

Industrial Class Design

Max. 10MHz High Speed Pulse Counter

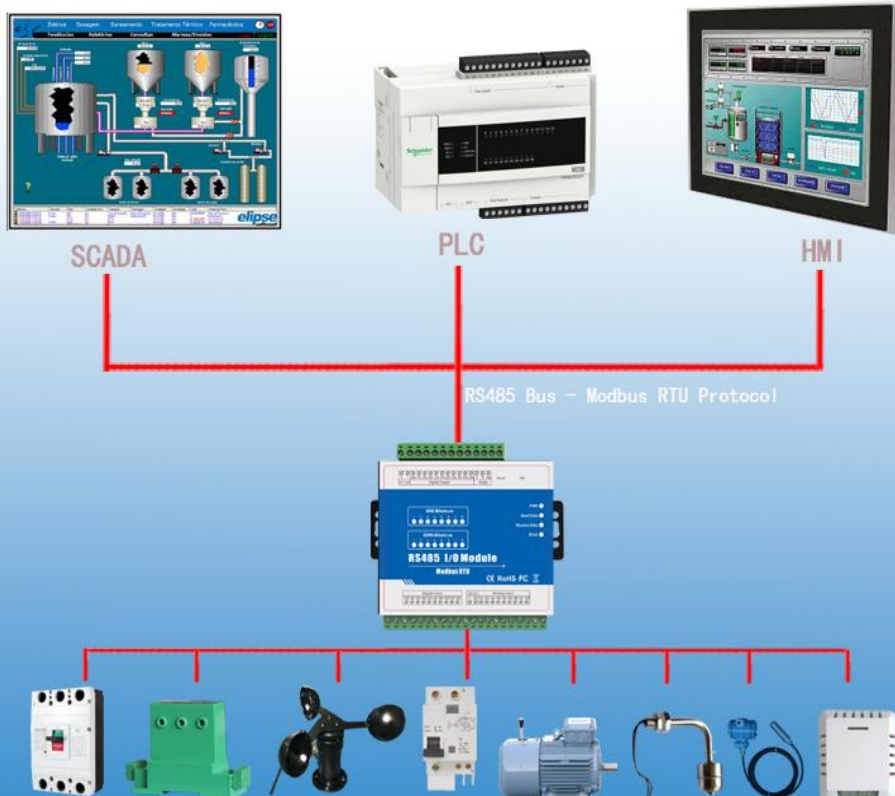
Max. 300KHz High Speed Pulse Output

Supports PWM Control

Industrial Remote I/O Module

Modbus RTU – RS485

KING PIGEON



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

M Series Modbus RTU Remote IO Module Working Diagram

Mxx Series Data Sheet

Ver 1.0

Date Issued: 2017-04-15

King Pigeon Hi-Tech. Co., Ltd.

www.GPRS-M2M.com



Industrial Remote I/O Module

Remote Data Acquisition Module

M Series Modbus Remote I/O Module Table

Model	Descriptions	DC Output	DC Input	Classic Power Consumption
M100	1 RS485, 2 DI, 2 AI, 2 DO(Sink) or Relay	1 DC	12~36VDC	0.84W-1.32W
M110	1 RS485, 4 DI, 4 DO(Sink) or Relay	1 DC		
M120	1 RS485, 4 DI, 4 AI, 2AO, 4 DO(Sink) or Relay	1 DC		
M130	1 RS485, 8 DI, 4 DO(Sink) or Relay	1 DC	12~36VDC	0.64W-1.84W
M140	1 RS485, 8 DI, 8 DO(Sink) or Relay	1 DC		
M150	1 RS485, 8 DI, 4 AI, 4 DO(Sink) or Relay	1 DC		
M160	1 RS485, 8 DI, 8 AI, 8 DO(Sink) or Relay	1 DC		
M200	1 RS485, 2AO	1 DC	12~36VDC	0.84W-1.32W
M210	1 RS485, 4 DI	1 DC		
M220	1 RS485, 4 DO(Sink) or Relay	1 DC		
M230	1 RS485, 4 AI	1 DC		
M240	1 RS485, 4 RTD, 2/3 wire PT100/pt1000	---		
M310	1 RS485, 8 DI	1 DC	12~36VDC	0.64W-1.84W
M320	1 RS485, 8 DO(Sink) or Relay	1 DC		
M330	1 RS485, 8 AI	1 DC		
M340	1 RS485, 8 RTD, 2/3 wire PT100/pt1000	↖	12~36VDC	0.6W-0.84W
M410	1 RS485, 16 DI	1 DC		
M420	1 RS485, 16 DO(Sink) or Relay	↖		

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: M240, M340 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.



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.	Initialize/Reset the Module -----	10
7.	Settings & Operation the Module -----	10
8.	Register List, Modbus Function Code, Register Address, Data Type -----	12
9.	Warranty -----	18

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.

King Pigeon Hi-Tech.Co., Ltd, its employees and distributors, accept no liability for any loss or damage including consequential damage due to reliance on any material contained in this handbook.

King Pigeon Hi-Tech.Co., Ltd, its employees and distributors, accept no liability for any Network upgrading or due to the technology specifications contained in this handbook.

【UPGRADE HISTORY】

DATE	FIRMWARE VERSION	HARDWARE VERSION	DESCRIPTION



Industrial Remote I/O Module

Remote Data Acquisition Module

1. Brief introduction

The M Series Modbus Remote I/O Module is an industrial class, isolated designed, high reliability, high stability and high precision data acquisition module, embedded 32-Bit High Performance Microprocessor MCU, provides a RS485 interface. It provides multi I/O, supports standard Modbus RTU, 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, security monitoring system, automatically measurement and control system.

The M Series Modbus Remote I/O module provides different I/O ports for variety applications. Includes optical-isolated digital inputs, compatibles dry contact and wet contact, supports max 10MHz high speed pulse counter, the DIN1 can be used for encode, digital outputs supports 10Hz~300Khz high speed pulse output or relay outputs, 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, isolated 12bits analog inputs, supports 0~5V, 0~10V, 4~20mA, 0~20mA analog signal, 12bits analog outputs, supports 0~10VDC signal output, resistance thermal detector inputs compatibles 2/3 wires PT100 and PT1000. All of the I/O ports are high sampling frequency and special filtering strategy to ensure its reliability.

The M Series Modbus Remote I/O module can work at wide working voltage range, the range is 12 ~ 36VDC with anti-reverse protection design. Also, it provides 1channel 12~36VDC power output for external device to save wiring cost.

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 USB to RS485 Converter

3. Mainly Features

- Embedded 32-Bit High Performance Microprocessor MCU, inbuilt watchdog;
- Power supply 12~36VDC with over voltage and phase-reversal protection;
- Optical isolated digital input(Compatible Dry or Wet type);
- DIN1 supports max 10MHz high speed pulse counter, can be used to encode measurement;
- Digital output(Sink) or relay output, supports 10Hz~300KHz high speed pulse output;
- 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;
- Isolated analog input, 12-bit resolution, supports 0~20mA,4~20mA,0-5VDC, 0-10VDC;
- Analog output, 12-bit resolution, supports 0-10VDC;
- RTD input, supports PT100 and PT1000 resistance sensor, compatible 2 or 3 wires;
- High sampling frequency and special filtering strategy to ensure reliability;
- 1 RS485 Serial port, supports Modbus RTU slave;
- Provides 1 channel VDC power source output for external device, saving wiring cost;
- LED instructions work status, with reset button to reset, easy on-site installation and commissioning;



Industrial Remote I/O Module

Remote Data Acquisition Module

- 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.

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. 10Mhz(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(DC 5A/30V, 5A/250VAC)
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, the output duty cycle from 10-90%; DO2 can be used to control the direction of the stepper motor.)
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 (backside switch selectable)
Input Range	0~5VDC , 0~10VDC, 0~20 mA, 4~20mA,



Industrial Remote I/O Module

Remote Data Acquisition Module

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
Measurement Range	-120~+420°C
Resolution	0.1°C or 0.1 ohm
Input Connection	2- or 3-wire
Accuracy	±0.1% FSR @ 25°C ±0.3% FSR @ -40 and 75°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
• Serial Port	
RS485	MODBUS RTU Slave.
Protection	15KV ESD Protection
Modbus Slave address	1~247



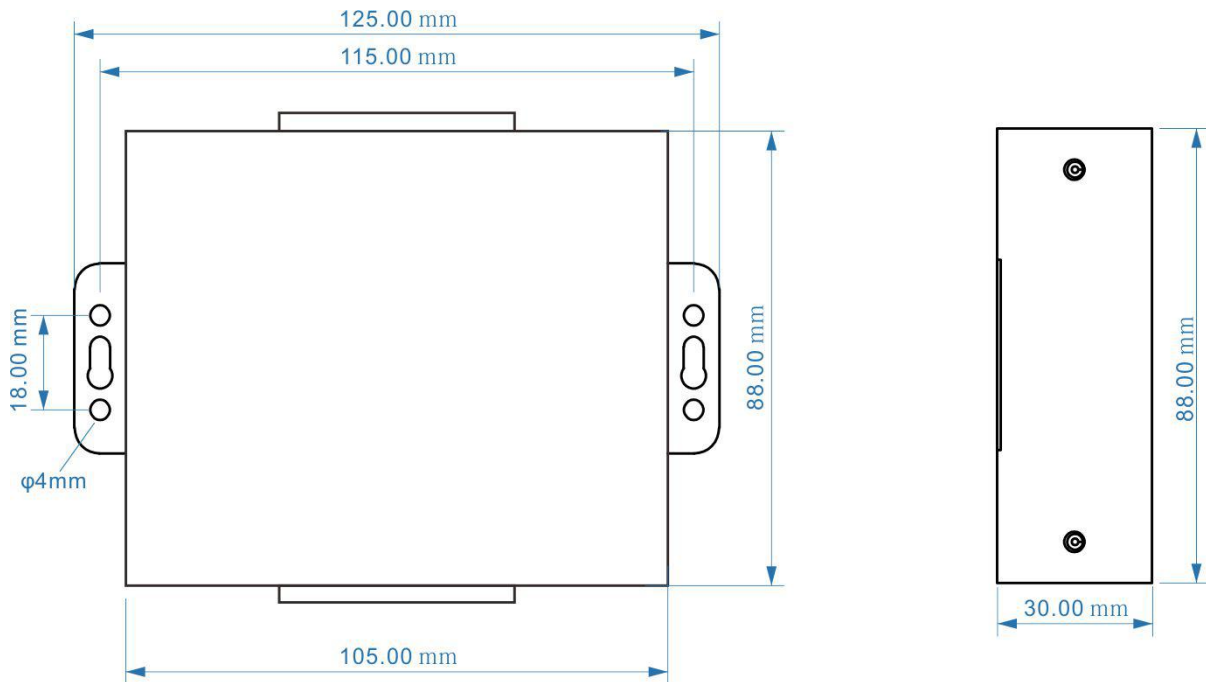
Industrial Remote I/O Module

Remote Data Acquisition Module

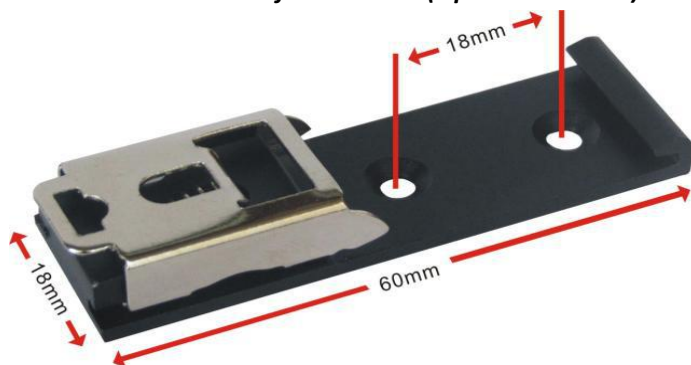
Response Time	10mS
Baud Rate	1200,2400,4800,9600,19200,38400,57600,115200Bps;
• Physical Characteristics	
Wiring	I/O cable max. 14 AWG
Dimensions	105 x 88 x 30 mm
Weight	Under 205 g
Mounting	DIN rail or wall
• Environmental Limits	
Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F) Wide 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

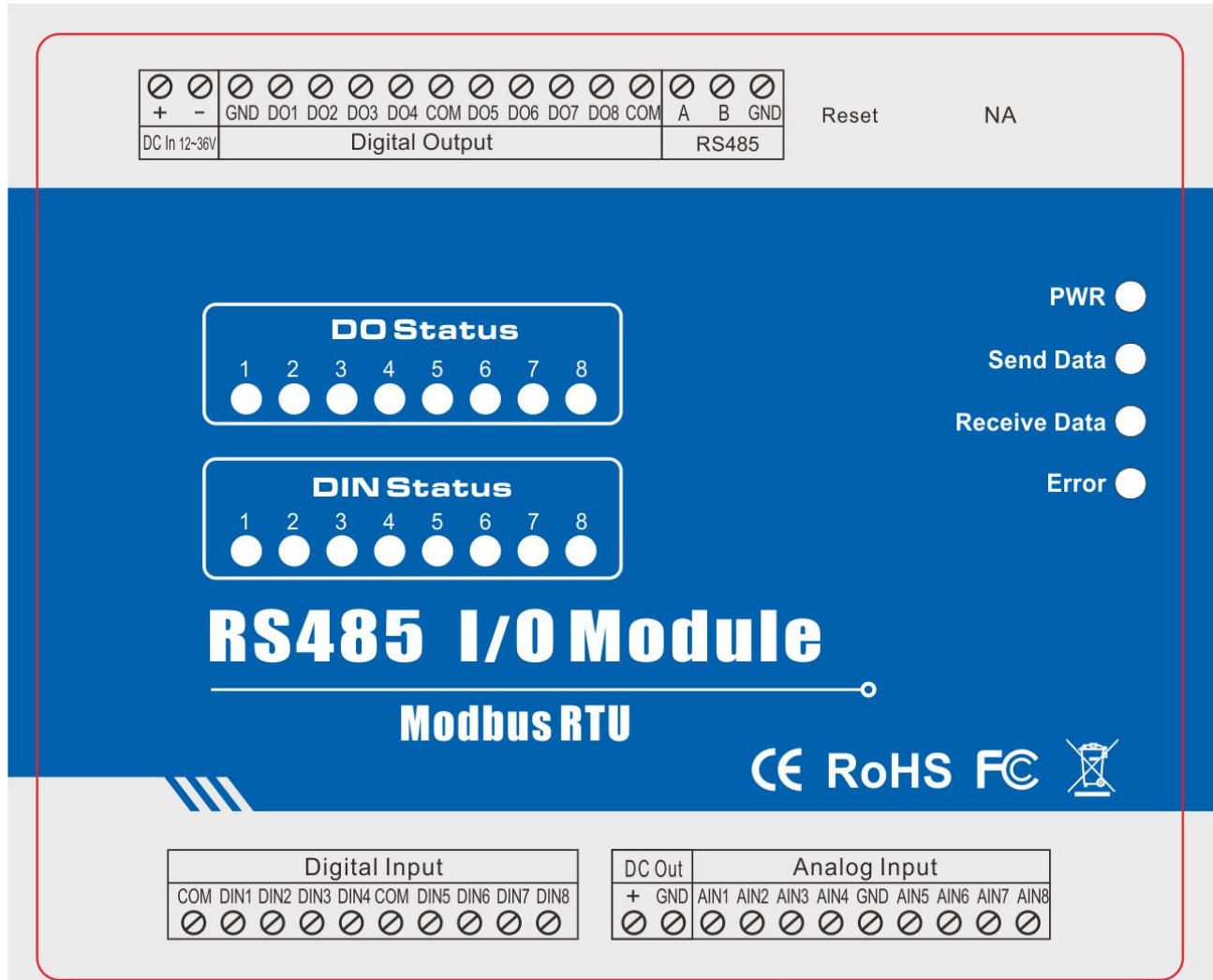








35mm Standard DIN rail fixed Bracket(Optional Bracket)



35mm DIN Rail Fixed Bracket

5.2 Led Instruction



LED Indicator Instruction	
	Power Indicator: Power on the module will always on.
	RS485 transmit data indicator, when the Slave responses data to Master will on.
	RS485 receive data Indicator, when the Slave received data from Master will on.
	Error Indicator: will turn on when power on occurs error or upgrade firmware failure.
	Digital input status indicator, turn on while status change.
	Digital Output status indicator, turn on while relay close or Sink output high level.

5.3 Interface Instructions for installation



Industrial Remote I/O Module

Remote Data Acquisition Module

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.
DC Out	+	DC Power output positive for external device, output voltage= input voltage.
	GND	DC Power output negative port.
Reset		Reset button. Recovery the parameters to factory default value.
Ethernet RJ45		Reserved
RS485	A	RS485 data A
	B	RS485 data B
	GND	RS485 data ground if required.
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.

Any questions please help to contact us feel free.

[Http://www.GPRS-M2M.com](http://www.GPRS-M2M.com)