

Industrial Class Design

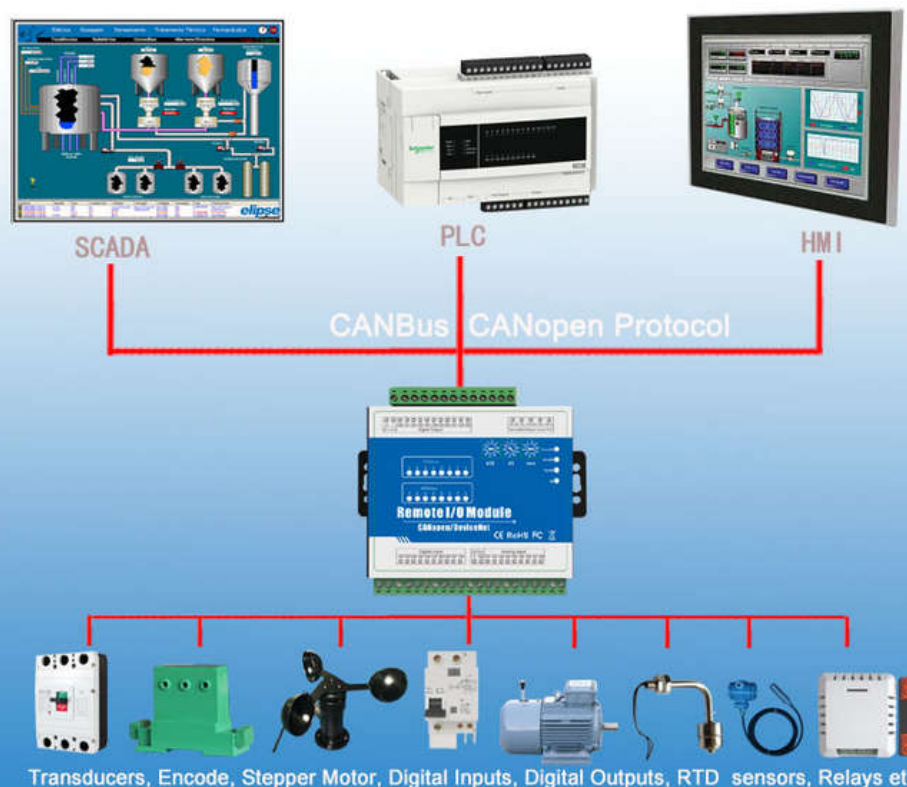
1Mhz High Speed Pulse Counter

Supports PWM Control

DO High Speed Pulse Output

Industrial Remote I/O Module CANopen I/O Module

KING PIGEON



Transducers, Encode, Stepper Motor, Digital Inputs, Digital Outputs, RTD sensors, Relays etc.

Mxxx Series CANopen Remote IO Module Working Diagram

Mxxx Series User Manual

Ver 1.0

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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

Table of Contents

1. Brief introduction-----	4
2. Standard Packing list-----	4
3. Mainly Features-----	4
4. Technical Specification-----	5
5. Physical Layout and Installation Diagram-----	7
6. CANopen Communication-----	13
7. Warranty-----	25

This handbook has been designed as a guide to the installation and operation of M Series Industrial Remote I/O Module.

Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.

We recommend that the advice of a registered electrician be sought before any Installation work commences.

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【UPGRADE HISTORY】

DATE	FIRMWARE VERSION	HARDWARE VERSION	DESCRIPTION



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



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

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	±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



Industrial Remote I/O Module

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



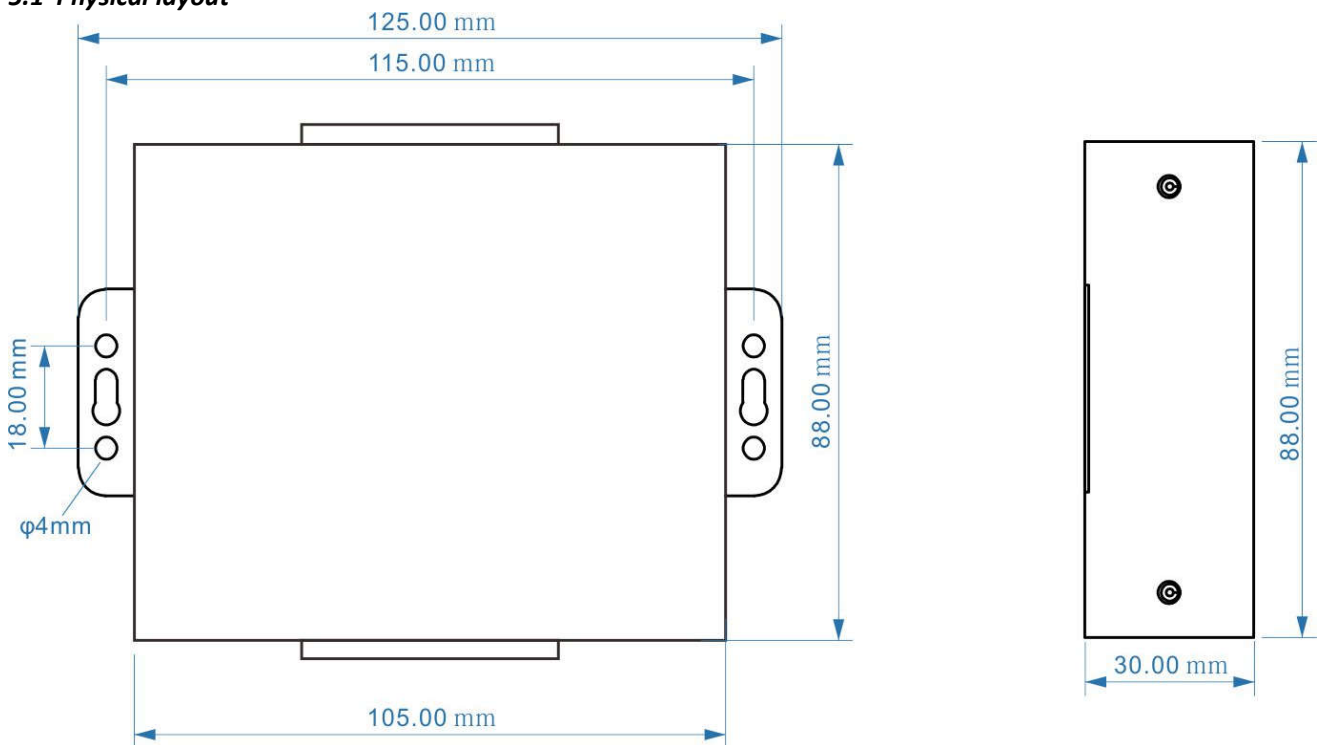
Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

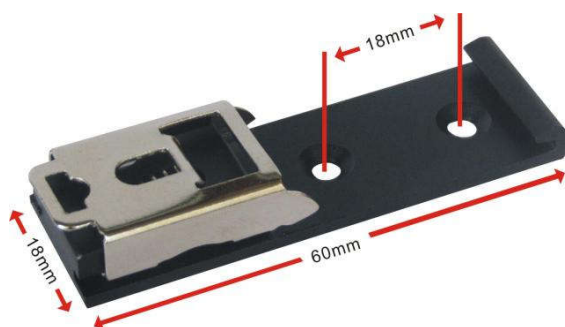
Dimensions	105 x 88 x 30 mm
Weight	Under 205 g
Mounting	DIN rail or wall
• Environmental Limits	
Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)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

5. Physical Layout and Installation Diagram

5.1 Physical layout



35mm Standard DIN rail fixed Bracket(Optional Bracket)

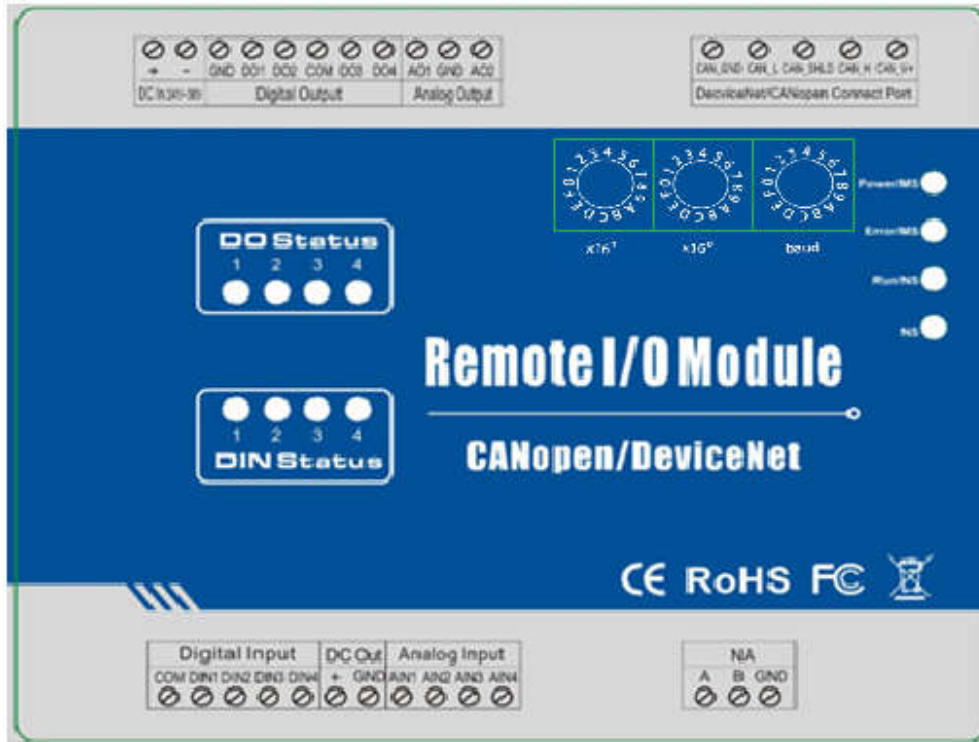


35mm DIN Rail Fixed Bracket



Industrial Remote I/O Module CANopen I/O Data Acquisition Module

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



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

		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.

5.4 Typically Wiring Instruction:

Communication cable length and communication rate:

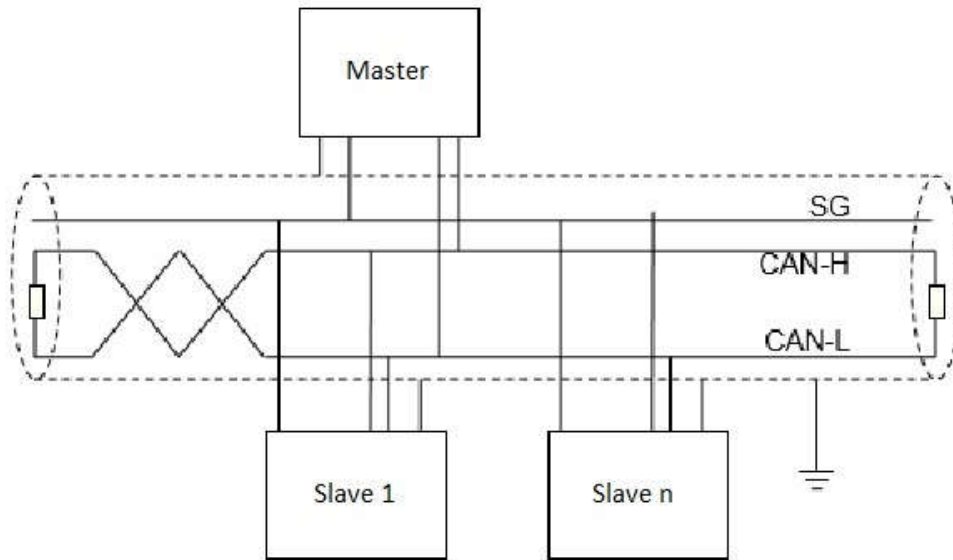
Communication distance related to communication rate, use CANopen special shielded twisted pair, when communication rate is 10K, max communication distance is 1Km; when communication rate is 1M, Max communication distance is 25m.

Bus networks connection:

Two end of bus need to connect 120 Ω terminal resistor, every CANopen network max support 128 devices. And

the shielding layer of bus cable can only support one connect with GND, to avoid different energy of positions cause cycle.

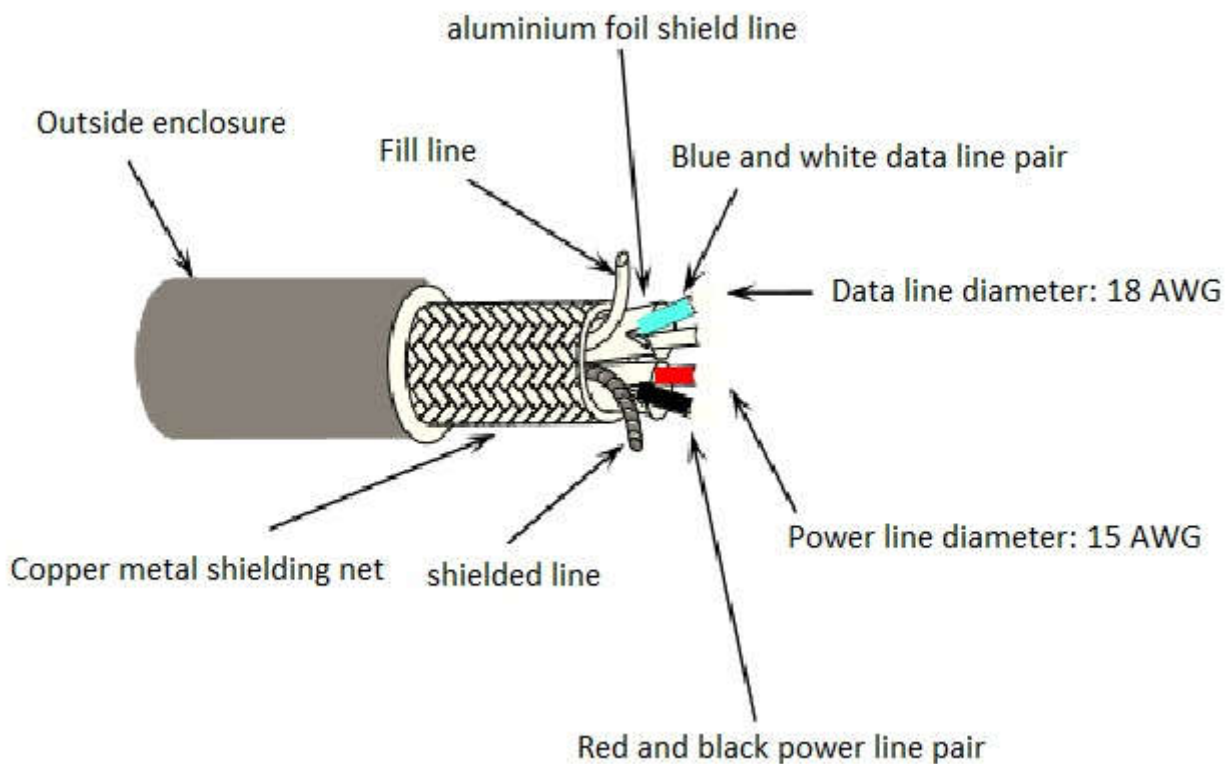
CANopen networks connection:



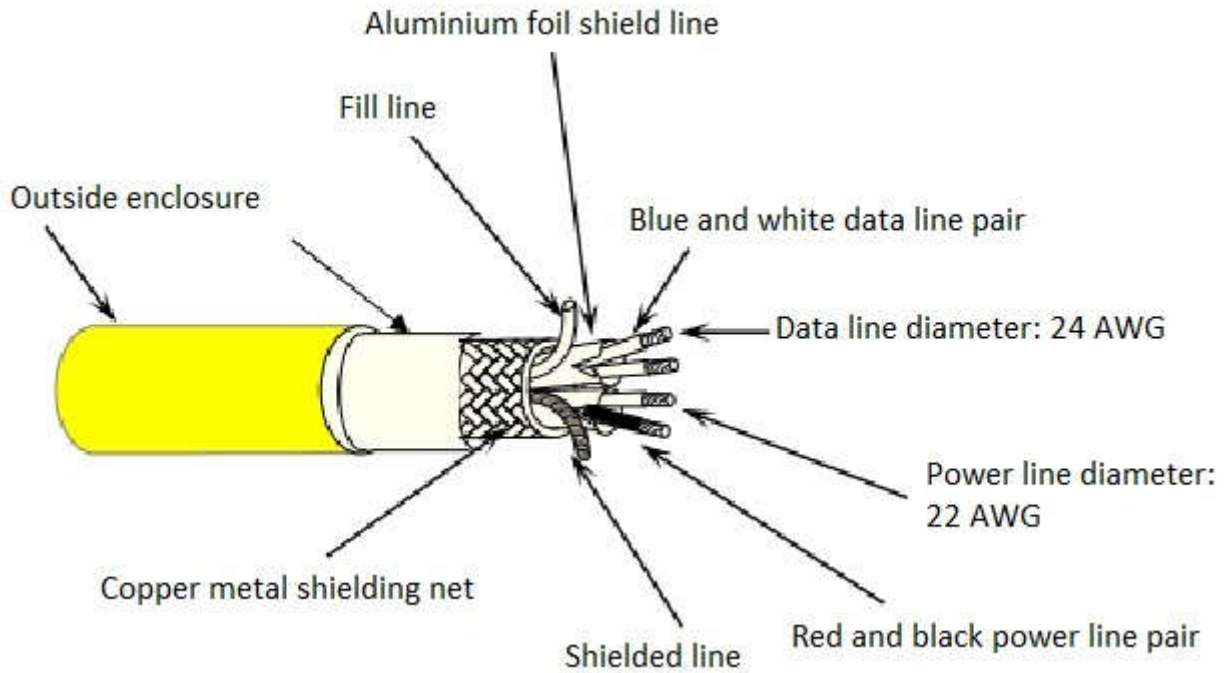
Communication cable choosing:

Standard CANopen bus communication cable include main lines and branch lines, the structure is same, only the size of inner communication cables are different.

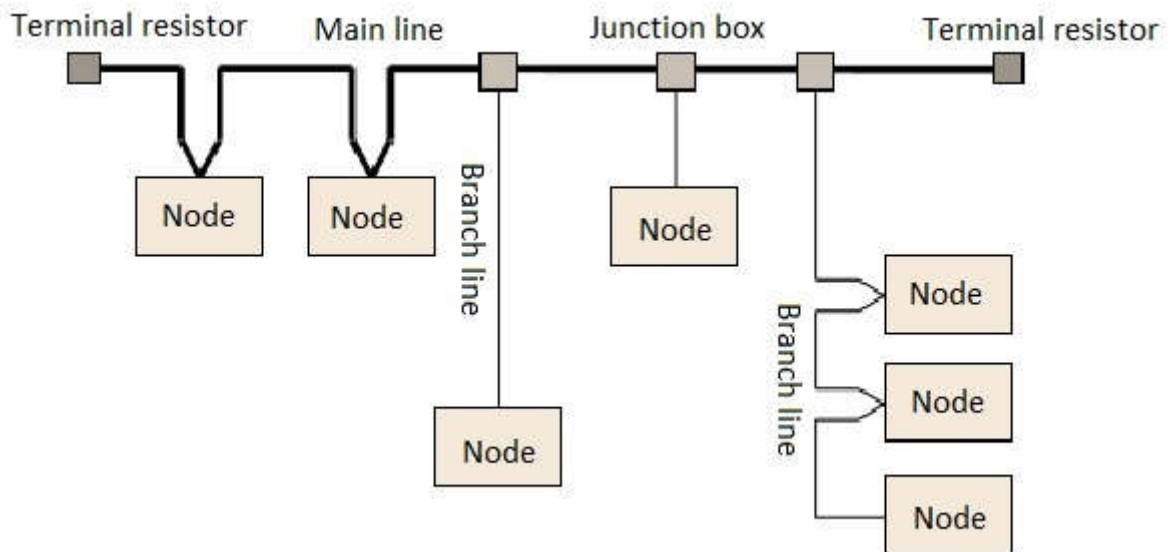
Main lines structure:



Branch line structure:



Main and branch connection:



Wiring:

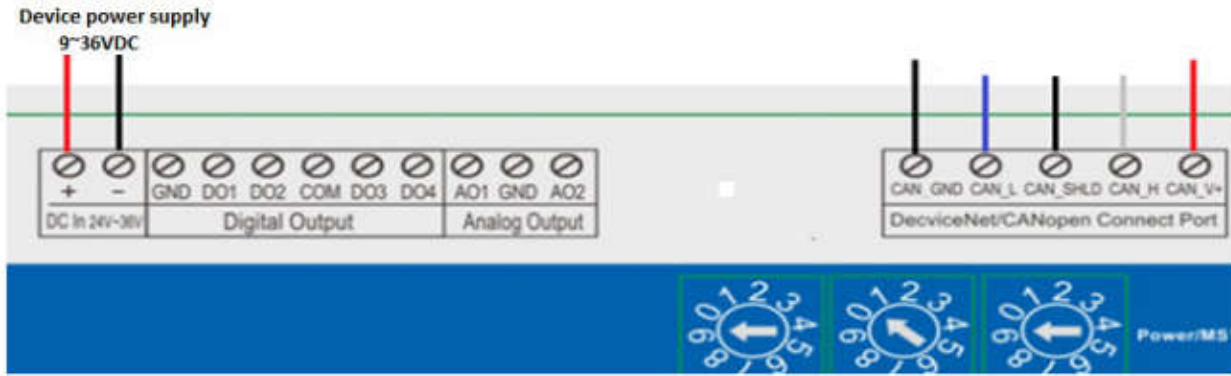
When connecting MxxxC series module to CANopen networks, please notice below:

- 1) Use twisted-pair shielded cable with characteristic impedance of $120\ \Omega$, two end of bus need to connect $120\ \Omega$ terminal resistor;
- 2) The shielding layer of communication cable can only support one single-end point connect with GND within a network;
- 3) Please keep CAN communication cable far away with power cable, 30cm or more distance better, if communication cable have to cross with power cable, please keep orthogonal direction;



Industrial Remote I/O Module

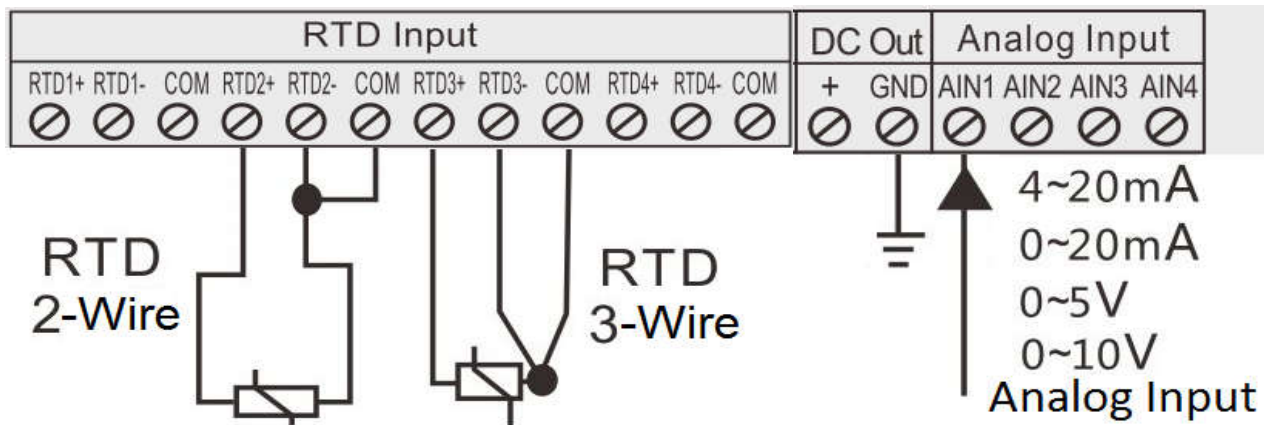
CANopen I/O Data Acquisition Module



5.5 RTD and analog input typically Wiring Instruction:

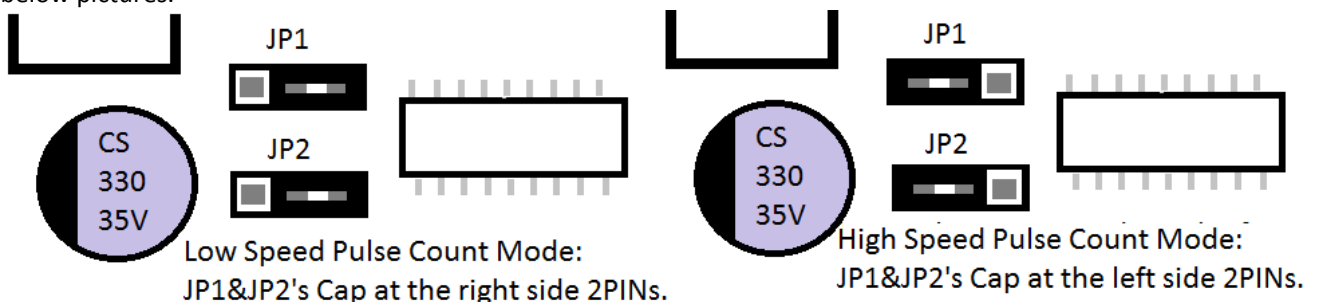
Tips:

Resistance Thermal Detector (RTD) compatibles 2-wire or 3-wire, please reference above mentioned wiring instruction. If the sensor near the module and the wire resistance is small can be ignored, can be used 2-wire wiring, if the distance is far and the wire resistance affect the value, should be used 3-wire way connection.



5.6 Setup the DIN1 High Speed Pulse Count & Low Speed Pulse Count Mode:

The DIN1 can be used as pulse counter, default is high speed mode, the max. frequency is 10Mhz. it can be change to low speed pulse count mode by open the shell, and change the JP1 & JP2's Caps to the right side 2PINs, see below pictures.



Tips:

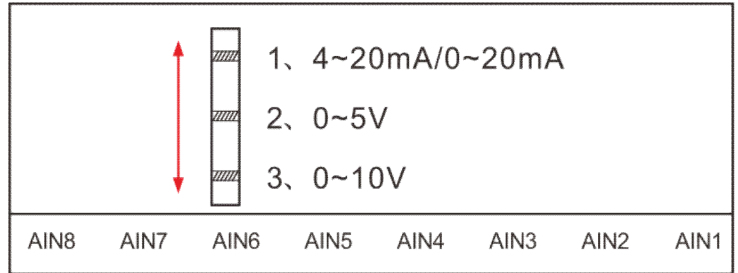
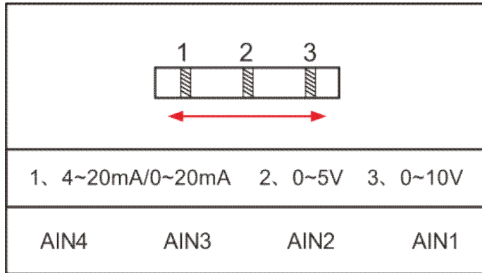
- 1) AIN value range is different according to different transducer connected;
- 2) Digital input DIN1 value, 0=open, 1=close;
- 3) Digital output DO1 value, 0=open, 1=close.
- 4) Unfixed data: In the table below, the Byte position of this part is according to if enable relative function such as pulse counter, pulse output etc....If enable, then the Byte position and data type is according to the instruction in table; If disable, then Byte position will be replaced by follow-up data. For example, in the table below, Byte 2,3,4,5, if disable pulse counter function, then the Byte 6 will tack the Byte 2 position automatically.
- 5) In the table below, RTD support real measurement value and the value which be inner calculated, users can read the register value according to their need. (Temperature range: -50~200°C and accuracy can reach 0.1)



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

- 6) AIN value is the ADC measurement value, the user can calculate its really value follow the below formula:
 A) At the backside of the module, the user can choose the correct analog input type for each channel. Includes:
 1: 0-20mA/4-20mA; 2: 0-5V; 3: 0-10V.
 Please set the switch to correct position according to the analog input transducer. The backside label is below:



B) According to the input type, following the below formula to calculate the real value of the transducer.
 If the transducer measurement range is $b \sim a$, a =maximum measurement value, b = minimum measurement value. If the read ADC value= M , should calculate the real value= Y .

***If the channel input type is 0-20mA, the formula is:**

If $M > 4021$, then $Y = a$;

If $0 \leq M \leq 4021$, then $Y = M * (a - b) / 4021 + b$.

***If the channel input type is 4-20mA, the formula is:**

If $M > 4021$, then $Y = a$;

If $804 \leq M \leq 4021$, then $Y = (M - 804) * (a - b) / 3217 + b$;

If $M < 804$, then $Y = b$.

***If the channel input type is 0-5V, the formula is:**

If $M > 4006$, then $Y = a$;

If $0 \leq M \leq 4006$, then $Y = M * (a - b) / 4006 + b$.

***If the channel input type is 0-10V, the formula is:**

If $M > 4004$, then $Y = a$;

If $0 \leq M \leq 4004$, then $Y = M * (a - b) / 4004 + b$.

6. CANopen Communication

6.1 Object Dictionary OD

Object Dictionary is a function that every CANopen device must have, it contains all the parameters that can be accessed by the device. Client uses the Index and the Sub-index to read and write the parameters in the Object Dictionary.

Object Dictionary is mainly used to set the device configuration and perform non-instant communication. Each object is addressed by a 16-bit index. In order to search for a single element in the data structure, an 8-bit sub-index is defined. At the same time, the object dictionary also defines the data type.

Index	Object
0 0 0 0	Reserved
0 0 0 1 - 0 0 0 F	Basic data type
0 0 2 0 - 0 0 3 F	Complex data type
0 0 4 0 - 0 0 5 F	Manufacturer-specified data type
0 0 6 0 - 0 0 7 F	Basic data type of the device sub-protocol
0 0 8 0 - 0 0 9 F	Complex data type of the device sub-protocol
0 0 A 0 - 0 F F F	Reserved
1 0 0 0 - 1 F F F	Communication sub-protocol area
2 0 0 0 - 5 F F F	Manufacturer specific sub-protocol area
6 0 0 0 - 9 F F F	Standard device sub-protocol area
A 0 0 0 - B F F F	Standard interface sub-protocol area
C 0 0 0 - F F F F	Reserved



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

Each node in the CANopen network has an object dictionary. The object dictionary contains all the parameters that describe the device and its network behavior. A node's object dictionary is described in EDS (EDS: Electronic Data Sheet) or recorded on paper. The node itself only needs to be able to provide the necessary objects in the object dictionary, and other optional objects that make up the configurable functionality of the node part.

6.2 CANopen communication

CANopen physical layer CANbus transmits small amount of data each time, including 11-bit ID, Remote Transfer Request (RTR) bit, and data up to 8 bytes. CANopen refers to the 11-bit ID of CANbus as the communication object ID (COB-ID). When transmission data conflicts, the CANbus arbitration mechanism will continue to transmit the message with the smallest COB-ID without waiting or retransmitting. The using of 8-byte data by different communication objects and the meaning of each byte are different.

The using of 8-byte data by different communication objects and the meaning of each byte are different. Below is standard CANopen page frame:

	Function code	Node ID	RTR	Data length	Data
Length	4 bit	7 bit	1 bit	4 bit	0-8 byte

The CANopen communication model mainly defines three communication protocols: NMT agreement, Service Data object(SDO) agreement, Process Data Object (PDO) agreement.

NMT Agreement

Network Management Message NM performs NMT communication according to architecture of master/slave. There is only one master for this architecture, and the master can be paired with multiple slaves. All CANopen nodes have their own NMT status, master can control slaver's status by NMT messages.

The NMT communication data is mainly used for managing CANopen network. NMT only uses 2 byte in the data byte, as below:

	Function code	Node ID	RTR	Data length	Identifier	Byte 0	Byte 1
Length	4 bit	7 bit	1 bit	4 bit	0x000	Command byte	Slave node ID

Service Data Object (SDO)

Service Data Object SDO is used to read and write object dictionary of CANopen device. The node that provides object dictionary is called SDO server, the node that accesses object dictionary is called SDO client. SDO communication must start with SDO client and provide initialization related parameters.

About CANopen terminology, uploading means reading data from SDO server, downloading means setting SDO server data.

SDO communication data is mainly used for non-time critical data, such as communication parameters. The use of SDO in data byte as below:

	Function code	Node ID	RTR	Data length	Byte 0	Byte 1	Byte 2	Byte 3-7
Length	4 bit	7 bit	1 bit	4 bit	SDO command	Index	Sub-index	Data

Process Data Object (PDO)

PDO is used for transmitting real-time data from one producer to one or more customers, can also be used to exchange real-time data between multiple nodes.

PDO has two types: TPDO for transmitting and RPDO for receiving.

One node's TPDO is for transferring data to other nodes, and RPDO is for receiving the data transmitted from other nodes. MxxxC products have 4 TPDOs and 4 RPDOs in one node.

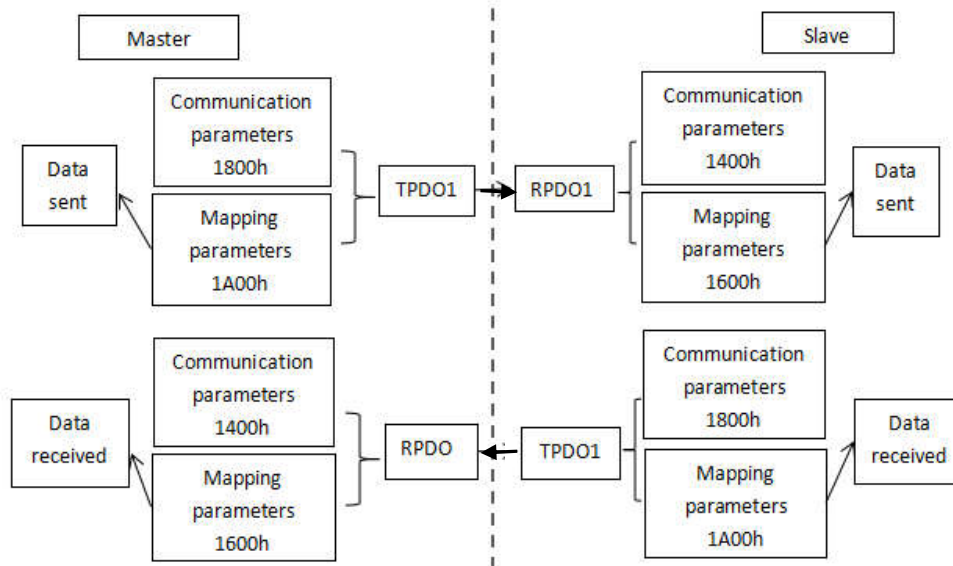
Every PDO is described by two objects in object dictionary: communication parameters and mapping parameters.



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

PDO communication parameter indicates which COB-ID, transmission type, disable time and timing time are used; PDO mapping parameter is used for setting mapping relationship of the data in the PDO message, and determining the location of the data needs to be transmitted in the CAN message. The parameter allows producer and consumer of PDO to know what information is being transmitted, to maximize transmission efficiency, don't need add additional protocol in CAN message to control information. One PDO can map up to 64 objects.



The use of SDO in data byte as below:

	Function code	Node ID	RTR	Data length	Data
Length	4 bit	7 bit	1 bit	4 bit	The 8 bytes of Process Data Object (PDO) are all used for transferring real-time data.

MxxxC communication parameters in object dictionary

Index	Sub-index	Object name	Data type	Default
1000h		Device type	Unsigned 32	0x00030191
1001h		Error register	Unsigned 8	0
1003h	00h	Error type	Unsigned 8	0x0000
	01h	Standard error	Unsigned 32	0x0000
1014h		COB-ID emergency management	Unsigned 32	\$NodeID + 0x80
1016h		Consumer heartbeat time		
	00h	Number of sub-index	Unsigned 8	1
1017h	01h	Consumer heartbeat time	Unsigned 32	0
		Producer heartbeat time	Unsigned 32	0
1018h		Identification object		
	00h	Number of sub-index	Unsigned 8	3
	01h	Factory ID	Unsigned 32	60000
	02h	Product model	Unsigned 32	xxx
1400h		RxPDO1 communication parameter		
	00h	Number of sub-index	Unsigned 8	3
	01h	COB-ID	Unsigned 32	\$NodeID + 0x80000200
	02h	Communication	Unsigned 8	255
1401h	03h	Disable timer	Unsigned 16	0
		RxPDO2 communication		



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

		parameter		
	00h	Number of sub-index	Unsigned 8	3
	01h	COB-ID	Unsigned 32	\$NodeID + 0x80000300
	02h	Communication	Unsigned 8	255
	03h	Stop timer	Unsigned 16	0
1600h		RxPDO1 mapping parameter		
	00h	Number of sub-index	Unsigned 8	2
	01h	Mapping object 1	Unsigned 32	0x62000108
	02h	Mapping object 2	Unsigned 32	0x62000208
1601h		RxPDO2 mapping parameter		
	00h	Number of sub-index	Unsigned 8	4
	01h	Mapping object 1	Unsigned 32	0x20000108
	02h	Mapping object 2	Unsigned 32	0x20000208
	03h	Mapping object 3	Unsigned 32	0x20000320
	04h	Mapping object 4	Unsigned 32	0x20000410
1800h		TxPDO1 communication parameter		
	00	Number of sub-index	Unsigned 8	5
	01	COB-ID	Unsigned 32	\$NodeID + 0x80000180
	02	Communication	Unsigned 8	255
	03	Stop timer	Unsigned 16	50
	05	Event timer	Unsigned 16	100
1801h		TxPDO2 Communication parameter		
	00h	Number of sub-index	Unsigned 8	5
	01h	COB-ID	Unsigned 32	\$NodeID + 0x80000280
	02h	Communication	Unsigned 8	255
	03h	Stop timer	Unsigned 16	50
	05h	Event timer	Unsigned 16	100
1802h		TxPDO3 Communication parameter		
	00h	Number of sub-index	Unsigned 8	5
	01h	COB-ID	Unsigned 32	\$NodeID + 0x80000380
	02h	Communication	Unsigned 8	255
	03h	Stop timer	Unsigned 16	50
	05h	Event timer	Unsigned 16	100
1A00		TxPDO1 mapping parameter		
	00h	Number of sub-index	Unsigned 8	2
	01h	Mapping object 1	Unsigned 32	0x60000208
	02h	Mapping object 2	Unsigned 32	0x60000208
1A01		TxPDO2 mapping parameter		
	00h	Number of sub-index	Unsigned 8	2
	01h	Mapping object 1	Unsigned 32	0x21000110
	02h	Mapping object 2	Unsigned 32	0x21000220
1A02		TxPDO3 mapping parameter		
	00h	Number of sub-index	Unsigned 8	2
	01h	Mapping object 1	Unsigned 32	0x64010110
	02h	Mapping object 2	Unsigned 32	0x64010210

MxxxC Standard device parameters in the object dictionary



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

M100C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	2 DO Digital output	0	0	Bit0~bit2 stands for DIN1~2	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
		02	Duty cycle	5		Input 10%-90%	
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
		9					
04	Pulse Frequency 1-30000	10	5	Automatically multiply by 10,means output 10Hz-300KHz			
		11					
Input data Slaver->Master	6000	01	2 DI Digital input	0	0	Bit0~bit2 stands for DIN1~2	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	TxPDO2 (need to enable pulse input,if disable, then this part not working)
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
	8			4			
	9						
6401	01	AI1 Analog input	10	5		TxPDO3	
			11				
	02	AI2 Analog input	12	6			
			13				

M110C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	4 DO Digital output	0	0	Bit0~bit3 stand for DIN1~4	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
				02		Duty cycle	
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
		9					
04	Pulse Frequency	10	5	Automatically multiply by			
		11					



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

				1-30000		10,means output 10Hz-300KHz	
Input data Slaver->Master	6000	01	4 DI Digital input	0	0	Bit0~bit3 stand for DIN1~4	
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
				8	4		
				9			

M120C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	4 DO Digital output	0	0	Bit0~bit3 stand for DIN1~4	
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	
			Duty cycle	5		Input 10%-90%	
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
				9			
		04	Pulse Frequency 1-30000	10	5	Automatically multiply by 10,means output 10Hz-300KHz	
				11			
	6411	01	AO1 Analog output	12	6	Range 0~4095 relate to 0~10V,max load 1A	
				13			
02		AO2 Analog output	14	7	Range 0~4095 relate to 0~10V,max load 1A		
			15				
Input data Slaver->Master	6000	01	4 DI Digital input	0	0	Bit0~bit3 stand for DIN1~4	
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
				8	4		
				9			
6401	01	AI1 Analog input	10	5			
			11		TxPDO3		



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

	02	AI2 Analog input	12	6	
			13		
	03	AI3 Analog input	14	7	
			15		
	04	AI4 Analog input	16	8	
			17		

M130C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	4 DO Digital output	0	0	Bit0~bit3 stand for DIN1~4	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
				5			
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
				9			
04		Pulse Frequency 1-30000	10	5	Automatically multiply by 10,means output 10Hz-300KHz		
			11				
Input data Slaver->Master	6000	01	8 DI Digital input	0	0	Bit0~bit7 stand for DIN1~8	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	TxPDO2 (need to enable pulse input,if disable, then this part not working)
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
8	4						
9							

M140C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	8 DO Digital output	0	0	Bit0~bit7 stand for DIN1~8	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
				5			
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
				9			



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

		04	Pulse Frequency 1-30000	10	5	Automatically multiply by 10, means output 10Hz-300KHz	
				11			
Input data Slaver->Master	6000	01	8 DI Digital input	0	0	Bit0~bit7 stand for DIN1~8	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	TxPDO2 (need to enable pulse input, if disable, then this part not working)
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
				8	4		
				9			

M150C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	4 DO Digital output	0	0	Bit0~bit3 stand for DIN1~4	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output, if disable, then this part not working)
				5			
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
				9			
04		Pulse Frequency 1-30000	10	5	Automatically multiply by 10, means output 10Hz-300KHz		
			11				
Input data Slaver->Master	6000	01	8 DI Digital input	0	0	Bit0~bit7 stand for DIN1~8	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	1	Status byte refers to page 25	TxPDO2 (need to enable pulse input, if disable, then this part not working)
				5			
		02	Pulse Input	6	2	Statistics Pulse Input	
				7			
				8	3		
				9			
	6401	01	AI1 Analog input	10	4		TxPDO3
				11			
		02	AI2 Analog input	12	5		
				13			
03		AI3 Analog input	14	6			
			15				
04		AI4 Analog input	16	7			
			17				



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

M160C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	8 DO Digital output	0	0	Bit0~bit7 stand for DIN1~8	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
			Duty cycle	5		Input 10%-90%	
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
				9			
		04	Pulse Frequency 1-30000	10	5	Automatically multiply by 10,means output 10Hz-300KHz	
				11			
Input data Slaver->Master	6000	01	8 DI Digital input	0	0	Bit0~bit7 stand for DIN1~8	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	TxPDO2 (need to enable pulse input,if disable, then this part not working)
			5				
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
				8	4		
	9						
	6401	01	AI1 Analog input	10	5		TxPDO3
				11			
		02	AI2 Analog input	12	6		
				13			
		03	AI3 Analog input	14	7		
				15			
		04	AI4 Analog input	16	8		
				17			
	6401	05	AI5 Analog input	18	9		TxPDO4
				19			
06		AI6 Analog input	20	10			
			21				
07		AI7 Analog input	22	11			
			23				
08		AI8 Analog input	24	12			
			25				

M200C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6411	01	AO1 Analog output	0	0	Range 0~4095 relate to 0~10V, max load 1A	RxPDO2
				1			
		02	AO2	2	1	Range 0~4095	



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

			Analog output	3		relate to 0~10V, max load 1A	
Input data Slaver->Master							

M210C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6000	01	4 DI Digital input	0	0	Bit0~bit3 stand for DIN1~4	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	TxPDO2 (need to enable pulse input,if disable, then this part not working)
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
				8	4		
9							
Output data Master->Slaver	2000	01	Control byte	0	0	Control byte refers to page 25	RxPDO2
				1			

M220C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	4 DO Digital output	0	0	Bit0~bit3 stand for DIN1~4	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
				5			
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
		9					
		04	Pulse Frequency 1-30000	10	5	Automatically multiply by 10,means output 10Hz-300KHz	
11							

M230C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6401	01	AI1 Analog input	0	0		TxPDO2
				1			
		02	AI2 Analog input	2	1		
				3			
		03	AI3 Analog input	4	2		
				5			



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

	04	AI4 Analog input	6 7	3		
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M240C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6401	01	RTD1	0	0	PT100 accuracy 0.1 PT1000 accuracy 0.01	TxPDO2
				1			
		02	RTD2	2	1		
				3			
		03	RTD3	4	2		
				5			
		04	RTD4	6	3		
				7			

M310C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6000	01	8 DI Digital input	0	0	Bit0~bit7 stand for DIN1~8	TxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2100	01	Status byte	4	2	Status byte refers to page 25	TxPDO2 (need to enable pulse input,if disable, then this part not working)
				5			
		02	Pulse Input	6	3	Statistics Pulse Input	
				7			
8				4			
9							
Output data Master->Slaver	2000	01	Control byte	0	0	Control byte refers to page 25	RxPDO2

M320C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	8 DO Digital output	0	0	Bit0~bit7 stand for DIN1~8	RxPDO1
				1			
		02		2	1	Bit8~bit15 (reserved)	
				3			
	2000	01	Control byte	4	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
				5			
		03	Pulse Output	6	3	Specify Pulse Output	
				7			
				8	4		
		9					
		04	Pulse Frequency 1-30000	10	5	Automatically multiply by 10,means output 10Hz-300KHz	
11							

M330C Module I/O Transmission



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6401	01	AI1 Analog input	0	0		TxPDO2
				1			
		02	AI2 Analog input	2	1		
				3			
		03	AI3 Analog input	4	2		
				5			
		04	AI4 Analog input	6	3		
				7			
	6401	05	AI5 Analog input	8	4		
				9			
		06	AI6 Analog input	10	5		
				11			
		07	AI7 Analog input	12	6		
				13			
		08	AI8 Analog input	14	7		
				15			

M340C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6401	01	RTD1	0	0		TxPDO2
				1			
		02	RTD2	2	1		
				3			
		03	RTD3	4	2		
				5			
		04	RTD4	6	3		
				7			
	6401	05	RTD5	8	4		
				9			
		06	RTD6	10	5		
				11			
		07	RTD7	12	6		
				13			
		08	RTD8	14	7		
				15			

M410C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Input data Slaver->Master	6000	01	16 DI Digital input	0	0	Bit0~bit7 stand for DIN1~8	TxPDO1
				1			
		02		2	1	Bit8~bit15 stand for DIN9~16	
				3			
	2100	01	Status byte	2	1	Status byte refers to page 25	TxPDO2 (need to enable pulse input,if disable, then this part not working)
				3			
		02	Pulse Input	4	2	Statistics Pulse Input	
				5			
				6	3		
				7			



Industrial Remote I/O Module

CANopen I/O Data Acquisition Module

Output data Master->Slaver	2000	01	Control byte	0	0	Control byte refers to page 25	RxPDO2
				1			

M420C Module I/O Transmission

I/O data	Index	Sub-index	Function	Byte	Word	Description	PDO communication
Output data Master->Slaver	6200	01	16 DO Digital output	0	0	Bit0~bit7 stand for DIN1~8	RxPDO1
				1			
		02		2	1	Bit8~bit15 stand for DIN9~16	
				3			
	2000	01	Control byte	2	2	Control byte refers to page 25	RxPDO2 (need to enable pulse output,if disable, then this part not working)
				02			
		03	Pulse Output	4	3	Specify Pulse Output	
				5			
				6	4		
				7			
		04	Pulse Frequency 1-30000	8	5	Automatically multiply by 10,means output 10Hz-300KHz	
				9			

Status byte structure description:

Bit0	Bit1	Bit2	Bit3
Count function enable	Enable pulse output function(When control word=0 in pulse output controlling, the status clear to 0)	Pulse output status 0-No output 1-Outputting 2-Output finished	

Control byte structure description:

Bit0	Bit1	Bit2	Bit3
Clear DI1 pulse counting value 1-Always clear counting value	Pulse output direction 0- DO2 Output low 1- DO2 Output high	Pulse output controlling 0 - No output 1 - Output certain qty 2 - keep on outputting	

(The EDS file provided by factory and dealers.)

7. Warranty

- 1) This module is warranted to be free of defects in material and workmanship for one year.
- 2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions. In no event shall the manufacturer be liable for any module altered by purchasers

The End!

Any questions please help to contact us feel free.

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