

EtherCAT



EtherCAT Junction Slave Module

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202608

ECAT-0105S User Manual

www.nietz.cn

Version 1.0

Thank you for purchasing the EtherCAT communication slave branch module independently developed and manufactured by Nietz Electric Co., Ltd.!

ECAT series products support EtherCAT communication and are externally powered by a DC24V power supply. This manual mainly describes the specifications, features, and operating methods of this series of modules. Please read it carefully before use so that you can use these products more clearly and safely.

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1. Foreword

1.1 Safety Precautions

1. Before installing, operating, or maintaining the product, read and follow the safety precautions below.
2. To ensure personal and equipment safety, when installing, operating, and maintaining the product, follow all safety precautions marked on the product and described in this manual.
3. The items marked in this manual as "Caution," "Warning," and "Danger" do not represent all safety precautions that should be observed; they are only a supplement to all safety precautions.
4. This product should be used in an environment that meets the design specifications; otherwise, it may cause failures. Functional abnormalities or component damage resulting from failure to comply with the relevant requirements are not covered by the product warranty.
5. The company assumes no legal liability for personal injury, property loss, or other damage caused by improper operation of the product.

1.2 Safety Level Definitions

-  **"Warning"**: Failure to follow the instructions may result in death or serious bodily injury.
-  **"Caution"**: Failure to follow the instructions may result in minor bodily injury or equipment damage.

Please keep this guide for future reference and be sure to pass this manual on to the end user.

1.3 When Designing the Control System

Warning

Be sure to design a safety circuit so that the control system can continue to operate safely when the external power supply is lost or the programmable controller fails.

If the load current exceeds the rated value, or a load short circuit causes prolonged overcurrent, the module may smoke or catch fire. Install safety devices such as fuses or circuit breakers externally.

Caution

Always provide, in the external circuitry of the programmable controller, an emergency stop circuit, a protection circuit, an interlock circuit for forward/reverse operation, and upper/lower limit interlock switches to prevent machine damage.

For safe equipment operation, design external protective circuits and safety mechanisms for output signals related to major accidents.

After the programmable controller CPU detects a system abnormality, it may turn off all outputs. If part of the controller circuitry fails, its outputs may become uncontrolled. To ensure normal operation, design appropriate external control circuits.

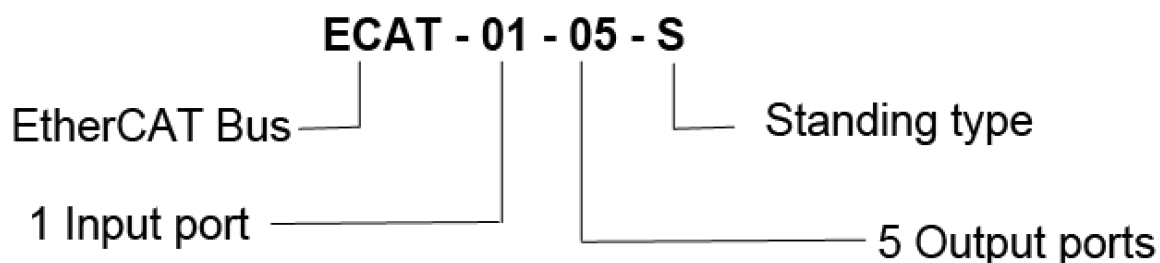
If the programmable controller's relay, transistor, or other output units are damaged, the outputs may be unable to be controlled to the ON or OFF state. The programmable controller is designed for indoor use and electrical environments of Overvoltage Category II. Its power supply system should have lightning protection devices to ensure that lightning-induced overvoltage is not applied to the controller's power input, signal input, control output, or other terminals, avoiding damage.

2. Product Features

1. **Stable and Reliable** The module adapts to everyday industrial environments, provides stable connections without dropouts, and offers strong interference resistance.
2. **Multiple Installation Methods** Supports DIN rail and mounting-hole installation.
3. **Simple Wiring** The module has one IN input Ethernet port and five OUT output Ethernet ports, allowing connection to five modules.
4. **Easy to Use** Just connect +24V and -0V power, connect the controller Ethernet port to the input port, and connect the devices to the output ports to expand the module.

3. Product Selection

3.1 Model Naming



3.2 Ordering Guide

Model	Description
ECAT-0105S	EtherCAT, vertical, 1 input port, 5 output ports

4. Product Parameters

4.1 General Specifications

Item	Specification
Power Supply Specification	24VDC (22VDC~26VDC) -15%, +20%
Maximum Communication Speed	100MB/s
Bus Interface	2*RJ45
Transmission Distance	≤100M
Data Transmission Medium	Ethernet/EtherCAT CAT5 cable
Operating Temperature	-20~+60°C

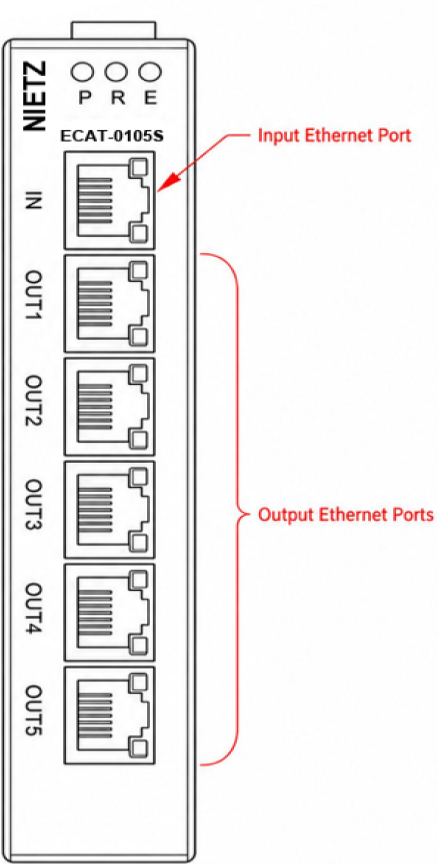
Item	Specification
Storage Temperature	-25℃~75℃
Relative Humidity	25℃~85℃
Dimensions	111mmx77mmx24mm
Wire Gauge	24AWG, 22AWG, 20AWG

4.2 Interface Function Definition

Name	Function Definition
PE	Voltage input interface
X1 EC IN	Port1 (input port)
X2 EC OUT	Port2 (output port)
X3 EC OUT	Port3 (output port)
X4 EC OUT	Port4 (output port)
X5 EC OUT	Port5 (output port)
X6 EC OUT	Port6 (output port)

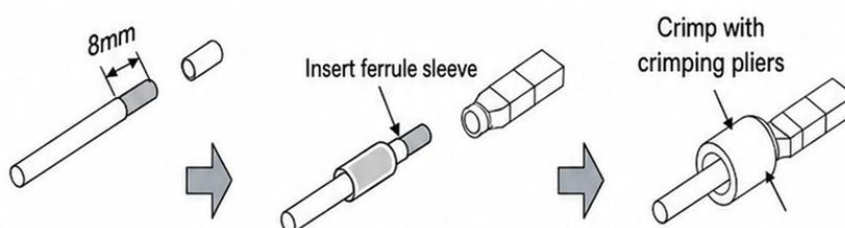
5. Wiring Diagram

5.1 Interface Description



5.2 Input/Output Wiring Instructions

1. Use Category 5 or Category 6 cable for Ethernet;
2. For the power cable, use standard single-core wire; recommended strip length: 8 mm;
3. For rigid single-core wire, after stripping to the corresponding length, press the button and insert the single-core wire into the voltage input port;
4. This device requires only 24 V and 0 V power wires for supply. From the control-side Ethernet port, connect to the input network port for communication, and connect the output network port to devices as needed;
5. Do not bundle the power cable and communication cable together. Route them at least 100 mm apart; otherwise noise may cause abnormal device communication;
6. **Wiring steps**
 - a) Strip the cable insulation, expose 8 mm of copper, and insert the wire into the ferrule sleeve.
 - b) Insert the conductor into the round hole of the ferrule, then crimp using crimping pliers.



5.3 Communication Cable Description

Matching accessory name	Bootlace ferrule
Model	GTVE07512
Applicable wire size	Metric/MM:0.75 AWG:21

Item	Specification
Cable type	High-flex crossover cable, S-FTP, Cat.6A, one-piece molded
Standards met	EIA/TIA568A EN5D173 SO/IEC11801 EIA/TIA TSB EIA/TIA SB40-A&TSB36
Wire Type	Twisted pair
Pairs	4

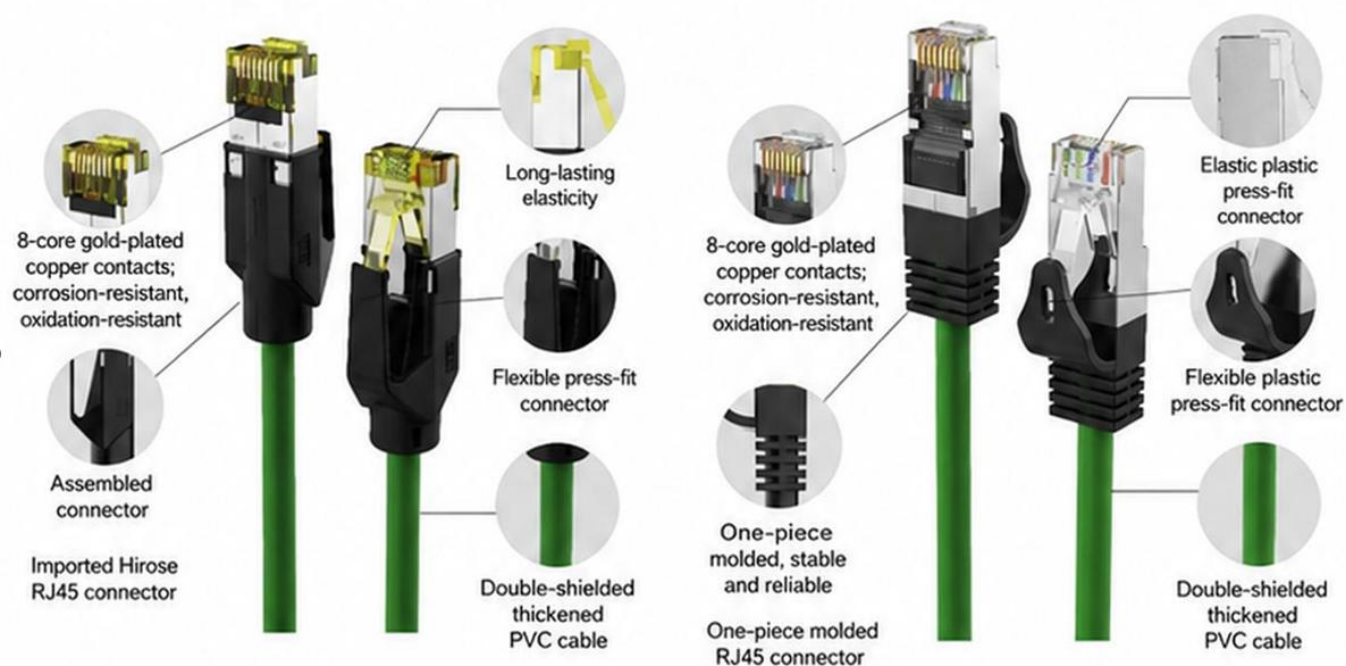
Length requirement

When using the EtherCAT bus, normal communication is supported with device cable length within 100 m.

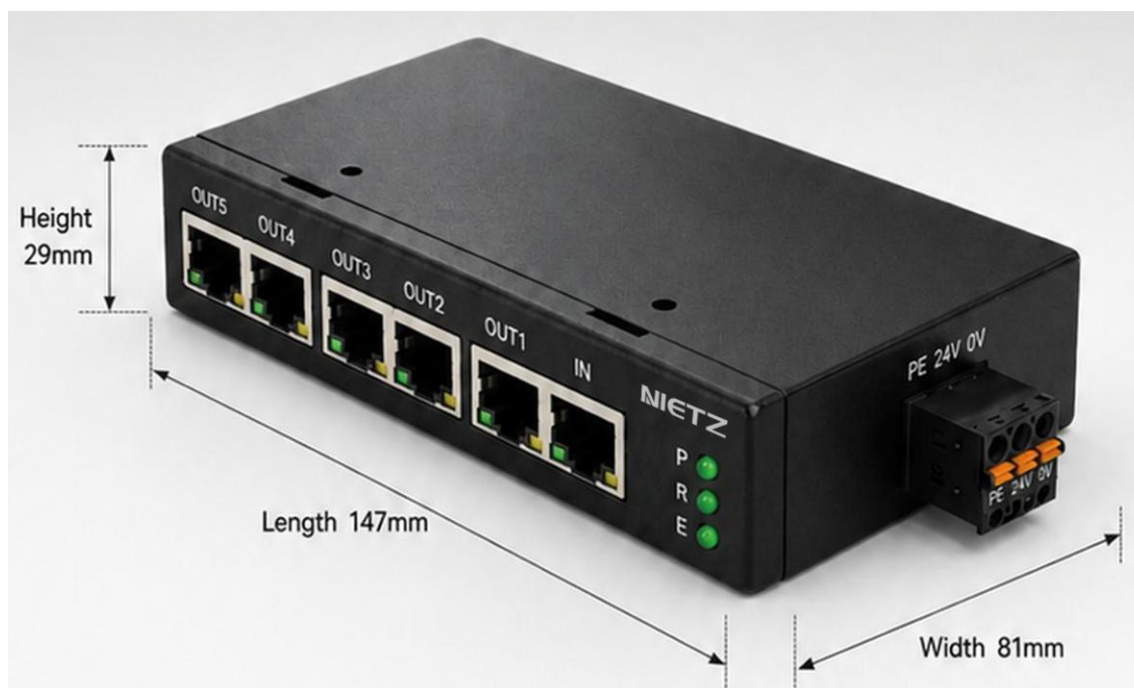
Technical requirements

1. 100% continuity test; no short circuit, open circuit, misalignment, or contact defects.
2. Shielded cables must be used for network data transmission.

Recommended main cable



6.Dimension Drawing (Unit:mm)



Appendix

7.1 Glossary

Term	Definition
Optocoupler	A controlled device that transmits signals using light as the medium; a photosensitive semiconductor
RJ45	A type of information outlet connector in structured cabling systems, consisting of a plug and a jack

Term	Definition
IP20	Ingress protection rating; 2 indicates dust protection level 2, 0 indicates water protection level 0
PDO	Process data, an object in the object dictionary; its configuration may be fixed or optional