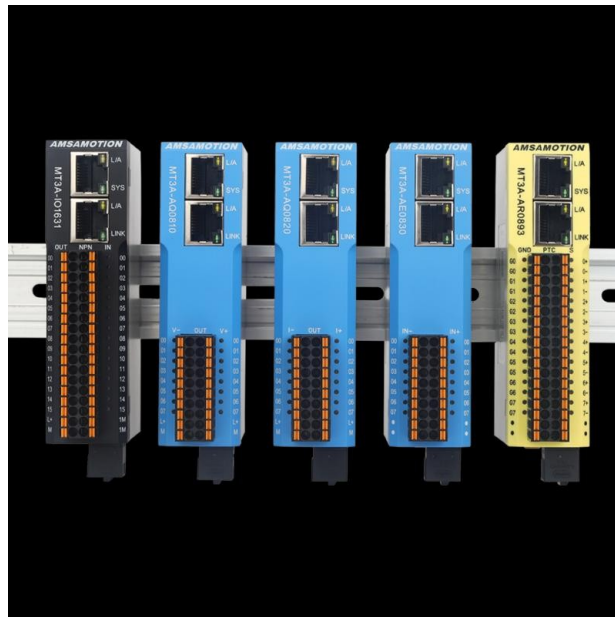


MT3A Series Product User Manual

English translation of AMSAMOTION MT3A series manual, V1.3



Original revision date: 2026-02-05

Source: AMSAMOTION Chinese manual

Table of Contents

Preface

1. Product Overview

1.1 Product Introduction

1.2 Product Features

1.3 Model List

2. Product Specifications

2.1 General Parameters

2.2 Digital Module Parameters

2.3 Analog Module Parameters

2.4 Temperature Module Parameters

2.5 Weighing Module Parameters

3. Product Structure and Wiring

3.1 Common Indicator Description

3.2 Button Description

3.3 Wiring Precautions and Requirements

3.4 Digital Module Wiring Diagrams

3.5 Analog Module Wiring Diagrams

3.6 Temperature Module Wiring Diagrams

3.7 Weighing Module Wiring Diagrams

4. Product Functions

4.1 Modbus TCP Server

4.2 Modbus TCP Client

4.3 Ethernet Port Expansion Function

5. Web Parameter Configuration

5.1 Web Login

5.2 Master/Slave IP Settings

5.3 Bus Error Output State Configuration

5.4 Network Master/Slave Data View

6. Register Address Description

Revision History

About Us

Preface

Manual content

This manual mainly describes the parameters, Ethernet-port expansion function, wiring, and other information for AMSAMOTION MT3A series modules. It is intended as a reference for customers who have purchased this product.

Instructions for use

- This product is professional equipment intended for industrial applications and must be used only by personnel with electrical-operation experience.
- The examples in this manual are provided only for user reference and understanding. If you have questions, contact AMSAMOTION technical personnel.
- When this module is used together with other products, make sure that the complete system complies with the applicable technical specifications.

Contact information

If you have questions about using this module, please contact your distributor or sales representative, or contact AMSAMOTION by phone.

Item	Details
Website	http://amsamotion.com
E-mail	amx@amsamotion.com
Phone	4001-522-518, press 1 for technical support; press 2 for sales
Address	Building 1, Yonglida Industrial Park, No. 1 Xinwen Third Street, Daojiao Town, Dongguan City, Guangdong Province, China

1. Product Overview

1.1 Product Introduction

The MT3A series modules use a Modbus TCP bus interface. Each module has an integrated switch and two industrial Ethernet ports. The modules are compact and provide high real-time performance. Input and output types include digital, analog, temperature, and weighing functions, covering a wide range of application requirements.

1.2 Product Features

- Compact structure and small footprint: only 105 x 70 x 28 mm.
- 100 Mbit/s industrial Ethernet ports with integrated two-port switch function.
- Supports Ethernet-port expansion: up to 17 modules use only one communication resource.
- Supports both TCP client and TCP server connection modes.
- Rich module lineup with complete I/O types.
- Compatible with mainstream Modbus TCP master stations.
- DIN 35 mm standard rail mounting and spring-cage terminals for easy installation and wiring.

1.3 Model List

Model	Product description
Digital modules	
MT3A-IO1631	16-channel digital input (PNP/NPN), 16-channel digital output (NPN)
MT3A-IO1632	16-channel digital input (PNP/NPN), 16-channel digital output (PNP)

MT3A-OD3201	32-channel digital output (NPN)
MT3A-OD3202	32-channel digital output (PNP)
MT3A-ID3230	32-channel digital input (PNP/NPN)
MT3A-ID1630	16-channel digital input (PNP/NPN)
Analog modules	
MT3A-AE0830	8-channel analog voltage/current input
MT3A-AE1630	16-channel analog voltage/current input
MT3A-AQ0810	8-channel analog voltage output
MT3A-AQ0820	8-channel analog current output
Temperature modules	
MT3A-AR0893	8-channel RTD input
MT3A-AT0892	8-channel thermocouple input
Weighing module	
MT3A-AW0415	4-channel weighing input

2. Product Specifications

2.1 General Parameters

Category	Parameter	Value
Interface parameters	Bus protocol	Modbus TCP
Interface parameters	Default IP address	192.168.1.12
Interface parameters	Ethernet-port expansion capacity	16 modules
Interface parameters	Transmission rate	100 Mbps
Interface parameters	Transmission distance	≤100 m between two stations
Interface parameters	Bus interface	2 x RJ45
Technical parameters	Power supply	24 V DC (20-28 V)
Technical parameters	Dimensions	28 x 105 x 70 mm (without terminals) / 28 x 105 x 86 mm (with terminals)
Technical parameters	Operating temperature	-10 °C to +60 °C
Technical parameters	Storage temperature	-20 °C to +70 °C
Technical parameters	Relative humidity	95%, non-condensing
Technical parameters	Protection rating	IP20

2.2 Digital Module Parameters

Digital input

Parameter	Value
Signal type	NPN/PNP
"0" signal voltage (PNP)	-3 to +3 V
"1" signal voltage (PNP)	15 to 30 V
"0" signal voltage (NPN)	15 to 30 V
"1" signal voltage (NPN)	-3 to +3 V
Input filtering	20 ms
Input current	4 mA
Isolation	Optocoupler isolation

Digital output

Parameter	Value
Signal type	NPN/PNP (according to model list)
Rated current per channel	Maximum 0.5 A per channel; maximum load current 2 A for each continuous group of 8 channels
Isolation	Optocoupler isolation

2.3 Analog Module Parameters

Analog input

Parameter	Value
Input signal (voltage)	0-10 V (0-10000)

Input signal (current)	0-20 mA (0-20000)
Resolution	0.001 V; 0.001 mA; 14-bit
Sampling rate	0.1 s
Accuracy	0.2% FS
Input impedance (voltage)	100 kΩ
Input impedance (current)	100 Ω

Analog output

Parameter	Value
Output signal (voltage)	0-10 V (0-10000)
Output signal (current)	0-20 mA (0-20000)
Resolution	0.003 V; 0.005 mA; 12-bit
Accuracy	Voltage: 0.3% FS; current: 0.5% FS
Load impedance requirement (voltage)	≥1000 Ω
Load impedance requirement (current)	≤600 Ω

2.4 Temperature Module Parameters

MT3A-AR0893

Parameter	Value
Input signal type	PT50, PT100, PT200, PT500, PT1000, CU50, CU100. PT-series sensors support only 0.385055; CU-series sensors support only 0.0042.
Resolution	0.01 °C
Error	PT100/PT1000: ±0.35 °C; PT50/PT200/PT500/CU50/CU100: ±0.50 °C
Measurement range	PT series: -50 to 300 °C; CU series: -50 to 150 °C
Digital conversion range	PT series: -5000 to 30000; CU series: -5000 to 15000. Note: divide the read code value by 100 to obtain the actual temperature.
Sampling rate	6 ms per channel

MT3A-AT1692 / MT3A-AT0892

Parameter	Value
Input signal type	B, E, J, K (default), R, S, T, N
Resolution	0.1 °C
Error	±2 °C
Measurement range	B: 100 to 1820 °C; E: -270 to 1000 °C; J: -210 to 1200 °C; K: -270 to 1372 °C; R: -50 to 1768 °C; S: -50 to 1768 °C; T: -270 to 400 °C; N: -260 to 1300 °C
Digital conversion range	Actual temperature x 10 = corresponding digital value
Sampling rate	When filter parameter = 0: approximately 0.2 s; when filter parameter = 10: approximately 2 s

2.5 Weighing Module Parameters

MT3A-AW0415

Parameter	Value
Sensor type	Resistive strain-gauge sensor
Sensor excitation	5 V DC ±1%, maximum current 50 mA
Module resolution	1.1 mV/V: digital output 0-50000, weight value -999999 to 999999, maximum resolution 0.25 μV; 2.2 mV/V: 0.5 μV; 3.3 mV/V: 0.75 μV
Error	Full-scale error (combined accuracy): ≤0.03% F.S.; relative error: ≤0.08%
Sampling rate and conversion time	At 50 Hz, default sampling depth: 7, moving step: 1. At 100 Hz, default sampling depth: 10, moving step: 1. With the default configuration, measured conversion times are 185 ms/ch at 50 Hz and 120 ms/ch at 100 Hz.

3. Product Structure and Wiring

3.1 Common Indicator Description

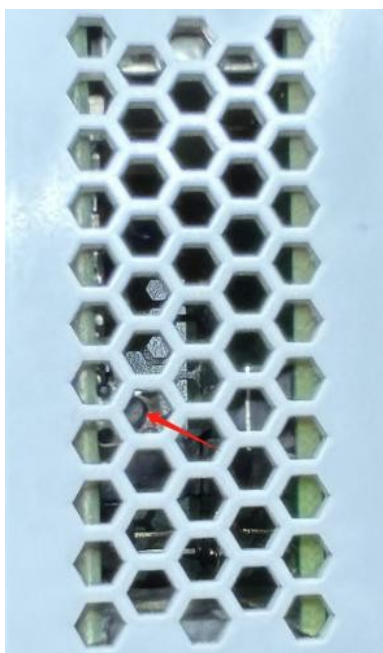
Mark	Name	Status description
L/A	Ethernet-port indicator	On: Ethernet port is connected normally. Off: Ethernet port network connection is abnormal.
SYS	System indicator	1) On for 1 s after power-on. 2) Slow flashing when communication with the upper computer is normal (0.5 s on, 0.5 s off). 3) Fast flashing when communication with the upper computer is disconnected (0.1 s on, 0.1 s off).
L/A	Ethernet-port indicator	On: Ethernet port is connected normally. Off: Ethernet port network connection is abnormal.
LINK	Master/slave indicator	1) On for 1 s after power-on. 2) Master: fast flashing when all slaves are connected normally (0.1 s on, 0.1 s off); slow flashing when one or more slaves are not connected or when a data error/timeout occurs in communication with a slave (0.5 s on, 0.5 s off). 3) Slave: off when not connected to the master; steady on after normal connection to the master.

3.2 Button Description

Reset: within 30 seconds after power-on, press and hold the reset button for 3 seconds and release it within 5.5 seconds to restore factory settings. Reset data includes user-name information, all network configuration parameters, and all function configuration parameters.

Enter BOOT mode: hold the button while powering on the module; release the button after the SYS indicator flashes quickly.

The reset button is on the non-power side, as shown below.



Reset button position, non-power side

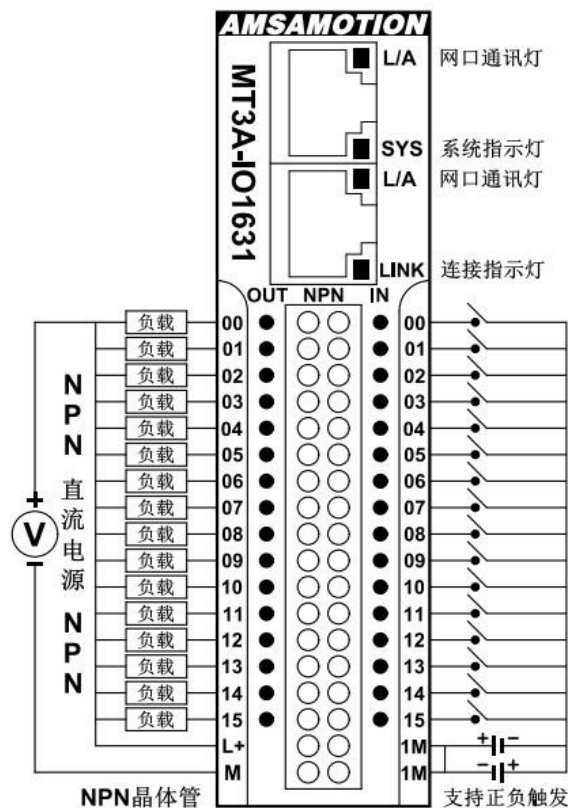
3.3 Wiring Precautions and Requirements

The terminal block uses a screwless design. Cable installation and removal can be performed with a flat-blade screwdriver (size ≤ 3 mm). The recommended stripping length is 10 mm. For power wiring, use a 24 V DC power module and connect PE reliably to ground.

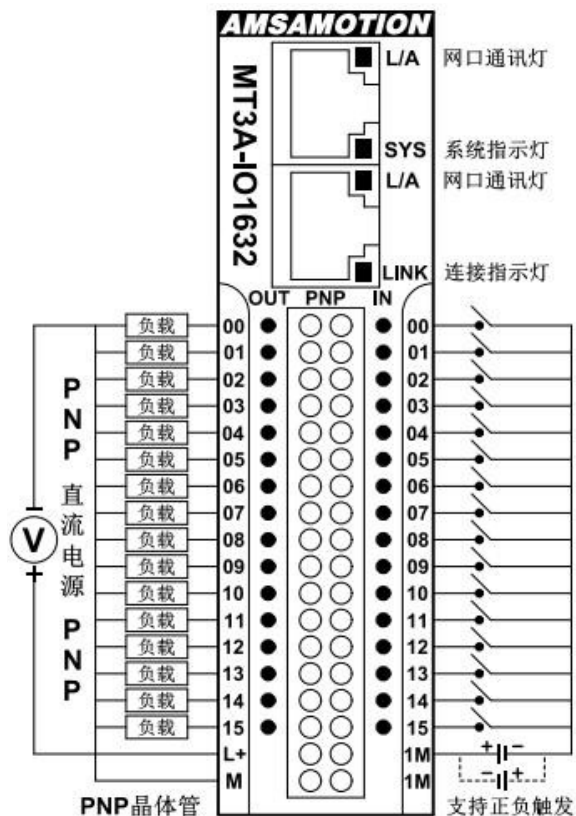
For bus connection, use a standard RJ45 network interface and standard RJ45 crystal plug. Category 5 or higher double-shielded network cable is recommended. If the Ethernet-port expansion function is not used, the two Ethernet ports function as a switch and either port can be used. The cable length between devices must not exceed 100 m.

3.4 Digital Module Wiring Diagrams

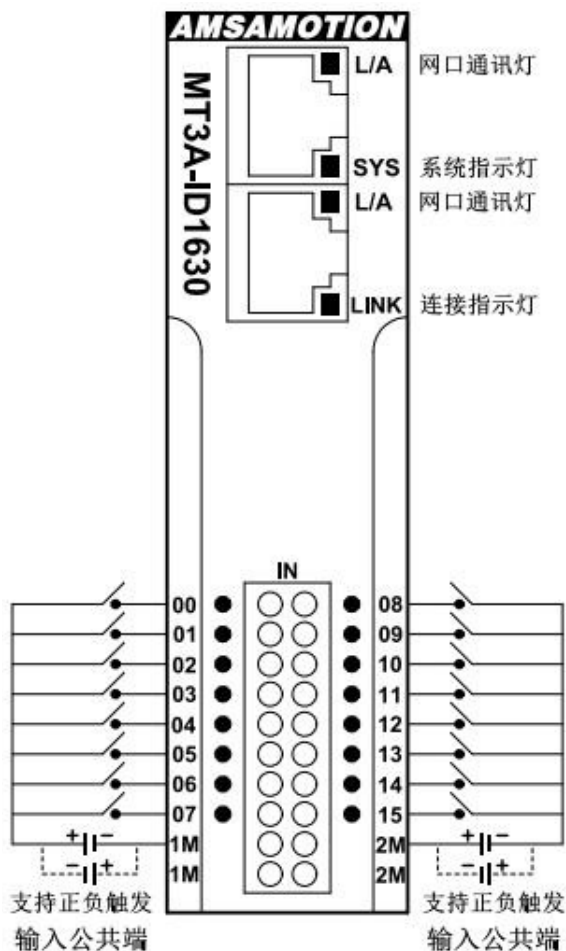
Common labels in the original diagrams: Load = load; DC power supply = DC supply; NPN/PNP transistor = output transistor type; positive/negative trigger = supported trigger polarity; input common = input common terminal; L/A = Ethernet communication indicator; SYS = system indicator; LINK = link indicator.



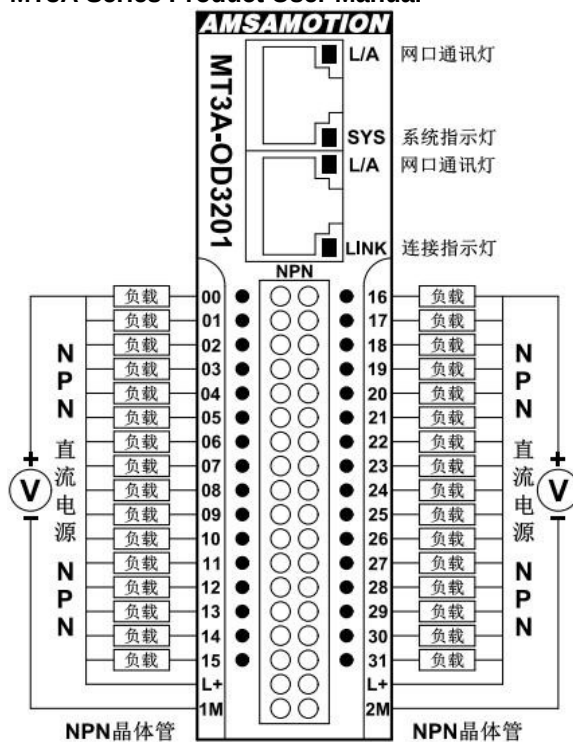
MT3A-IO1631 digital I/O wiring



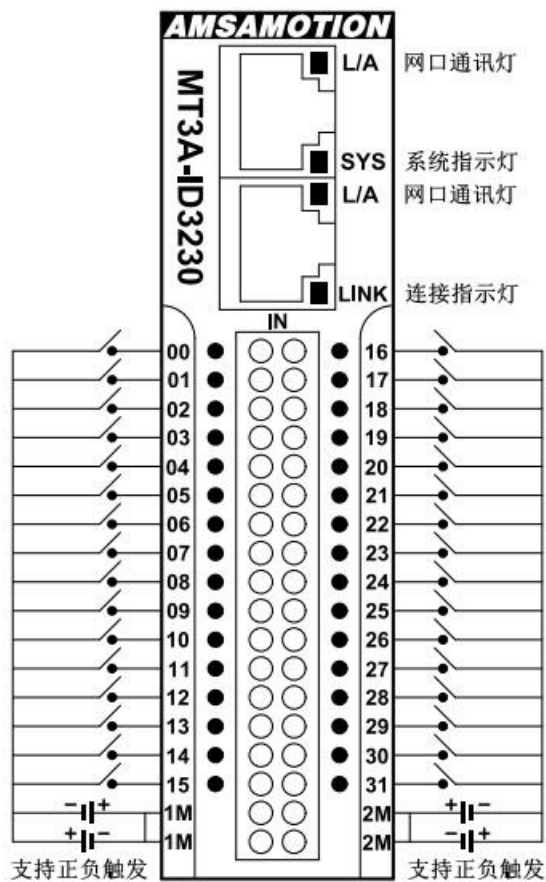
MT3A-IO1632 digital I/O wiring



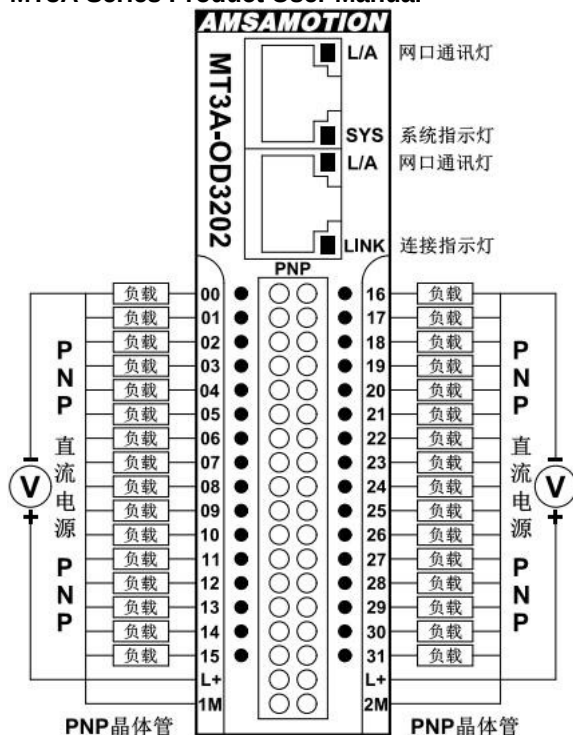
MT3A-ID1630 digital input wiring



MT3A-OD3201/OD3202 digital output wiring, part 1



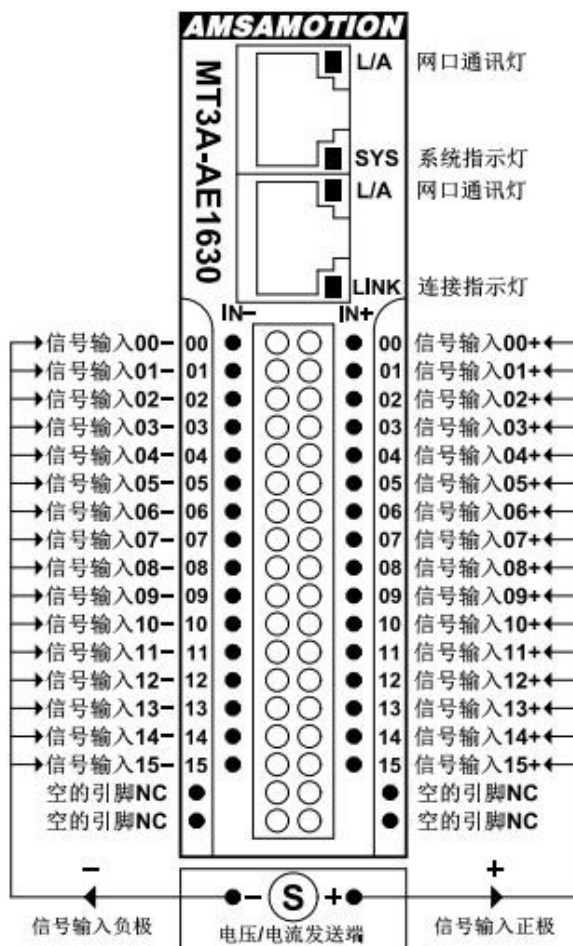
Digital output wiring, part 2

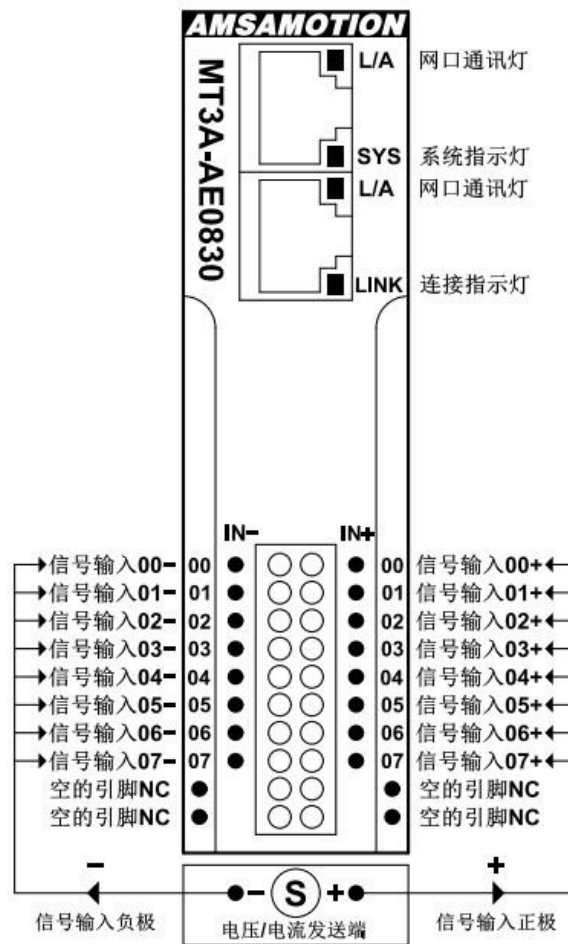


Digital output wiring, part 3

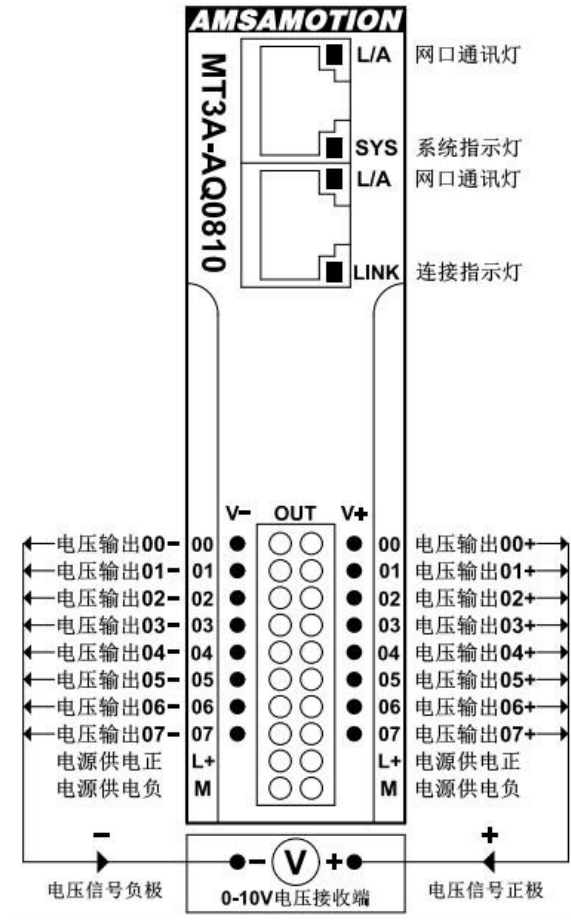
3.5 Analog Module Wiring Diagrams

Analog input and output diagrams show voltage/current terminals, analog ground, and shield/ground references for the corresponding module variants.



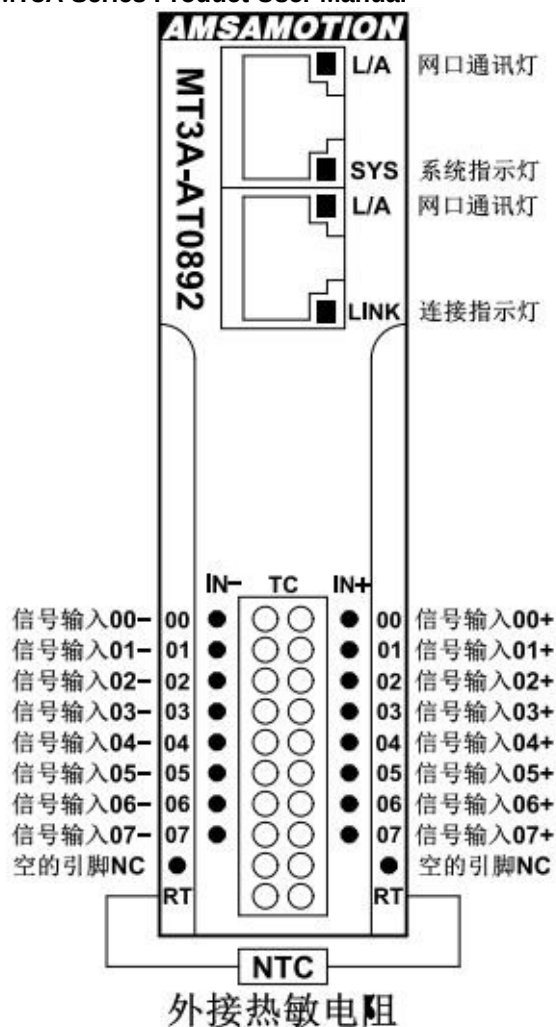


MT3A-AQ0810 voltage output wiring



MT3A-AQ0820 current output wiring

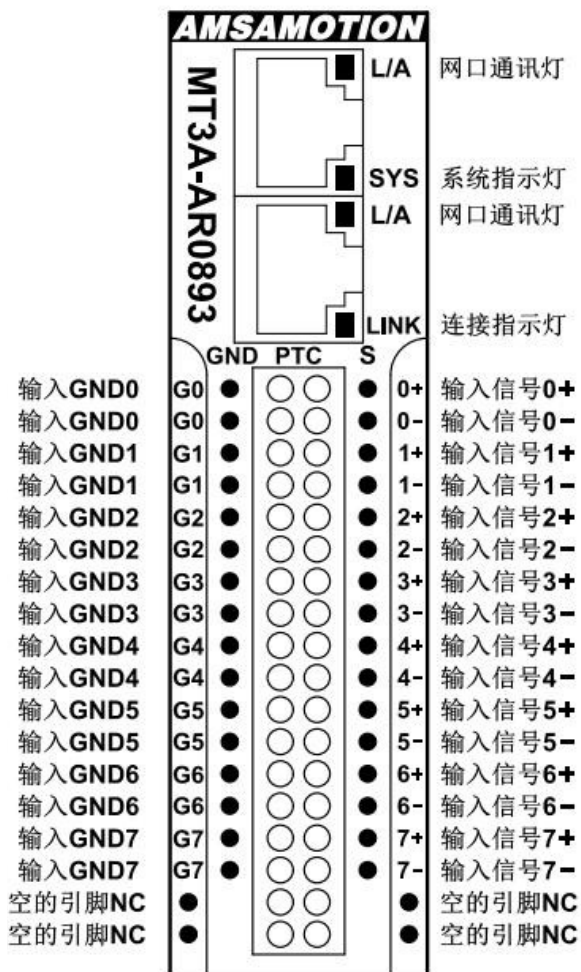




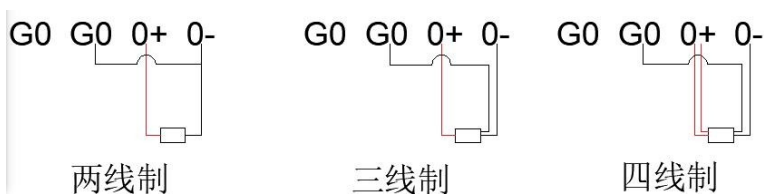
Thermocouple temperature input wiring

3.7 Weighing Module Wiring Diagrams

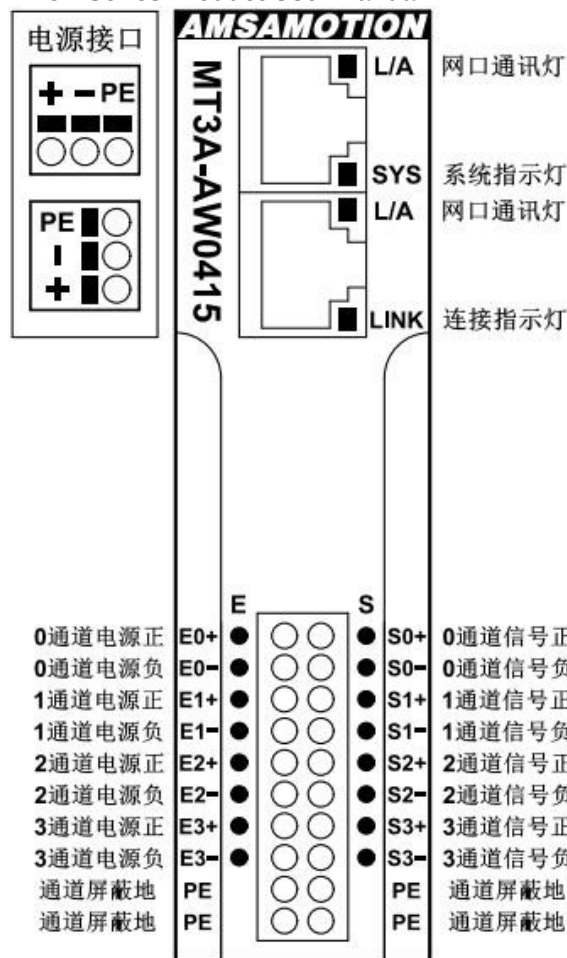
Weighing-module labels include excitation, feedback, signal, analog ground, and sensor wiring arrangements. The small bridge diagrams show four-wire, three-wire, and two-wire connection methods.



MT3A-AW0415 weighing input wiring



Bridge connection methods



Weighing module terminal wiring

4. Product Functions

4.1 Modbus TCP Server

As a TCP server, the module can accept up to two Modbus TCP client connections. Clients access the module through the Modbus TCP protocol.

Category	Parameter detail	Description
Master IP	192.168.1.12	Factory default; can be changed on the web page
Local port	502	Factory default; can be changed on the web page
Master station number	1	Factory default; setting range: 1-254

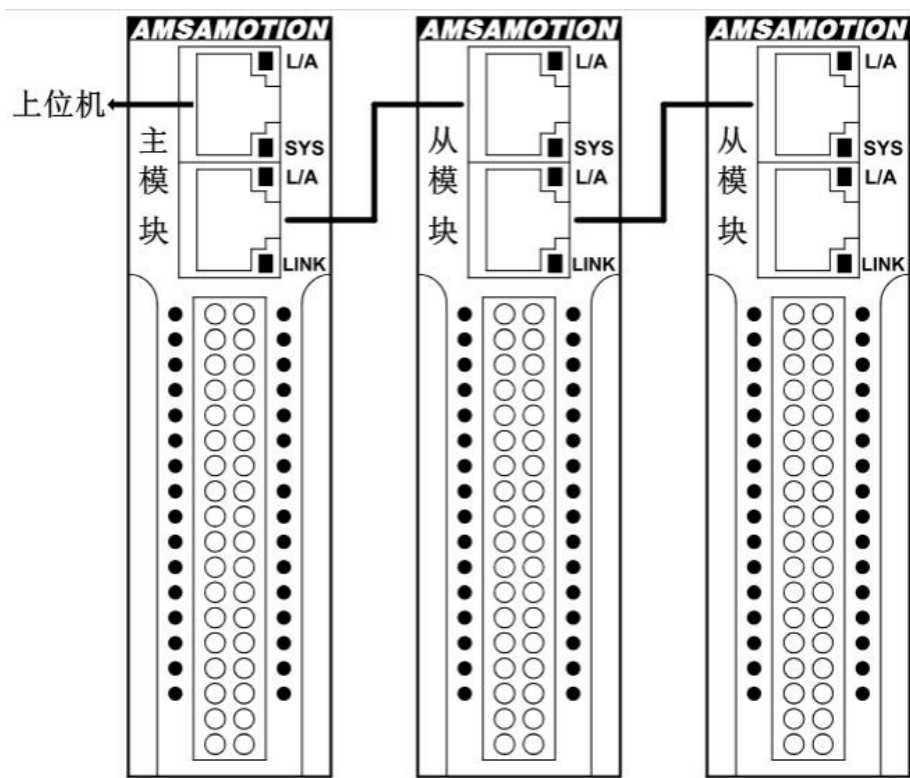
4.2 Modbus TCP Client

The module provides a TCP client mode for connecting to a remote server. The server accesses the module through the Modbus TCP protocol.

Category	Parameter detail	Description
Upper-computer IP address	192.168.1.13	Factory default; can be changed on the web page
Local port	8080	Factory default; can be changed on the web page
Master station number	1	Factory default; setting range: 1-254

4.3 Ethernet Port Expansion Function

The module is factory-configured as a master by default. One master can connect to up to 16 slaves. Each network slave can automatically map the registers of this module into the network master.



Ethernet port expansion topology

The following procedure describes how to form a one-master/multiple-slave network in a local area network. Each module must be connected individually to a computer or LAN switch for configuration. Do not connect multiple unconfigured modules to the LAN at the same time, otherwise IP address conflicts may occur. When the “Master/Slave selection” or “Slave selection” parameter changes, the IP address changes accordingly. For example, when a module is changed from network master to network slave and “Slave selection” is set to slave station 2, the IP address changes from 192.168.1.12 to 192.168.1.21.

Category	Parameter detail	Description
Master/slave selection	Network master	
Slave selection	Station 0	Not selectable
Number of slaves	16	Set according to the actual number used
Master IP	192.168.1.12	Factory default; can be changed as required
Slave IP 1-IP16	192.168.1.20-35	Factory default; can be changed as required

Category	Parameter detail	Description
Master/slave selection	Network slave	
Slave selection	Station 1	Set according to the actual order of this module
Number of slaves	0	Not selectable
Master IP	192.168.1.12	Factory default; can be changed as required
Slave IP 1-IP16	192.168.1.20-35	Factory default; can be changed as required

5. Web Parameter Configuration

5.1 Web Login

Open a browser and enter the module IP address. The default IP address is 192.168.1.12. On the login page, enter “amx666” as both the login account and login password, and click the login button to enter the module parameter page.

Web login page

5.2 Master/Slave IP Settings

配置网络参数

通讯模块型号:	MT3A-IO1631	固件版本号:	1.0	MAC地址:	84:B3:86:D1:00:00
设备名称:		默认网关:	192.168.1.1	子网掩码:	255.255.255.0
网络主从选择:	网络主站	网络站号选择:	0号站	网络从站数量:	0
上位机IP地址:	192.168.1.13	上位机端口号:	8080	本地端口号:	502
网络主站 IP:	192.168.1.12	网络从站 IP 1:	192.168.1.20	网络从站 IP 2:	192.168.1.21
网络从站 IP 3:	192.168.1.22	网络从站 IP 4:	192.168.1.23	网络从站 IP 5:	192.168.1.24
网络从站 IP 6:	192.168.1.25	网络从站 IP 7:	192.168.1.26	网络从站 IP 8:	192.168.1.27
网络从站 IP 9:	192.168.1.28	网络从站 IP 10:	192.168.1.29	网络从站 IP 11:	192.168.1.30
网络从站 IP 12:	192.168.1.31	网络从站 IP 13:	192.168.1.32	网络从站 IP 14:	192.168.1.33
网络从站 IP 15:	192.168.1.34	网络从站 IP 16:	192.168.1.35		

Master/slave IP settings

5.3 Bus Error Output State Configuration

总线错误判定时间:	2秒							
本机寄存器:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	16
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0

Bus error output state configuration

- Bus-error judgment time setting: value range 0.5 s to 5 s.

1) When the module acts as a master, if erroneous data is received from the upper computer or if the disconnection time exceeds this parameter, it is considered a master bus error. The master sends this error information to all network slaves. The Run indicator red LED on the master and slave modules flashes.

2) When the module acts as a slave, if the communication disconnection time between the slave and master exceeds this parameter, it is considered a slave bus error. The Link indicator on the slave module turns off.

5.4 Network Master/Slave Data View

网络主站寄存器:	线圈寄存器 DO 个数	16	离散寄存器 DI 个数	16	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 1:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 2:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 3:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 4:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 5:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 6:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 7:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
网络从站寄存器 8:	线圈寄存器 DO 个数	0	离散寄存器 DI 个数	0	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0
系统总寄存器:	线圈寄存器 DO 个数	16	离散寄存器 DI 个数	16	只读寄存器 RO 个数	0	保持寄存器 RW 个数	0
	线圈寄存器 DO 地址	0	离散寄存器 DI 地址	0	只读寄存器 RO 地址	0	保持寄存器 RW 地址	0

Network master/slave data view

1) Coil-register DO, DI, RO, and RW addresses indicate the mapped addresses of the data read/write access area for the network master itself and for each corresponding network slave.

2) After the network configuration of one network master and one or more network slaves is completed, this item displays the same data whether it is viewed from the network master or from any network slave.

6. Register Address Description

6.1 Digital Input/Output Addresses

Name	PLC corresponding address	Modbus corresponding address	Supported function code
Input channels 1-16	10001-10016	0x0000-0x000F	0x02
Output channels 1-16	00001-00016	0x0000-0x000F	0x01, 0x05, 0x0F

6.2 Analog Input, Temperature, and Weighing Addresses

PLC corresponding address	Modbus corresponding address (word)	Supported function code
30001-3XXXX	0x0000-0xFFFF	0x04

6.3 Analog Output Addresses

PLC corresponding address	Modbus corresponding address	Supported function code
---------------------------	------------------------------	-------------------------

	(word)	
40001-4XXXX	0x0000-0xFFFF	0x03, 0x06, 0x10

Notes:

- The addresses above are single-module addresses. If the Ethernet expansion function is used, module addresses are automatically arranged in sequence and can be viewed on the web page.
- One weighing-module channel occupies two words.

Revision History

Version	Revision date	Revision description	Maintainer
1.0	2024-05-08	Initial version	Zhang
1.1	2025-04-18	Models added	Zhang
1.2	2025-09-18	Models added	Zhang
1.3	2026-02-05	Models added	Zhang

About Us

Item	Details
Company name	Dongguan AMSAMOTION Automation Technology Co., Ltd.
Official website	www.amsamotion.com
Technical service	4001-522-518, press 1
Company e-mail	sale@amsamotion.com
Company address	Building 1, Yonglida Industrial Park, No. 1 Xinwen Third Street, Daojiao Town, Dongguan City, Guangdong Province, China



Official WeChat account and official Douyin account

Translation note: This English document was prepared from the Chinese MT3A Series Product User Manual V1.3. Product names, register ranges, IP addresses, electrical ratings, and model identifiers are retained as in the source manual.