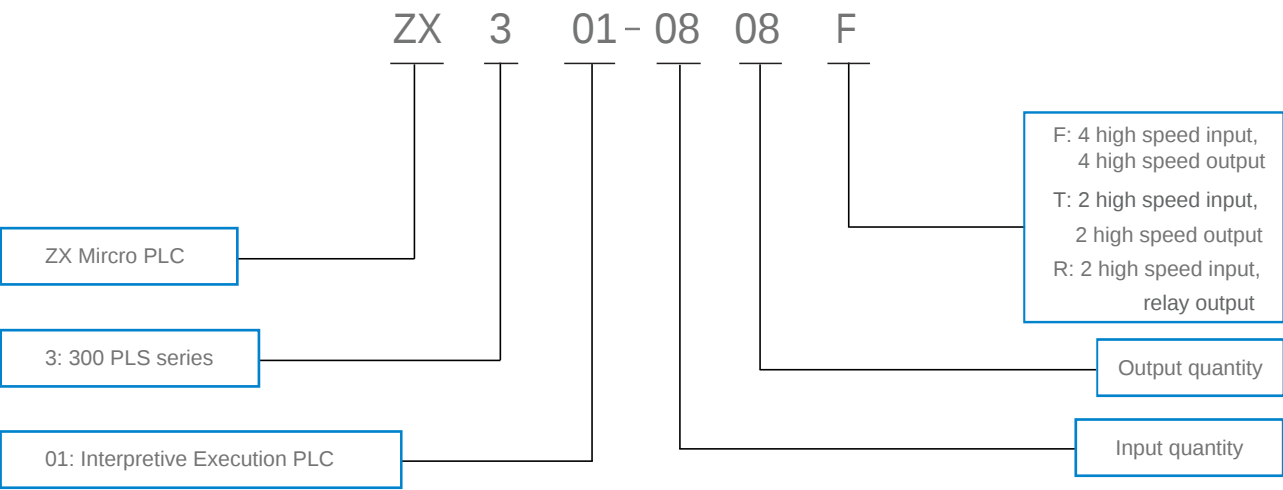
 - The host supports up to 4 high-speed pulse outputs, 4 single-phase high-speed input counts, or 1 AB phase + 2 single-phase high-speed count inputs.
- Flexible expansion modules

 - Self-developed programming environment ZxWorks, easy to use and convenient to program
 - Compatible with Mitsubishi programming software, similar to most small PLC programming instructions
 - Supports both X10 and E10 series expansion modules. Supports up to 12 X10 series expansion modules and one E10 series expansion module (E10 series expansion modules are limited to the first module connected on the right).
- Rich instruction set

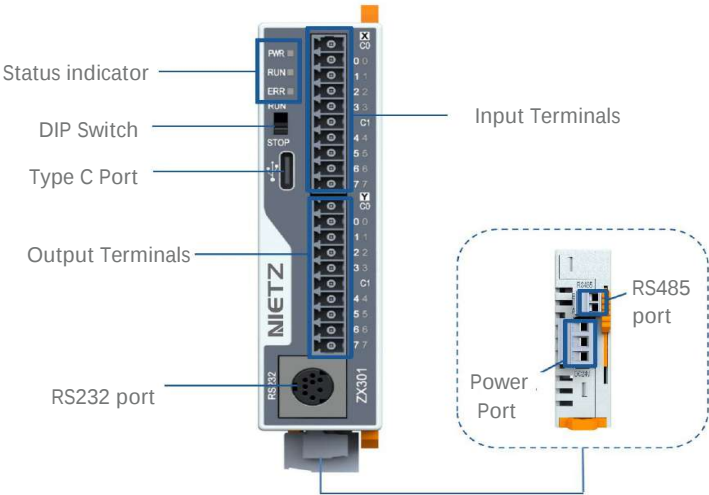
 - 64K or 16000-step program storage unit and 4K power-off retention data to meet most logic control
 - RS232 communication port: supports Modbus RTU master-slave communication; supports downloading and monitoring user programs
 - RS485 communication port: support Modbus RTU master-slave communication
 - USB communication port: support Type C to download monitoring program
- Convenient programming platform

 - Features the proprietary programming environment "ZX Works," designed for ease of use and convenient programming (currently under development; future support planned).
 - Compatible with Mitsubishi programming software, enabling seamless program migration; programming instructions are similar to those of most small-scale PLCs.

Naming Rules

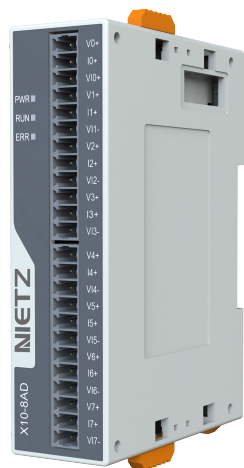


Interface Layout

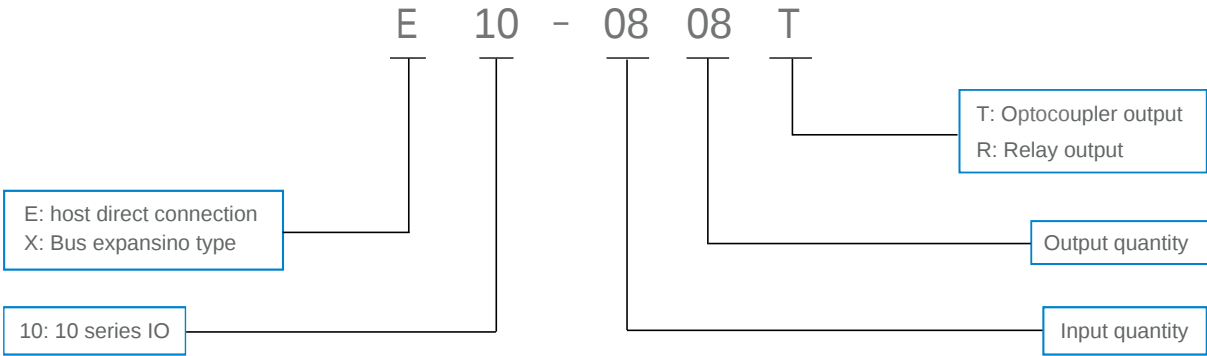


PLC Model

Model	ZX301-0806T	ZX301-0808T	ZX301-0806R	ZX301-0808F
Input Power	DC24V±10%, maximum 4A, typical 2.4A; supports short-circuit reverse connection protection, no external UPS required			
Data / Storage Capacity	64K or 16,000-step program storage unit + 4K power-off retention data capacity			
High-speed Counting	Single-ended 4-channel high-speed counting (100K) or AB phase 2-channel single-ended high-speed counting (100K)			Single-ended 4-channel high-speed counting (100K) or AB phase 1-channel single-ended high-speed counting (100K)
Input and Output	Main unit: 8 inputs + 6 outputs (including high-speed input and output)	Main unit: 8 inputs + 8 outputs (including high-speed input and output)	Main unit: 8 inputs + 6 relay outputs (including high-speed input)	Main unit: 8 inputs + 8 relay outputs (including high-speed input)
Pulse Output	2 high-speed outputs (100K)	Replay output	—	4 high-speed outputs (100K)
Program Execution Mode	Cyclic scanning, parsing and execution			
Power-off Retention	1S			
Communication	1 way RS232; 1 way RS485			
RUN / STOP	Supports PLC RUN/STOP Control			
Expansion Modules	E10 series (directly connect to PLC, max 1 unit); X10 series (Modbus connect to PLC, max 12 units)			
Prog. Software	ZxWorks, Mitsubishi Gx Works2			
Modbus Communication	Supports Modbus RTU communication			
USB Communication	Type-C interface; supports program download, monitoring, debugging, and firmware update			



Naming Rules



Host direct connection

Model	E10-0808T	E10-0808R
Description Interface	8-channel DI and 8-channel DO/NPN sink output	8-channel DI and 4 groups of 8-channel relay outputs
Parameter Description	Isolation method: Optocoupler isolation Rated voltage: 24 VDC±20% Current consumption: Single point maxi 0.3A	Isolation: Optocoupler/Relay Rated voltage: 24 VDC±20% Current consumption: Maximum 5A per pointOutput: AC 250V/DC 30V 5A

Bus expansion type

Model	X10-0808T	X10-0808R	X10-0402A	X10-4PT	X10-4TC
Description Interface	8-channel DI and 8-channel DO/NPN sink output	8-channel DI and 4 groups of 8-channel relay outputs	2-way AO, 4-way AI	4-channel I/3-wire thermal resistance acquisition	4-channel I/2-wire thermocouple acquisition
Parameter Description	Isolation method: Optocoupler isolationRated voltage: 24 VDC±20%Current consumption: Single point maxi 0.3A	Isolation method: Optocoupler / Relay isolationRated voltage: 24 VDC±20%Current consumption: Single point max 5A	Input: 0~10V,420mA Input accuracy: 12 bits ±5% Output:0~10V,4~20mA Output accuracy: 16 bits±5%	Pt100, Pt500, Pt1000, Cu100, KTY84-130, NTC5K, NTC10K	Thermocouple type: R F N J K R S T

ZQ500/600 series is a high-performance, mid-range PLC from NIETZ Technology. Designed and developed in full compliance with PLC open specifications and IEC 61131-3, it supports programming languages such as ST, LD, SFC, and CFC. It boasts powerful CPU performance, stable and reliable software and hardware system design, extensive expansion capabilities, a compact size, and modularity. It is primarily used in motion control scenarios and complex production line networking, and is particularly well-suited for multi-channel servo control and multi-bus protocol integration.



Advantage

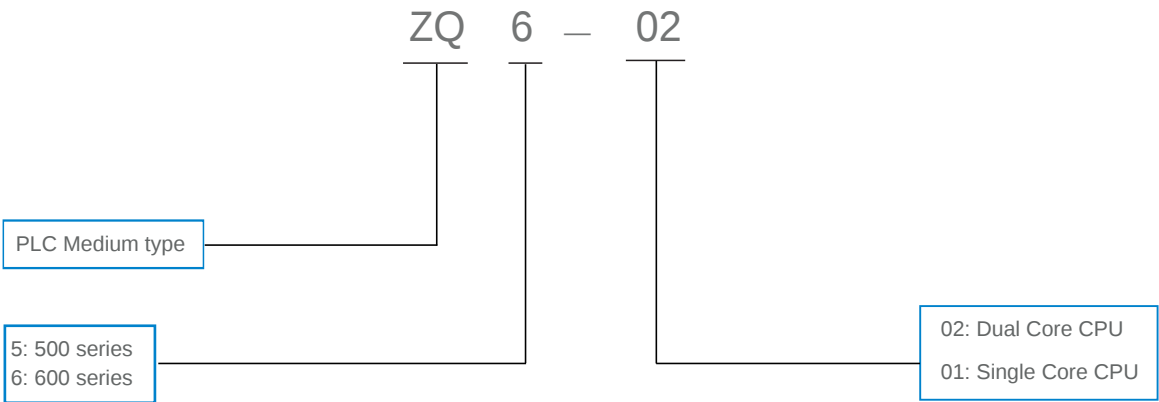
- Powerful software and hardware configuration

 - Dual-core processor, 1.4GHz main frequency, nanosecond instruction processing speed
 - 128M Byte program capacity, 128M Byte data capacity (1M Byte supports power-off retention variables and 64K M device memory), data preservation during power outages without the need for an external UPS module
 - The main unit can be expanded to 32 QY20 series IO modules, supporting DI, DO, AD, DA, PT, TC, PO, HC, and other modules
- Rich communication interfaces

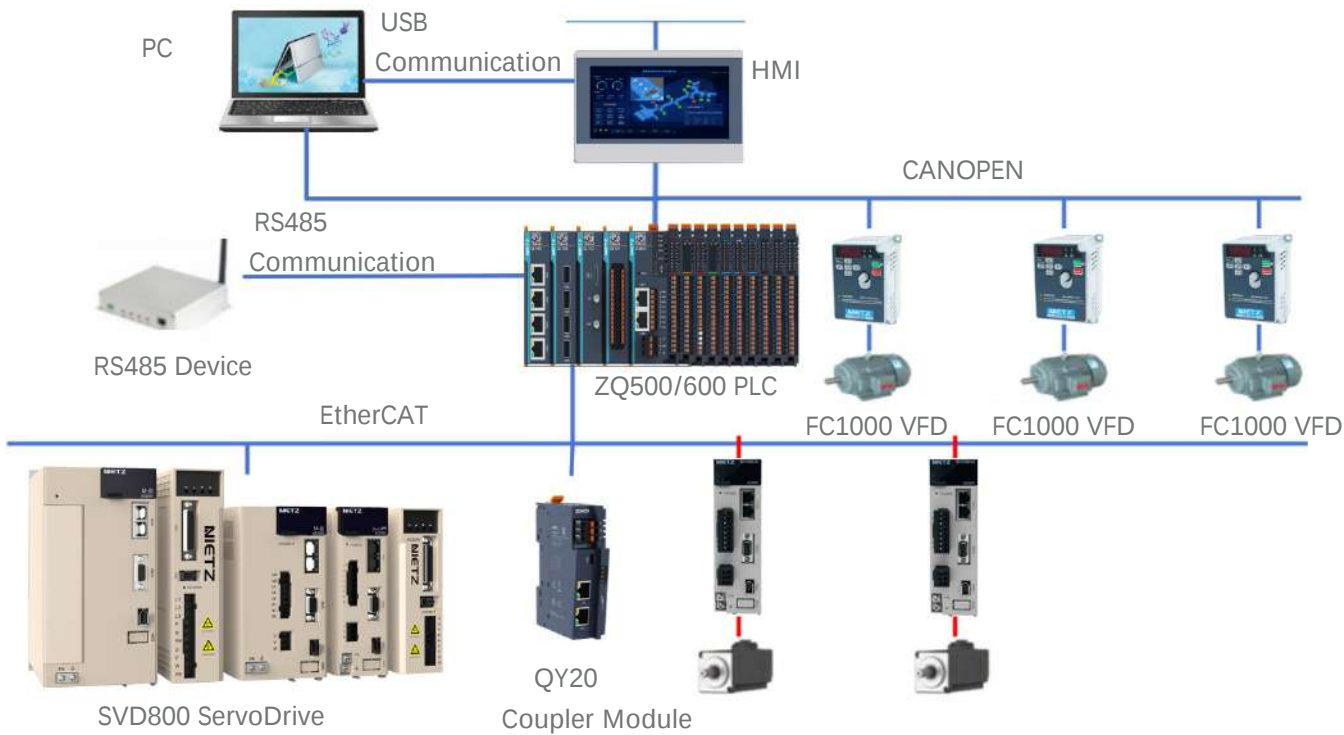
 - Supports two Ethernet ports, LAN1 of which can be configured as an EtherCAT master or PROFINET master /slave. When used as EtherCAT, it supports up to 64-axis control and can connect 256 EtherCAT slaves. LAN1 and LAN2 each support 63 Modbus TCP slaves and 16 OPC UA sessions (clients).
 - Supports 2-way RS485 communication (both master and slave modes), 1-way CAN communication, and supports 127 slaves when
 - Using ladder diagrams, function blocks, and ST programming languages compliant with the IEC61131-3/PLCopen standard effectively reduces project development time and improves project development efficiency.
- Flexible and comprehensive performance

 - 1ms cycle, 4-axis synchronous control, supports up to 64 axes.
 - The entire series supports EtherCAT linear, star, and ring network topologies. Splitters can be integrated via expansion modules.

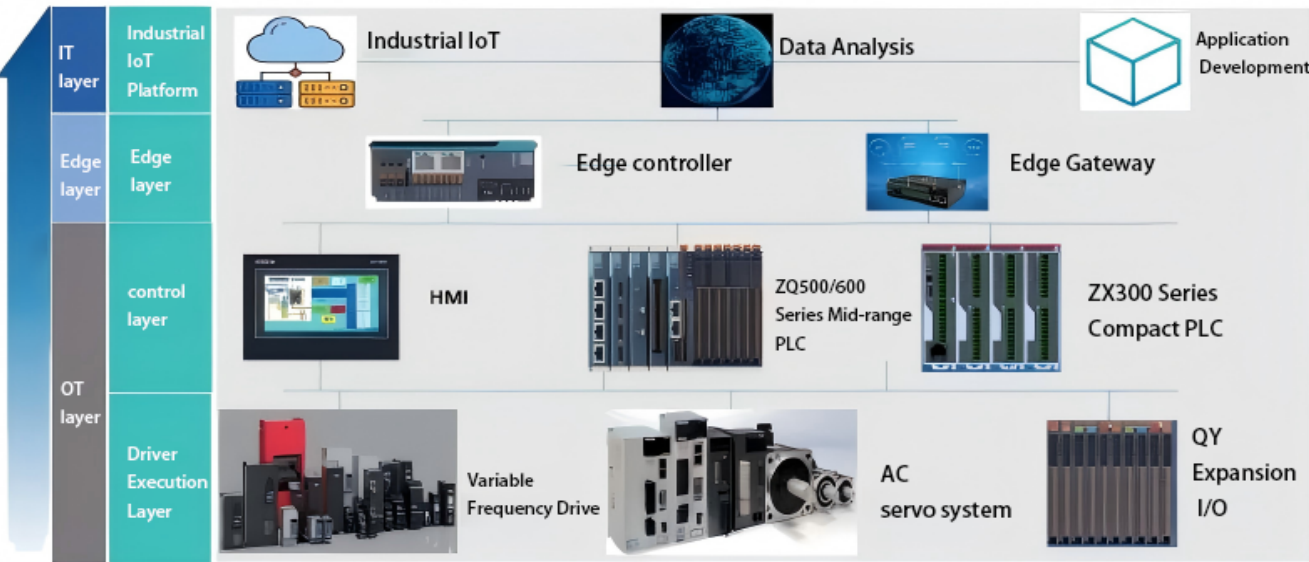
Naming Rules



Multi-fieldbus Expansion System for ZQ500/600 Series PLC

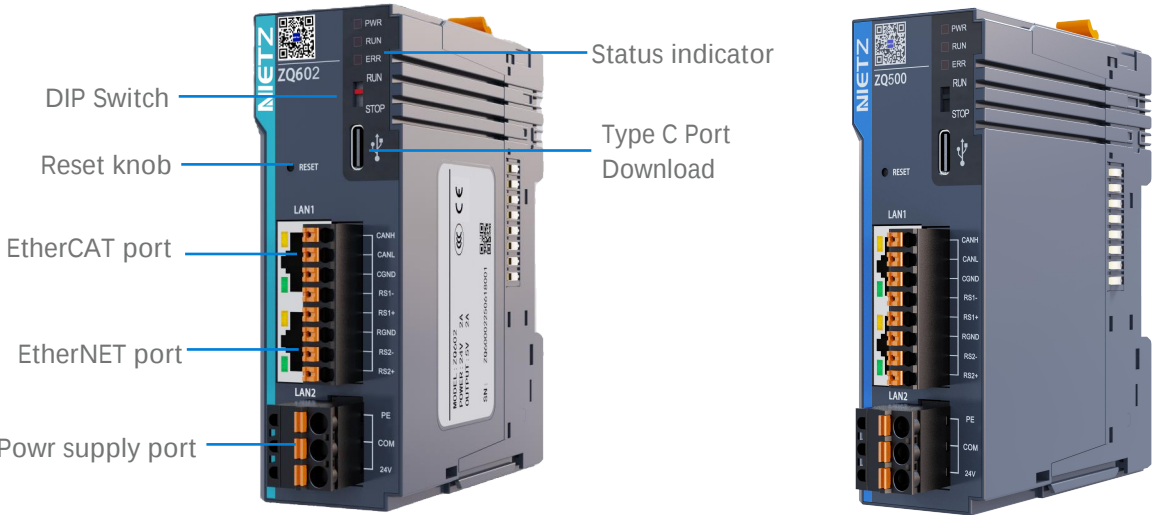


The ZQ500/600 Series PLC supports multiple fieldbuses, enabling comprehensive expansion connectivity. Its conventional architecture diagram is shown below



Use ladder diagrams, function blocks and ST language that comply with IEC61131-3/PLC open standards to effectively reduce project development time and improve project development efficiency.

Interface Layout



PLC Model

Model		ZQ501	ZQ502	ZQ601	ZQ602
Input Power		DC24V±10%, maximum 4A, typical 2.4A, supports short circuit/reverse connection protection, no external UPS required			
Memory		4G			
Data/storage capacity		128M program capacity, 128M data capacity (1M power-off retention space + 64K M device power-off retention)			
Communication specifications	EtherCAT	1 channel, support expansion			
	Modbus RTU	2 channels			
	CAN communication	The main unit has 1 CAN channel (maximum 8 slaves), supporting CANopen and CAN free protocols			
	USB communication	Support			
EtherCAT Communication	EtherCAT Axes	4+4	8+8	16+16	32+32
	EtherCAT slaves	Support up to 256			
	Communication cycle	Minimum 1ms	Minimum 1ms	2ms 4-axis synchronization	1ms 4-axis synchronization
ProfiNET Communication		Support ProfiNET master-slave			
Scalability	Right expansion	The main unit supports 32 QY20 series blade modules			
	Left expansion	EtherCAT redundancy, EtherCAT splitter, 4-way routing, high-speed pulse, 4G/5G, remote debugging and monitoring, MQTT cloud, EtherCAT slave and other functions (under development)			
RUN/STOP		Can realize PLC stop/run			
RESET	Factory Reset	Clear the user program and restore the initial IP address			
Programming language		IEC61131-3			

QY20 Coupler Module

The QY20 series plug-in IO modules consist of a coupler module, an IO function module, a relay power supply module, and a cover. The IO function modules are further divided into various types and numbers of function modules, including digital, analog, pulse output, encoder, and temperature. Customers can match them according to on-site requirements. They support mainstream communication protocols such as EtherCAT, PROFINET, CC-Link IE TSN, and are widely applicable to various bus applications.



Advantage

- Thin and light insert

 - The plug-in modular design allows the coupler to be as thin as 24mm and a single module to be as thin as 12mm.

High speed response

 - Transmission speeds can reach 100Mbps (full-duplex), with a communication cycle as short as 500us.High-precision distributed clock, precise synchronization (jitter 1 us) high-speed backplane bus ensures rapid response.

Various protections

 - The power input (coupler, relay power module, etc.) has reverse polarity protection, and the digital output (transistor type) and analog output (voltage, current) have short-circuit protection.
- Easy to install

 - Snap-on rail design allows for easy assembly and disassembly, simplifying maintenance.
 - Screwless terminal blocks reduce wiring time and improve installation efficiency. Each coupler supports up to 32 IO modules.
 - The three-stage design and removable terminals allow for quick replacement without reinstalling cables, simplifying future maintenance.
 - One-click firmware upgrades for the coupler and modules are available via USB-C.

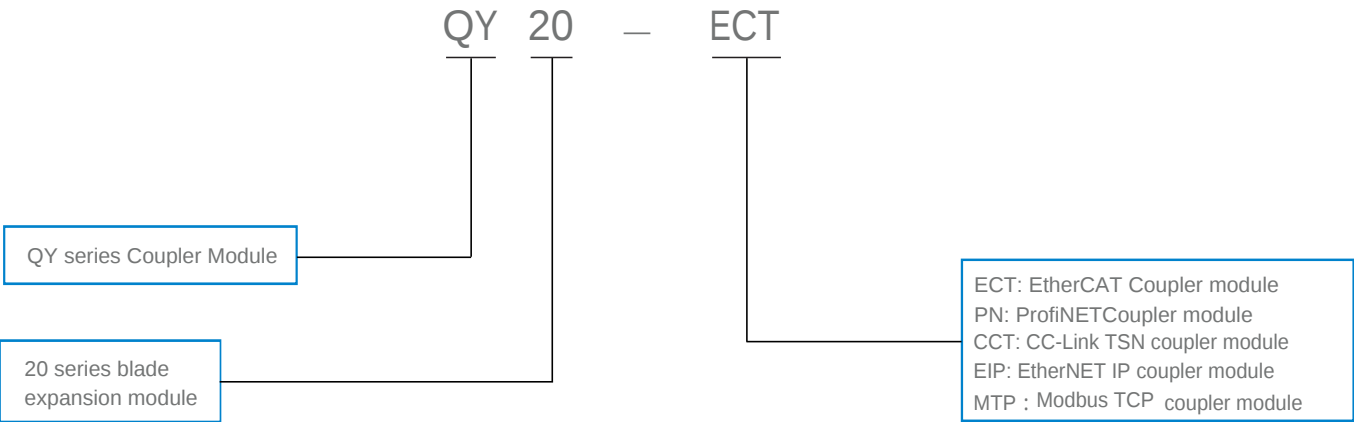
Mainstream protocols

 - Supports a variety of mainstream bus communication protocols, easily connecting to fieldbuses such as EtherCAT, PROFINET, CC-Link IE TSN,and EtherNET/IP.

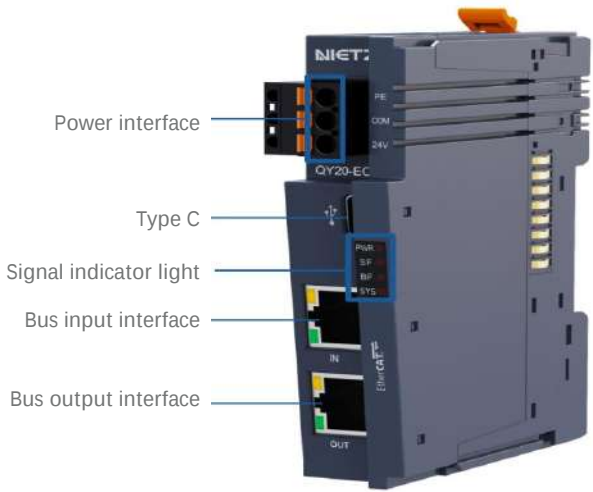
Rich types

 - IO expansion modules with various types and points, including digital, analog, pulse output, encoder, and temperature

Naming Rules



Interface Layout



Expansion Module Code

Model	QY20-ECT	QY20-PN	QY20-CCT	QY20-EIP	QY20-MTP
Protocol	EtherCAT	ProfiNET	CC-Link IE TSN	EtherNET IP	Modbus TCP
Supported IO number	32				
Input Power	24VDC(±20%)0.5A				
Output	5V 2A				
Works Temp.	-20℃~55℃				
Protective class	IP20				

QY20 IO Module

The QY20 series IO expansion modules adopt a plug-in structure and realize IO expansion of protocols such as EtherCAT, PROFINET, EtherNET/IP, CC-Link IE TSN through a high-speed backplane bus. Or they can be directly extended to the right side of the ZQ600 series PLC to realize PLC expansion. They include various types of modules such as digital, analog, pulse output, encoder, and temperature.



Advantage

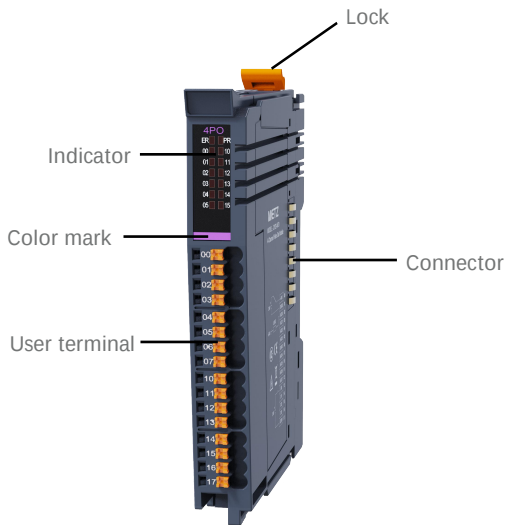
- Rich types

 - The expansion IO modules offer a wide range of functions, including digital, analog, pulse output, encoder, and temperature control. Each module can be easily identified by its color, allowing for flexible combination and expansion, allowing for diverse applications.
 - Supports error diagnosis, with error indicators on each module. Each module also supports fault alarm function, making detection and maintenance simple and convenient.
 - Snap-on guide rail structure, easy to disassemble and assemble, easy to maintain
- Easy to install

 - Screwless terminal blocks reduce wiring time and improve installation efficiency. Each coupler supports up to 32 IO modules.
 - The three-stage structural design and removable terminals allow for quick replacement without reinstalling cables, making future maintenance easier.
 - One-click upgrade of coupler and module firmware via Type-C connection
- High speed response

 - High-speed backplane bus, fast response

Interface Layout



Digital output modules

Model	QY20-0016P	QY20-0016N
Interface	16 ways PNP digital output	16 ways NPN digital output
Input power	24V DC (±20%) 30mA	
Output characteristics	Single channel 500mA, resistive load, inductive load, lamp load	
Operating temperature	-10℃ ~55℃	
Protection level	IP20	

Digital input modules

Model	QY20-1600P	QY20-1600N
Interface	16 ways PNP digital input	16 ways NPN digital input
Input power	24V DC (±20%) 30mA	
Output characteristics	24V 500mA Input ON logic: 15V~26V Input OFF logic: 0V~4V	
Operating temperature	-10℃ ~55℃	
Protection level	IP20	

Analog input and output modules

Model	QY20-4AD	QY20-4DA
Interface	4 ways analog input	4 ways analog output
Input power	24V DC (±20%) 30mA	
Output characteristics	-10V~10V, 0~10V, -5~5V, 0~5V, 1~5V, 0~20mA, 4~20mA	
Measurement accuracy	25℃: Full scale × ±0.3% (-10V~10V full scale) -20~55℃ : full scale × ±0.5% (-10V~10V full scale)	
Operating temperature	-10℃ ~55℃	
Protection level	IP20	

Temperature detect module

Model	QY20-1600P	QY20-1600N
Interface	16 ways PNP digital input	16 ways NPN digital input
Input power	24V DC (±20%) 30mA	
Output characteristics	24V 500mA Input ON logic: 15V~26V Input OFF logic: 0V~4V	
Operating temperature	-10℃ ~55℃	
Protection level	IP20	

■ Digital input and output module

Model	QY20-0808P	QY20-0808N
Interface	8-channel PNP digital input8channel PNPdigital output	8-channel NPN digital input8-channel NPNdigital output
Input power	24V DC (±20%) 30mA	
Input characteristics	24V 500mAInput ON logic: 15V~26V Input OFF logic: 0V~4V	
Output characteristics	Single channel 500mA, resistive load, inductive load, lamp load	
Operating temperature	-10℃~55℃	
Protection level	IP20	

■ Multi-way analog input module

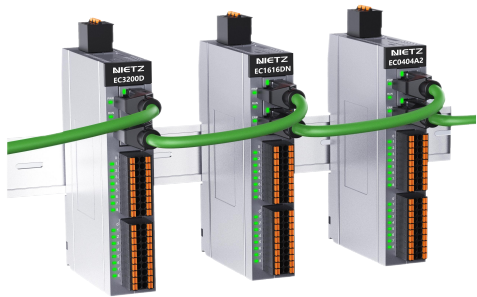
Model	QY20-8AI	QY20-8AIL-L	QY20-8AV	QY20-8AV-L
Interface	8-channel current input(16bit)	8-channel current input(12bit)	8-channel voltage input(16bit)	8-channel voltage input(12bit)
Input power	24V DC (±20%)30mA			
Input characteristics	0~20mA,4~20mA		-10~10V,0~10V,-5~5V,0~5V,1~5V	0V~10V,0~5V,1~5V
Operating temperature	-10℃~55℃			
Protection level	IP20			

■ Other function module

Model	QY20-4HC	QY20-4PO	QY20-PS
Interface	2 ways encoder module	4 ways pulse output module	Power module
Input power	24V DC (±20%) 30mA		
Input characteristics	2-way 5V differential or 24V single-endedinput, each supporting 2-way probe or DI(used when 5V differential), 1-waycomparison output or DO	4 channels of pulse output supports positioning & velocitymotion modes	24VDC(±20%)500mA,5V2A
Operating temperature	-10℃ ~55℃		
Protection level	IP20		

EC Vertical Integrated IO Module

The EC series vertical integrated I/O modules feature an exquisite compact vertical structure to improve control cabinet space utilization. Built on the high speed EtherCAT bus, they deliver real-time and reliable data transmission. With a comprehensive range of specifications and no external coupler required, the modules offer excellent cost-performance and support customized selection, making them flexibly applicable to various automation equipment and system integration projects.



■ Advantage

Compact Vertical Design

- Featuring an innovative vertical structure, each unit is only 25 mm in width and 77 mm in height. It enables high-density deployment within limited cabinet space to greatly improve space utilization, making it ideal for industrial equipment and system integration projects with strict installation dimension requirements.

High-Speed Communication for Real-Time Data Transmission

- Adopting the standard EtherCAT bus protocol, it delivers outstanding communication performance. The minimum communication cycle reaches 250 μs, and a 250 μs filter function is equipped to ensure stable and real-time data transmission.

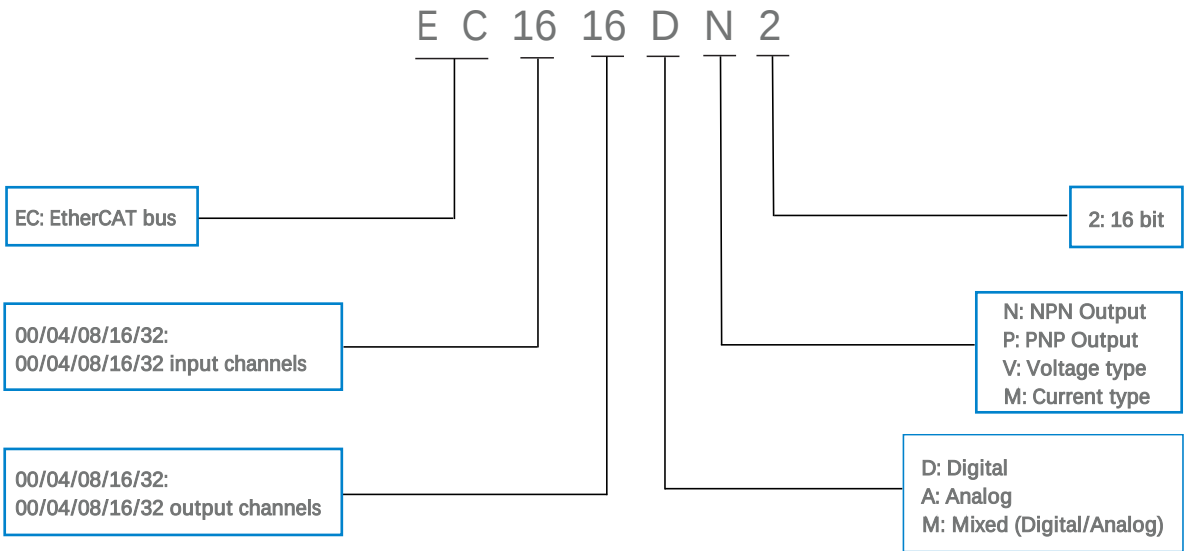
Cost-Effective to Meet Diverse Requirements

- It significantly reduces procurement costs while maintaining reliable performance. A comprehensive product portfolio includes digital-only I/O modules and analog-only I/O modules with no external coupler required.

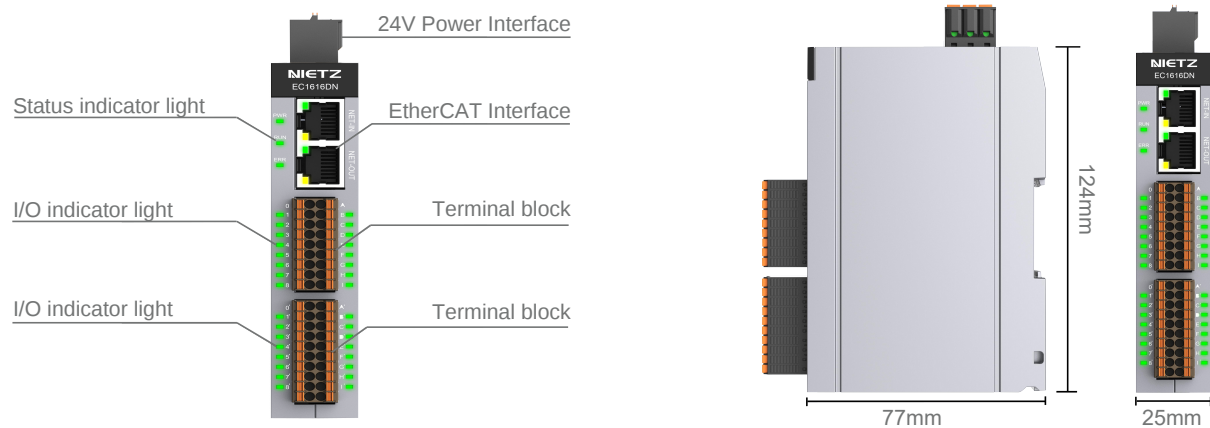
Full Product Range

- The product lineup currently consists of digital-only I/O modules and analog-only I/O modules, eliminating the need for an external coupler. Users can select corresponding modules according to their actual demands.

■ Naming Rules



Interface Layout



General Sprcifications

Item	Function Definition
Power Specification	24VDC (20.4VDC ~ 28.8VDC) -15%, +20%
Maximum Communication Speed	100MB/s
Bus Interface	2*RJ45
Transmission Distance	100M
Data Transmission Medium	Ethernet/EtherCAT, CAT5 Cable
Operating Temperature	-20°C ~ +60°C
Storage Temperature	-25°C ~ +75°C
Relative Humidity	95%, Non-condensing
Protection Rating	IP20

Digital Input Parameters

Item	Function Definition
PNP/NPN Selection	Manual Selection
Input Connection Type	Spring Terminal
Input Type	Sink and Source Compatible
Input Voltage Rating	24VDC (Max. 30V)
Input Current	4 ~ 20mA
ON Voltage	7V ~ 30V
OFF Voltage	-3V ~ 3V
Input Impedance	4.30%
Isolation Type	Optocoupler Isolation, 3000V
Input Status Indication	Indicator lights up when input is activated
Minimum Switching Frequency	0.25ms
Filter Time	Default: 3ms, Adjustable from 0-100ms (Unit: ms)

Digital output Parameters

Item	Function Definition
Output Connection Type	Spring Terminal
Output Type	NPN or PNP
Output Voltage Rating	24VDC (-15% ~ 20%)
Maximum Leakage Current when OFF	<0.5mA
Resistive Load	0.5A/Point; 2A/Common Terminal
Inductive Load	12W/24VDC (Total)
Lamp Load	2W/24VDC (Total)
Isolation Type	Optocoupler Isolation, 3000V
Output Status Indication	Optocoupler Driver, Output Indicator ON
Short-circuit Protection for Output	Available

Analog Input Parameters

Item	Function Definition
Input Connection Type	Spring Terminal
Input Type	Voltage: -10V~10V, 0~10V Current: 4~20mA, 0~20mA, 0~24mA
Resolution	16bit
Sampling Rate	≥10K sps
Input Impedance	100Ω
Isolation Withstand Voltage	500V
Accuracy	±0.1%
Minimum Frequency Switch	1ms

Analog Output Parameters

Item	Function Definition
Input Connection Type	Spring Terminal
Output Type	Voltage: -10V~10V, 0~10V Current: 4~20mA, 0~20mA, 0~24mA
Resolution	16bit
Sampling Rate	≥10K sps
Input Impedance	>500Ω
Isolation Withstand Voltage	500V
Accuracy	±0.5%

EC Vertical Integrated IO Module

Model	Description
EC1616DN	EtherCAT, Vertical, 16 Inputs, 16 Outputs, Digital, NPN
EC1616DP	EtherCAT, Vertical, 16 Inputs, 16 Outputs, Digital, PNP
EC3200D	EtherCAT, Vertical, 32 Inputs, 0 Output, Digital, NPN/PNP Selectable
EC0032DN	EtherCAT, Vertical, 0 Input, 32 Outputs, Digital, NPN
EC0808AV2	EtherCAT, Vertical, Analog 8 In 8 Out, Voltage Type, -10V~10V
EC0808AM2	EtherCAT, Vertical, Analog 8 In 8 Out, 4-Ch Voltage, 4-Ch Current Type
EC0404AC2	EtherCAT, Vertical, Analog 4 In 4 Out, Voltage & Current Type
EC0800AM2	EtherCAT, Vertical, Analog 8 In, Voltage & Current Type

EtherCAT Junction Slave Module—ECAT-0105S

This ECAT-0105S EtherCAT Junction Slave Module is engineered for industrial applications, delivering reliable and anti-interference network performance. It supports flexible mounting methods to adapt to diverse cabinet layouts, adopts a multi-branch port design to simplify on-site wiring and break the restrictions of traditional daisy-chain topology. Featuring straightforward connection and deployment, it allows fast EtherCAT network expansion with minimal configuration effort for your automation system.



Advantage

- Stable and Reliable

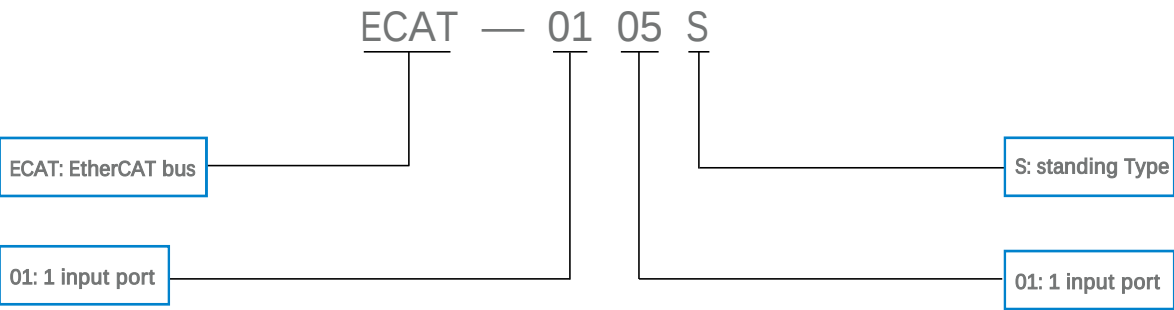
 - The module adapts to everyday industrial environments, provides stable connections without dropouts and offers strong interference resistance. The maximum distance between stations can reach 100 meters. Each port features 4kV contact electrostatic discharge (ESD) protection.
- Simple Wiring

 - The module has one IN input Ethernet port and five OUT output Ethernet ports, allowing connection to five modules.
- Easy to Use

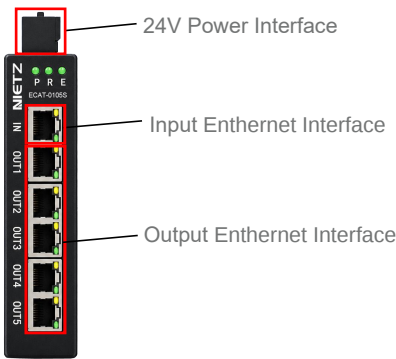
 - Just connect +24V and -0V power to the controller Ethernet port to the input port, and connect the devices to the output ports to expand the module.
- Multiple Installation Methods

 - Supports DIN rail and mounting-hole installation.

Naming Rules



Interface Layout



Junction Device Parameters

Item	Specification
Wire Gauge	24AWG / 22AWG / 20AWG
Rated Current	2A / 3A / 4A
Supply Voltage	DC 22V ~ 26V
Operating Ambient Temperature	-20 ~ +60℃
Storage Ambient Temperature	-25 ~ 75℃
Operating Ambient Humidity	25% ~ 85% RH
Storage Ambient Humidity	25% ~ 85% RH
Overall Dimension	1 Input 5 Output, 29mm72mm130mm

EtherCAT Automation System

