

EX1S Series Micro PLC

Instruction Manual

[Installation mode]

<1> Do not use the following environments:

- 1, ambient wet, humid environment, condensation
- 2, corrosive gases, the presence of ambient dust
- 3, water, chemicals and other conductive liquid splashing into place

<2> line:

- 1, avoid going near high-voltage, high-current power supply or cable
- 2, the power not to over-pressure: the polarity is correct
- 3, communication cable connection is correct

1 General Specifications:

Insulation Voltage: DC 500V 2M Ω more

Anti-noise: 1000V 1 μ S pulse 1 minute

Communication Port 1: RS-232, connect PC, HMI programming or debugging

Communication Port 2: RS-485, HMI programming or debugging, support modbus Rtu agreement and Mitsubishi Agreement

Installation: screws or rail mounting

Ground: The third ground (not with strong power system common ground)

2 Hardware Features: Electrical features

Input voltage: DC24V

Voltage range: DC22V ~ DC26V

Current consumption: less than 260mA

Allowed loss of power: 10ms or less (actual loss of power of less than 1s)

Anti-voltage shock: AC1000V, 10mA, less than one minute (signal and ground)

Insulation resistance: DC500V, 10M Ω or more (signal and ground)

Surroundings

Operating temperature: 0 °C ~ 50 °C

Storage temperature: -20 °C ~ 60 °C

Operating Humidity: 10% RH ~ 90% RH (non-condensing)

Immunity: interference voltage: 1500Vp-p pulse period: 1 μ s Duration: 1 minute

Air non-corrosive gases

3 PLC models and machine types:

Product name and model

EX1S-14MR / T: 8 inputs X0 ~ X7 / 6 Point Y0 ~ Y5 \

EX1S-20MR / T: 12 inputs X0 ~ X13 / 8 Point Y0 ~ Y7 \

EX1S-20MRT-4AD2DA: 12 inputs X0 ~ X13 / 8 Point Y0 ~ Y7 4-channel 10V \ 20MA

EX1S-22MRT-4AD 12 inputs X0 ~ X13 / 10 Point Y0 ~ Y11 4-channel 10V \ 20MA
 EX1S-30MR / T: 16 input points X0 ~ X17 14 Point Y0 ~ Y15

NOTE: 4AD input types and range: 0 ~ 5V, 0 ~ 10V, 0 ~ 20MA, 4 ~ 20MA input registers:
 D8030, 8031, D8032, D8033

NOTE: 2DA output type and range: 0 ~ 5V, 0 ~ 10V, ~ 20MA, 4 ~ 20MA output registers:
 D8037, D8038

4. Performance Specifications:

Project		Performance
Operational control		Storage program loop operation mode (special LST), interrupt instruction.
Input and output control.		Batch mode, input and output refresh command, the pulse capture function.
Programming Language		Relays RoHS + ladder approach.
Program memory	Sequence command \ Step Ladder Instructions	Twenty-seven sequence instructions, step ladder instruction two.
	Application Instructions	Eighty-five species one hundred sixty-seven
Processing speed	Basic Instructions	0.55 ~ 0.7us / command
	Application Instructions	80us / instruction
Input and output points (X \ Y)	Input Points	Maximum X0 ~ X17 16-point input
	output Points	Maximum Y0 ~ Y15 14-point output
Internal relay (M)	General use	M0 ~ M383 384 points
	Holding use	M384 ~ M511 128 points
	Special use	M8000 ~ M8255 256 points
State relay (S)	Initial state	S0 ~ S9 10 points
	General use	S10 ~ S127 118 points
	Holding use	S0 ~ S127 128 points
Timer (T)	100ms	T0 ~ T62 63 points (0.1 to 3,276.7 sec)
	10ms	If M8028 is ON, T32 after the timer is 10ms timer (0.01 to 327.67 seconds)
	1ms accumulative (holding)	T63 1 point (0.001 to 32.767 seconds)
Counter (C)	16-bit general-purpose registers	D0 ~ D127 128 points
	16-bit Holding register	D128 ~ D255 128 points
	File register (holding)	D1000 ~ D2499 1500 points
	16-bit special register	D8000 ~ D8255 256 points
	16-bit index registers	V0 ~ V7, Z0 ~ Z7 16 points
Pointer (P \ I)	JAMP, CALL branch	P0 ~ P63 64 points

	used	
	Input interrupt, timer interrupt	I0 ~ I5 6 points
Nesting (N)	Master Use	N0 ~ N7 8 points
Constant (K \ H)	Decimal constant (K)	16-bit: -32,768 ~ +32,767 32-bit: -2,147,483,648 ~ +2,147,483,647
	Hexadecimal constant (H)	16-bit: 0 ~ FFFF 32-bit: 0 ~ FFFFFFFF

5, RS485 port Modbus Slave Address:

Software data type	PLC internal register address	Modbus Rtu address	Variable Type
Status Register (S)	S0 ~ S127	0x(1x)0000 ~ 0x(1x)0127	BIT
Enter state point (X)	X0 ~ X17	0x(1x)0128 ~ 0x(1x)0159	BIT
Output status point (Y)	Y0 ~ Y15	0x(1x)0160 ~ 0x(1x)0191	BIT
Internal relay (M)	M0 ~ M511	0x(1x)0256 ~ 0x(1x)0767	BIT
General-purpose register (D)	D0 ~ D255	4x(3x)1024 ~ 4x(3x)1279	WORD(D)
Special register (D8xxx)	D8000 ~ D8255	4x(3x)0768 ~ 4x(3x)1023	WORD(D)
Modbus Rtu Address setting:		D8121 range (0 to 255)	
Modbus Rtu communication format settings:		D8120 See Chapter 6	

5.1 HMI connection real Modbus protocol via the RS485 interface

选择通讯协议



设定通讯格式



监控1号站X0状态



监控1号站D0数值

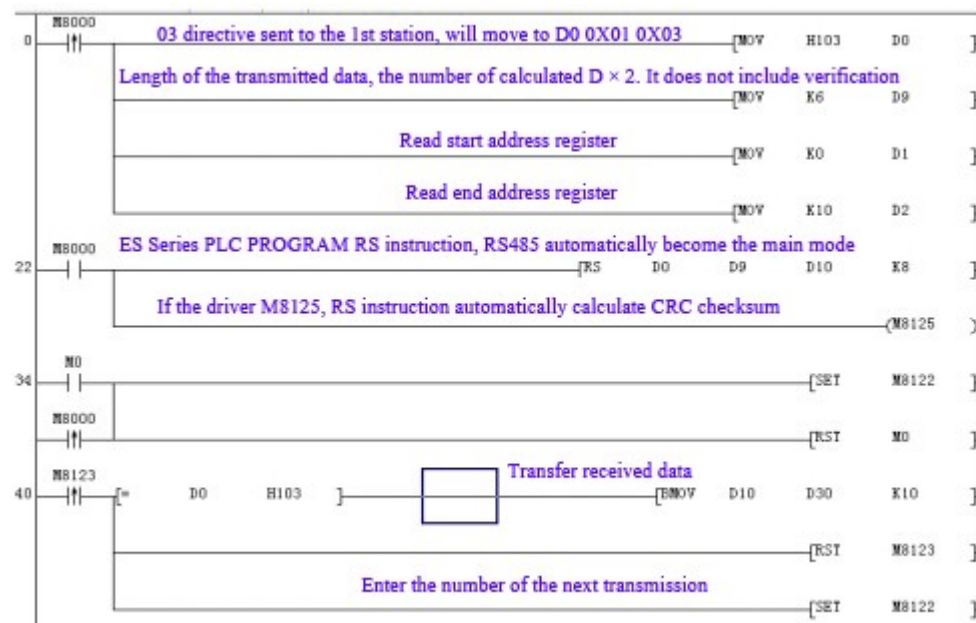


6, RS485 interface communication format setting

Bit No.	Name	Contents	
		0 (bit off)	1 (bit ON)
b0	Data length	7Bit	8Bit
b1 b2	The parity	b2,b1 (0, 0): No (0, 1) Odd number (ODD) (1, 1) Even number (EVEN)	
b3	Stop bit	1 bit	2 bit
b4 b5 b6 b7	{bps}	b7,b6,b5,b4 (0,0,1,1): 300 (0,1,0,0): 600 (0,1,0,1): 1,200 (0,1,1,0): 2,400	b7,b6,b5,b4 (0,0,1,1): 4,800 (1,0,0,0): 9,600 (1,0,0,1): 19,200
b8 ※ 1	Start character	No	Have (D8124) Start value STX(02H)
b9 ※ 1	Termination character	No	Have (D8125) Start value ETX(03H)
b10 b11	Control line	No procedure Connecting Communication * 4	b11,b10 (0,0):无 <RS-232C 接口 > (0,1):普通模式 <RS-232C 接口 > (1,0):互锁模式 <RS-232C 接口 > ※ 5 (1,1):调制解调器模式 <RS-232C 接口, RS-485 接口 > ※ b11,b10 (0,0): RS-485 Interface (1,0): RS-232C Interface
b12	Do not use		
b13 ※ 2	And verification	Not attached	Accessory
b14 ※ 2	Agreement	Do not use	Use
b15 ※ 2	Control order	Mode 1	Mode 4

Note: Use according to Mitsubishi unspecified format

7, RS485 port Modbus master Description:



Note: 1, if the program has RS instruction, RS485 interface is automatically configured as master mode;

2, the master mode is set RS485 communication format configured as slave mode;

3. If the M8125 bit ON, compared with RS485 modbus mode, whether Mitsubishi free format;

8) PLC Digital and Analog Input Specifications:

IO digital input characteristics:

Input signal voltage: DC24V \pm 10%

Input signal Current: 7mA / DC24V

Input ON current: 5mA or more.

Input OFF current: 1mA or less.

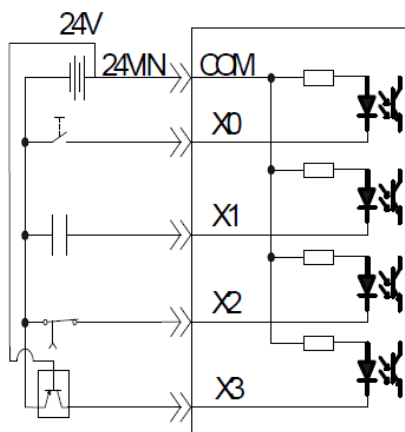
Input type: Input or NPN open collector transistor.

Circuit insulation: optocouplers fully isolated.

Input response time: 10msec.

Input motion display: Input ON time LED lights.

NPN input wiring diagram:



AD Analog input characteristics:

Analog Input Signal: DC0 ~ 5V, 0 ~ 10V, DC0 ~ 20mA, 4 ~ 20mA.

Number of Channels: EX1S-22-4AD four analog input channels.

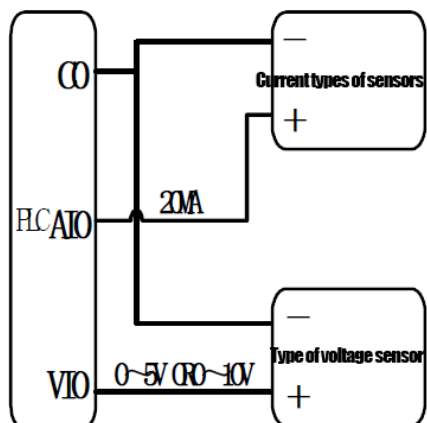
Comprehensive Accuracy: 0.5%.

Maximum input range: DC0-40mA, DC15V.

Analog Input Protection: transient suppression diodes.

Resolution / Speed: 4096 (12bit) / 10msec.

Analog Input Register: CH1: D8030 ~ CH3: D8033.



9) PLC relay, transistor, analog output specifications:

Digital Relay output characteristics:

Output Type: Relay, dry contact.

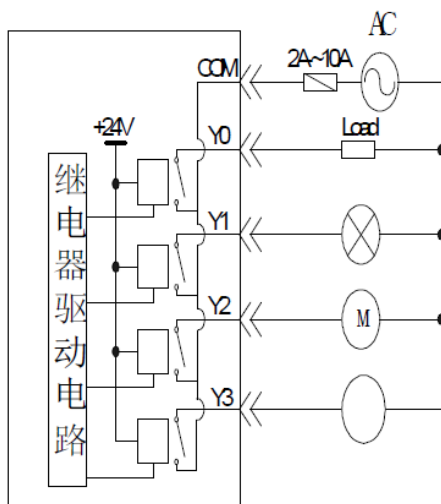
Circuit insulation: mechanical insulation.

Action Knowledge: LED indicator.

Maximum load: resistive load 3A. Inductive load 80VA. Lamp load 100W.

Output response time: 10msec

Output Operation indicator: LED lights when output ON.



Transistor output characteristics:

Output Type: Transistor, no contacts.

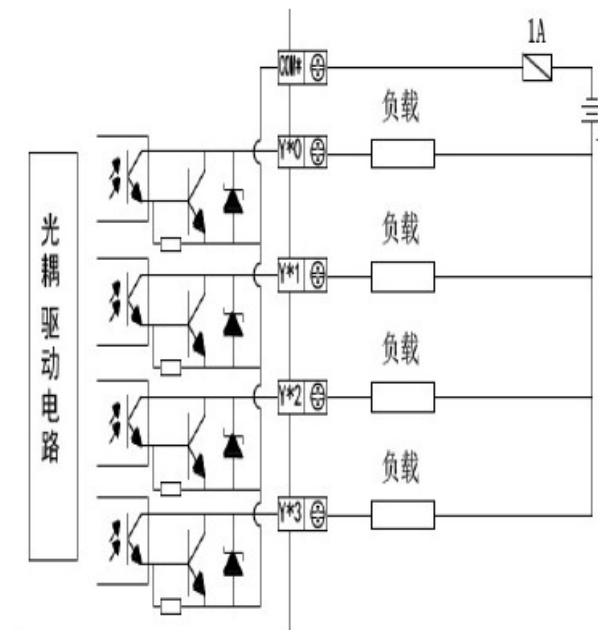
Circuit insulation: optocouplers insulation.

Action indication: LED indicator.

Maximum load: resistive load 1A, inductive load 12W / DC24V, lamp load 1.5W / DC24V.

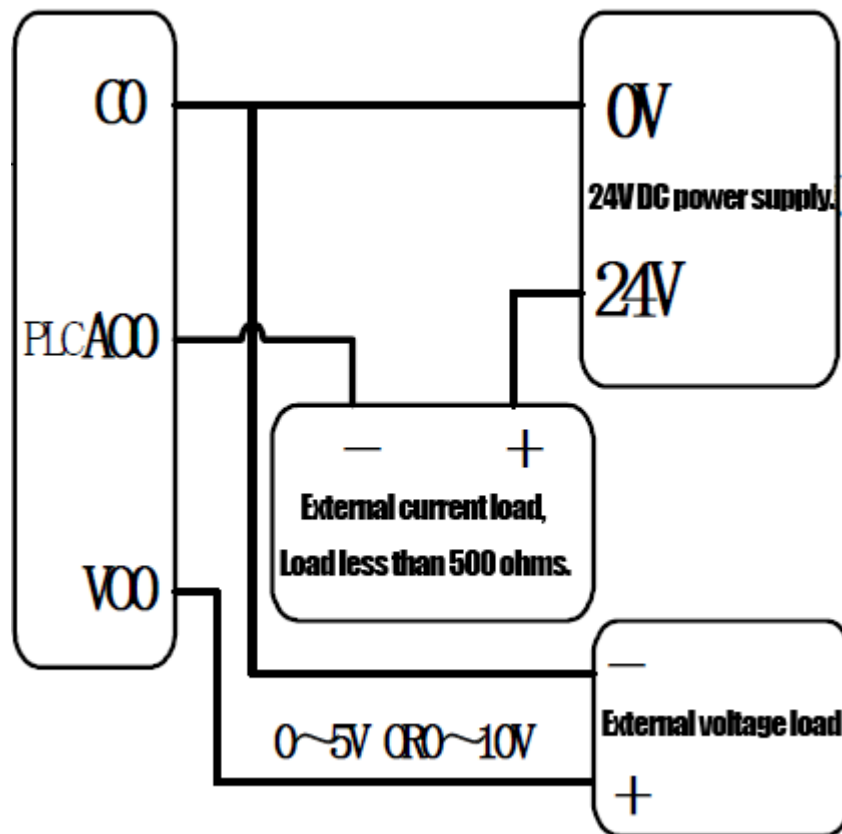
Output response time: 0.2msec.

Output Operation indicator: LED lights when output ON.



Analog output characteristics:

Output signal: 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA.
 Number of Channels: EX1S-20MRT4ADDA two-channel output.
 Comprehensive Accuracy: 0.5%.
 The maximum output range: 10V or 20MA.
 Analog Output Protection: transient suppression diodes.
 Resolution / Speed: 4096 (12Bit) / 10msec.
 Output Register: CH1: D8037 ~ CH2: D8038.

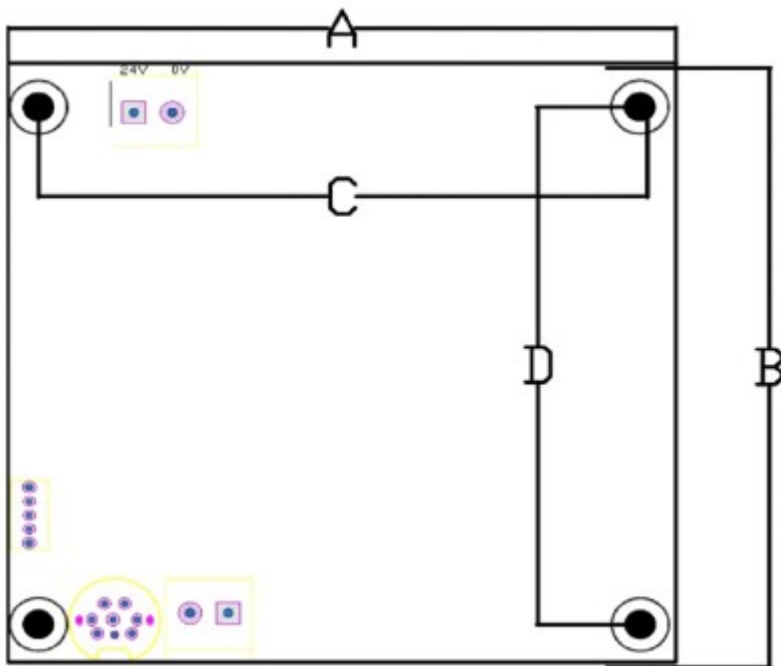


10) PLC terminals definition:

EX-22MRT – 4AD 侧面端子图 - 8P :

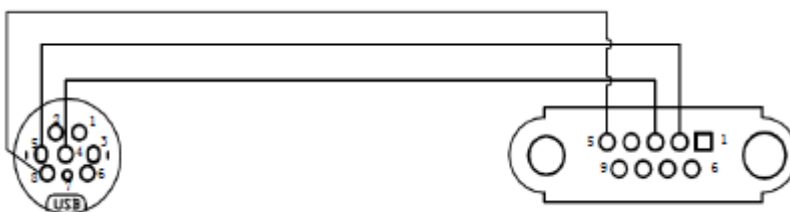
CO	VA0	C1	VA1	C2	VA2	C3	VA3
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11) Size:



name	A(mm)	B(mm)	C(mm)	D(mm)
EX1S-14MR / T	75mm	80mm	85mm	88mm
EX1S-20MR / T	75mm	115mm	85mm	125mm
EX1S-20MRT-4AD2DA	122mm	88mm	115mm	80mm
EX1S-22MRT-4AD	125mm	85mm	115mm	75mm
EX1S-30MR / T	150mm	85mm	140mm	75mm

12) EX1S Series Programming Line:



Note: Compatible Xinje or Delta PLC download cable