



PRODUCT

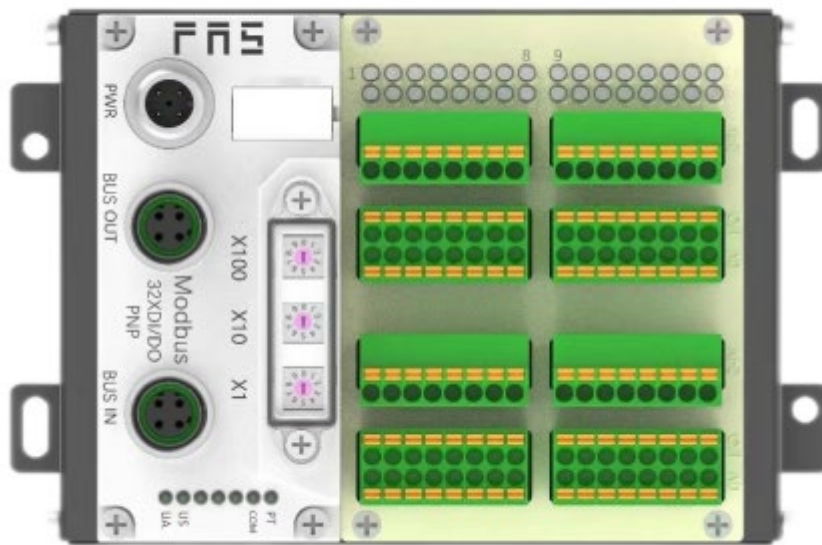
USE INSTRUCTIONS



Ordering code: 009M51

Part number: FNI MBR-106-006-K54

32 DI/DO NPN adaptive IP20 module user manual



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■ Expected use

This manual describes as decentralized input and output modules for connecting to an industrial network.

■ Installation and start-up

Precautions!

Installation and start-up may only be performed by trained personnel. A qualified individual is one who is familiar with the installation and operation of the product and has the necessary qualifications to perform such operations. Any damage caused by unauthorized operation or illegal and improper use is not covered by the manufacturer's warranty. The equipment operator is responsible for ensuring that appropriate safety and accident prevention regulations are observed.

■ Corrosion resistance

Precautions!

FNI modules generally have good chemical and oil resistance. When used in corrosive media (e.g. high concentrations of chemicals, oils, lubricants, coolants and other material media (i.e. very low water content), these media must be checked before the corresponding application material compatibility. If a module fails or is damaged due to this corrosive medium, a defect claim cannot be made.

■ Dangerous voltage

Precautions!

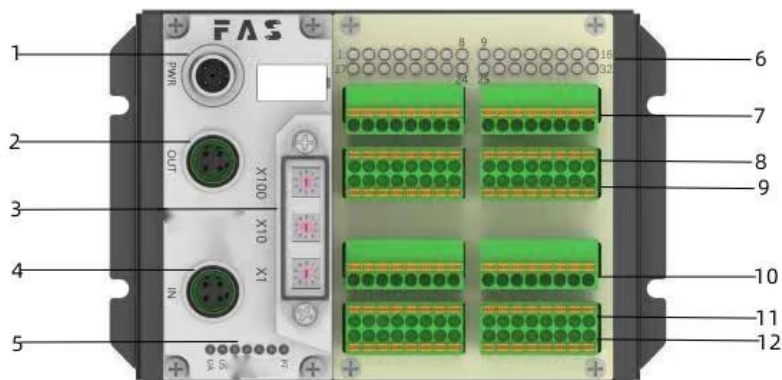
Disconnect all power before using the device!

■ General security

Debugging and inspection	Fault	Owner/operator obligations	Expected use
Before debugging, read the user manual carefully.	If the defect or equipment failure cannot be corrected, the operation of the equipment must be stopped to avoid damage that may be caused by unauthorized use.	This equipment is an EMC Class A compliant product. This device produces RF noise.	The warranty and limited liability statement provided by the manufacturer does not cover damage caused by: ·Unauthorized tampering ·Improper use operation ·The instructions provided in the user manual explain the use, installation and handling of discrepancies
This system cannot be used in an environment where the safety of personnel depends on the functionality of the equipment.	Only after the housing is fully installed can the intended use be assured.	The owner/operator must take appropriate precautions to use this equipment. This device can only use the power supply that matches this device, and can only connect cables approved for application.	

1 Getting started guide

1.1 Module overview



1 Power supply interface

2 R485 output port

3 DIP switch

4 R485 input port

5 Module status indicator

6 Signal status indicator

7 Sensor actuator power supply +24V

8 1-8 signal interface

9 Sensor actuator power supply 0V

10 Sensor actuator power supply +24V

11 9-16 signal interface

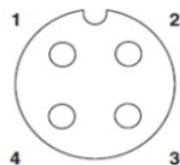
12 Sensor actuator power supply 0V

1.2 Mechanical connection

The module is installed using 4 M4 bolts or DIN35 rail snaps.

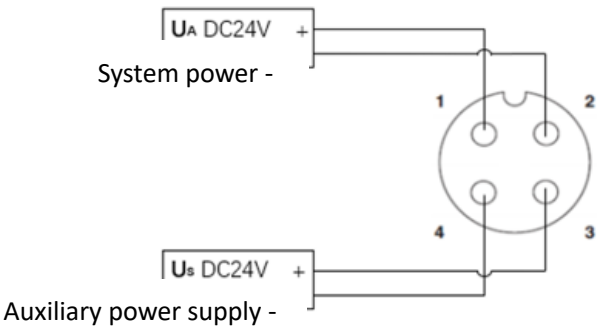
1.3 Electrical connection

1.3.1 Power interface (A-coded)



Pin	Function	Describe
1	Ua+	+24V(Brown)
2	Ua-*	0V(White)
3	Us+	+24V (Blue)
4	Us-*	0V(Black)

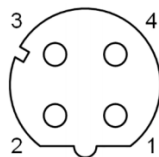
Power interface



Notes:

1. It is recommended to provide US power and UA power separately.
2. The total current of Actuator power supply is <4A, and the total current of Bus power supply is <1A;
3. The FE connection from the housing to the machine must be low impedance and as short as possible.

1.3.2 Network Interface (D-coded)

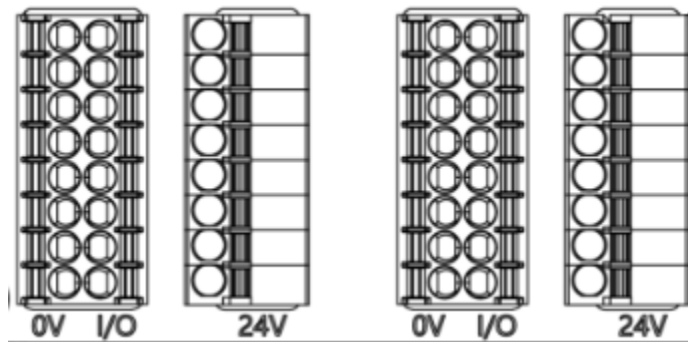


Pin	Function	
1	-	-
2	A+	RS485+
3	-	-
4	B-	RS485-

Note:

Unused I/O port sockets must be covered with end caps to meet IP67 protection rating.

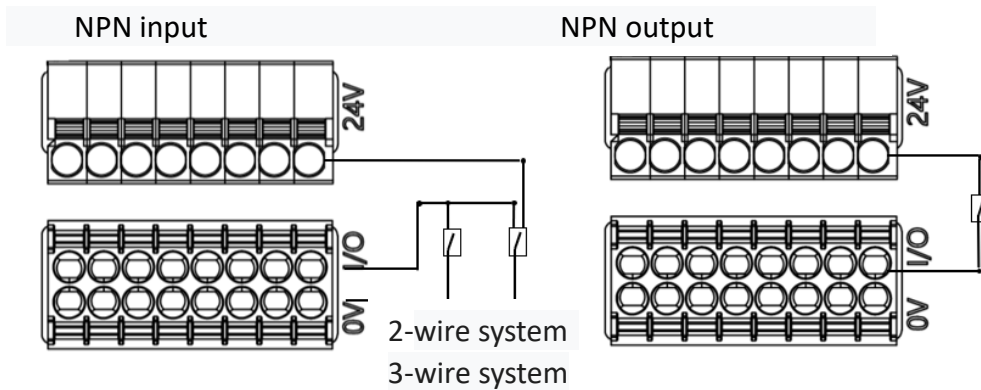
1.3.3 Signal port (screw-free spring-type terminal block)



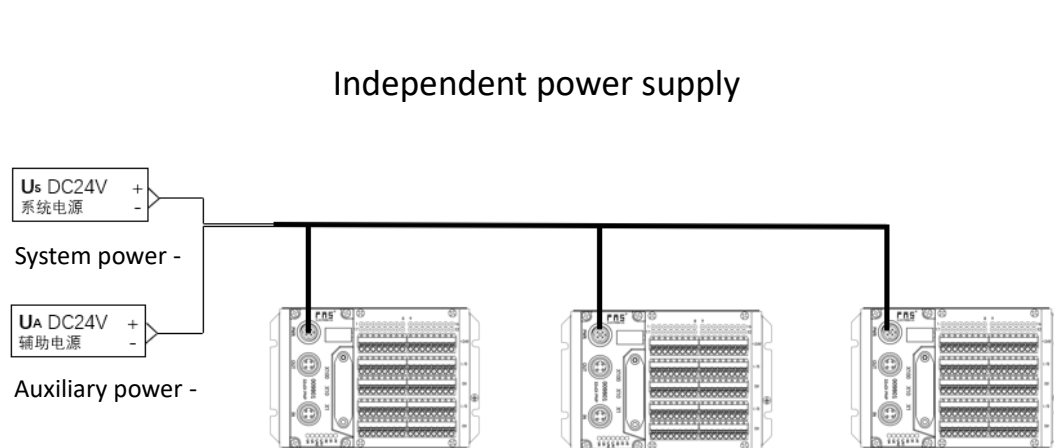
Notes:

1. Input and output signal types supported: three-wire NPN, two-wire NPN, dry contact;
2. Pin +24V single-channel output current maximum 500mA. Module total current <4A;
3. Total current of each 8 channels (1~8, 9~16, 17-24, 25-32) <1A.

Common I/O



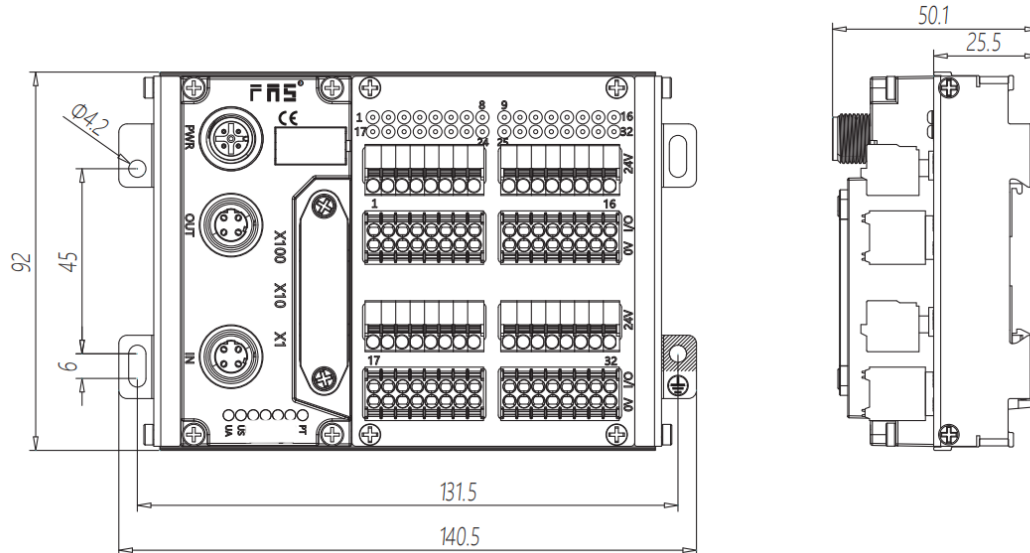
1.3.4 IP20 module wiring method



In independent power supply mode, the maximum current of each module can reach 4A

2 Technical data

2.1. Size



2.2 Mechanical data

Housing material	Aluminum shell
Housing grade complies with IEC 60529	IP20
Power interface	A-Coded
Input port/output port	Pluggable screw-free quick-connect terminals
Dimensions (W*H*D)	140.5mm*92mm*50.1mm
Installation type	Screw fixation or DIN35 rail mounting
Weight	About 670g

2.3 Operating conditions

Operating temperature	-5°C ~ 80°C
Storage temperature	-25°C ~ 85°C

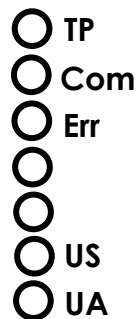
2.4 Electrical data

Power supply voltage	18~30V DC, conform to EN61131-2
Voltage fluctuation	<1%
Input current when power supply voltage is 24V	<130mA

2.5 Network port

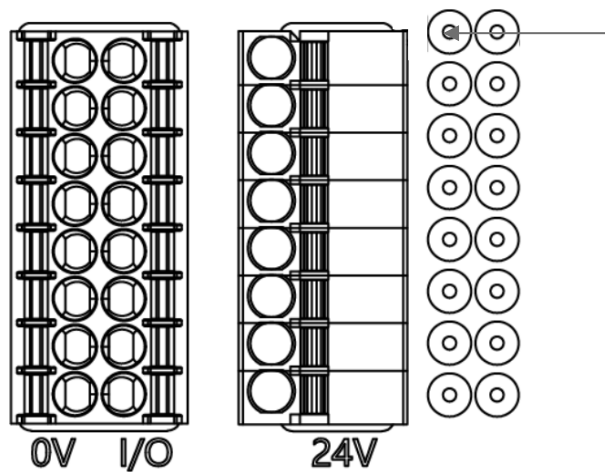
Ports	2 x 10Base-/100Base-Tx
Port connections	M12, D-Coded
IEEE 802.3 compliant cable types	Shielded twisted pair, minimum STP CAT 5/STP CAT 5e
Data transfer rates	10/100 M bit/s
Maximum cable lengths	100m
Flow control	Half-duty/full-duty (IEEE 802.3-PAUSE)

2.6 Function indicator



LED	Display	Function
PT	Green, flashing	Setting completed, waiting for setting
COM	Off	Waiting for connection
	Green, flashing	Communication successful, exchanging data
Err	Green	Input voltage normal
	Red, flashing	Input voltage low (< 18 V)
US	Green	Input voltage normal
	Red, flashing	Input voltage low (< 18 V)
UA	Green	Output voltage normal
	Red, flashing	Output voltage low (< 18 V)
	Red, solid	Output voltage does not exist (< 11 V)

I/O Port Status



LED	Status	Function
1	Closed	The state of the I/O pin input or output is 0
1	Yellow	The state of the I/O pin input or output is 1

3 Integrated

3.1 Module Configuration

3.1.1 DIP switch setting

Node address (range 1-247): In the power-off state, turn the dial to the preset node address

Example:

Dip switch X100=0, X10=2, X1=5

The node number is 25

Note: The maximum node number is 247. After the dial is adjusted, it needs to be powered on again to take effect;

3.1.2 Baud rate and parity check setting

For example: The baud rate to be set is 9600 NONE

1. In the power-off state, turn the dial to 988,
2. After the power is turned on and the PT light flashes, turn the dial knob to (210)
3. After waiting for 3 seconds, turn off the power and restore the dial to the original node address

Dip switch instructions are as follows:

X100: Fixed to 2, indicating the setting of baud rate and parity

X10: Indicates the baud rate index value

X1: Number indicates the parity check index value

Dial code X10	Baud rate bps
0	4800
1	9600
2	19200
3	38400
4	115200
5	128000
6	115200
7	115200
8	115200
9	115200

Pull code X1	Check digit
0	NONE (no check)
1	ODD (odd check)
2	EVEN (even check)
3	NONE (no check)
4	NONE (no check)
5	NONE (no check)
6	NONE (no check)
7	NONE (no check)
8	NONE (no check)
9	NONE (no check)

3.2 Data mapping

3.2.1 Output coil A1 -A16

Coil address	PLC address bits	Coil Name	Read and write permissions	Coil address	PLC address bits	Coil Name	Read and write permissions
100	00101	A1	R/W	108	00109	A9	R/W
101	00102	A2	R/W	109	00110	A10	R/W
102	00103	A3	R/W	110	00111	A11	R/W
103	00104	A4	R/W	111	00112	A12	R/W
104	00105	A5	R/W	112	00113	A13	R/W
105	00106	A6	R/W	113	00114	A14	R/W
106	00107	A7	R/W	114	00115	A15	R/W
107	00108	A8	R/W	115	00116	A16	R/W

Coil address	PLC address bits	Coil Name	Read and write permissions	Coil address	PLC address bits	Coil Name	Read and write permissions
116	00117	A17	R/W	124	00125	A25	R/W
117	00118	A18	R/W	125	00126	A26	R/W
118	00119	A19	R/W	126	00127	A27	R/W
119	00120	A20	R/W	127	00128	A28	R/W
120	00121	A21	R/W	128	00129	A29	R/W
121	00122	A22	R/W	129	00130	A30	R/W
122	00123	A23	R/W	130	00131	A31	R/W
123	00124	A24	R/W	131	00132	A32	R/W

3.2.2 Discrete input I1 -I64

Input coil address	PLC address bits	Coil Name	Read and write permissions	Input coil address	PLC address bits	Coil Name	Read and write permissions
200	10201	I1	R	208	10209	I9	R
201	10202	I2	R	209	10210	I10	R
202	10203	I3	R	210	10211	I11	R
203	10204	I4	R	211	10212	I12	R
204	10205	I5	R	212	10213	I13	R
205	10206	I6	R	213	10214	I14	R
206	10207	I7	R	214	10215	I15	R
207	10208	I8	R	215	10216	I16	R

Input coil address	PLC address bits	Coil Name	Read and write permissions	Input coil address	PLC address bits	Coil Name	Read and write permissions
216	10217	I17	R	224	10225	I25	R
217	10218	I18	R	225	10226	I26	R
218	10219	I19	R	226	10227	I27	R
219	10220	I20	R	227	10228	I28	R
220	10221	I21	R	228	10229	I29	R
221	10222	I22	R	229	10230	I30	R
222	10223	I23	R	230	10231	I31	R
223	10224	I24	R	231	10232	I32	R

3.2.3 Coil output holding register (readable and writable)

Register	PLC address bits	BIT															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
10H	40017	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
11H	40018	A32	A31	A30	A29	A28	A27	A26	A25	A24	A23	A22	A21	A20	A19	A18	A17

3.2.4 Coil status input register (read only) (read input)

Register	PLC address bits	BIT															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
20H	30033	I16	I15	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1
21H	30034	I32	I31	I30	I29	I28	I27	I26	I25	I24	I23	I22	I21	I20	I19	I18	I17

3.2.5 Short circuit overcurrent input status holding register (read only)

Register	PLC address bits	BIT															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
30H	40049	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
31H	40050	A32	A31	A30	A29	A28	A27	A26	A25	A24	A23	A22	A21	A20	A19	A18	A17

32H	40052	A4 8	A4 7	A4 6	A4 5	A4 4	A4 3	A4 2	A4 1	A4 0	A3 9	A3 8	A3 7	A3 6	A3 5	A3 4	A33
33H	40053	A6 4	A6 3	A6 2	A6 1	A6 0	A5 9	A5 8	A5 7	A5 6	A5 5	A5 4	A5 3	A5 2	A5 1	A5 0	A49

Register	PLC address bits	BIT															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
30H	40049	A1 6	A1 5	A1 4	A1 3	A1 2	A1 1	A1 0	A9	A8	A7	A6	A5	A4	A3	A2	A1
31H	40050	A3 2	A3 1	A3 0	A2 9	A2 8	A2 7	A2 6	A2 5	A2 4	A2 3	A2 2	A2 1	A2 0	A1 9	A1 8	A17

3.2.6 Fault reset holding register (write only)

Register	PLC address bits	Number of registers	Remark
0040H	40065	1	Write 005A first, then reset all faults within 500ms.

3.2.7 Parameter holding register (read only)

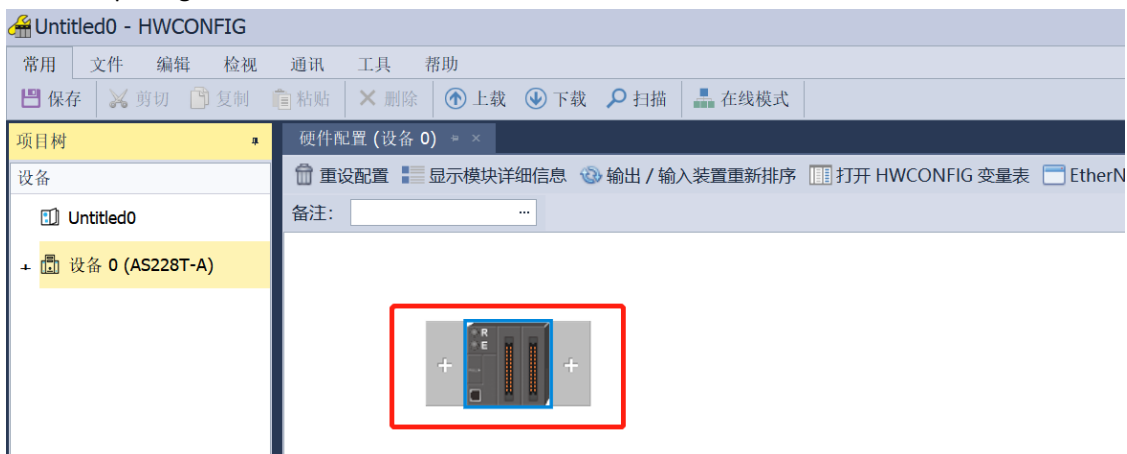
Register	PLC address bits	Function	Value range	Remark
0050H	40081	Device address	1-254	0: Broadcast address
0051H	40082	Baud rate index value	0-9	
0052H	40083	Parity index value	0-5	
0053H	40097	Product model		51:Indicates 009M51
0054H	40101	Software version		102001:V1.2.1

3.2.8 Integration in Delta AS228T PLC

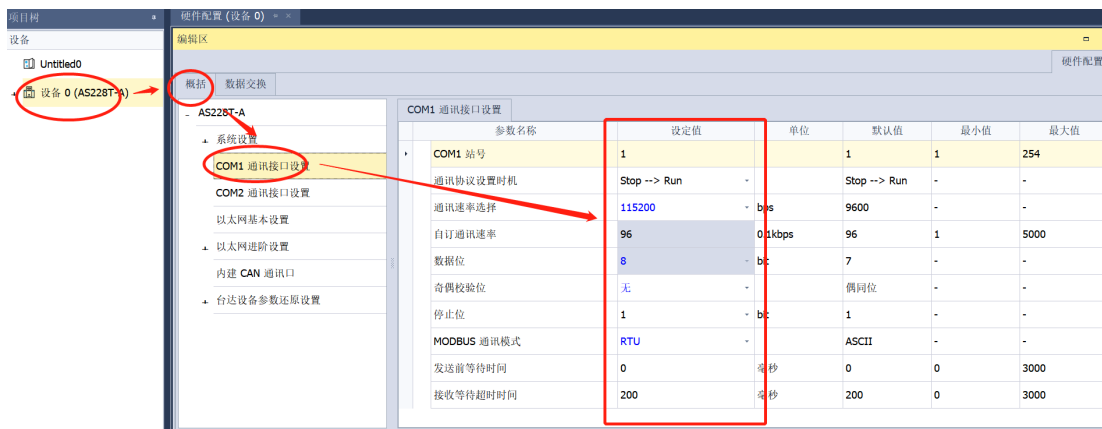
1. Before integrating the device into the PLC, first connect the module communication line to the COM1 port of the PLC. The corresponding relationship is A and +, B and;
2. Double-click "HWCONFIG" in the project tree;



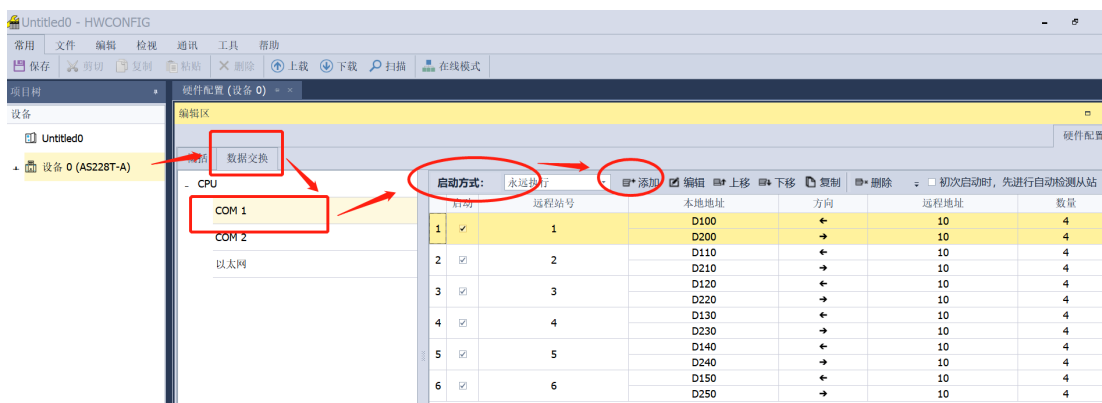
3. After opening the HWCONFIG window, double-click the PLC icon



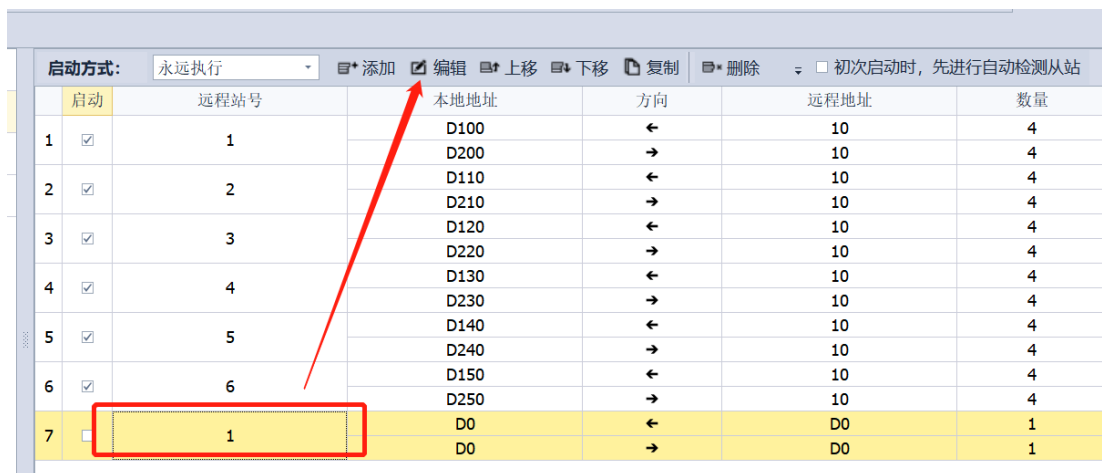
4. Click Device---General---COM1 Communication Interface Settings to set parameters such as baud rate and mode;



5. Click Device---Data Exchange---COM1, select Always Execute as the startup mode, and add the address to be controlled;



6. Select the added item and click "Edit" to make detailed settings;



In the pop-up window, check "Start".

Update cycle time: needs to be adjusted according to the actual number of connected slaves. Generally, the more the number, the larger the value required;

Remote station number: fill in according to the module address dial;

Type: Select standard MODBUS driver;

Read: Configure the coil or register to be read, fill in according to the mapping table as needed, the local address is the control address of the PLC, and the remote address is the mapping address of the module. Note that the address here is hexadecimal, and the address in the mapping table is decimal and needs to be converted before filling in;

Write: Configure the coil or register to be written, fill in according to the mapping table as needed, the local address is the control address of the PLC, and the remote address is the mapping address of the module. Note that the address here is hexadecimal, **The address in the mapping table is in decimal and needs to be converted before filling in. The same coil can only use one writing method, coil method or register method. Configuring two methods at the same time will cause confusion.**

数据交换设置

本地设置

☒ 启动

最短更新周期 (毫秒) 10 应用至全部

连接超时 (毫秒) 100 应用至全部

☐ 支持同步读写 (功能码: 0x17)

远程装置设置

远程站号 1

IP 地址

远程装置类型 Standard Modbus Device

读取

本地起始地址 D0 - D29999 远程起始地址 (Hex) 0 - FFFF 数量 (Bit)

D Register 0 0 ← 0x01 Read Coils 0 0 1

写入

本地起始地址 D0 - D29999 远程起始地址 (Hex) 0 - FFFF 数量 (Bit)

D Register 0 0 → 0x0F Write Multiple Coils 0 0 1

确定 取消

7. After all configurations are completed, click "Download" in the menu bar to download the configuration data to the PLC.

4 Appendix

4.1 Ordering Information

Product Order Code	Ordering code
FNI MBR-106-006-K54	009M51

■ High Quality Product / Sincere Service



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