

Industrial Class Design

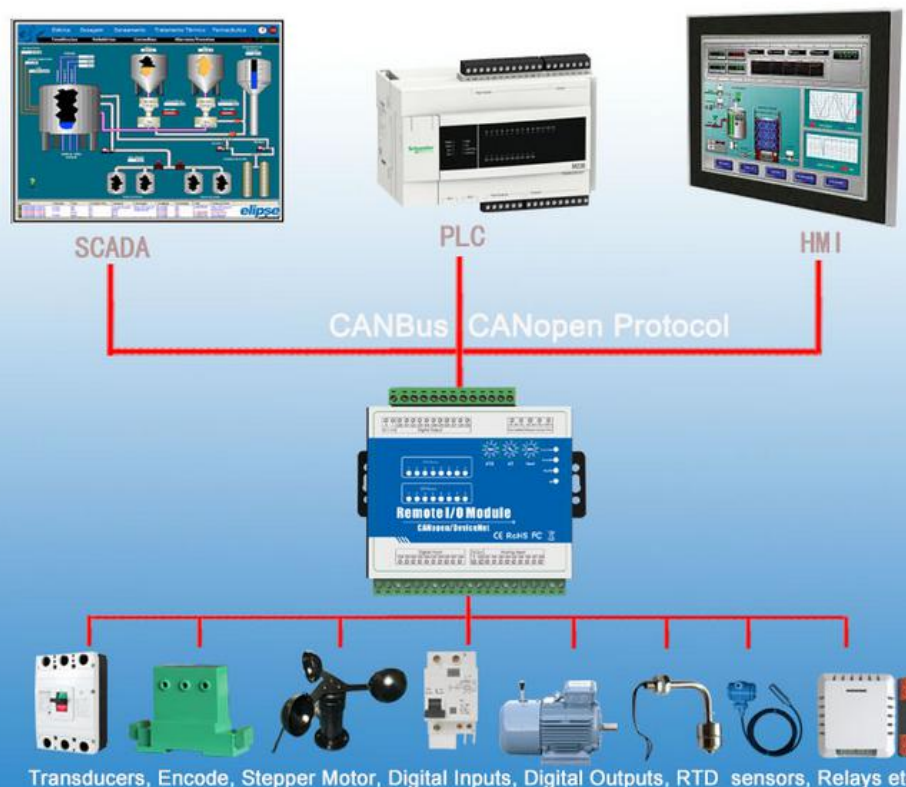
1Mhz High Speed Pulse Counter

Supports PWM Control

DO High Speed Pulse Output

Industrial Remote I/O Module CANopen I/O Module

KING PIGEON



Mxxx Series CANopen Remote IO Module Working Diagram

MxxxC Series Data Sheet

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King Pigeon Hi-Tech. Co., Ltd.

www.GPRS-M2M.com



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

Mxxxx CANopen Series Remote I/O Module Table

Model	Descriptions	DC Output	DC Input	Typical Power Consumption
M100c	1 CANBus, 2 DI, 2 AI, 2 DO(Sink) or Relay	1 DC	12~36VDC	1.05W-2.05W
M110c	1 CANBus, 4 DI, 4 DO(Sink) or Relay	1 DC		1.05W-2.35W
M120c	1 CANBus, 4 DI, 4 AI, 2AO, 4 DO(Sink) or Relay	1 DC	24~36VDC	1.05W-2.7W
M130c	1 CANBus, 8 DI, 4 DO(Sink) or Relay	1 DC	12~36VDC	1.1W-2.85W
M140c	1 CANBus, 8 DI, 8 DO(Sink) or Relay	1 DC		1.1W-3.65W
M150c	1 CANBus, 8 DI, 4 AI, 4 DO(Sink) or Relay	1 DC		1.1W-3.7W
M160c	1 CANBus, 8 DI, 8 AI, 8 DO(Sink) or Relay	1 DC		1.1W-3.75W
M200c	1 CANBus, 2AO	1 DC	24~36VDC	1.05W-1.4W
M210c	1 CANBus, 4 DI	1 DC	12~36VDC	1.05W-1.5W
M220c	1 CANBus, 4 DO(Sink) or Relay	1 DC		1.05W-1.6W
M230c	1 CANBus, 4 AI	1 DC		1.05W-1.15W
M240c	1 CANBus, 4 RTD, 2/3 wire PT100/pt1000	---		0.7W-0.9W
M310c	1 CANBus, 8 DI	1 DC	12~36VDC	1.1W-2W
M320c	1 CANBus, 8 DO(Sink) or Relay	1 DC		1.1W- 2.75W
M330c	1 CANBus, 8 AI	1 DC		1.1W-1.2 W
M340c	1 CANBus, 8 RTD, 2/3 wire PT100/pt1000	---	12~36VDC	0.7W-1.1W
M410c	1 CANBus, 16 DI	1 DC		1W-2.3W
M420c	1 CANBus, 16 DO(Sink) or Relay	---		1W-3.3W

Special instructions for ordering

- 1) If the model provides digital input, the DIN default type: wet contact, optional: dry contact. The input type cannot be changed after manufacturer delivered. The DIN1 default is high-speed count mode; it can be changed to low-speed count mode by open the shell and change the internal jumper. If require dry contact input, please note when ordering, if DIN1 require high-speed pulse count mode then must be wet contact.
- 2) If the model provides digital output, the DO default type: SINK, optional: Relay. The output type cannot be changed after manufacturer delivered. The DO1 supports PWM high-speed pulse output, the output duty cycle from 10-90%; DO2 can be used to control the direction of the stepper motor. If require relay output, please note when ordering, if DO1, DO2 used for high-speed pulse output then must be Sink.
- 3) The model number: M240c, M340c support thermal resistance temperature transmitter default type: PT100, optional: PT1000, if you need PT1000 type of thermal resistance, please note when ordering.
- 4) The valid number of I / O ports corresponding to the model number is described in the Model List, the not included I/O port in the model is invalid, although in the hardware reserved them.



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

1. Brief introduction

The MxxxC CANopen Series Remote I/O Module are industrial class, high reliability, high stability and high precision data acquisition module, embedded 32-Bit High Performance Microprocessor MCU, it provides 1 isolated CAN Bus interface and multi I/O, supports standard CANopen Protocol, based on the CAN bus and mainly used for the embedded network of the machine control, such as industrial machine control, aircraft engines monitoring, factory automation, medical equipments control, remote data acquisition, environmental monitoring, and packaging machines control.

It can be intergraded into SCADA, OPC server, HMI and other automation systems. It is design for working in the harsh industrial application environment, widely used in a variety of industrial automation.

2. Standard Packing List

Remote I/O Module X 1; User Manual X 1.

Note: The package does not include AC/DC Adaptor.

Optional: 35mm Standard DIN rail fixed Bracket

3. Mainly Features

- Wide range power supply with anti-reverse protection design;
- Embedded 32-Bit High Performance Microprocessor MCU, inbuilt watchdog;
- 1 CANBUS Interface, comply with CANopen specification CiA301, CiA401;
- Dynamic PDO-connection and mapping
- Support Polling I/O operation mode;
- 2 LED instructions work status, compliant with CiA303-3
- Support setting Address ID and Baud Rate via rotary switch;
- Support programmed disconnection faulty handling;
- Optical isolated digital input(Compatible Dry or Wet type), supports max 1MHz high speed pulse counter;
- Digital output(Sink) or relay output, supports 10Hz~300KHz high speed pulse output, support PWM;
- Isolated analog input, 12-bit resolution, supports 0~20mA, 4~20mA, 0-5VDC, 0-10VDC;
- RTD input, supports PT100 and PT1000 resistance sensor;
- High sampling frequency and special filtering strategy to ensure reliability;
- Provides 1 channel VDC power source output for external device, saving wiring cost;
- Using metal shell, protection class IP30. Metal shell and system security isolation, especially suitable for industrial applications in the field;
- Small size, L105 * W88 * H30mm, compatible wall installation and DIN35mm industrial rail installation



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4. Technical Specifications

• Digital Input

Sensor Type	Wet Contact (NPN or PNP), Dry Contact
I/O Mode	DI or Event Counter
Dry Contact	<ul style="list-style-type: none"> • On: short to GND, logic=1 • Off: open, logic=0
Wet Contact (DI to COM)	<ul style="list-style-type: none"> • On: 10 to 30 VDC, logic=1 • Off: 0 to 3 VDC, logic=0
Counter Frequency	Only the 1 st Channel can be used as pulse counter, Compatibles DI and counter simultaneously. Counter value will save after power off. High Speed Mode: Max. 1Mhz(Default); Low Speed Mode: Max. 10KHz (Optional, can open the cover to choose low speed mode.)
Digital sampling frequency	500Hz
Digital filtering strategy	Continues 3 times
Isolation	Optical Isolated,3k VDC or 2k Vrms

• Digital Output

Type	Sink or Relay
I/O Mode	DO or Relay or Pulse Output
Pulse Output Frequency	10Hz~300KHz(Only the 1 st Channel is Sink type can be used as high speed pulse output, DO1 supports PWM high-speed pulse output.)
Over-Voltage Protection	50 VDC
Over-Temperature Shutdown	175°C (typical), 150°C (min.)
Load Current	Max.500 mA per channel
Digital sampling frequency	500Hz
Isolation	If DO is Sink type, then no isolation. If it is Relay, then is electrical isolation.

• Analog Input

Type	Differential input
Resolution	12 bits
I/O Mode	Voltage / Current (jumper selectable)
Input Range	0~5VDC , 0~10VDC, 0~20 mA, 4~20mA,
Accuracy	<ul style="list-style-type: none"> ±0.1% FSR @ 25°C ±0.3% FSR @ -10 and 60°C ±0.5% FSR @ -40 and 75°C
Sampling frequency	20Hz
Isolation	Electrical isolation

• RTD Input

Sensor Type	PT100 or PT1000
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CANopen I/O Data Acquisition Module

Measurement Range	-50~+200°C
Resolution	0.1°C or 0.1 ohm
Input Connection	2- or 3-wire
Accuracy	±0.5°C
Sampling frequency	20Hz
Isolation	No
• Analog Output	
Type	Differential input
Resolution	12 bits
Output Range	0 to 10 VDC
Drive Current	1A (max.)
Accuracy	±0.1% FSR @ 25°C ±0.3% FSR @ -10 and 60°C ±0.5% FSR @ -40 and 75°C
Isolation	No
• Working Power Requirements	
Input Voltage	12~36VDC for no-AO output model, 24~36VDC for AO output model; Peak Voltage:+40VDC, Power consumption: Less than 1.7W, If equipped relay output, then each Relay action: 0.15W.
Input Current	139 mA @ 24 VDC
• Power Output	
Output Voltage	12~36VDC, equal to the input voltage.
Output Current	139 mA @ 24 VDC
• CANBUS	
CANBUS Interface	5.08mm Terminal
Protection	ESD 500VDC
Wires Connection	Shield Twisted wires, CAN V+, CAN_H, CAN_L, CAN_Shield, GND
CANopen Protocol	CiA301, CiA401
MAC ID	Range:0 ~ 127.
Baud Rate Setting	Range:10, 20, 50, 100, 125, 250, 500, 800kbps, 1Mbps
Predefined Master/Slave Connection Set Rate	Group 2 Only Server
I/O Operation Mode	Polling
• Physical Characteristics	
Wiring	I/O cable max. 14 AWG



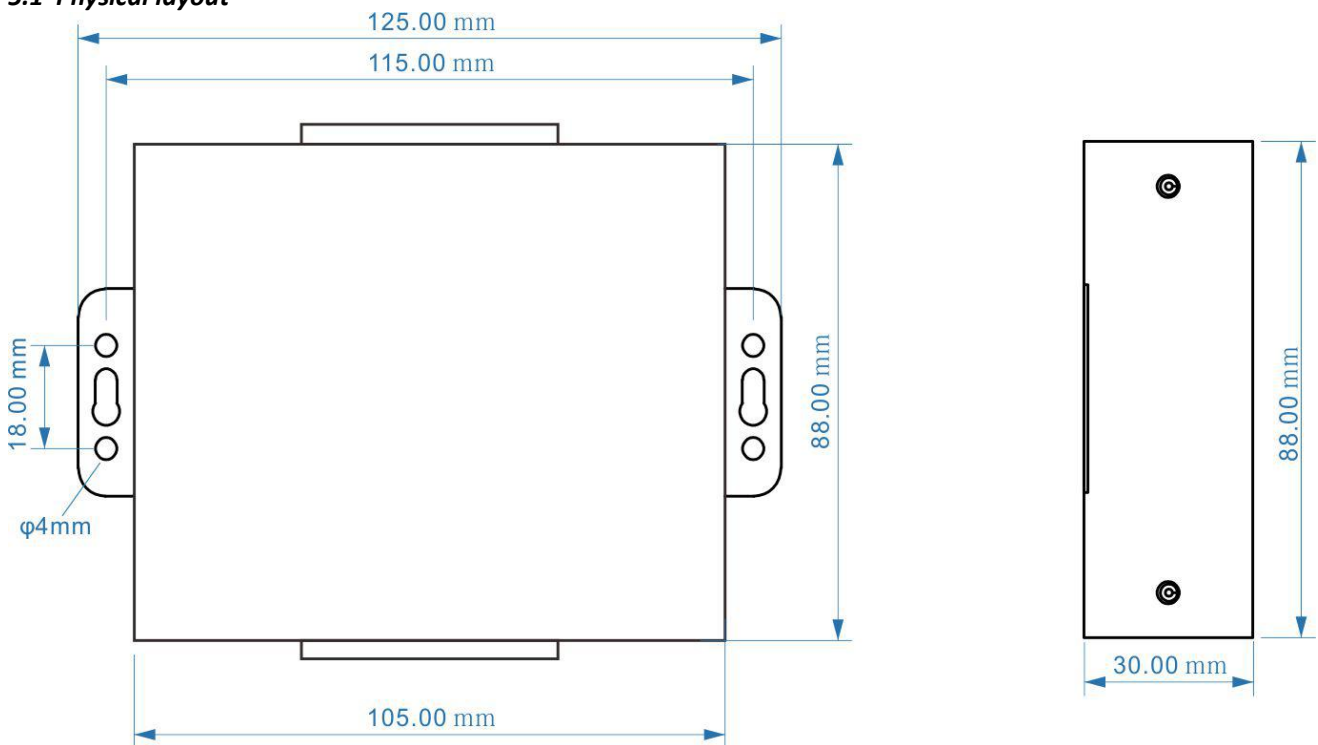
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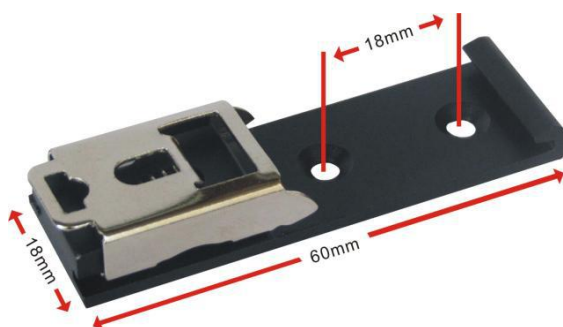
Dimensions	105 x 88 x 30 mm
Weight	Under 205 g
Mounting	DIN rail or wall
• Environmental Limits	
Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Altitude	Up to 3000 m

5. Physical Layout and Installation Diagram

5.1 Physical layout



35mm Standard DIN rail fixed Bracket(Optional Bracket)

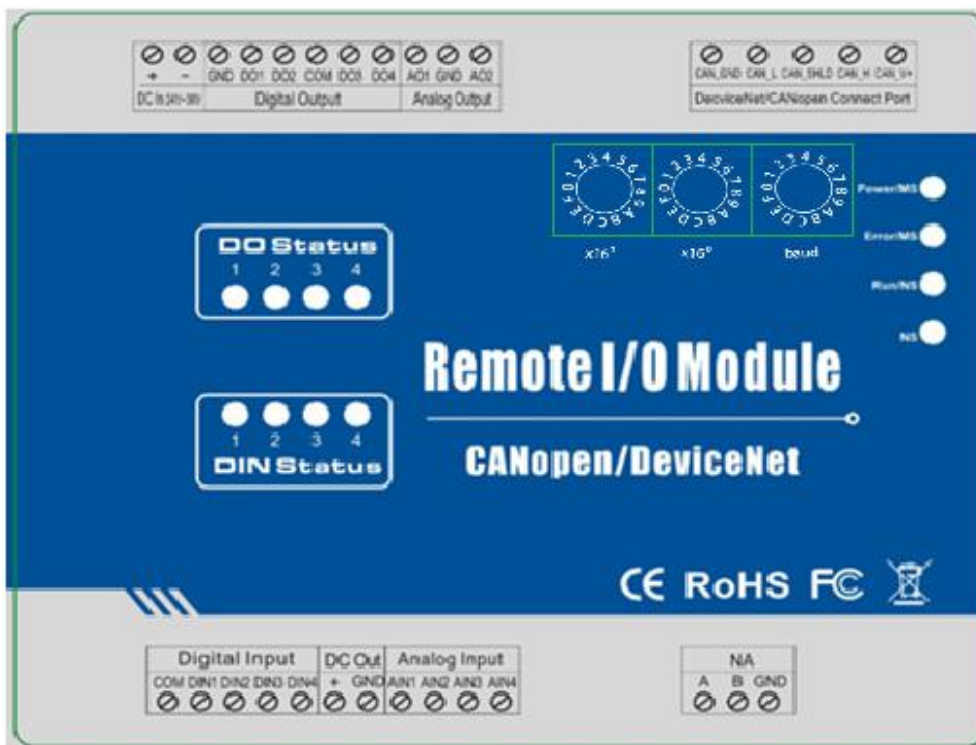


35mm DIN Rail Fixed Bracket



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5.2 Led Instruction



LED Indicator Instruction	
	Module Status (MS) Indicator Green
	Reserved
	Reserved
	Error Status (NS) Indicator Red
	CANopen Address Setting Switch
	CANopen Communication Rate Set Switch, When =0 stands for communication rate is 10Kbps; =4 stands for communication rate is 250Kbps =1 stands for communication rate is 20Kbps; =5 stands for communication rate is 500Kbps =2 stands for communication rate is 50Kbps; =6 stands for communication rate is 800Kbps =3 stands for communication rate is 125Kbps =7 stands for communication rate is 1Mbps
	Digital input status indicator, turn on while status change.
	Digital Output status indicator, turn on while relay close or Sink output high level.

Indicator Instruction:

Indicator Status	Description	Handling
LED Off	No power	Check Module power supply
Green LED Flash	Waiting I/O data	1) Check if master is running or not. 2) Ensure Module already configured to Master scan



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		list. 3) Check the networks connection is well or not
Green LED On	Running	
Red LED Flash	Fault configuration or communication timeout	1) Configure Module again in the Master 2) Check the networks connection is well or not
Red LED On	Fault Hardware	1) Reconnect power supply for Module 2) Ensure communication rate is same with other devices in the networks. 3) Check if the device ID is within correct range or repeat with other devices in same network 4) Check if networks or wiring are suitable 5) No response for many times, factory repairing.

5.3 Interface Instructions for installation

See below interface definition, please connect the correct wires.

Interface Definition Instruction		
DC in 12~36V	+	DC12~36V positive input, 1A, for power on the Unit. If need to use the AO port, then please power on it by DC24~36v.
	-	DC12~36V negative input, 1A.
DC Out	+	DC Power output positive for external device, output voltage= input voltage.
	GND	DC Power output negative port.
CANopen Connect port	CAN_V+	CAN Bus positive
	CAN_H	CAN Bus signal. High
	CAN_SHLD	Shield cable
	CAN_L	CAN Bus signal. Low
	CAN_GND	CAN Bud GND
NA	A	reserved
	B	reserved
	GND	reserved
Digital Input	DINx+	The x channel digital input positive
	GND	Digital input negative
Digital Output	DOx+	The x channel Digital Output High Level or Relay NO port.
	GND	Sink output: GND (For output type is SINK.)
	COM	Relay output: COM.(For output type is Relay)
Analog Input	AINx+	The x channel Analog input positive.
	GND	Analog input negative.
Analog Output	AOx+	The x channel Analog output positive.
	GND	Analog output negative.
RTD Input	RTDx+	The x channel Resistance Thermal input positive.
	RTDx -	Resistance Thermal input negative.
	COM	Resistance Thermal input COM port.

The End!

Any questions please help to contact us feel free.

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