The SRL Series Product User Guide

Ver 1.8

Table of Contents

Manual version	Description
V1.0	Initial version.
V1.1	Updated products, and added product descriptions for SRL1032, SRL2232, SRL2132, SRL1332, SRL1432, SRL3208, and SRL4208.
V1.2	Added product description for SRL3522.
V1.3	Added product descriptions for SRL3274 and SRL3284.
V1.4	Added product descriptions for SRL9001, SRL6002, SRL6004, SRL5012, SRL5034, SRL5202, SRL5204, and SRL9020.
V1.5	Added product description for SRL5234.
V1.6	Updated SRL5234 PDO parameters and SRL5012 gated parameters.
V1.7	Updated parameter configuration for SRL5012.
V1.8	Added SRL3404 product description.

1. Product Model

The SRL series products are high-performance EtherCAT modules, including couplers, digital I/O terminals, analog I/O terminals, and temperature measurement module, with 24VDC power supply and module diagnostic functions. The product list is shown as follows:

Model	Description
SRL8200	EtherCAT bus, 2 *RJ45 ports, high-performance backplane bus, extendable up to 64 modules.
SRL9020	----
SRL1016	16-channel digital input, supports PNP/NPN input.
SRL1032	32-channel digital input, supports PNP/NPN input.
SRL1332	16-channel NPN input, 16-channel transistor NPN output.
SRL1432	16-channel PNP input, 16-channel transistor PNP output.
SRL2116	16-channel digital output, transistor NPN, rated 0VDC (±3V)/0.5A.
SRL2216	16-channel digital output, transistor PNP, rated 24VDC/0.5A.
SRL2132	32-channel digital output, transistor NPN, rated 0VDC (±3V)/0.5A, total not exceeding 10A per module.
SRL2232	32-channel digital output, transistor PNP, rated 24VDC/0.5A, total not exceeding 10A per module.
SRL3522	Dual-channel analog rapid acquisition module
SRL3204	4-channel voltage/current input, 16-bit precision.
SRL3404	4-channel multifunctional analog input terminal, 24-bit precision
SRL3208	8-channel voltage/current input, 16-bit precision.
SRL3284	4-channel thermocouple input terminal.
SRL3274	4-channel resistance thermometer input terminal.
SRL4204	4-channel voltage/current output, ±10V or 0~20mA, 16-bit precision.
SRL4208	8-channel voltage/current output, ±10V or 0~20mA, 16-bit precision.
SRL5012	A 2-channel high-speed count module. Each channel features a set of A, B, and C inputs. It supports both single-ended wiring (24V level, up to 200kHz, PNP/NPN compatible) and differential wiring (5V level, up to 4MHz). The module provides standard counting functionality.
SRL5034	4-channel high-speed count module, with 4 sets of A, B, and C count inputs and differential (max 4MHz at 5V), supports standard counting functions.
SRL5234	High-speed pulse output terminal, with 4-axis PTO output, NPN-type single-ended output up to 400KHz (at 5V), and differential output up to 1MHz.
SRL6002	Serial port module, with 2*RS422/RS232/RS485 ports, supports Modbus RTU and free port protocol, with maximum baud rate 115.2Kbps.
SRL6004	Serial port module, with 4*RS422/RS232/RS485 ports, supports Modbus RTU and free port protocol, with maximum baud rate 115.2Kbps.
SRL9001	Power Relay Module

2. SRL8200

2.1. Electrical Specifications

Model	**SRL8200 Module**
Product overview	2*RJ45 ports, 24VDC power supply with stable performance and strong anti-interference capability
Technical specifications	
Order No.	SRL8200
Electrical interface	RJ45
Working power supply	18~28V DC
5V DC power supply	<2A (If the number of extension modules exceeds 8, one SRL9001 power relay module must be added.)
Power consumption	188mA
CPU connection status	No (standalone as slave)
Supported protocols	EtherCAT Slave
Number of built-in I/O ports	None
Isolation	
Between channels and buses	Existent
Power to bus	Existent
Display indicator	Power +24V green indicator, BF red indicator, and RUN indicator
System power diagnosis and warning	Supported
Environmental conditions	Operating temperature: -20~60°C; relative humidity: 5%~90% (non-condensing)
Storage temperature	-40~60 °C
Dimensions (L × W × H)	48×100×80（mm）

2.2. Wiring Diagram

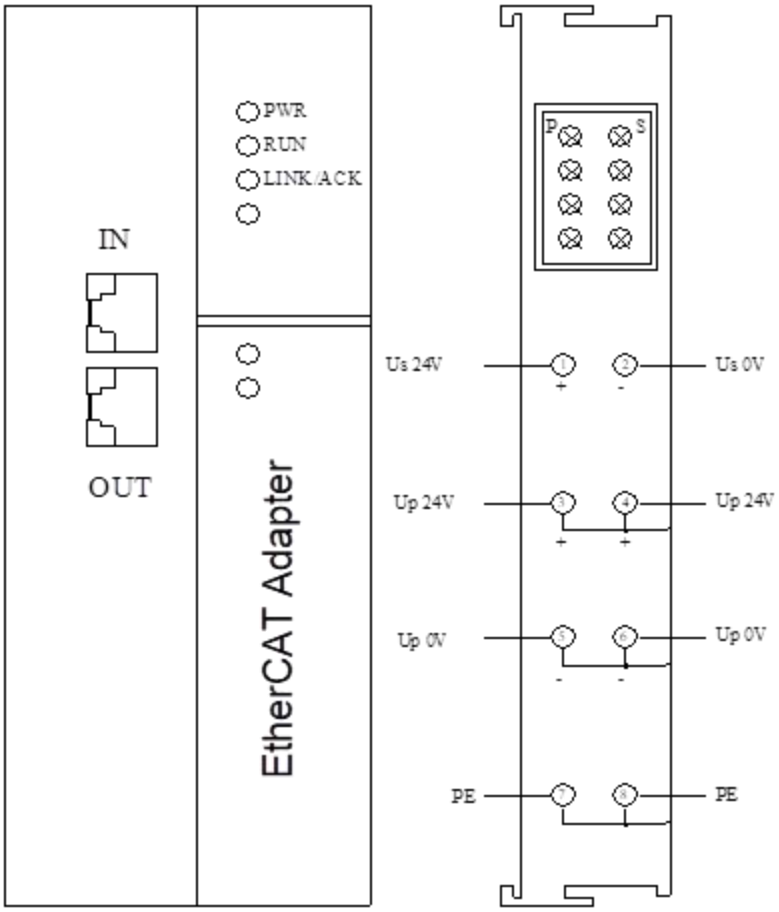
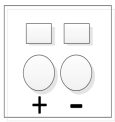
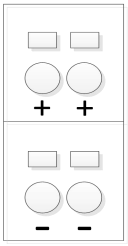


Figure 1-2

Note: Us supplies power to the coupler, while Up supplies power to the extension module, requiring two independent power sources. The terminal pairs (③-④, ⑤-⑥, ⑦-⑧) are internally bridged. Therefore, wiring your power supply to either set (③⑤⑦ or ④⑥⑧) can power the extension module.

2.3. Terminal Description

Wiring Terminal	Description
	ECT coupler power supply terminal
	Extension module power supply terminal

2.4. Indicator Description

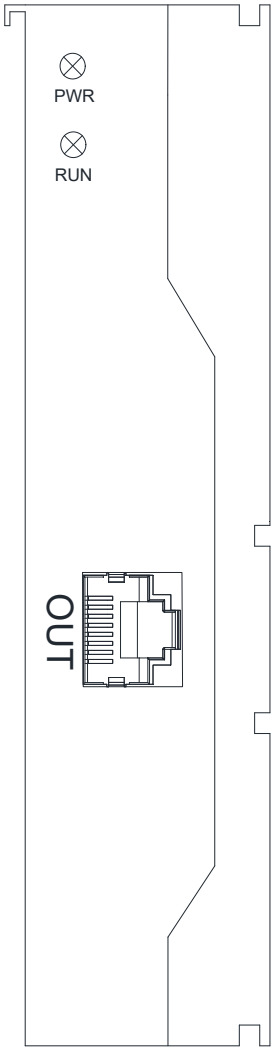
Indicator	Description
PWR	Power indicator: On: Module is powered normally; off: Module is not powered or powered abnormally.
RUN	Module indicator, Off: Communication is normal; Steadily lit: Module is in the "Init" state; Fast flash: Module is in the "Pre-Op" state; Slow flash: Module is in the "safe-Op" state;
LINK/ACT	Module communication indicator: Fast flash: Normal; Off: No module is mounted; Steadily lit: Module is present but the IN port of ECT is not connected.
P	When power is connected to the extension module power supply terminal on the coupler, the P indicator will light up; when no power is connected, the indicator will turn off.
S	When power is connected to the coupler power supply terminal, the S indicator will light up; it will turn off when it is abnormal.

3. SRL9020

3.1. Electrical Specifications

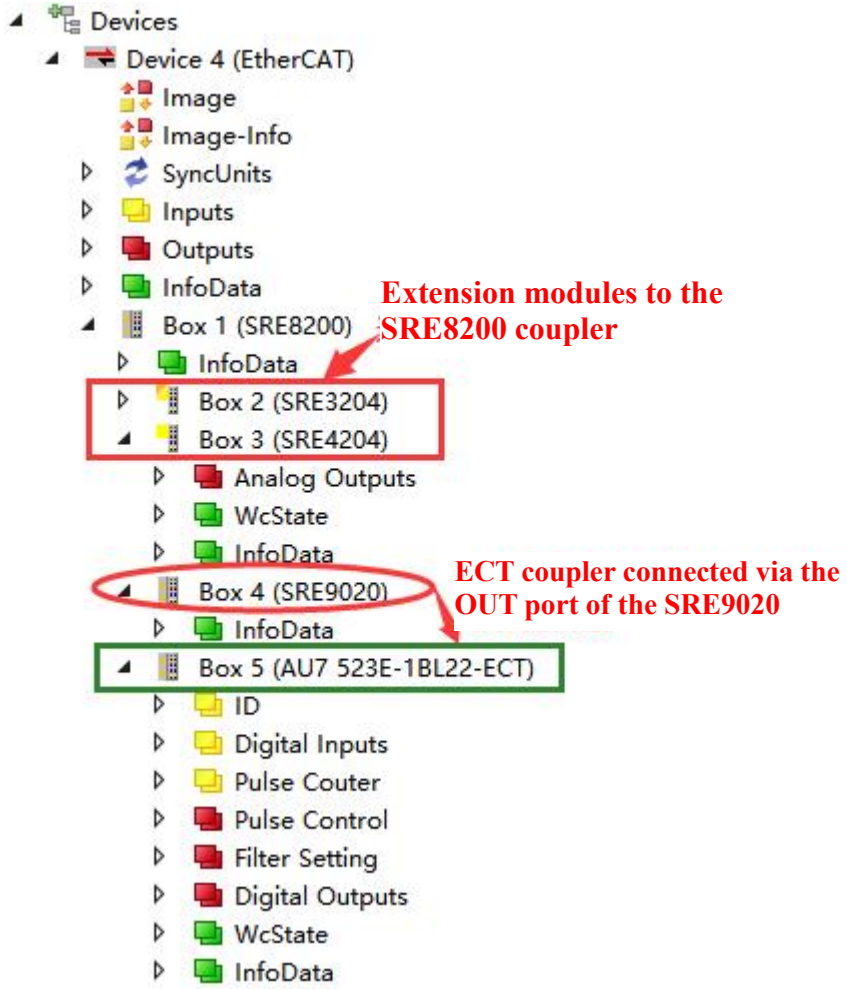
Model	**SRL9020**
Product overview	1*RJ45 port
Technical specifications	
Order No.	SRL9020
Electrical interface	RJ45
Working power supply	18~28V DC
Bus 5V DC current consumption	230mA
Supported protocols	EtherCAT Slave
Number of built-in I/O ports	None
Isolation	
Between channels and buses	Existent
Power to bus	Existent
Display indicator	Power and RUN green indicators
System power diagnosis and warning	Supported
Environmental conditions	Operating temperature: -20~60°C; relative humidity: 5%~90% (non-condensing)
Storage temperature	-40~60 °C
Dimensions (L × W × H)	24×100×80（mm）

3.2. Wiring Diagram



3.3. Module Description

The network port OUT of the module is used for EtherCAT communication, connecting to the IN port of the next-level EtherCAT slave. When using SRL9020, it must be connected to the last device in the segment.



4. Digital Input Terminal

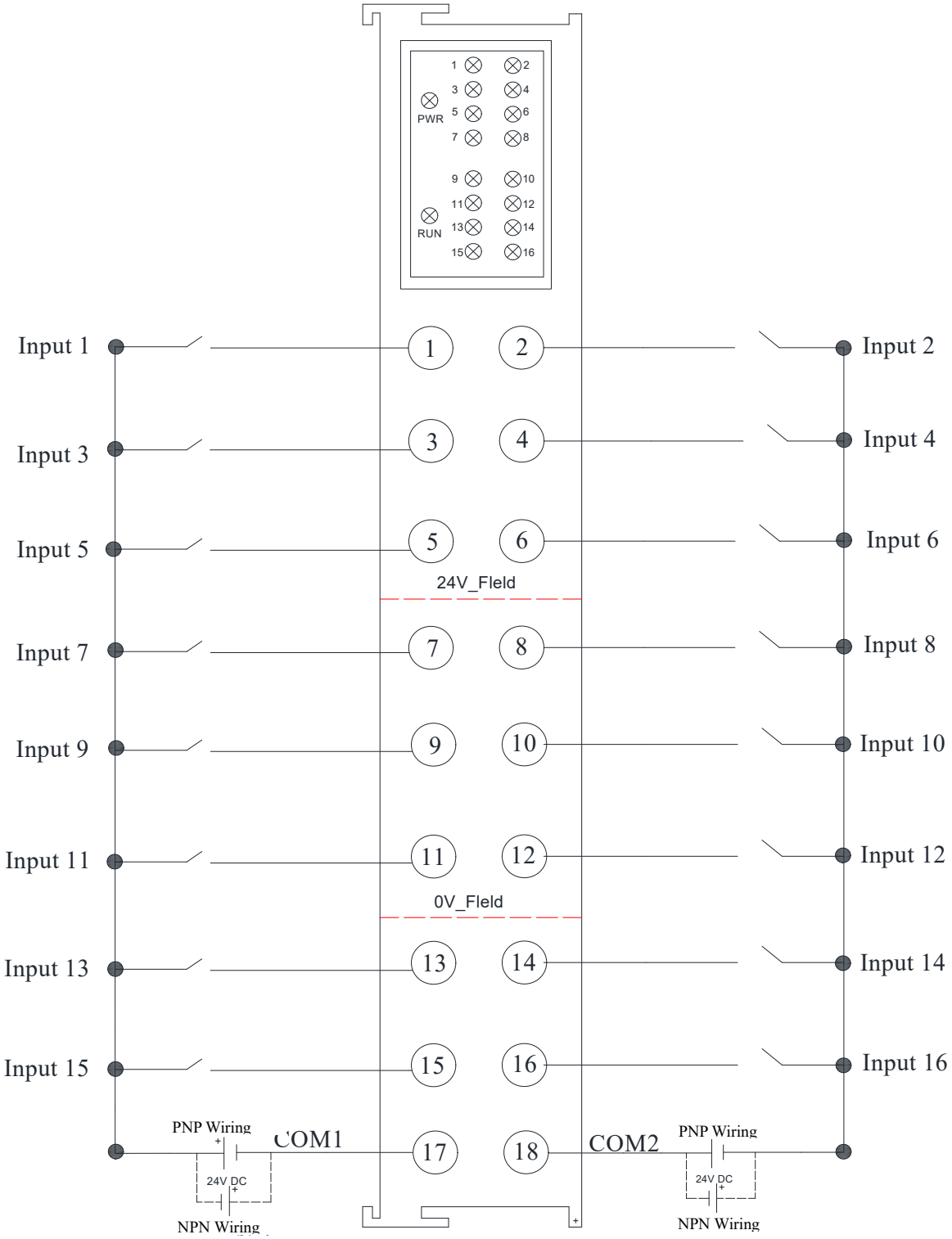
High-performance digital input terminal features 16/32-channel digital input, NPN/PNP input and 24VDC, with the module diagnostic function.

4.1. Electrical Specifications

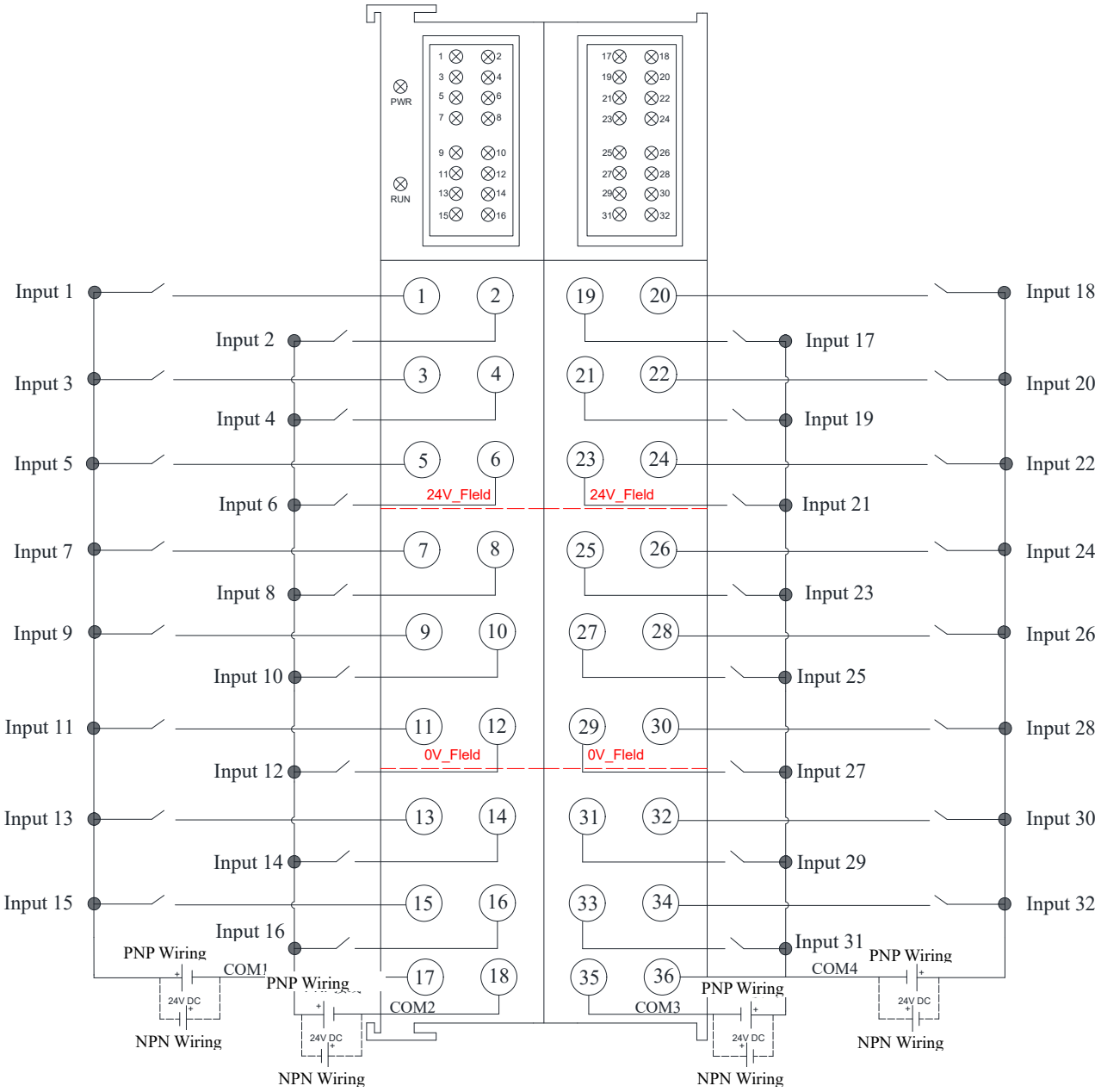
Model	SRL1016	SRL1032
Technical specifications		
Number of input points	16	32
Bus 5VDC current consumption	183mA	200mA
Cable length (unshielded)	100m	
Input characteristics	Source, sink	
Allowable static current	1mA	
Insulation test voltage	500V DC	
Isolation		
● Between channels and buses	Existent	
● Between channels	Existent	
Display indicator	Green LED indicator per channel input	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	15×100×80 mm	30×100×80 mm

4.2. Wiring Diagram

4.2.1. SRL1016 Wiring Diagram



4.2.2. SRL1032 Wiring Diagram



4.3. Interface Description

4.3.1. SRL1016 Wiring Terminal Description

Terminal	Description
Input1~Input16	Module Input Terminal
COM1、COM2	Input Common Terminal

4.3.2. SRL1032 Wiring Terminal Description

Terminal	Description
Input1~Input32	Module Input Terminal
COM1~COM4	Input Common Terminal

4.4. Indicator Description

4.4.1. SRL1016 Indicator Description

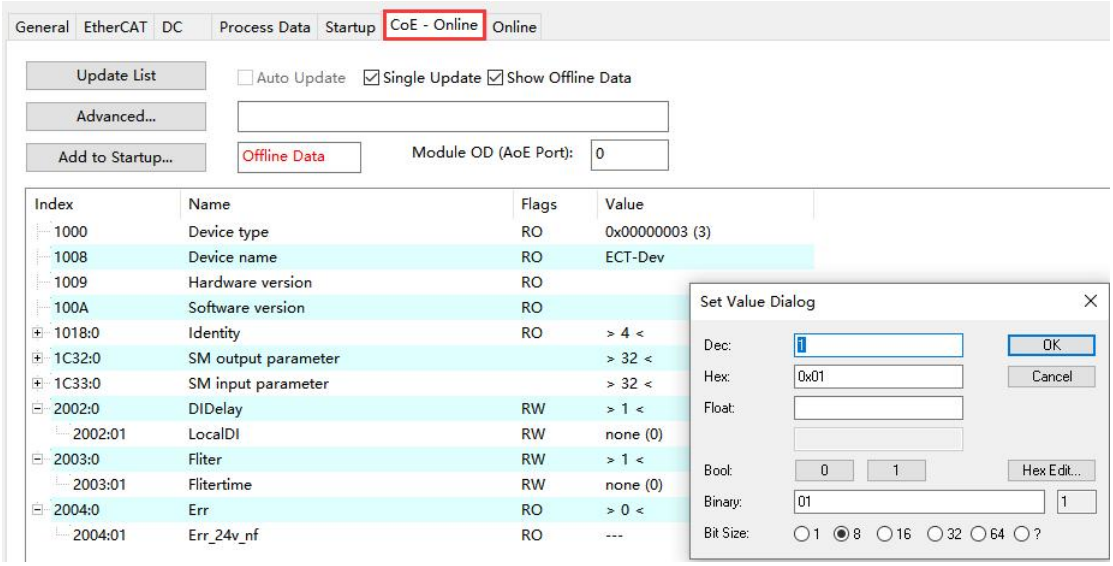
Indicator	Description
PWR (Green)	Module power indicator: On: Module is powered normally Off: Module is not powered or powered abnormally
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
I1~I16 (Green)	The digital input indicator: the corresponding indicator will light up when a signal is detected on the input channel.

4.4.2. SRL1032 Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Module is powered normally Off: Module is not powered or powered abnormally
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
I1~I32 (Green)	The digital input indicator: the corresponding indicator will light up when a signal is detected on the input channel.

4.5. COE General Parameter Description

Module-related parameters can be viewed or modified in COE parameters. Parameter settings are not saved after power-off.



Parameters	Description
2002:01 LocalDI	Parameters for configuring the digital input terminal: DI delay None: No delay 1.6ms: DI delay is 1.6ms 3.2ms: DI delay is 3.2ms 12.8ms: DI delay is 12.8ms 20ms: DI delay is 20ms 50ms: DI delay is 50ms
2003:01 Fliter time	None: No filtering; 1：1ms； 2：2ms； 3：5ms； 4：10ms； 5：20ms； 6：50ms。
2004:01 Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal.

5. Digital Output Terminal

5.1. Electrical Specifications for 16-Point Digital Output

SRL2216/SRL2116 digital output terminal features 16-channel digital output, with the module diagnostic function.

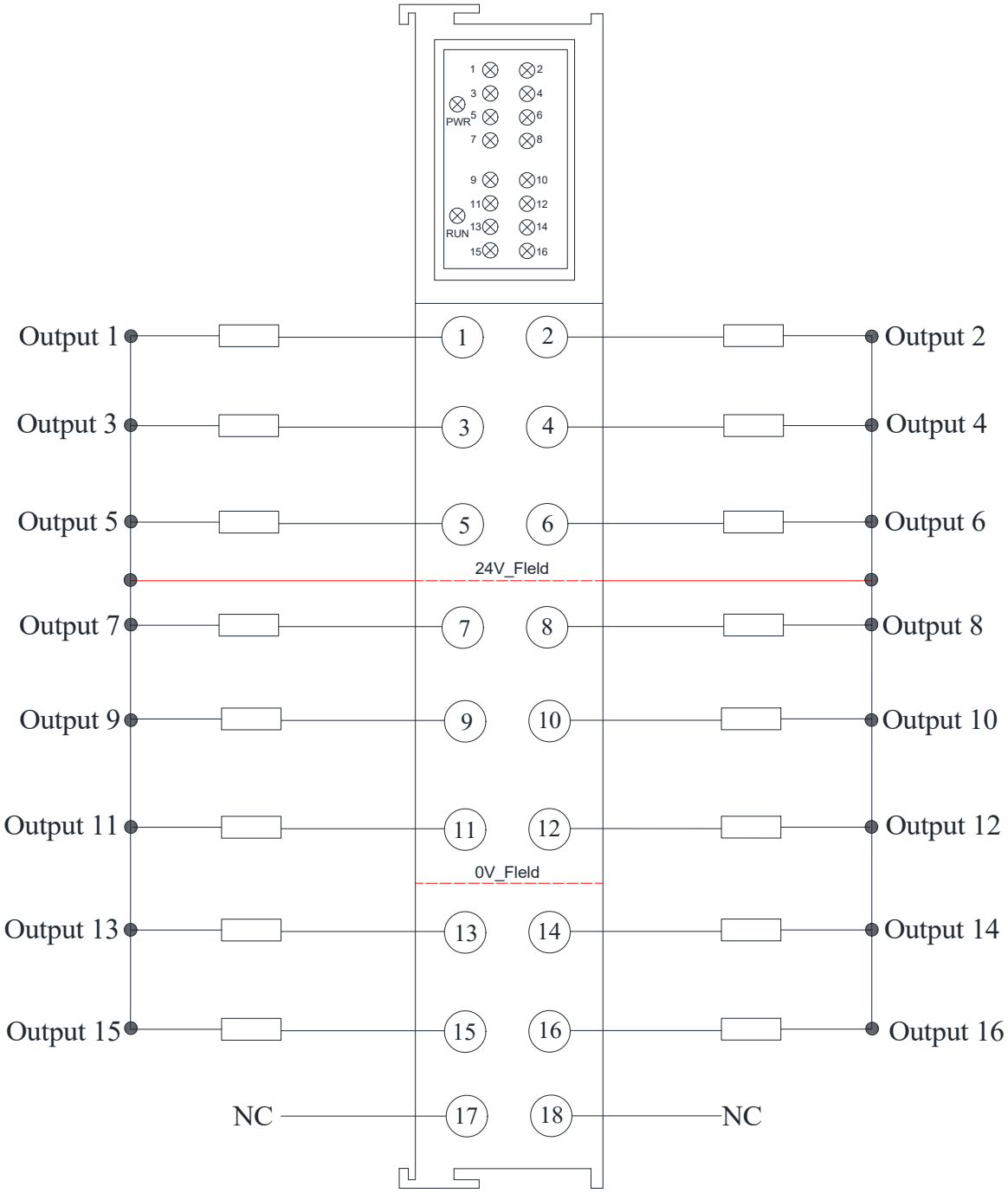
Model	SRL2216	SRL2116
Technical specifications		
Output type	PNP solid-state MOSFET	NPN solid-state MOSFET
Number of output points	16	
Bus 5VDC current consumption	190mA	175mA
Cable length (unshielded)	100m	
Output short-circuit protection	Yes, electronic type	
Maximum lamp load	5W	
Output current “1”	0.5A	
Leakage current	＜1mA	
Switching frequency		
● Maximum resistive load	100HZ	
● Maximum inductive load	0.5HZ	
● Maximum lamp load	10HZ	
● Maximum mechanical load	---	
Insulation test voltage	500V DC	
Isolation		
● Between channels and buses	Existent	
● Between channels	Existent	
Display indicator	Green LED display per channel output	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	15×100×80（mm）	

5.2. Electrical Specifications for 32-Point Digital Output

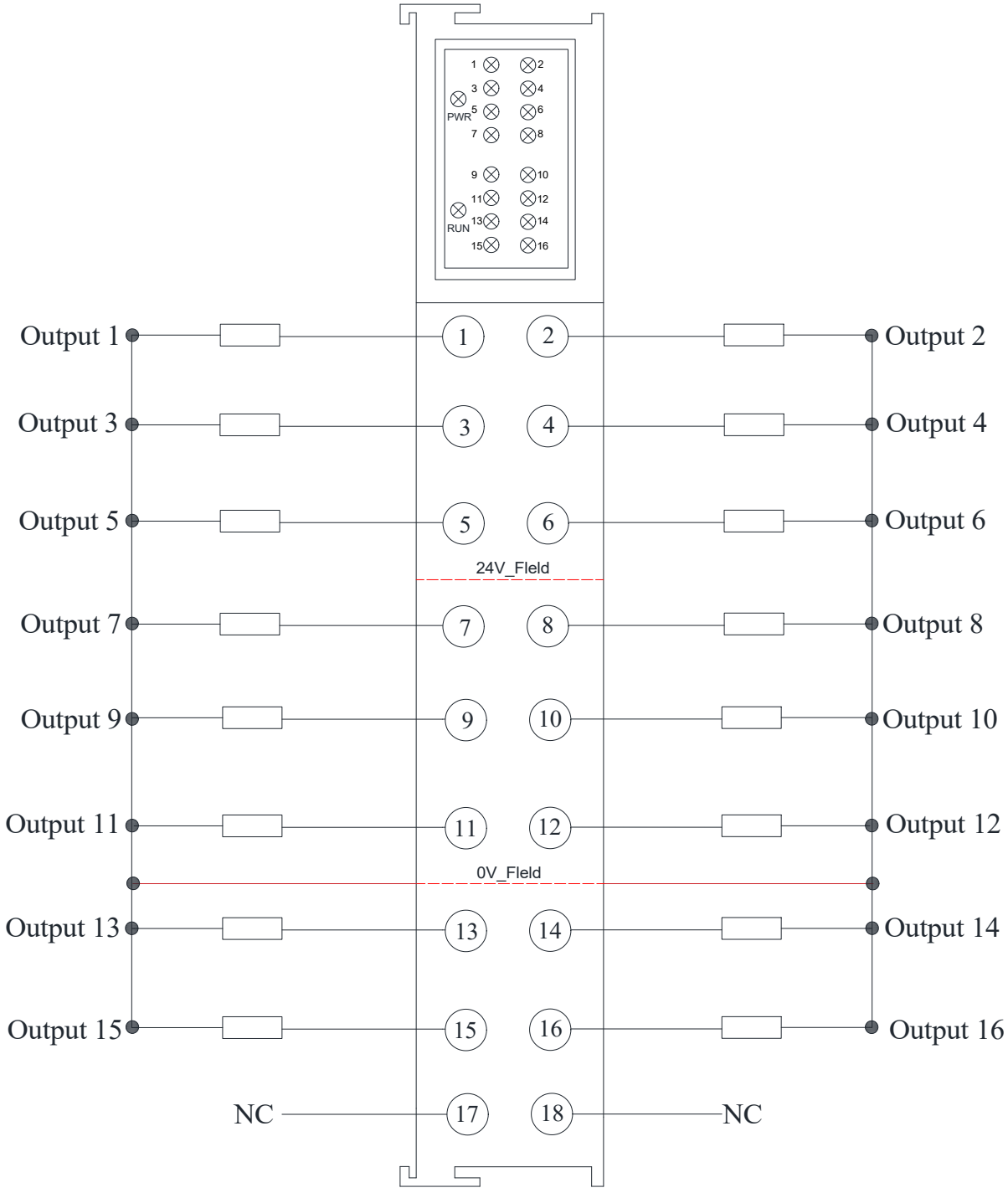
Model	SRL2232	SRL2132
Technical specifications		
Output type	PNP solid-state MOSFET	NPN solid-state MOSFET
Number of output points	32	
Bus 5VDC current consumption	181mA	175mA
Cable length (unshielded)	100m	
Output short-circuit protection	Yes, electronic type	
Maximum lamp load	5W	
Output current “1”	0.5A	
Leakage current	＜1mA	
Switching frequency		
● Maximum resistive load	100HZ	
● Maximum inductive load	0.5HZ	
● Maximum lamp load	10HZ	
● Maximum mechanical load	---	
Insulation test voltage	500V DC	
Isolation		
● Between channels and buses	Existent	
● Between channels	Existent	
Display indicator	Green LED display per channel output	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Dimensions (L × W × H)	30×80×100（mm）	

5.3. Wiring Diagram

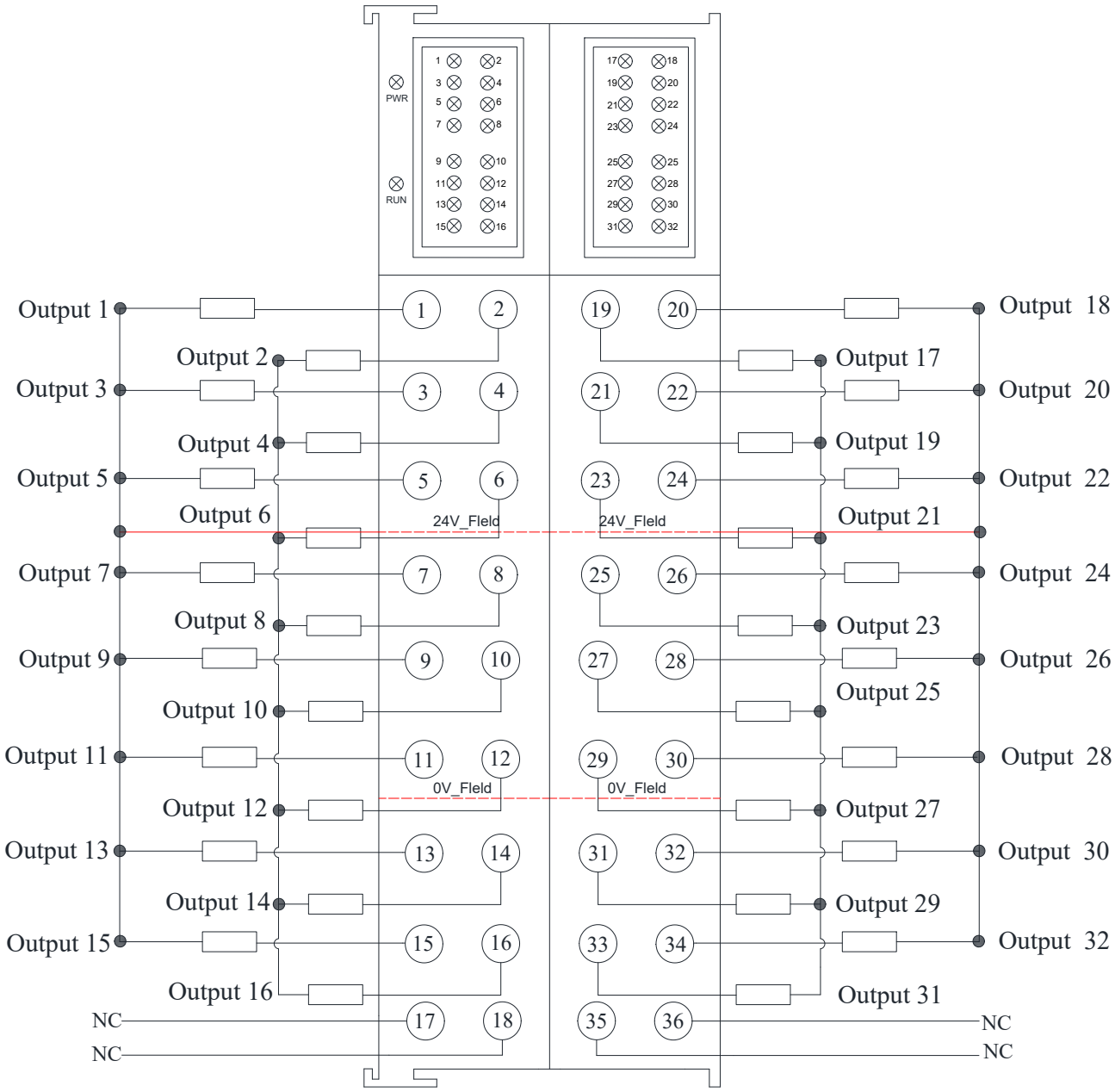
5.3.1. SRL2116 Wiring Diagram



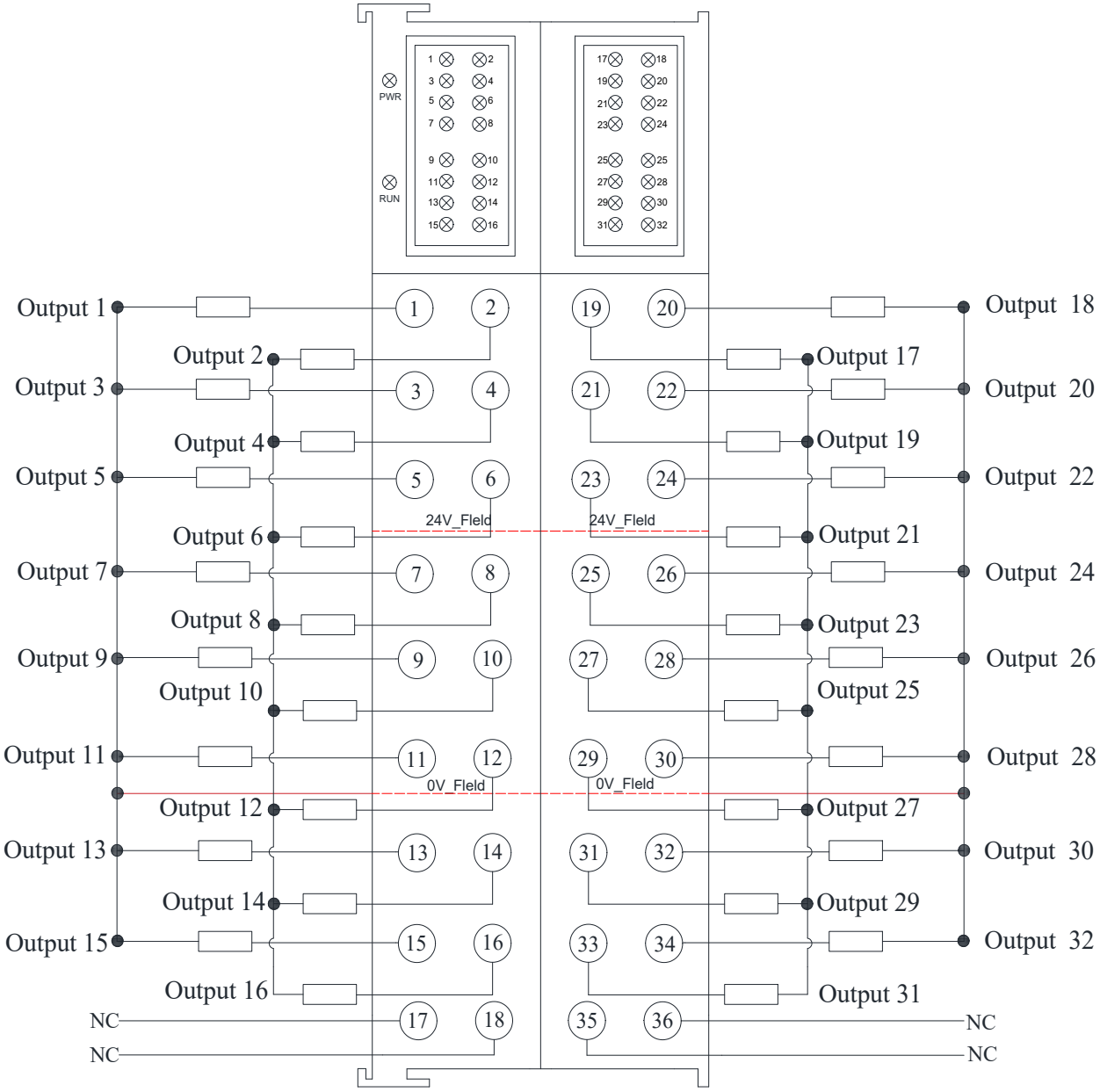
5.3.2. SRL2216 Wiring Diagram



5.3.3. SRL2132 Wiring Diagram



5.3.4. SRL2232 Wiring Diagram



5.4. Indicator Description

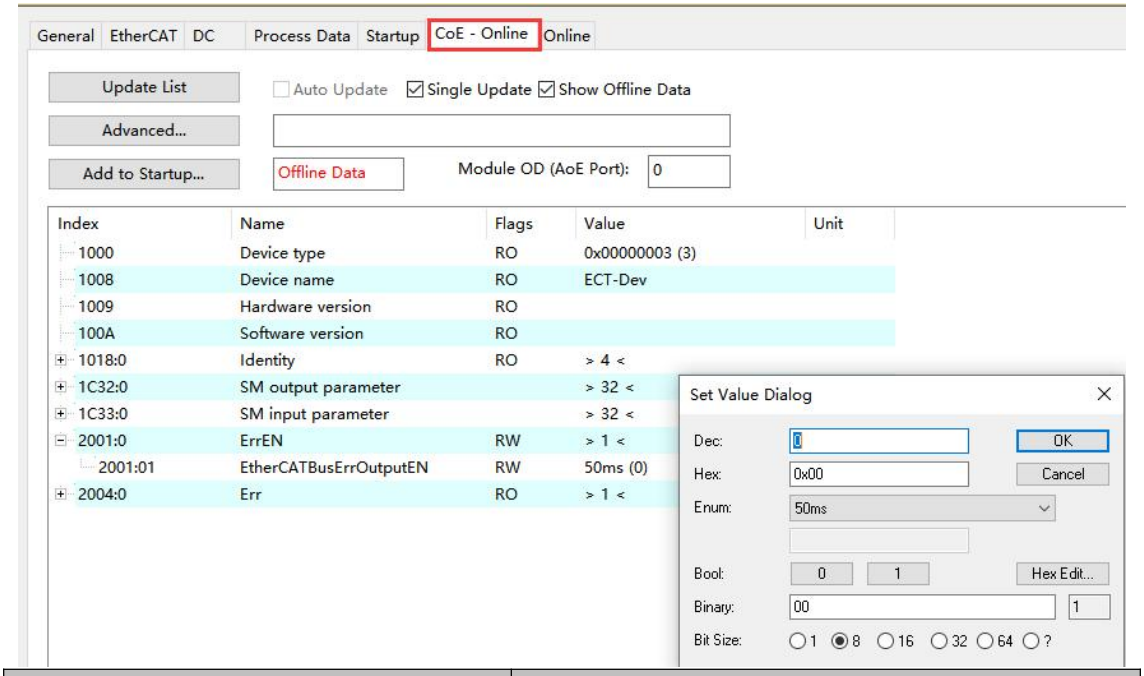
5.4.1. SRL2216/SRL2116 Indicator Description

Indicator	Description
PWR (Green)	Module power supply indicator: On: Module is powered normally; Off: Module is not powered;
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
LED1~LED16 (Green)	Digital Output Indicator: the corresponding indicator will light up when a signal is detected.

5.4.2. SRL2232/SRL2132 Indicator Description

Indicator	Description
PWR (Green)	Module power supply indicator: On: Module is powered normally; Off: Module is not powered;
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
LED1~LED32 (Green)	Digital Output Indicator: the corresponding indicator will light up when a signal is detected.

5.5. COE General Parameter Description



Parameters	Description
2001:01 EtherCATBusErrOutoutEN	Parameters for setting the action of output channels after a module communication failure.(The setting will not be saved after power-off): 0: Clear output after holding it for 50ms; 1: Hold output; 2: Clear output after holding it for 10ms; 3: Clear output after holding it for 20ms; 4: Clear output after holding it for 100ms; 5: Clear output after holding it for 500ms; 6: Clear output immediately;
2004:01 Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal. Bit1: Reserved; Bit2： 1: DO short circuit or overcurrent; 0: Normal.

6. Digital Fast Output Terminal

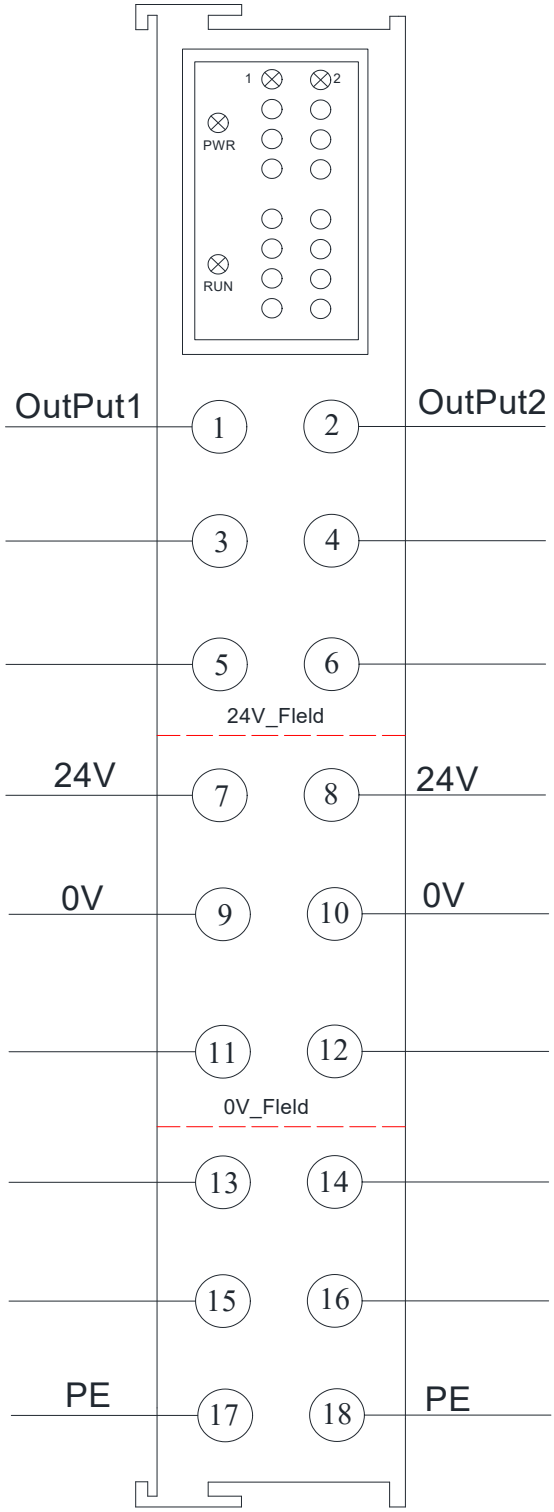
SRL5202/SRL5204 digital fast output terminal, with DC distributed clock and oversampling function, features the maximum output frequency of 1MHz, 2/4 channel output, transistor PNP, rated 24VDC/0.5A, and module diagnostic function.

6.1. Electrical Specifications

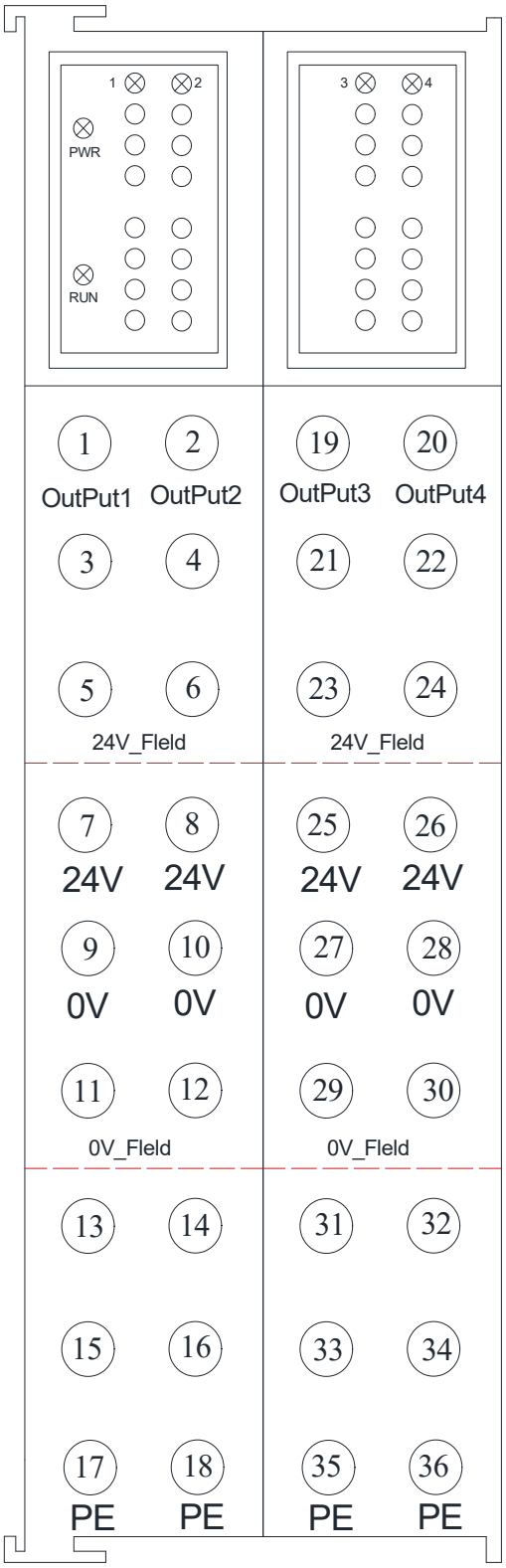
Model	SRL5202	SRL5204
Technical specifications		
Rated supply voltage	24V DC	
Bus 5VDC current consumption	165mA	165mA
Load type	Resistive load, inductive load, and lamp load	
Oversampling factor	N = integer multiple of cycle time, 1...1000	
Distributed clock	<< 1 µs	
Maximum output current	0.5 A per channel (short-circuit protection)	
Switching time	TON：< 1 µs，TOFF：< 1 µs	
Maximum frequency	1MHz	
24V current consumption	/	
Digital output characteristics		
Number of output points	2	4
Output type	Transistor PNP Output	
Isolation		
● Between channels and buses	Existent	
Display indicator	Power supply green LED display	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	15×100×80（mm）	

6.2. Wiring Diagram

6.2.1. SRL5202 Wiring Diagram



6.2.2. SRL5204 Wiring Diagram



6.3. Terminal Description

6.3.1. SRL5202 Terminal Description

Wiring Terminal	Description
Output1	Digital output channel 1
Output2	Digital output channel 2
24V	Positive pole of sensor power supply
0V	Negative pole of sensor power supply
PE	Shielded wire

6.3.2. SRL5204 Terminal Description

Wiring Terminal	Description
Output1	Digital output channel 1
Output2	Digital output channel 2
Output3	Digital output channel 3
Output4	Digital output channel 4
24V	Positive pole of sensor power supply
0V	Negative pole of sensor power supply
PE	Shielded wire

6.4. Indicator Description

6.4.1. SRL5202 Indicator Description

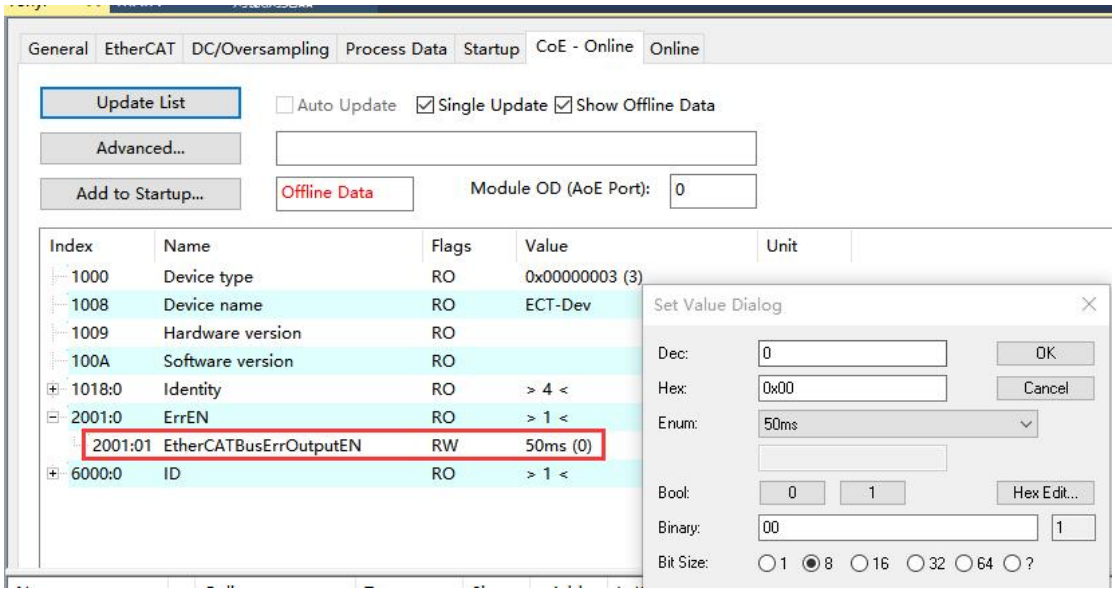
Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Power supply is abnormal
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
LED1	Output1 indicator On: Output1 is active Off: Output1 is inactive
LED2	Output2 indicator On: Output2 is active Off: Output2 is inactive

6.4.2. SRL5204 Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Power supply is abnormal
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
LED1	Output1 indicator On: Output1 is active Off: Output1 is inactive
LED2	Output2 indicator On: Output2 is active Off: Output2 is inactive
LED3	Output3 indicator On: Output3 is active Off: Output3 is inactive
LED4	Output4 indicator On: Output4 is active Off: Output4 is inactive

6.5. Parameter Description

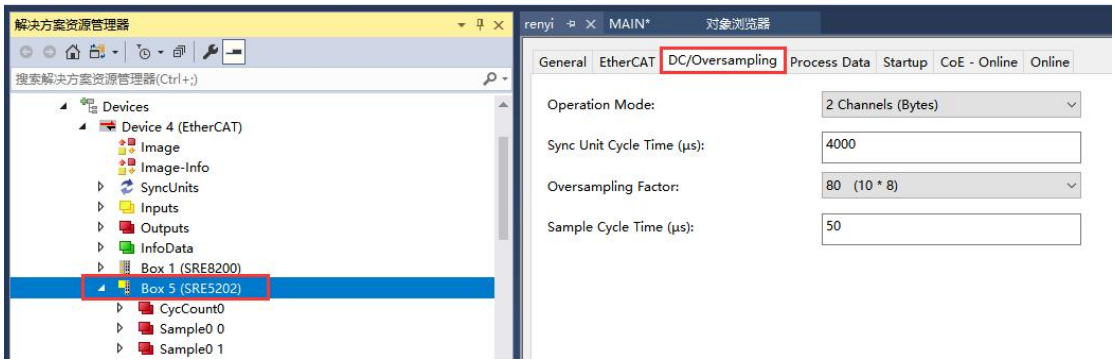
6.5.1. COE Parameter Description



Parameters	Description
2001:01 EtherCATBusErrOutoutEN	Parameters for setting the action of output channels after a module communication failure.(The setting will not be saved after power-off): 0: Clear output after holding it for 50ms; 1: Hold output; 2: Clear output after holding it for 10ms; 3: Clear output after holding it for 20ms; 4: Clear output after holding it for 100ms; 5: Clear output after holding it for 500ms; 6: Clear output immediately;

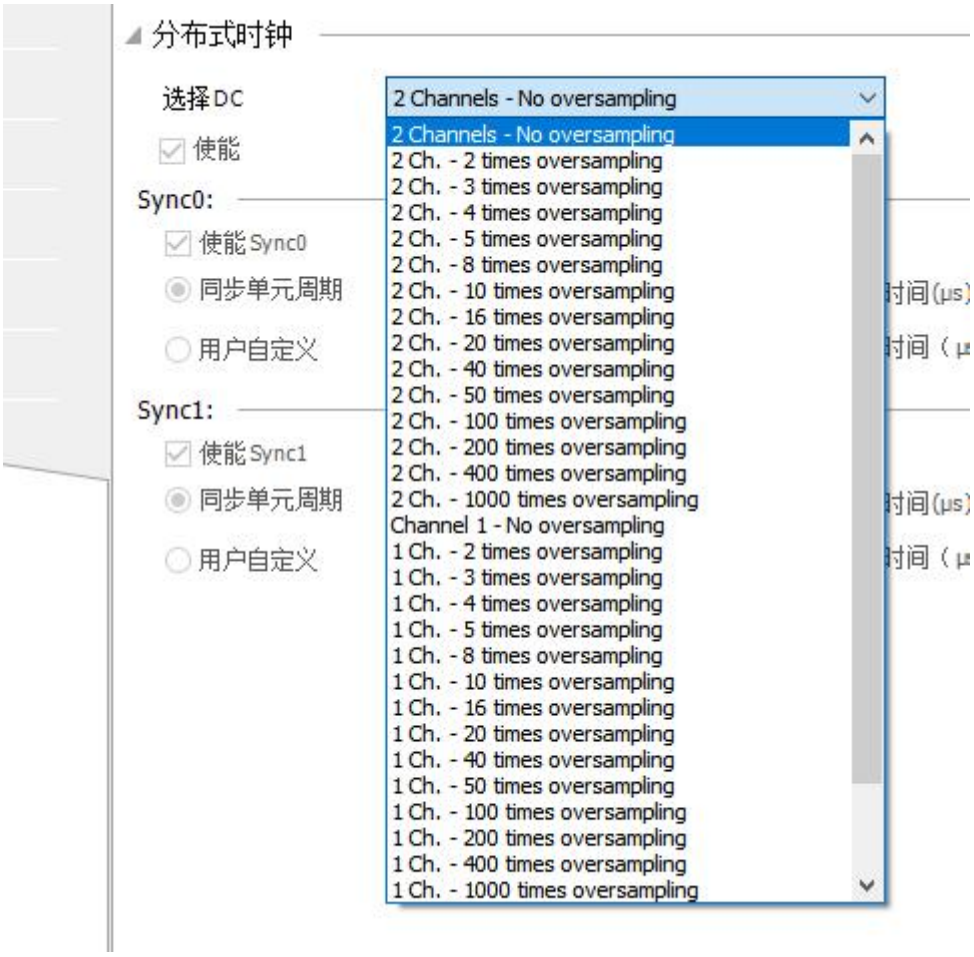
6.5.2. DC/Oversampling Parameter Description

Parameters take effect after refresh



Parameters	Description	
Operation Mode：	Selection of the number of channels: 2 Channels (Byte): Select to use two channels, Byte type 2 Channels (Bit): Select to use two channels, Bit type 1 Channel (Byte): Select to use one channel, Byte type (the first channel) 1 Channel (Bit): Select to use one channel, Bit type (the first channel) Note: For the SRL5204 module, selecting 1 Channels mode utilizes the first two channels, while selecting 2 Channels mode enables the use of all channels	
Sync Unit Cycle Time (us)：	Cycle time, determined by the EtherCAT cycle time setting	
Oversampling Factor:	1，2，4，5，8，10，16，20，25，32，40，50，64，80，100，125，128;	Sampling data (Bit)
	8(1*8)，16(2*8)，32(4*8)，40(5*8)，64(8*8)，80(10*8)，128(16*8)，160(20*8)，200(25*8)	Sampling data (Byte)
Sample Cycle Time (us)：	Sampling cycle is determined by the EtherCAT cycle time configured and the sampling factor	

6.5.3. Codesys/Distributed Clock



(For the SRL5204 module, selecting 1 Channels mode utilizes the first two channels, while selecting 2 Channels mode enables the use of all channels)

Operation Mode		Remarks
1 Ch. - X times oversampling	X:2，3，4，5，8，10，16，20，40，50，100，200，400，1000	Sampling data of channel 1 (bit)
2 Ch. - X times oversampling	X:2，3，4，5，8，10，16，20，40，50，100，200，400，1000	Sampling data for channels 1 and 2 (bit)

7. Digital I/O Terminal

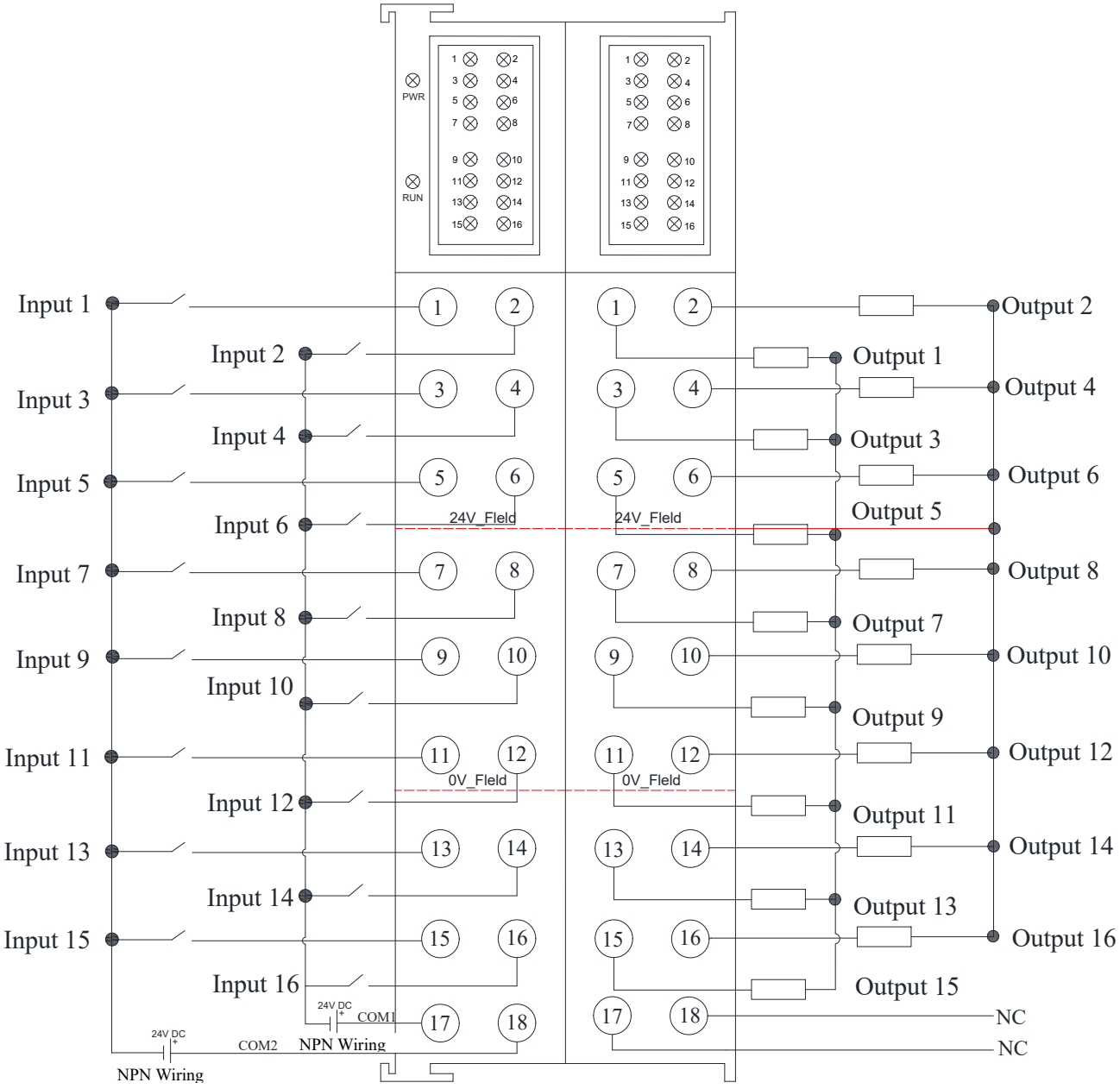
7.1. Electrical Specifications

SRL digital I/O terminal features 16-channel digital input, 16-channel digital output, and NPN/PNP, with diagnostic function.

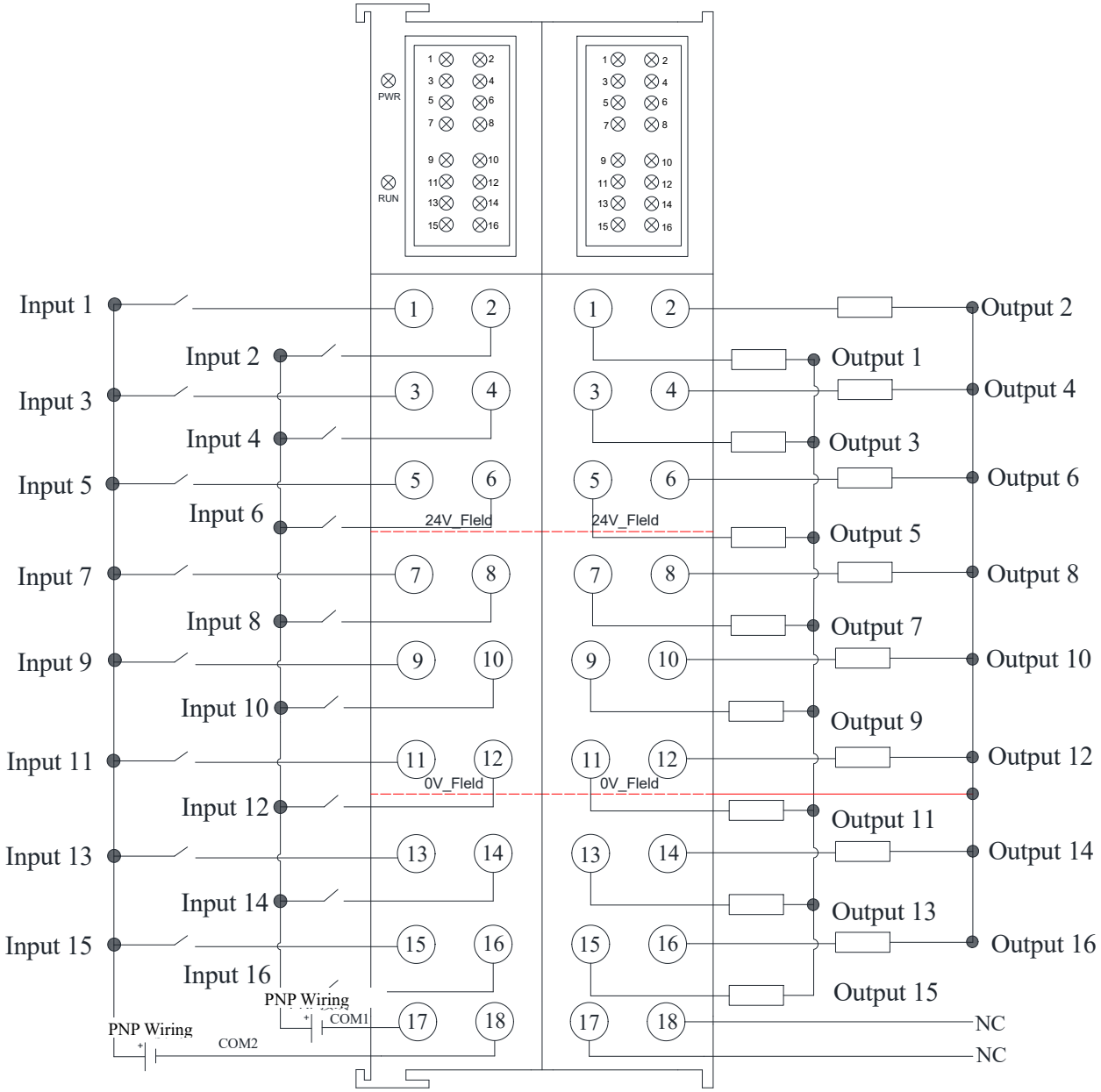
Model	SRL1332	SRL1432
Technical specifications		
Bus 5VDC current consumption	205mA	200mA
Input characteristics		
Number of input points	16	
● Rated value	24V DC	
● “0” signal	Maximum 5V DC, 1mA	
● “1” signal	Minimum 15V DC, 2.5mA	
Input characteristics	Sink	Source
Allowable static current	1mA	
Insulation test voltage	500V DC	
Cable length (unshielded)	Maximum 300m	
Cable length (shielded)	Maximum 500m	
Output		
Output type	NPN solid-state MOSFET	PNP solid-state MOSFET
Number of output points	16	
Cable length (unshielded)	Maximum 300m	
Cable length (shielded)	Maximum 500m	
Output short-circuit protection	Yes, electronic type	
Maximum lamp load	5W	
Output current “1”	0.5A	
Leakage current	＜1mA	
Mechanical life of contacts	---	
Electrical life of contacts (rated load)	---	
Switching frequency		
● Maximum resistive load	100HZ	
● Maximum inductive load	0.5HZ	
● Maximum lamp load	10HZ	
● Maximum mechanical load	---	
Insulation test voltage	500V DC	
Isolation		
● Between channels and buses	Existent	
● Between channels	Existent	
Display indicator	Green LED display per channel output	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	30×100×80（mm）	

7.2. Wiring Diagram

7.2.1. SRL1332 Wiring Diagram



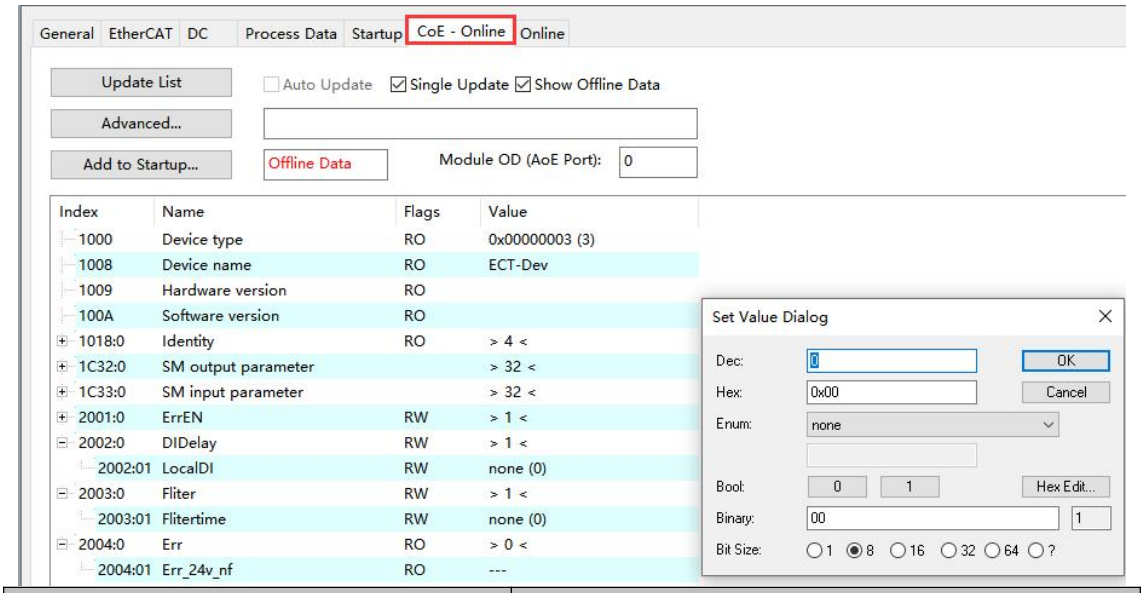
7.2.2. SRL1432 Wiring Diagram



7.3. Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Module is powered normally; Off: Module is not powered;
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
I1~I16 (Green)	Digital input indicator: the corresponding indicator will light up when a signal is detected.
Q1~Q16 (Green)	Digital Output Indicator: the corresponding indicator will light up when a signal is detected.

7.4. COE General Parameter Description



Parameters	Description
2001:01 EtherCATBusErrOutoutEN	Parameters for setting the action of output channels after a module communication failure. 0: Clear output after holding it for 50ms; 1: Hold output; 2: Clear output after holding it for 10ms 3: Clear output after holding it for 20ms; 4: Clear output after holding it for 100ms; 5: Clear output after holding it for 500ms; 6: Clear output immediately;
2002:01 LocalDI	Parameters for configuring the digital input terminal:

Parameters	Description
	DI delay None: No delay 1.6ms: DI delay is 1.6ms 3.2ms: DI delay is 3.2ms 12.8ms: DI delay is 12.8ms 20ms: DI delay is 20ms 50ms: DI delay is 50ms
2003:01 Fliter time	None: No filtering; 1：1ms； 2：2ms； 3：5ms； 4：10ms； 5：20ms； 6：50ms。
2004:01 Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal. Bit1: Reserved; Bit2： 1: DO short circuit or overcurrent; 0: Normal.

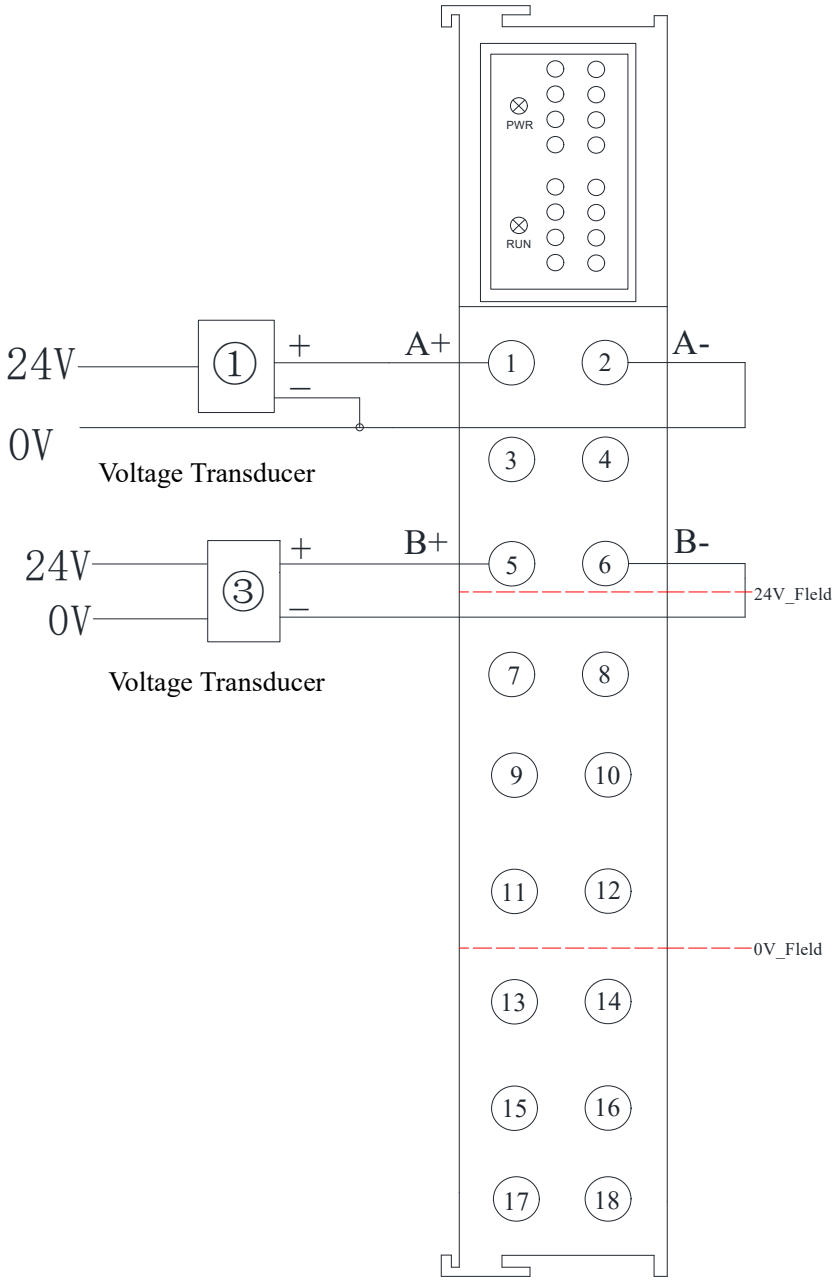
8. Analog Fast Acquisition Input Terminal

The SRL3522 dual-channel analog fast acquisition module **does not support the Omron platform**.

8.1. Electrical Specifications

Model	SRL3522
Technical specifications	
Power supply voltage	18~28V DC
Bus 5VDC current consumption	187mA
Number of input channels	2
Acquisition type	Voltage
Measuring range	
Voltage	-10V-10V
Data word	
Bipolar	-32000~32000
Resolution	16-bit
Input type	Differential input
Sampling type	Simultaneous
Oversampling factor	N = 1...100 optional (Max 100 ksamples/s)
Maximum sampling rate	Max 10 μs/100 ksps (per channel, synchronous)
Isolation	
● Between channels and buses	Existent
Display indicator	Power supply green LED display
Distributed clock	Supported
System power diagnosis and warning	Supported
Environmental conditions	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)
Storage temperature	-40~60 °C
Vibration/shock resistance	Compliant with EN 60068-2-6/EN 60068-2-27 Standards
EMI/EMR resistance	Compliant with EN 61000-6-2/EN 61000-6-4 Standards
Dimensions (L × W × H)	15×100×80 mm

8.2. SRL3522 Module Wiring Diagram



① 3-Wire Sensor

③ 4-Wire Sensor

* For single-ended connections, signal negative (-) and power supply negative (-) are shorted together

8.3. Indicator Description

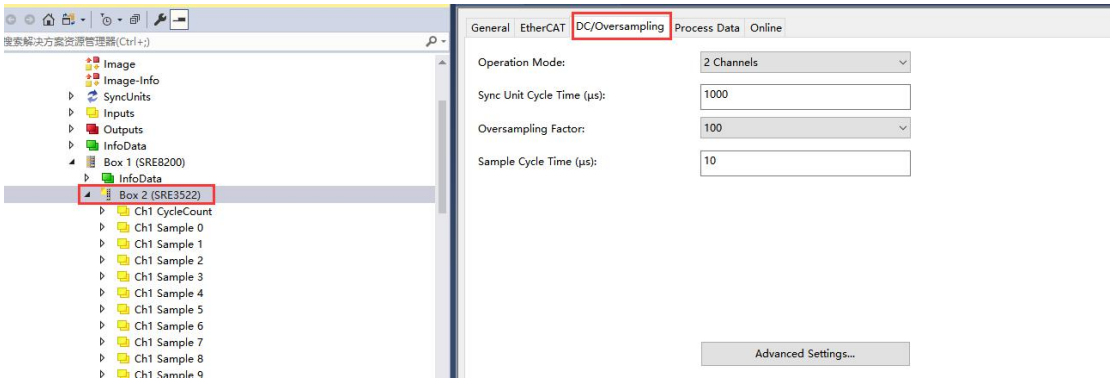
Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Power supply abnormal or module not powered
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication

8.4. Terminal Description

Terminal	Description
A+,A-	CH0 acquisition voltage input terminal
B+,B-	CH1 acquisition voltage input terminal

8.5. Parameter Description

The signal oversampling cycle is: Sample Cycle Time = Sync Unit Cycle Time/Oversampling Factor, with a minimum sampling cycle of 10us for sampling. Example: If the bus cycle time is 1000us and the sampling count is 100 times, then the sampling cycle is 10us. A value is sampled every 10us, requiring 100 executions. These data are accumulated and transmitted in the next bus cycle.



Parameters	Description
Operation Mode：	Selection of the number of channels: 2 Channels: Select to use two channels 1 Channel: Select to use one channel (the first channel)
Sync Unit Cycle Time (us)：	Cycle time, determined by the EtherCAT cycle time setting
Oversampling Factor:	Oversampling parameter: sampling count per cycle, **maximum 100 times.** 1：1 2：2 3：4 4：5 5：8 6：10 7：16 8：20 9：25 10：32 11：40 12：50 13：64 14：80 15：100
Sample Cycle Time (us):	Sampling cycle is determined by the EtherCAT cycle time configured and the sampling factor

9. Analog Input Terminal

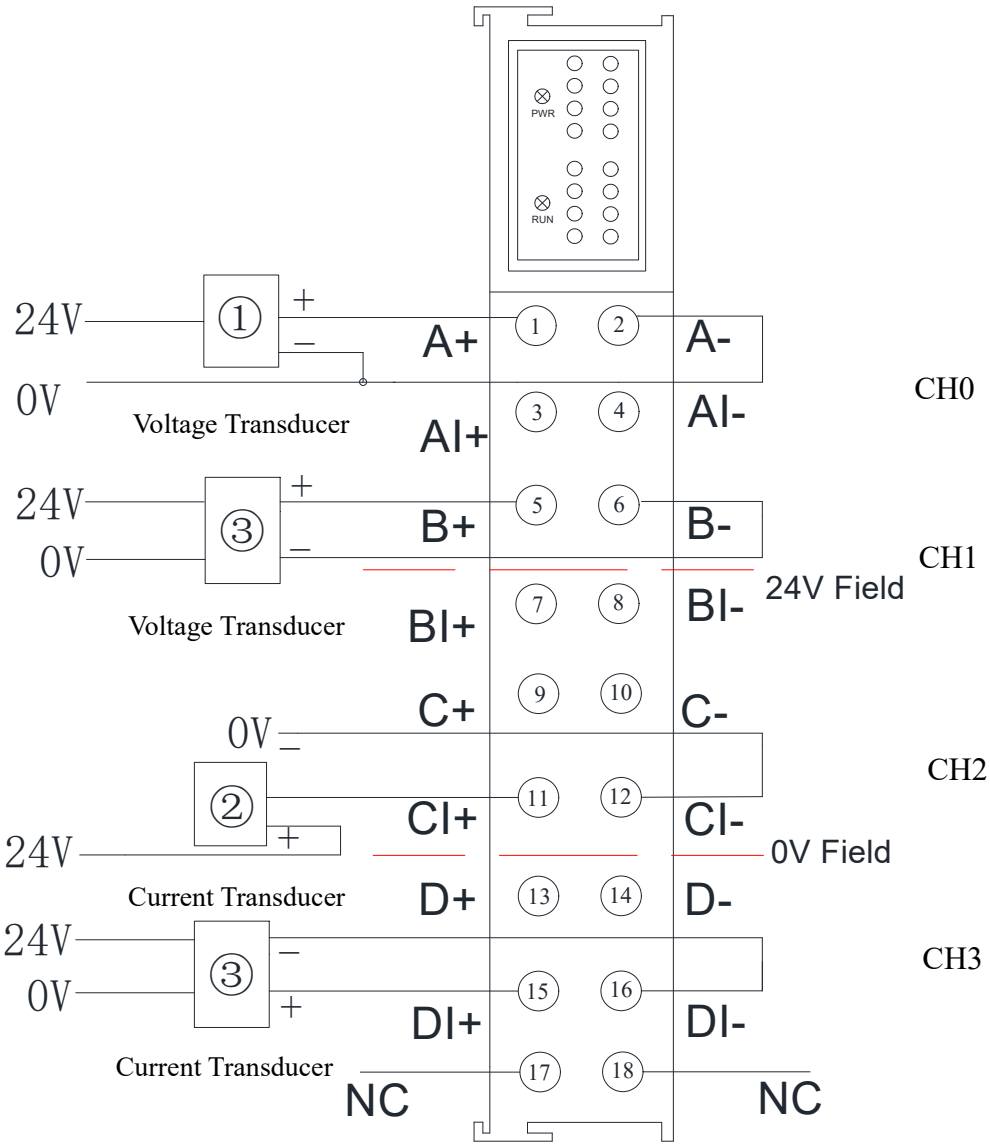
9.1. Electrical Specifications

High-performance analog input terminal features 16-bit precision and 4/8-channel voltage/current input, with the module diagnostic function.

Model	SRL3204	SRL3208
Technical specifications		
Power supply voltage	18~28V DC	
Bus 5VDC current consumption	160mA	165mA
Number of input channels	4	8
Input type	Voltage/Current	
Measuring range		
Voltage (Unipolar)	0-10V	
Voltage (Bipolar)	-10V-10V	
Current	0~20mA	
Data word		
Unipolar	0~32000	
Bipolar	-32000~32000	
Isolation		
● Between channels and buses	Existent	
Display indicator	Power supply green LED display	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	15×100×80 mm	30×100×80 mm

9.2. Module Wiring Diagram

9.2.1. SRL3204 Wiring diagram



① 3-Wire Sensor

② 2-Wire Sensor

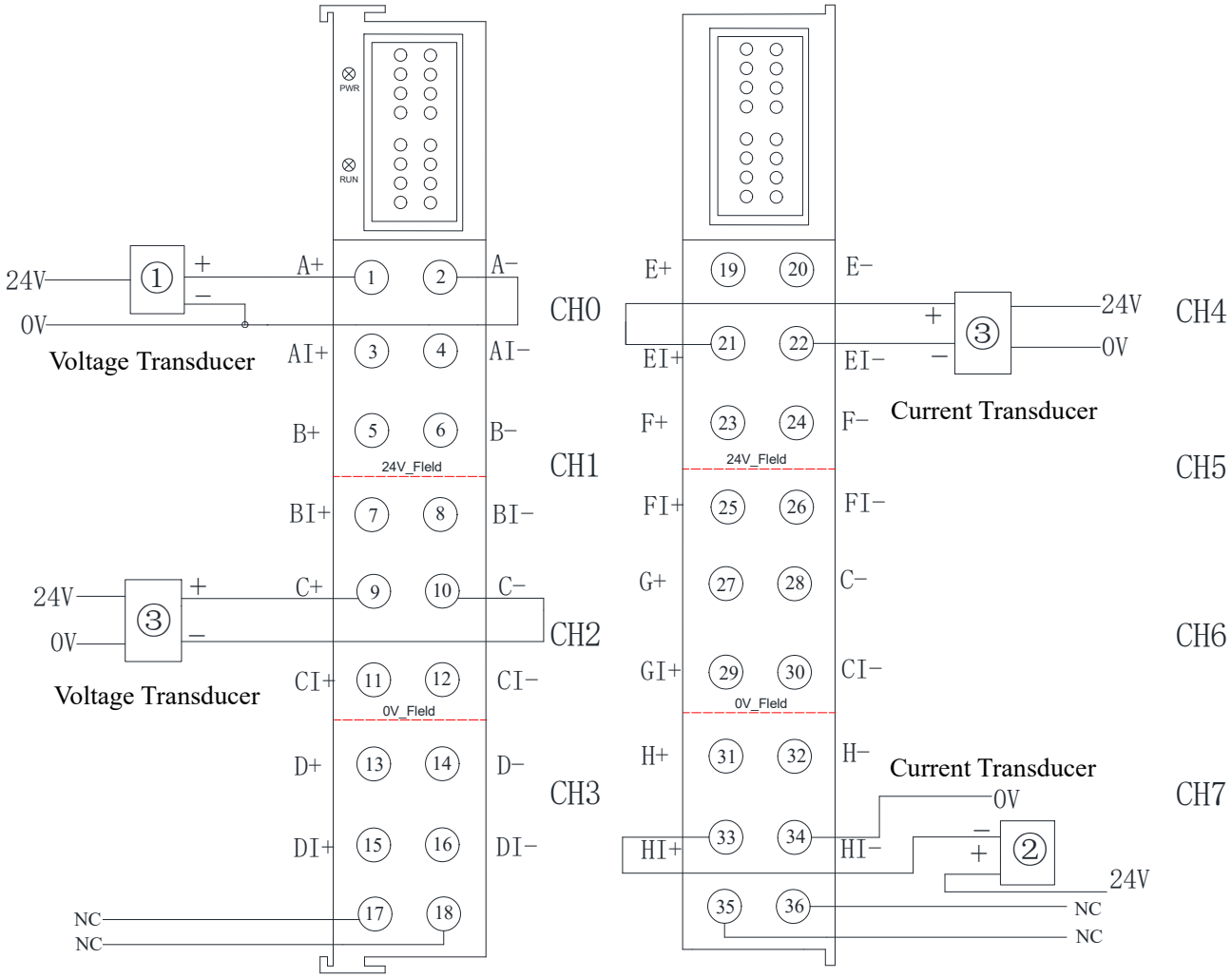
③ 4-Wire Sensor

∗ For single-ended connections, signal negative (-) and power supply negative (-) are shorted together

Note: A+ and A- are voltage signal input channels, and AI+ and AI- are current signal input channels. If CH0 needs to be connected to a voltage signal, it can be connected to A+ and A- terminals; if CH0 needs to be connected to a current signal, it can be connected to AI+ and AI- terminals; both channels are CH0 and occupy the same data address, so only one can be selected for use and both cannot be connected

simultaneously. The same rule applies to other input channels. The wiring in the diagram is only an example, and specific connections can be made as needed.

9.2.2. SRL3208 Wiring Diagram



① 3-Wire Sensor
② 2-Wire Sensor
③ 4-Wire Sensor

* For single-ended connections, signal negative (-) and power supply negative (-) are shorted together

Note: A+ and A- are voltage signal input channels, and AI+ and AI- are current signal input channels. If CH0 needs to be connected to a voltage signal, it can be connected to A+ and A- terminals; if CH0 needs to be connected to a current signal, it can be connected to AI+ and AI- terminals; both channels are CH0 and occupy the same data address, so only one can be selected for use and both cannot be connected simultaneously. The same rule applies to other input channels. The wiring in the diagram is only an example, and specific connections can be made as needed.

9.3. Terminal Description

9.3.1. SRL3204 Terminal Description

Terminal	Description
A+,A-	CH0 voltage input terminal
AI+,AI-	CH0 current input terminal
B+,B-	CH1 voltage input terminal
BI+,BI-	CH1 current input terminal
C+,C-	CH2 voltage input terminal
CI+,CI-	CH2 current input terminal
D+,D-	CH3 voltage input terminal
DI+,DI-	CH3 current input terminal

9.3.2. SRL3208 Terminal Description

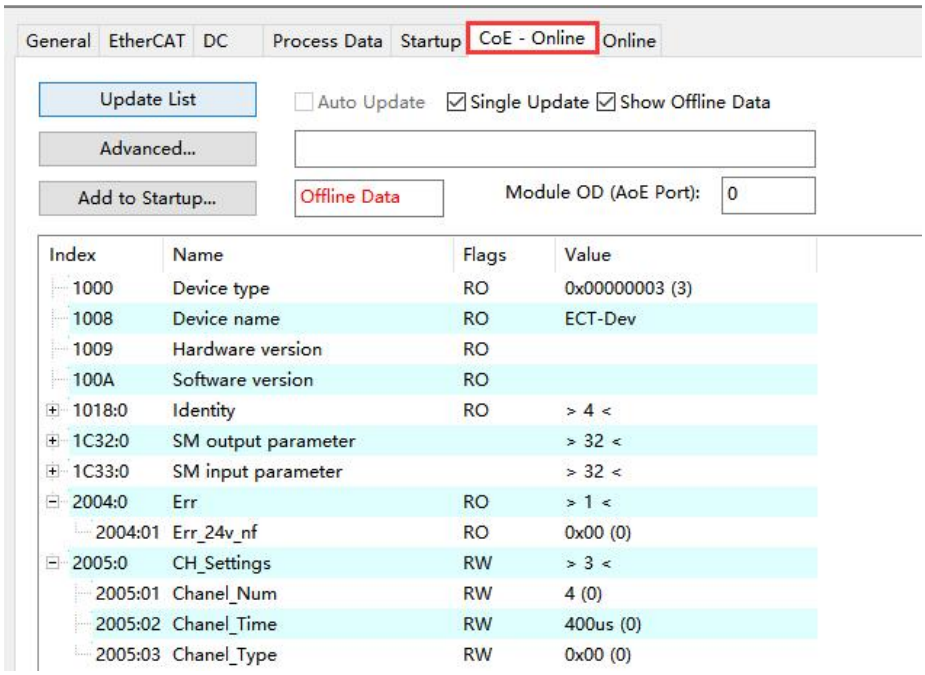
Terminal	Description
A+,A-	CH0 voltage input terminal
AI+,AI-	CH0 current input terminal
B+,B-	CH1 voltage input terminal
BI+,BI-	CH1 current input terminal
C+,C-	CH2 voltage input terminal
CI+,CI-	CH2 current input terminal
.....	.....
.....	.....
H+,H-	CH7 voltage input terminal
HI+,HI-	CH7 current input terminal

9.4. Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Module is powered normally; Off: Module is not powered;
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication

9.5. COE General Parameter Description

Configuration parameters will not be synchronized to Startup, and will not be saved after power-off or hot-plugging.



Parameters	Data type	Description
2004:01	Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal.
2005:01	Channel Num	0: Enable 4 channels; 1: Enable the first channel; 2: Enable the first 2 channels;
2005:02	Channel Time	Channel update time: 0：400us； 1：lms； 2：2ms； 3：5ms； 4：10ms； 5：20ms；
2005:03	Channel Type	Each BIT corresponds to one channel: for example Bit0: Corresponds to CH0; Bit1: Corresponds to CH1; ..... Set a detection value: 0: Voltage ±10V; 1: Current 0-20mA;

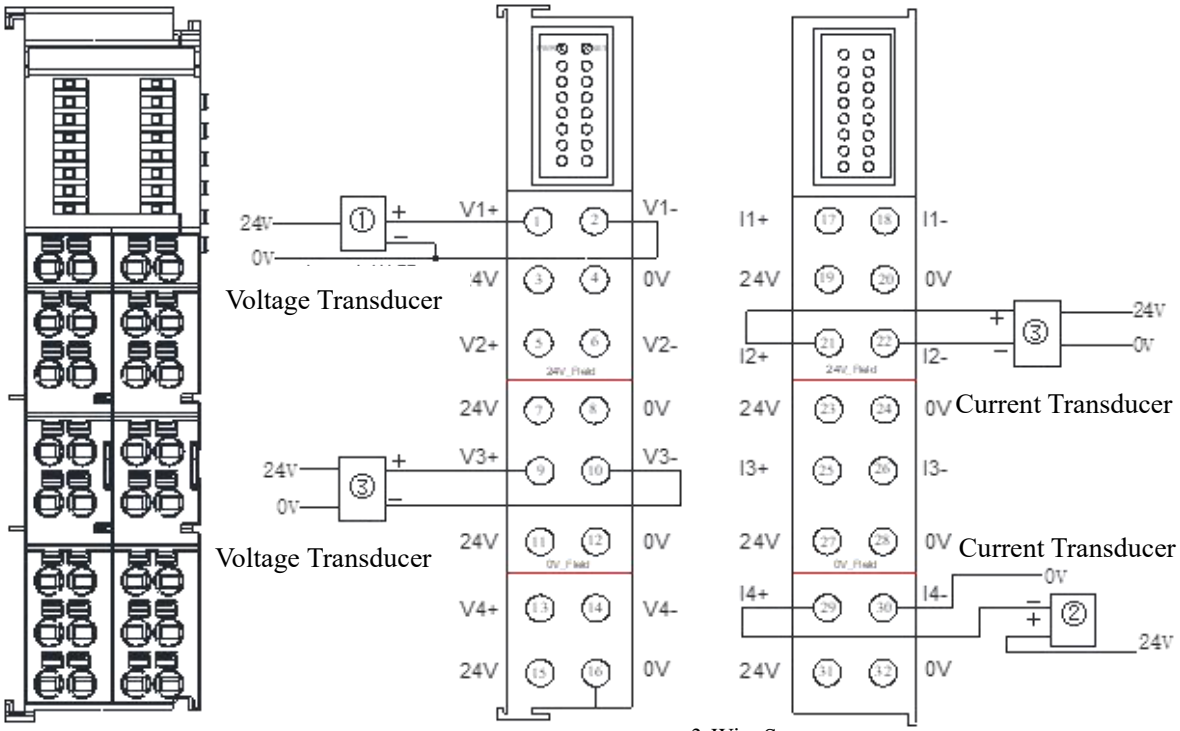
10. Multifunctional Analog Input Terminal

10.1. Electrical Specifications

SRL3404 EtherCAT bus 4-channel multifunctional analog input terminal features 24-bit precision (0.01%, 23°C, full scale), sampling frequency 10ksps (100μs), and voltage (±10V, 0-10V, -10-0V) or current (0-20mA, 4-20mA), and supports software filtering, with up to 64x oversampling capability.

Product Model	SRL3404
Technical specifications	
Power supply voltage	18V DC~28V DC
Number of input channels	4
Acquisition type	Voltage/Current
Measuring range	
Voltage (Unipolar)	0~10V、-10V~0V
Voltage (Bipolar)	-10V-10V
Current	0~20mA、4~20mA
Data word	
Unipolar	0~7812500
Bipolar	-7812500~7812500
Resolution	24-Bit
Analog accuracy	0.01% (At 23°C, full scale)
Oversampling factor	n = 1...64
Sampling frequency	10ksps（1000us）
Limit frequency of input filtering	3KHz
Internal impedance	＞500KΩ（30V）； >4MΩ (Others) 150Ω (Current)
Isolation	
● Between channels and buses	Existent
Display indicator	Power supply green LED display
Distributed clock	Supported
System power diagnosis and warning	Supported

Product Model	SRL3404
Environmental conditions	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)
Vibration/shock resistance	Compliant with EN 60068-2-6/EN 60068-2-27 Standards
EMI/EMR resistance	Compliant with EN 61000-6-2/EN 61000-6-4 Standards
Dimensions (L × W × H)	24×100×64 （mm）



10.2. Wiring Diagram

10.3. Indicator Description

Indicator	Indicator definition	Color	Status	Description
PWR	Module power	Green	Steadily lit	Module is powered normally

	indicator		Off	Module is not powered or powered abnormally
NET	Communication indicator	Green	Steadily lit	Communication is normal
			Off	Communication is abnormal

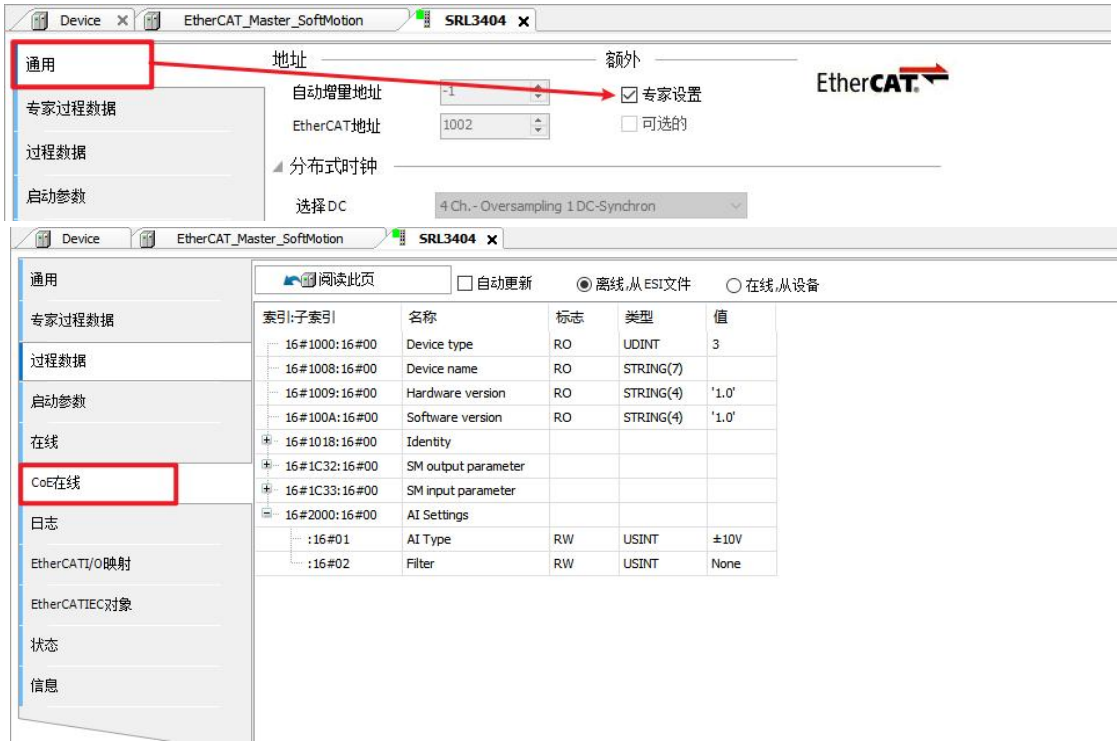
10.4. Terminal Description

Terminal	Description
V1+,V1-	CH1 acquisition voltage input terminal
V2+,V2-	CH2 acquisition voltage input terminal
V3+,V3-	CH3 acquisition voltage input terminal
V4+,V4-	CH4 acquisition voltage input terminal
I1+,I1-	CH1 acquisition current input terminal
I2+,I2-	CH2 acquisition current input terminal
I3+,I3-	CH3 acquisition current input terminal
I4+,I4-	CH4 acquisition current input terminal
24V	Power positive
0V	Power negative

10.5. Parameter Description

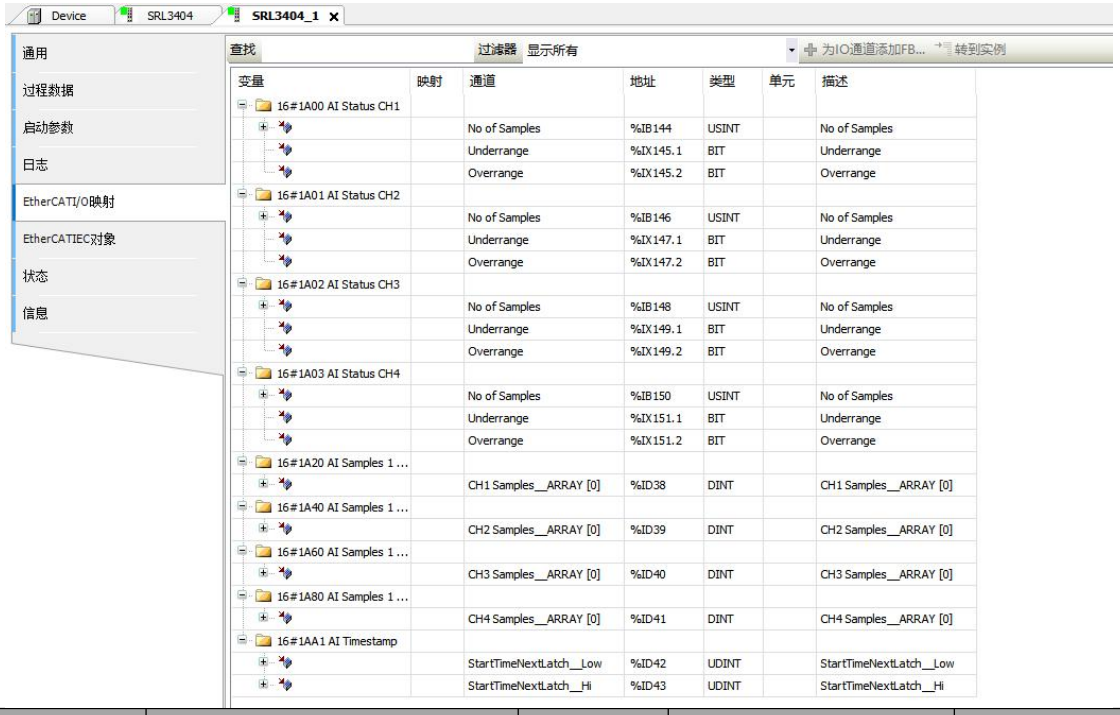
COE Online Parameters

In the offline status, check “Expert Settings” in “General Parameters”. After checking, it will be online, and the user can modify module parameters in COE online parameters.



Object dictionary	Subindex	Name	Meaning
0x2000	0x01	AI Type	AI range configuration: 0: ±10V (Default) 1：0-10V 2：-10-0V 3：0-20mA 4：4-20mA
	0x02	Filter	Filter configuration: 0：None 1：FIR Notch 50Hz 2：FIR Notch 60Hz 3：FIR LP 100Hz 4：FIR LP 1000Hz 5：FIR LP 3000Hz

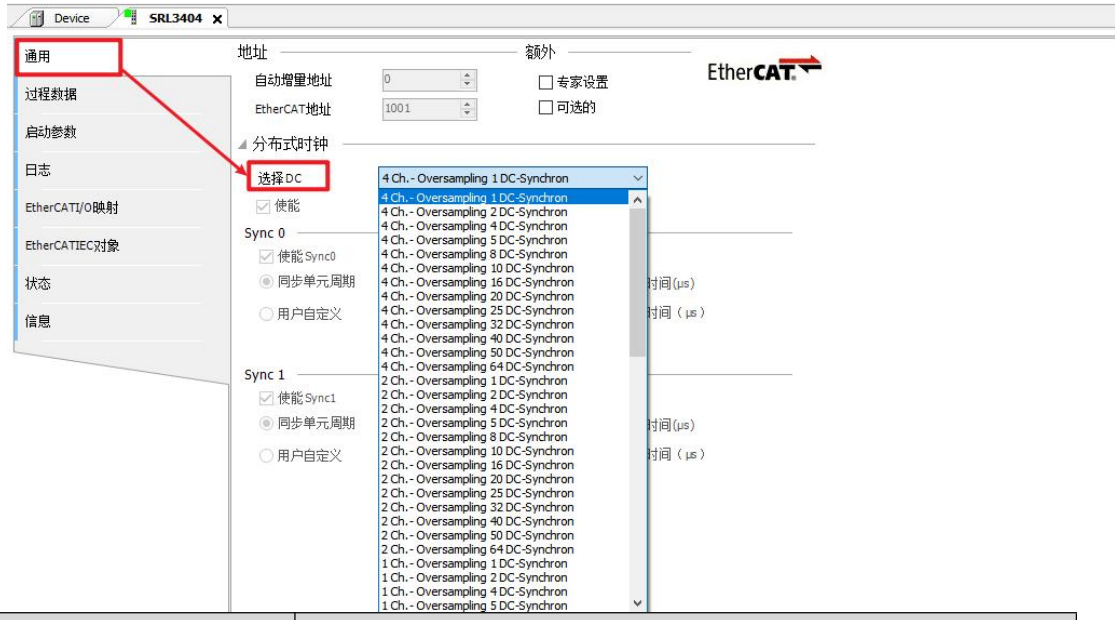
PDO parameters



Address index	Description	Data type	Meaning	Remarks
AI Status（CH1~CH4）	No of Samples	USINT	Current sampling count	Oversampling rate can be configured at 1,
	bit0: Reserved	BOOL	Reserved	

Address index	Description	Data type	Meaning	Remarks
	bit1：Underrange	BOOL	Underrange	2, 4, 5, 8, 10, 16, 20, 25, 32, 40, 50, and 64 Default 4 channels with 1x sampling rate
	bit2：Overrange	BOOL	Overrange	
	bit3-bit7: Reserved	BOOL	Reserved	
AI Samples（CH1~CH4）	CHx Samples_ARRAY[0]..Samples_ARRAY[31]	DINT	AI sampling value 0	
AI Timestamp	StartTimeNextLatch__Low	DINT	Lower 4 bytes of local timestamp	
	StartTimeNextLatch__Hi	DINT	Upper 4 bytes of local timestamp	

DC Distributed Clock Parameters



Parameters	Description
Operation Mode：	1/2/4 CH,-Oversampling （1、2、4、5、8、10、16、20、25、32、40、50、64）DC-Synchr
	1/2/4 CH,-Oversampling （1、2、4、5、8、10、16、20、25、32、40、50、64）SM-Synchr

11. Analog Output Terminal

11.1. Electrical Specifications

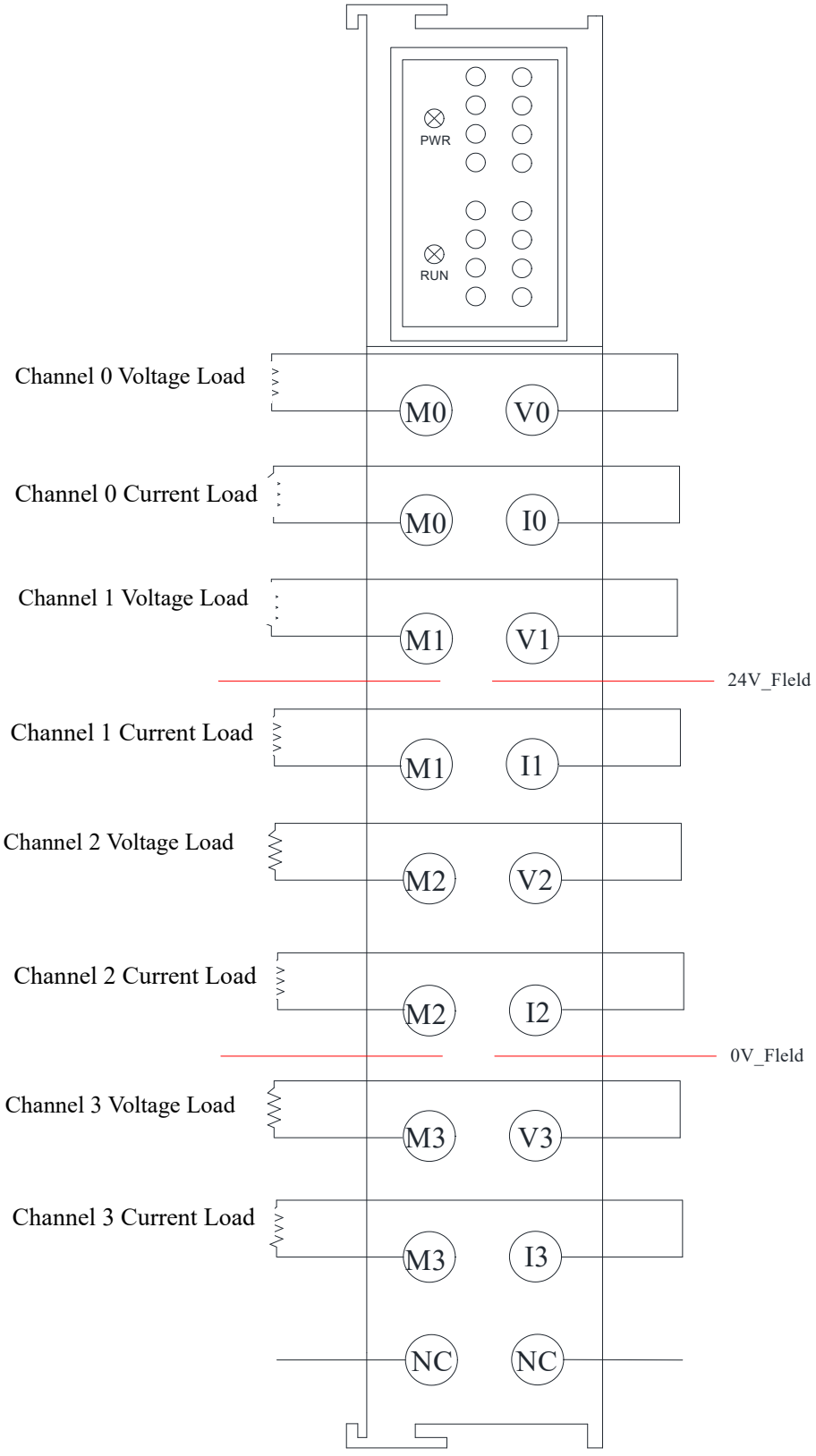
SRL4204 analog output terminal features 4-channel voltage or current, ±10V or

0~20mA, module diagnostic function, 16-bit precision, and 35mm DIN rail mounting.

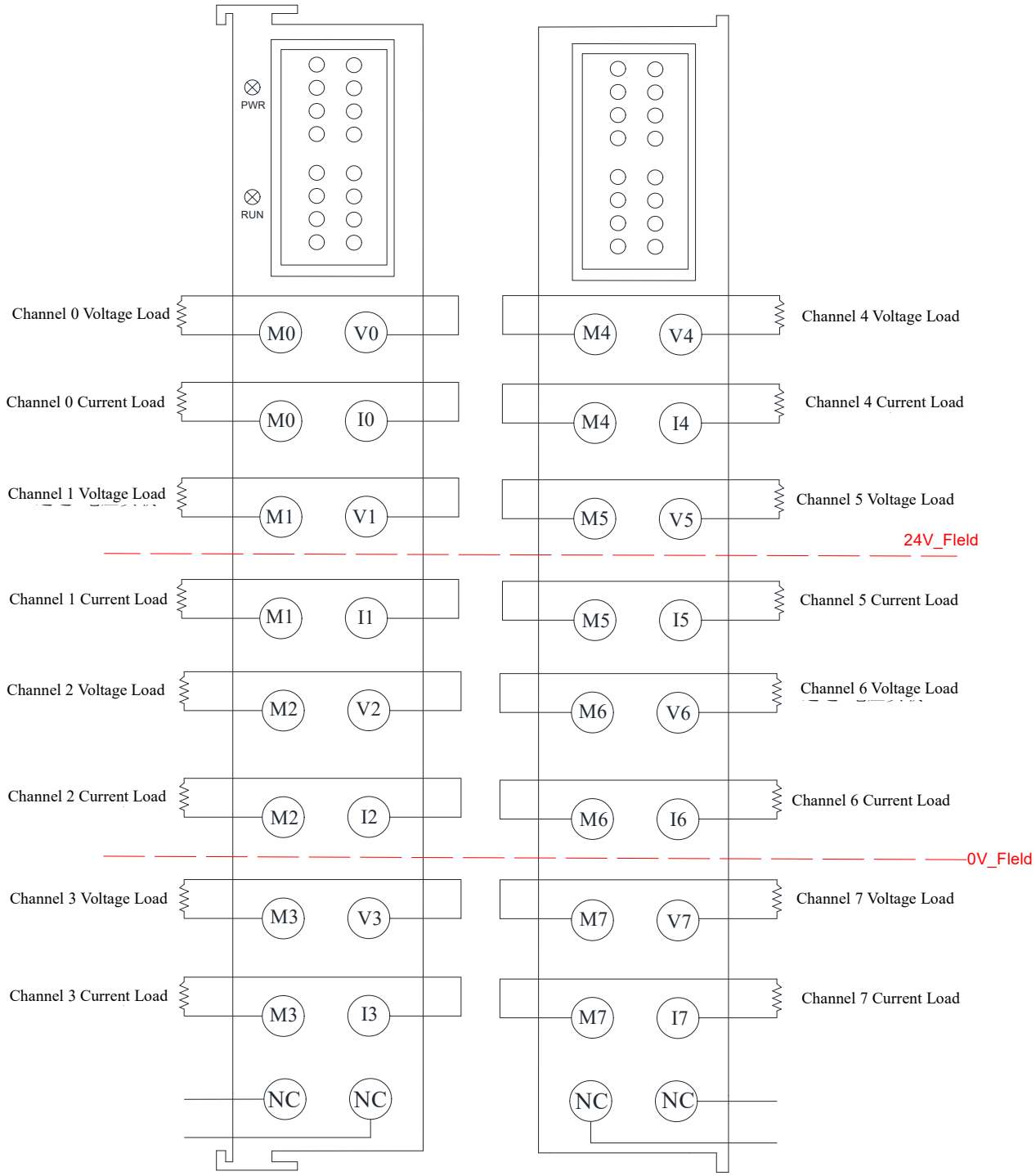
Model	SRL4204	SRL4208
Power supply voltage	18~28V DC	
Bus 5VDC current consumption	170mA	170mA
Number of output channels	4	8
Measuring range		
Voltage (Unipolar)	0~10V	
Voltage (Bipolar)	-10~10V	
Current	0~20mA	
Voltage	-32000~32000, full scale	
Current	0~32000, full scale	
Isolation		
● Between channels and buses	Existent	
Display indicator	Power supply green LED display	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	15×100×80 mm	30×100×80 mm

11.2. Module Wiring Diagram

11.2.1. SRL4204 Wiring Diagram



11.2.2. SRL4208 Wiring Diagram



11.3. Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Module is powered normally; Off: Module is not powered;
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication

11.4. Terminal Description

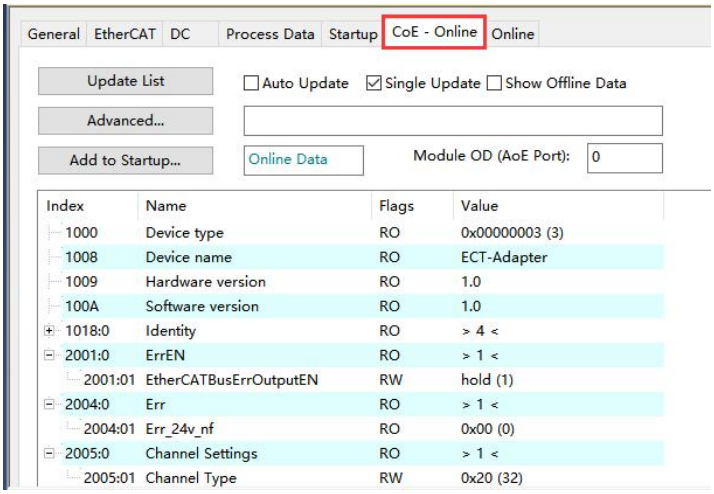
11.4.1. SRL4204 Terminal Description

Terminal	Description
V0，M0	CH0 voltage output terminal
I0，M0	CH0 current output terminal
V1，M1	CH1 voltage output terminal
I1，M1	CH1 current output terminal
V2，M2	CH2 voltage output terminal
I2，M2	CH2 current output terminal
V3，M3	CH3 voltage output terminal
I3，M3	CH3 current output terminal

11.4.2. SRL4208 Terminal Description

Terminal	Description
V0，M0	CH0 voltage output terminal
I0，M0	CH0 current output terminal
V1，M1	CH1 voltage output terminal
I1，M1	CH1 current output terminal
V2，M2	CH2 voltage output terminal
I2，M2	CH2 current output terminal
V3，M3	CH3 voltage output terminal
I3，M3	CH3 current output terminal
V4，M4	CH4 voltage output terminal
I4，M4	CH4 current output terminal
V5，M5	CH5 voltage output terminal
I5，M5	CH5 current output terminal
V6，M6	CH6 voltage output terminal
I6，M6	CH6 current output terminal
V7，M7	CH7 voltage output terminal
I7，M7	CH7 current output terminal

11.5. COE General Parameter Description



Parameters	Data type	Description
2001:01	EtherCATBusErrOutputEN	Parameters for setting the action of output channels after a module communication failure. 0: Clear output after holding it for 50ms; 1: Hold output; 2: Clear output after holding it for 10ms 3: Clear output after holding it for 20ms; 4: Clear output after holding it for 100ms; 5: Clear output after holding it for 500ms; 6: Clear output immediately;
2004:01	Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal.
2005:01	Channel Type	Each BIT corresponds to one channel: for example Bit0: Corresponds to CH0; Bit1: Corresponds to CH1; ..... Configure channel range settings: 0：±10V 1：0-20mA/0-10V

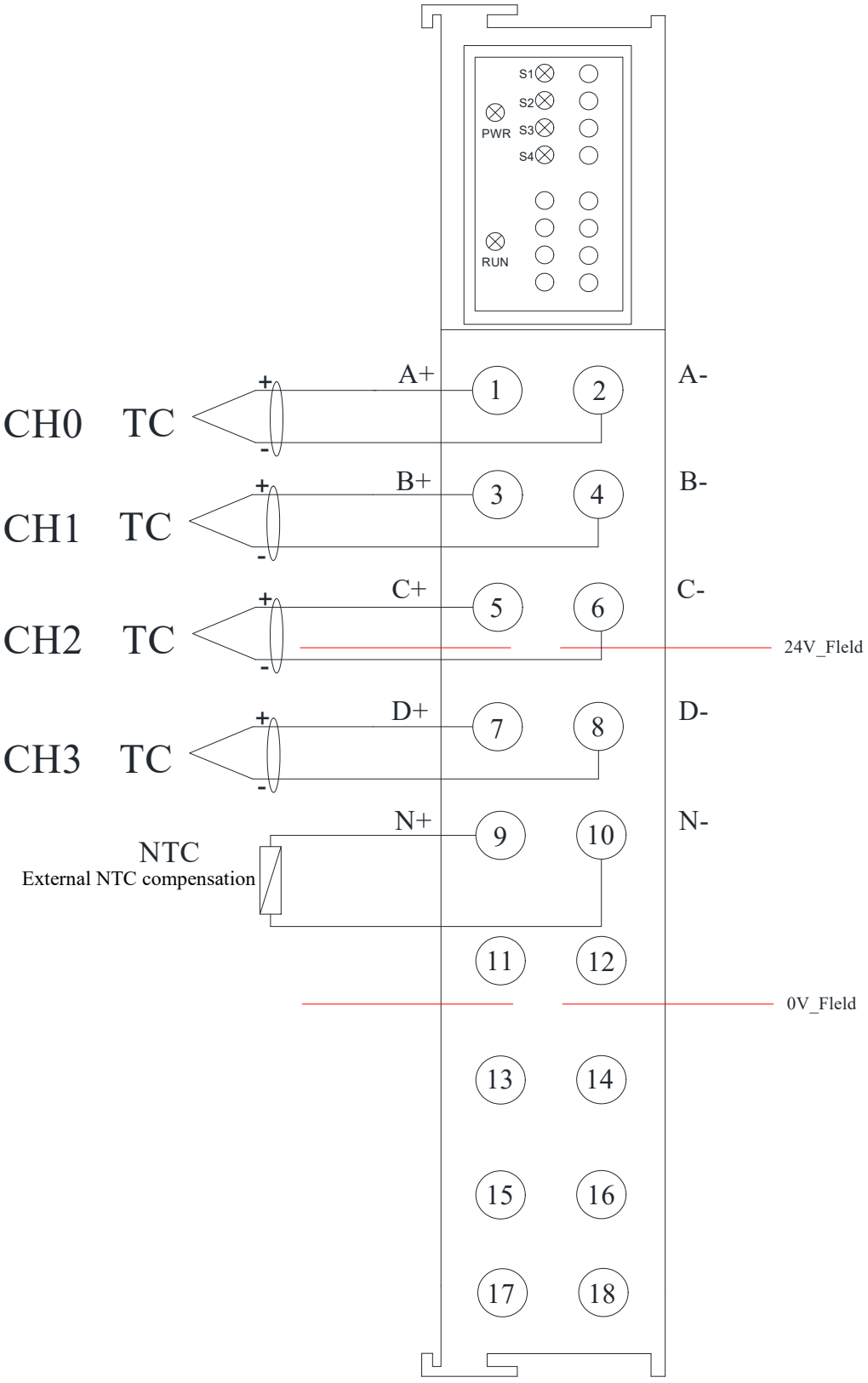
12. Temperature Measurement Module

12.1. SRL3284 Thermocouple Measurement Module

12.1.1. Electrical Specifications

Model	SRL3284
Technical specifications	
Number of input points	4
Input type	Thermocouple
Power supply polarity protection	Supported
Operating voltage	24VDC (allowable voltage range 18VDC~28VDC)
Bus 5VDC current consumption	165mA
Input range	Thermocouple type (select one): S/T/R/E/N/K/J; Voltage range: ±80mV
Measurement principle	Sigma -Delta
Resolution	
Temperature	0.1℃/0.1℉
Voltage	15-Bit + sign bit
Common-mode rejection	85dB，DC-50HZ/60HZ/400HZ
Conductor length	Maximum compensation conductor length 30m
Conductor loop resistance	Maximum 20Ω
Input impedance	≥10MΩ
Basic error	≤0.1%FS
Consistency	0.05%FS
Cold junction error	±1.5℃
Isolation	
● Between channels and buses	Existent
● Between power supply and bus	Existent
● Between channel and power supply	Existent
Display indicator	Power and RUN green indicators
Environmental conditions	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)
Storage temperature	-40~60 °C
Dimensions (L × W × H)	15×100×80（mm）

12.1.2. Module Wiring Diagram



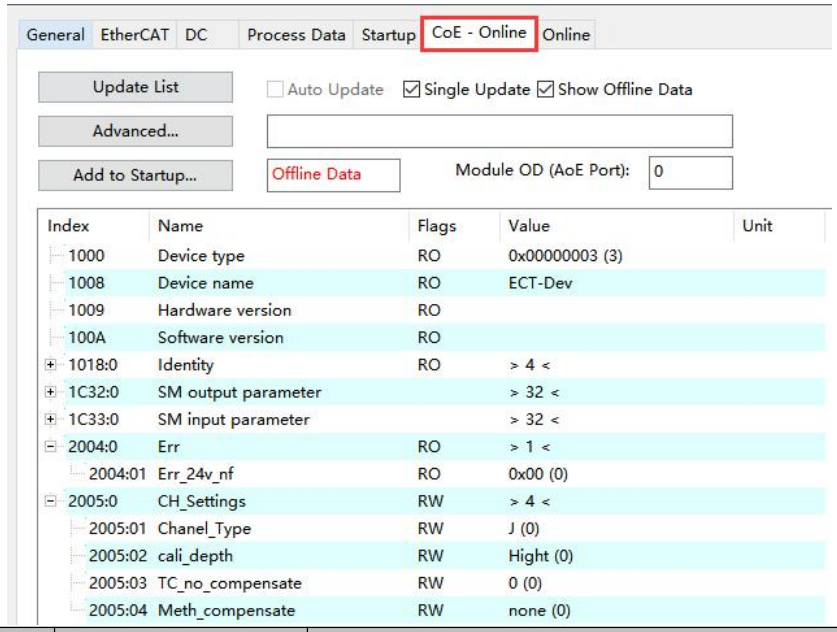
12.1.3. Terminal Description

Terminal	Description
A+ A-	CH0 thermocouple input terminal
B+ B-	CH1 thermocouple input terminal
C+ C-	CH2 thermocouple input terminal
D+ D-	CH3 thermocouple input terminal
NTC+ NTC-	External NTC compensation

12.1.4. Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Abnormal power supply or no power
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
S1 (Red)	Channel disconnection detection indicator Flashing: CH0 sampling value is in over range or in the disconnection state. Off: CH0 sampling value is within the normal range.
.....	.....
S4 (Red)	Channel disconnection detection indicator Flashing: CH3 sampling value is over range or in the disconnection state. Off: CH3 sampling value is within the normal range.

12.1.5. COE Parameter Description



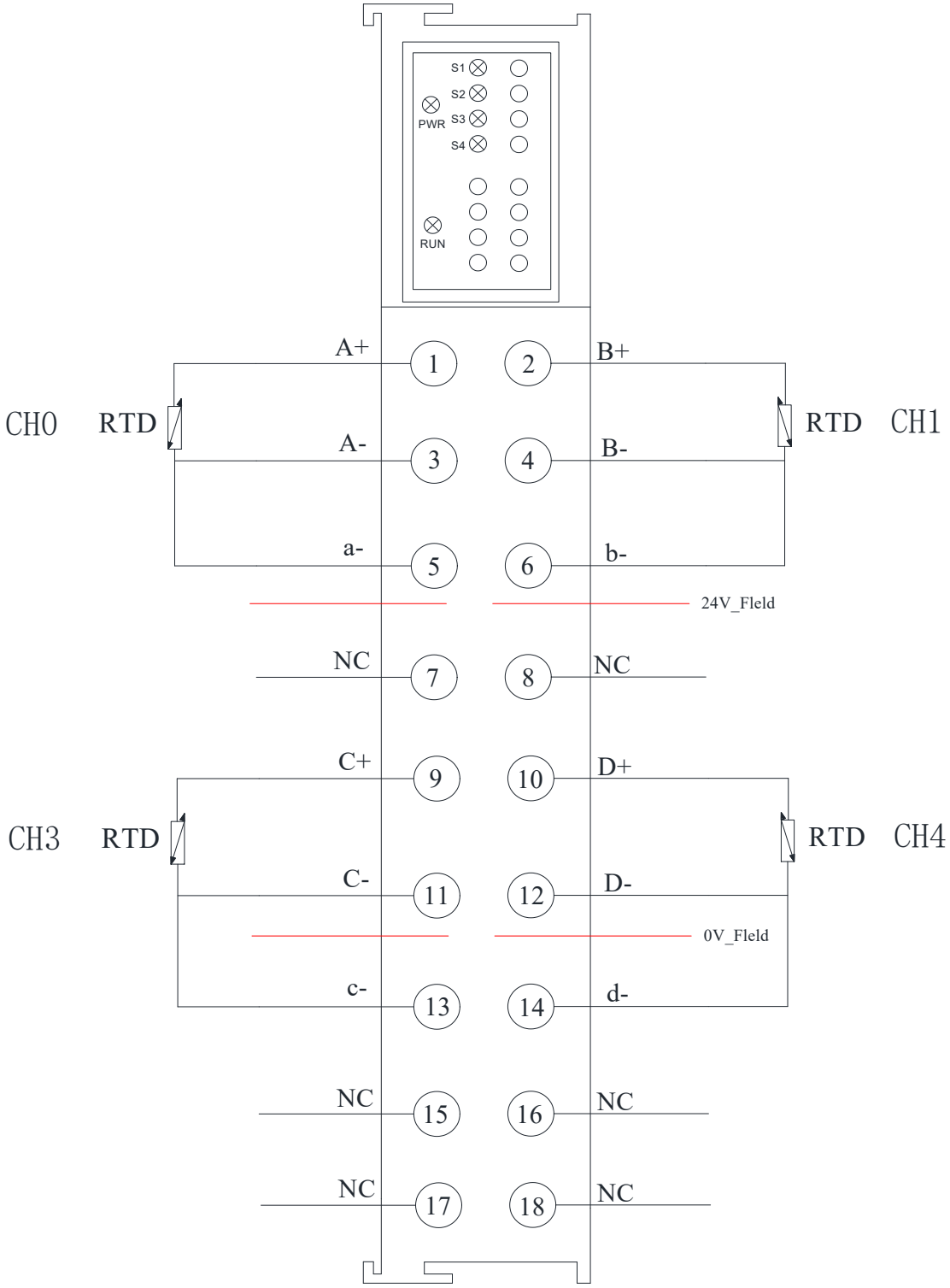
Parameters	Data type	Description
2004:01	Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal.
2005:01	Channel_Type	Configure channel thermocouple types, including 8 types: 0：J； 1：K； 2：T； 3：E； 4：R； 5：S； 6：N； 7：+/-80MV；
2005:02	cali_depth	Filter level: 0: High: Strong filtering; 1: Normal: Normal filtering; 2: None: No filtering;
2005:03	TC_no_compensate	Whether to perform cold junction compensation: 0: Yes; 1: No;
2005:04	Meth_compensate	Temperature compensation method: 0: None: internal compensation 1: Outside as NTC: external NTC compensation

12.2. SRL3274 Resistance Thermometer Measurement Module

12.2.1. Electrical Specifications

Model	SRL3274
Technical specifications	
Number of input points	4
Input type	Resistance thermometer
Power supply polarity protection	Supported
Maximum sustainable voltage	30V DC
Bus 5VDC current consumption	165mA
Input range	Resistance thermometer type (select one): Pt-100Ω,1000Ω(α=3850PPM,3920PPM, 3850.55PPM,3916PPM,3902PM) ; Ni-100Ω,1000Ω(α=6720PPM,6178PPM) ;
Measurement principle	Sigma -Delta
Data word	-32768~+32767
Resolution	
Temperature	0.1℃/0.1℉
Voltage	---
Resistance	15-Bit + sign bit
Measurement conversion time	Less than 400ms
Common-mode rejection	More than 125dB, AC120V
Cable length (compensating conductor)	Maximum 30m
Conductor loop resistance	Maximum 100Ω
Input impedance	≥1MΩ
Basic error	≤0.1%FS
Consistency	0.05%FS
Cold junction error	---
Isolation	
● Between channels and buses	Existent
● Between power supply and bus	Existent
● Between channel and power supply	Existent
Display indicator	Power supply green LED display
System power diagnosis and warning	Supported
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)
Dimensions (L × W × H)	15×100×80 mm

12.2.2. Module Wiring Diagram



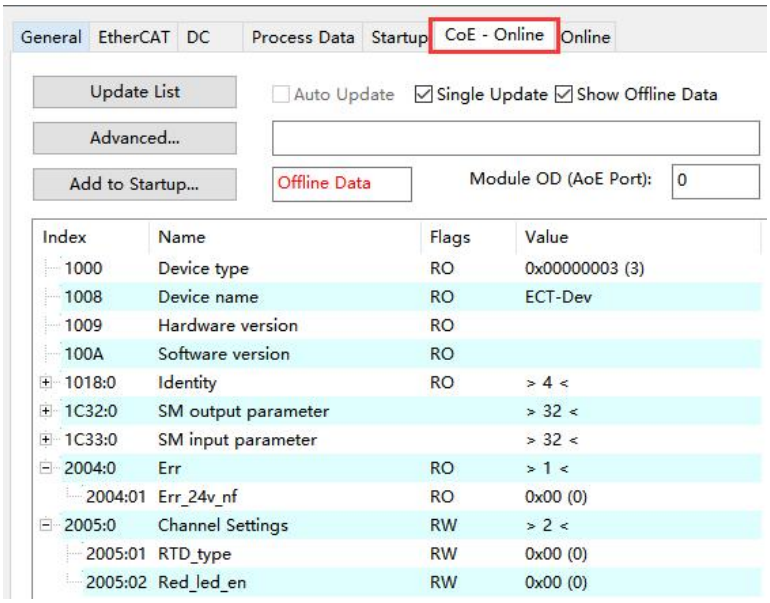
12.2.3. Terminal Description

Terminal	Description
A+,A-,a-	CH0 resistance thermometer input terminal
B+,B-,b-	CH1 resistance thermometer input terminal
C+,C-,c-	CH2 resistance thermometer input terminal
D+,D-,d-	CH3 resistance thermometer input terminal

12.2.4. Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Abnormal power supply or no power
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
S1 (Red)	Channel disconnection detection indicator Flashing: CH0 sampling value is in over range or in the disconnection state. Off: CH0 sampling value is within the normal range.
.....	.....
S4 (Red)	Channel disconnection detection indicator Flashing: CH3 sampling value is over range or in the disconnection state. Off: CH3 sampling value is within the normal range.

12.2.5. COE Parameter Description



Parameters	Data type	Description
2004:01	Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal.
2005:01	RTD_Ttype	Resistance thermometer type: 0：100Ω Pt 0.003850(Default) 1：1000Ω Pt 0.003850 2：100Ω Pt 0.003920 3：1000Ω Pt 0.003920 4：100Ω Pt 0.00385055 5：1000Ω Pt 0.00385055 6：100Ω Pt 0.003916 7：1000Ω Pt 0.003916 8：100Ω Pt 0.003902 9：1000Ω Pt 0.003902 11：100Ω Ni 0.006720 12：1000Ω Ni 0.006720 13：100Ω Ni 0.006178 14：1000Ω Ni 0.006178
2005:01	Red_led_en	Disconnection detection alarm: Bit0：LED indicate Ch1： Bit1：LED indicate Ch2： Bit2：LED indicate Ch3： Bit3：LED indicate Ch4： Definition: 0: Enable the disconnection detection alarm 1: Disable the disconnection detection alarm

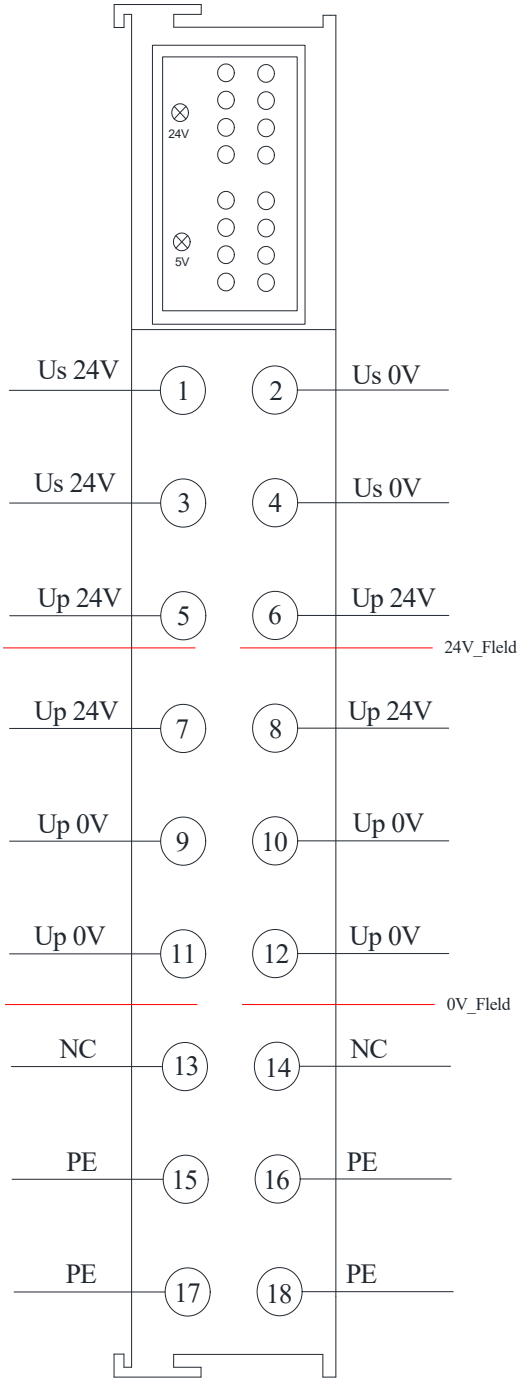
13. SRL9001 Power Relay Module

SRL power relay module is 24VDC power relay and also 5V DC isolated bus power relay, without system diagnostics or alarm functions, and does not occupy any slot number.

13.1. Electrical Specifications

Model	SRL9001
Power supply specifications	
Input power supply voltage	24VDC(±20%)
Output system voltage	5VDC±3% (Power supply for the extension module)
Output system current	10A
5V DC bus power supply	2000mA
Certification	CE
Physical characteristics	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)
Storage temperature	-25~+85℃
Storage temperature	-40~60 °C
Relative humidity	95%, non-condensation
Protection rating	IP20
Occupying slot	Not occupy
System diagnostics and alarms	Not support
Dimensions (L × W × H)	15×100×80（mm）

13.2. Module Wiring Diagram



13.3. Indicator Description

Indicator	Description
24V (Green)	Module power indicator: On: Power supply is normal Off: Abnormal power supply or no power
5V (Green)	Bus source indicator: On: Power supply is normal Off: Abnormal power supply or no power

13.4. Terminal Description

Terminal	Description
Us 24V	Positive pole of the system power
Us 0V	Negative pole of the system power
Up 24V	Positive pole of the IO channel power
Up 0V	Negative pole of the IO channel power
PE	Grounding

14. Serial port module

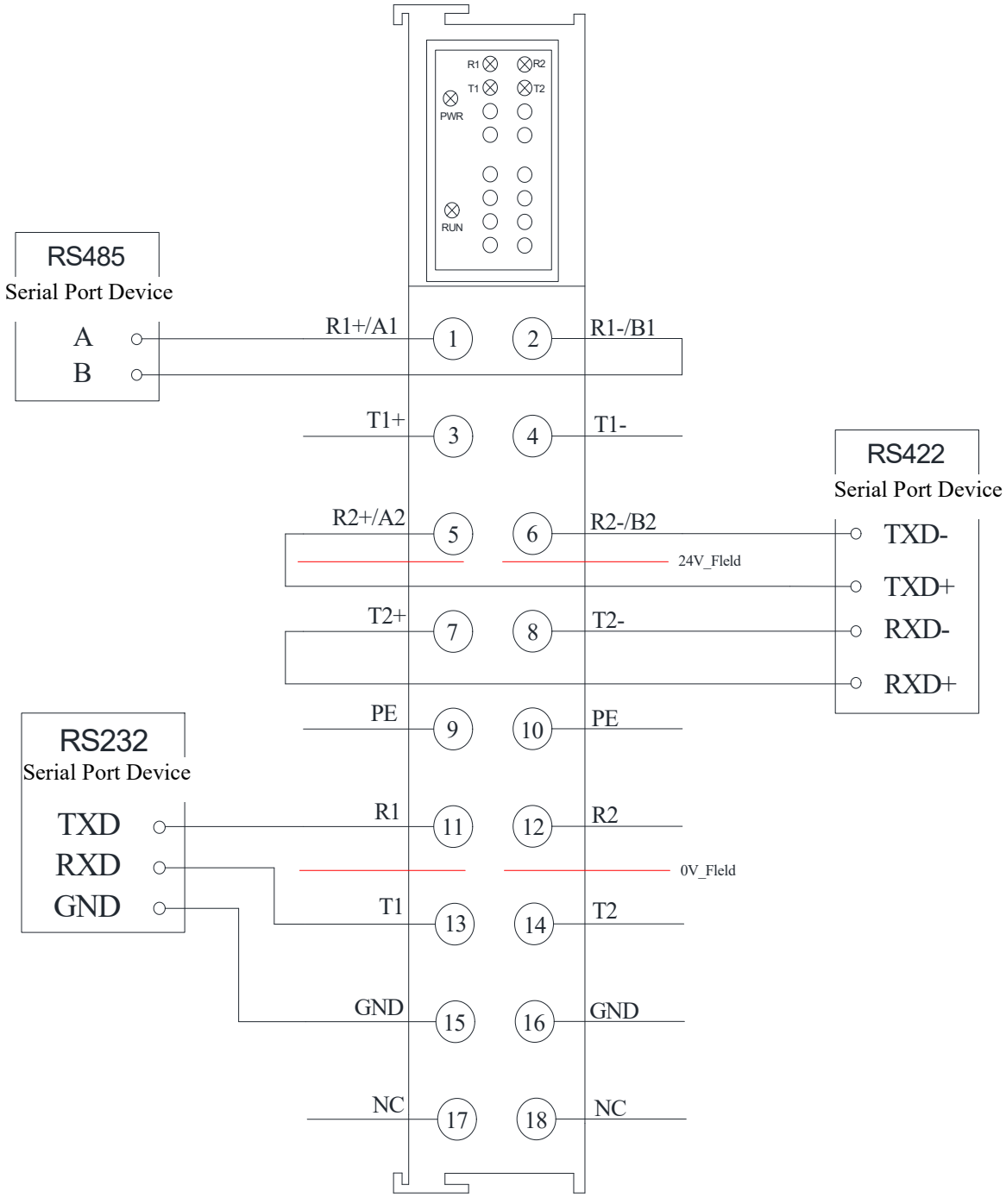
SRL6002/SRL6004 serial port communication module supports high-speed bus, with built-in 2/4 serial ports. Each serial port supports full-duplex (RS422/RS232) and half-duplex (RS485) modes. Each serial port independently supports Modbus-RTU master/slave and free port protocol.

14.1. Electrical Specifications

Model	SRL6002	SRL6004
Technical specifications		
Bus 5VDC current consumption	170mA	170mA
Port	2*RS422/RS232/RS485 ports	4*RS422/RS232/RS485 ports
Serial port supported protocols	Modbus-RTU master/slave and free port protocol	
Data transmission rate	1200bps、2400bps、4800bps、9.6Kbps、19.2Kbps、38.4Kbps、57.6Kbps、115.2Kbps	
Parity bit	No parity, odd parity, and even parity	
Stop bit	1、2	
Data bit	7、8	
Bus 5V DC current consumption	<70mA	
Distributed clock	Not support	
Isolation		
Between channels and buses	Existent	
Display indicator	Power supply green LED display	
Environmental conditions	Operating temperature: -20~60°C, relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	15×100×80（mm）	30×100×80（mm）

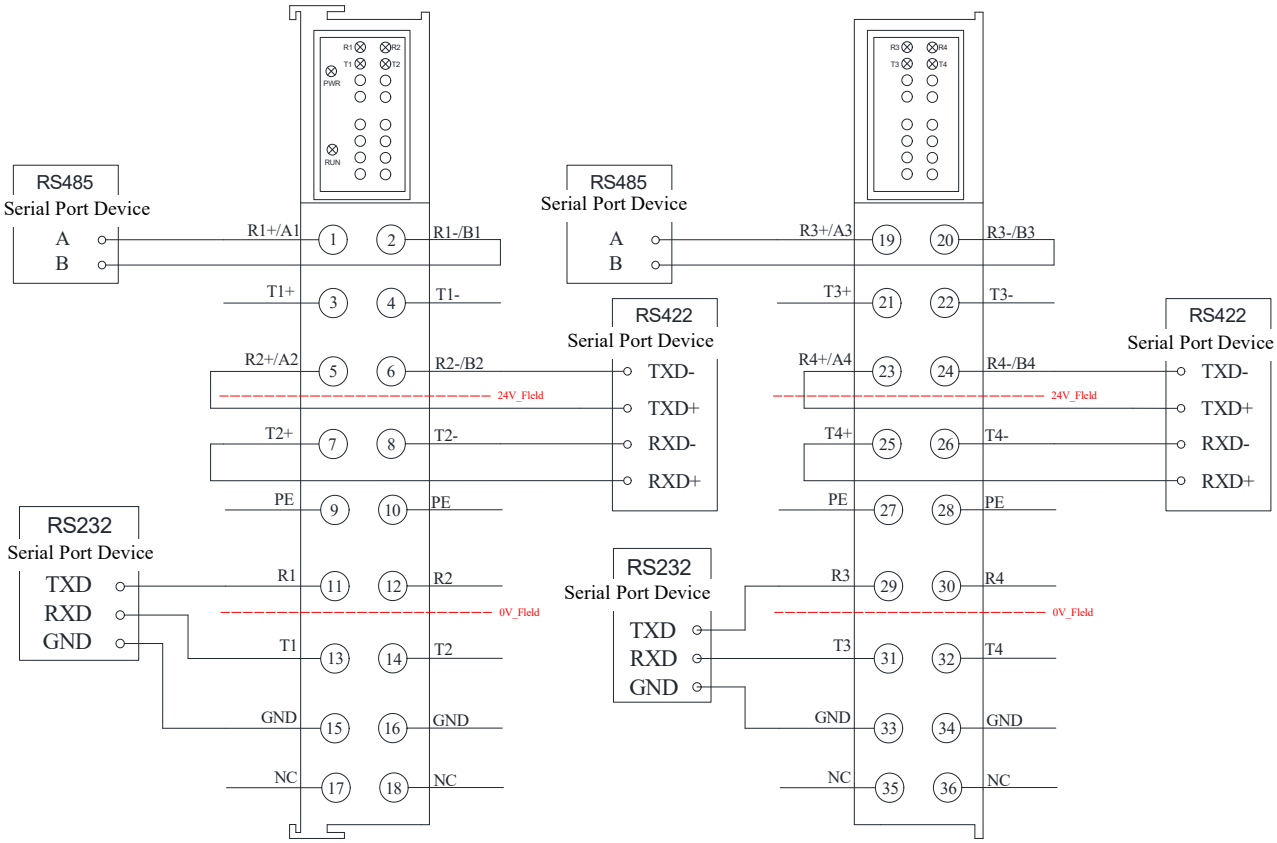
14.2. Module Wiring Diagram

14.2.1. SRL6002 Wiring Diagram



Note: Only one serial port type can be connected to a single channel at the same time. The wiring shown in the diagram is for illustration purposes only, and specific connections should be made according to practical usage.

14.2.2. SRL6004 Wiring Diagram



Note: Only one serial port type can be connected to a single channel at the same time. The wiring shown in the diagram is for illustration purposes only, and specific connections should be made according to practical usage.

14.3. Indicator Description

14.3.1. SRL6002 Indicator Description

Indicator	Meaning
PWR (Green)	Module power indicator: On: Module is powered normally; Off: no power supply or abnormal power supply
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
RX1/TX1	COM1 serial port transmit/receive indicator: the indicator flashes when data is transmitted or received;
RX2/TX2	COM2 Serial port transmit/receive indicator: the indicator flashes when data is transmitted or received;

14.3.2. SRL6004 Indicator Description

Indicator	Meaning
PWR (Green)	Module power indicator: On: Module is powered normally; Off: no power supply or abnormal power supply
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
RX1/TX1	COM1 serial port transmit/receive indicator: the indicator flashes when data is transmitted or received;
RX2/TX2	COM2 Serial port transmit/receive indicator: the indicator flashes when data is transmitted or received;
RX3/TX3	COM3 serial port transmit/receive indicator: the indicator flashes when data is transmitted or received;
RX4/TX4	COM4 serial port transmit/receive indicator: the indicator flashes when data is transmitted or received;

14.4. Module Terminal Description

14.4.1. SRL6002 Terminal Description

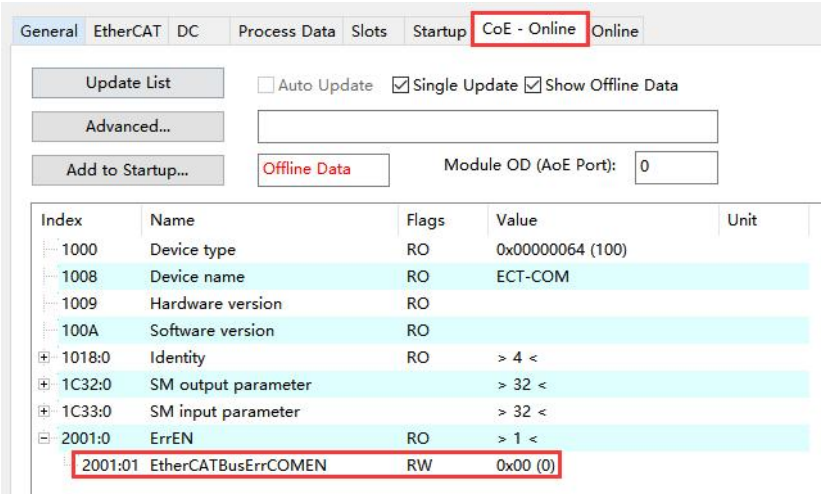
Terminal	Terminal Description	
R1+/A1	COM1 serial port RS422 signal receive +	COM1 serial port RS485 signal receive A+
T1+	COM1 serial port RS422 signal transmit +	
R1-/B1	COM1 serial port RS422 signal receive -	COM1 serial port RS485 signal receive B-
T1-	COM1 serial port RS422 signal transmit -	
R1	COM1 serial port RS232 signal receive	
T1	COM1 serial port RS232 signal transmit	
GND	COM1 serial port RS232 signal GND	
PE	Ground	
R2+/A2	COM2 serial port RS422 signal receive +	COM2 serial port RS485 signal receive A+
T1+	COM2 serial port RS422 signal transmit +	
R2-/B2	COM2 serial port RS422 signal receive -	COM2 serial port RS485 signal receive B-
T2-	COM2 serial port RS422 signal transmit -	
R2	COM2 serial port RS232 signal receive	
T2	COM2 serial port RS232 signal transmit	
GND	COM2 serial port RS232 signal GND	
PE	Ground	

14.4.2. SRL6004 Terminal Description

Terminal	Terminal Description	
R1+/A1	COM1 serial port RS422 signal receive +	COM1 serial port RS485 signal receive A+
T1+	COM1 serial port RS422 signal transmit +	
R1-/B1	COM1 serial port RS422 signal receive -	COM1 serial port RS485 signal receive B-
T1-	COM1 serial port RS422 signal transmit -	
R1	COM1 serial port RS232 signal receive	
T1	COM1 serial port RS232 signal transmit	
GND	COM1 serial port RS232 signal GND	
PE	Ground	
R2+/A2	COM2 serial port RS422 signal receive +	COM2 serial port RS485 signal receive A+
T1+	COM2 serial port RS422 signal transmit +	
R2-/B2	COM2 serial port RS422 signal receive -	COM2 serial port RS485 signal receive B-
T2-	COM2 serial port RS422 signal transmit -	
R2	COM2 serial port RS232 signal receive	
T2	COM2 serial port RS232 signal transmit	
GND	COM2 serial port RS232 signal GND	
PE	Ground	
R3+/A3	COM3 serial port RS422 signal receive +	COM3 serial port RS485 signal receive A+
T3+	COM3 serial port RS422 signal transmit +	
R3-/B3	COM3 serial Port RS422 signal receive-	COM3 serial port RS485 signal receive B-
T3-	COM3 serial Port RS422 signal transmit -	
R3	COM3 serial port RS232 signal receive	
T3	COM3 serial port RS232 signal transmit	
GND	COM3 serial port RS232 signal GND	
PE	Ground	
R4+/A4	COM4 serial Port RS422 signal receive+	COM4 serial port RS485 signal receive A+
T4+	COM4 serial port RS422 signal transmit +	
R4-/B4	COM4 serial port RS422 signal receive -	COM4 serial port RS485 signal receive B-
T4-	COM4 serial port RS422 signal transmit -	
R4	COM4 serial port RS232 signal receive	
T4	COM4 serial port RS232 signal transmit	
GND	COM4 serial port RS232 signal GND	
PE	Ground	

14.5. Parameter Description

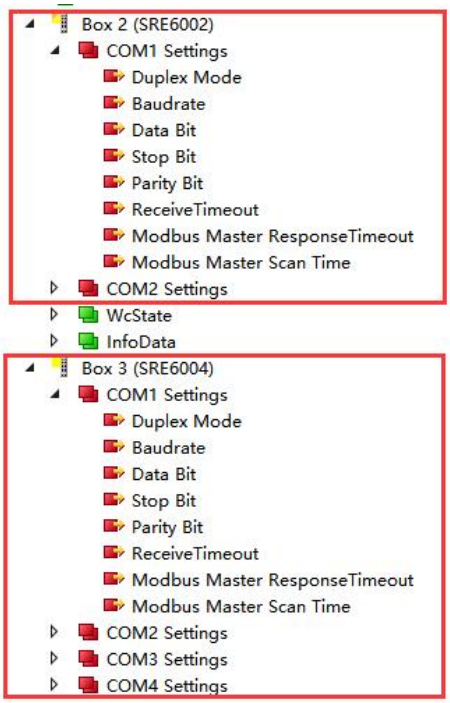
14.5.1. COE General Parameter Description



Parameters	Description
2001:01 EtherCATBusErrCOMEN	This parameter is used to set whether the COM port can transmit/receive data normally after the module communication is disconnected: 0: COM cannot transmit/receive data normally after ECT disconnection; 1: COM can transmit/receive data normally after ECT disconnection;

14.5.2. Parameter Description

SRL6002 and SRL6004 are modules with 2 and 4 serial ports respectively, and their parameter descriptions are the same. The following description takes SRL6004 as an example. The configuration of the SRL6002 can be performed accordingly. All parameter changes take effect immediately, without requiring power outage or restart, as shown below:



Parameters	Description
Duplex Mode	0: Full duplex (RS232/RS422) 1: Half duplex (RS485)
Baudrate	**Baud rate:** 0：1200 1：2400 2：4800 3：9600 4：19200 5：38400 6：57600 7：115200
Data Bit	**Data bit**: 0: 8-bit 1: 7-bit

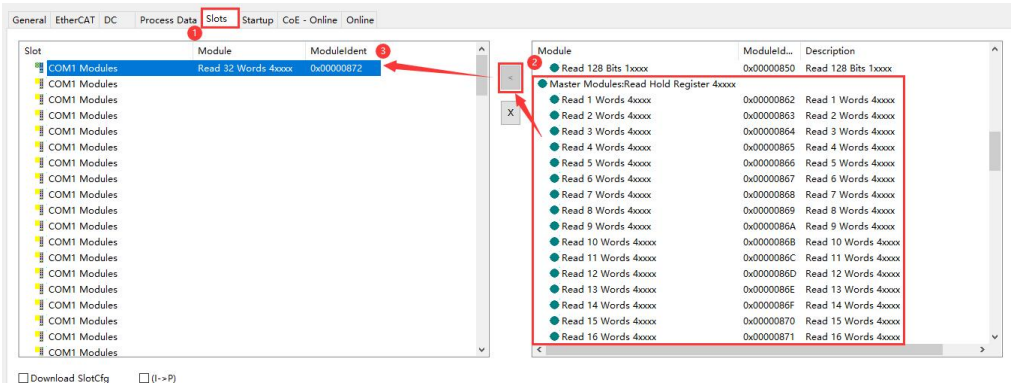
Stop Bit	**Stop bit:** 0: 1-bit 1: 2-bit
Parity Bit	**Parity bit:** 0: No parity 1: Odd parity 2: Even parity
ReceiveTimeout	**Serial port receive timeout:** 5-200 (unit: ms) If the value is out of range, it shall be calculated as the maximum value, e.g., a value exceeding 200 is calculated as 200.
Modbus Master ResponseTimeout	**Modbus RTU master mode response timeout** If the slave station fails to respond within the set time, it is judged as a communication timeout. 5-5000 (Unit: ms) If the value is out of range, it shall be calculated as the maximum value, e.g., a value exceeding 5000 is calculated as 5000.
Modbus Master Scan Time	**Modbus RTU master mode polling time** The interval between the completion of one command and the next in MBS master mode Unit: ms

14.6. Configuration Module Description

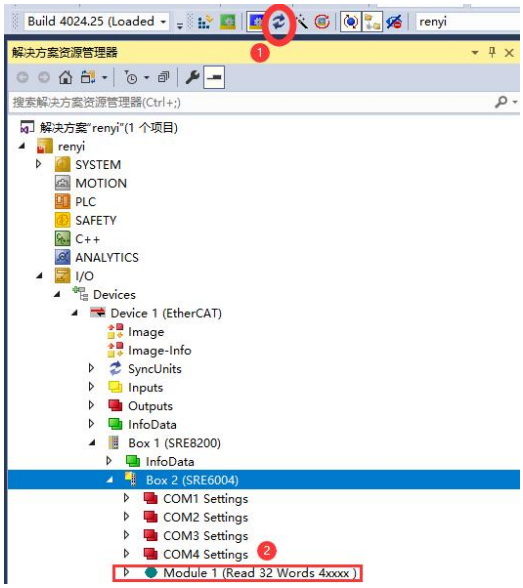
Each serial port can be independently configured as Modbus master, Modbus slave, or free port; the Modbus master can be configured with a maximum of 32 modules, the Modbus slave can be configured with a maximum of 1 module, and the free port can be configured with a maximum of 1 module.

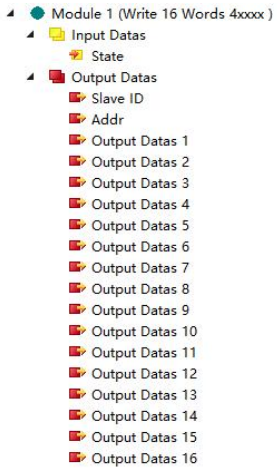
14.6.1. Modbus Master Configuration

In the Slot, select the module corresponding to the serial port, and add the module to be configured. For example, add "Read 32 Words 4xxxx" to Serial Port 1. Each serial port can be configured with a maximum of 32 modules under reasonable allocation, as shown below:

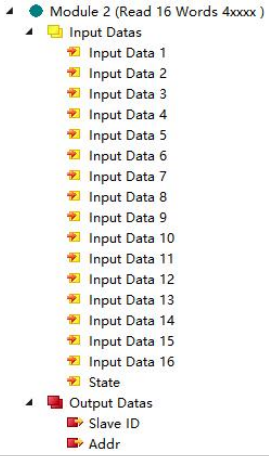


After configuration, add and refresh IO to enable OP, as shown below:





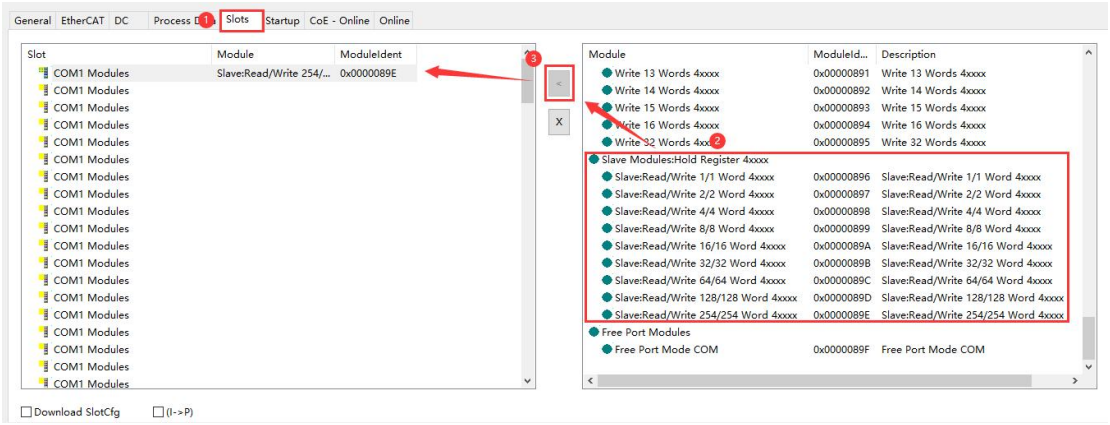
State	Module status: 1: Communication Normal 2: Communication Timeout 3: CRC Error 4: Function Code or Address Error
Output Data	Output Address: Output Data 1~Output Data x
Slave ID	ID of the slave station to be accessed
Addr	Address of the Modbus to be accessed



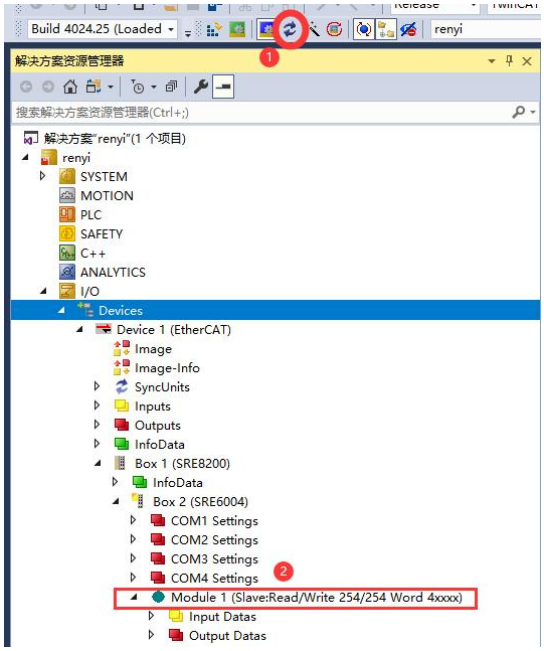
Input Data	Input address: Input Data 1~Input Data x
State	Module status: 1: Communication Normal 2: Communication Timeout 3: CRC Error 4: Function Code or Address Error
Slave ID	ID of the slave station to be accessed
Addr	Address of the Modbus to be accessed

14.6.2. Modbus Slave Configuration

In the Slot, select the module corresponding to the serial port, and add the slave module to be configured. Each serial port can be configured with a maximum of 1 module. If more than 1 module is configured, OP will fail, as shown below:



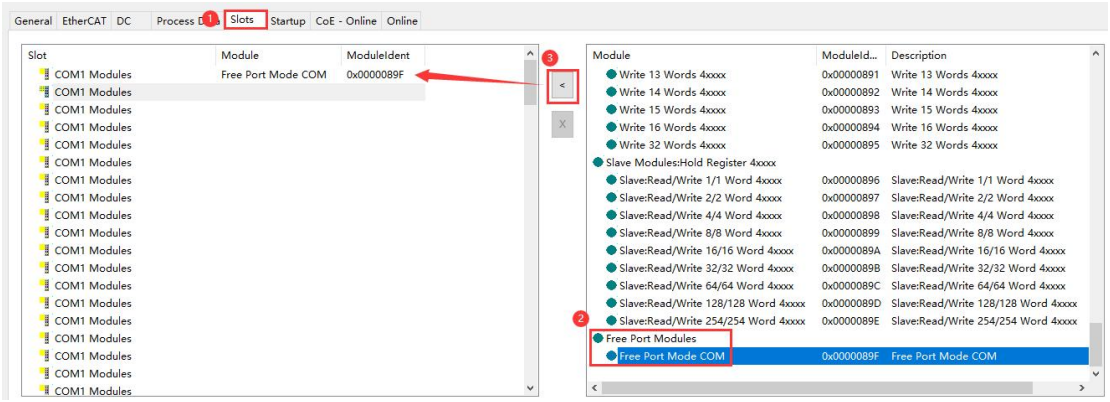
After configuration, add and refresh IO to enable OP, as shown below:



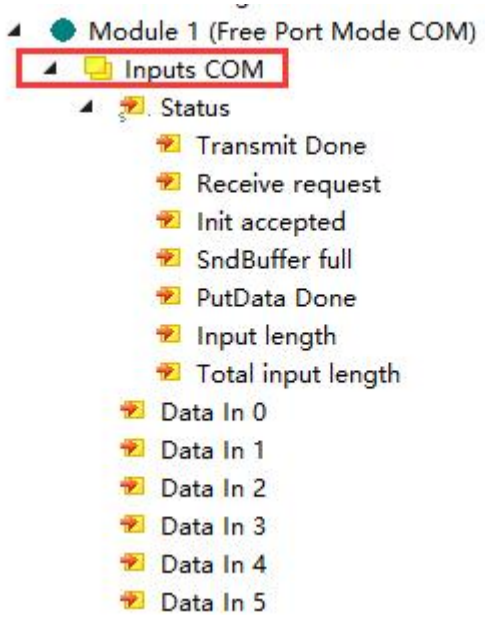
Parameters	Description
Input Datas:	Input Data 1~Input Data x The starting address of the data area that allows writing by the Modbus RTU master is 40256
Output Datas:	Output Data 1~Output Data x The starting address of the data area that allows reading by the Modbus RTU master is 40001
Slave ID:	ID of local slave

14.6.3. Free Port Configuration

In the Slot, select the module corresponding to the serial port and add it. Each serial port can be configured with a maximum of 1 module. If more than 1 is configured, OP will fail, as shown below:

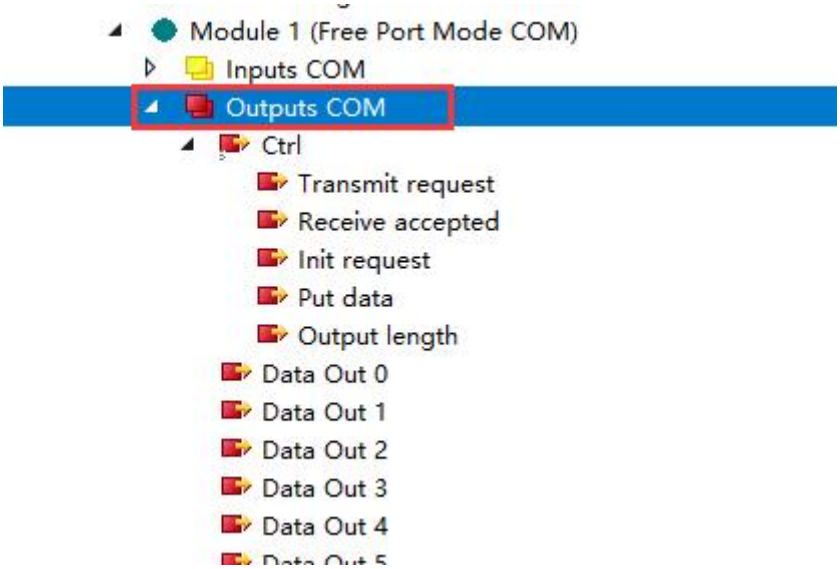


Input parameter description:



Status word meanings	Transmit Done: Current frame data transmission has been completed;
	Receive request: New data is to be received;
	Init accepted: Serial port reinitialization has been completed;
	SndBuffer full: The sent frame length exceeds 1024;
	PutData Done: Writing the sent data into the transmit buffer has been completed;
	Input length: Current data reception length;
	Total input length: Total length of data frame;
Data In 0~Data In 31	Receive data buffer.

Output parameter description:



Ctrl word meaning	Transmit request: a transmit request;
	Receive accepted: data has been received;
	Init request: Reinitialize the serial port;
	Put data: Write the sent data into the transmit buffer;
	Output length: The total length of the data frame to be sent;
Data Out 0~Data Out 31	Transmit data buffer.

When performing the free port communication, it is recommended to initialize the serial port before receiving or transmitting data. After successful initialization, the initialization control word "Init request" must be set to 0; otherwise, the serial port cannot transmit or receive data normally.

Transmit data:

(1) Initialize the serial port. When the control word "Init" request of COM1 is set to 1 and the status word "Init accepted" of COM1 displays 1, the initialization has been complete.

(2) Set the sent data length by writing 40 into the control word "Output length" of COM1.

(3) Write the data to be sent, from 1 to 32, into Output1~Output32 in sequence. (A maximum of 32 bytes of data can be written into the transmit buffer at a time. If the length of the data to be sent is greater than 32 bytes, the data needs to be written into the transmit buffer in batches and then sent out all at a time. For example, to transmit 40 bytes of data, write the data into the transmit buffer in two batches and then send out all 40 bytes at a time.)

(4) Set the control word "Transmit request" of COM1 to 1, and simultaneously

set the control word “Put data” to 1.

(5) Read the status word “PutData Done” of COM1. When PutData Done is 1, it indicates that 32 bytes have been successfully written into the transmit buffer. Then set the control word “Put data” to 0.

(6) Write data 33~40 into Output1~Output8, and then set the control word “Put data” to 1.

(7) When the status word “Transmit Done” of COM1 is 1, it indicates that the current data frame has been successfully sent. Then set the control words “Transmit request” and “Put data” to 0; the current frame transmission is completed.

Receive data:

(1) When the module receives data, the status word “Receive request” of COM2 is 1, and “Input length” is 32, indicating that the current receivable data is 32. “Total input length” displays a total length of 40;

(2) Reading Input1~Input32 allows access to the first 32 bytes. Set the control word “Receive accepted” of COM2 to 1. When the status word “Receive request” of COM2 is read as 0 at this time, set the control word “Receive accepted” of COM2 to 0. After setting it to 0, the status word “Receive request” of COM2 displays 1, and “Input length” shows 8, indicating there are 8 bytes of data to be received.

(3) At the moment, reading Input1~Input8 is to read the next 8 bytes. After reading, set the control word “Receive accepted” of COM2 to 1 and then to 0. After setting it to 0, the status word “Receive request” of COM1 displays 1. The current data frame reception is completed.

15. High-speed Count Module

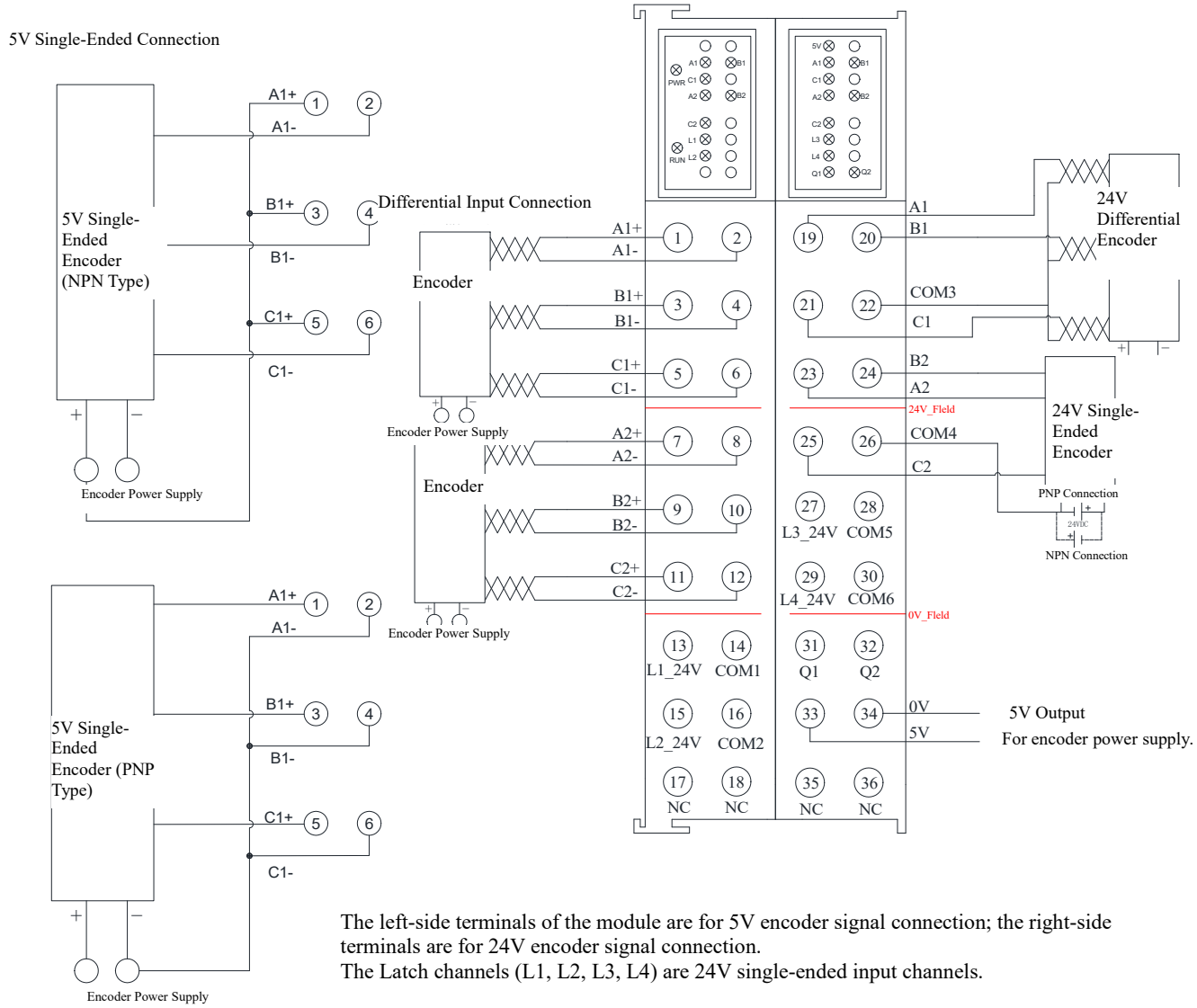
SRL5012/SRL5034 high-performance high-speed count module features 2/4 channel count inputs, and supports 4-channel latching function and standard count function.

15.1. Electrical Specifications

Model	SRL5012	SRL5034
Technical specifications		
High-speed count channel	2-channel (A, B, C) single-ended input maximum 200KHZ (supports rated voltage 5VDC and 24VDC); Differential maximum 4MHZ, rated voltage 5VDC	4-channel (A, B, C), differential maximum 4MHZ, rated voltage 5VDC
Bus 5VDC current consumption	200mA	200mA
High-speed counter input characteristics	Single-ended (rated 24V, maximum 200kHz), differential (5V, maximum 4MHz)	Differential (5V, maximum 4MHz)
Latch input characteristics	Single-ended input, 24V	
Gated signal output	2DO, NPN	4DO, NPN
Distributed clock	Supported	
Isolation		
Between channels and buses	Existent	
Display indicator	Power supply green LED display	
System power diagnosis and warning	Supported	
Environmental conditions	Operating temperature: -20~60℃; relative humidity: 5%~90% (non-condensing)	
Storage temperature	-40~60 °C	
Dimensions (L × W × H)	30×80×100（mm）	30×80×100（mm）

15.2. Wiring Diagram

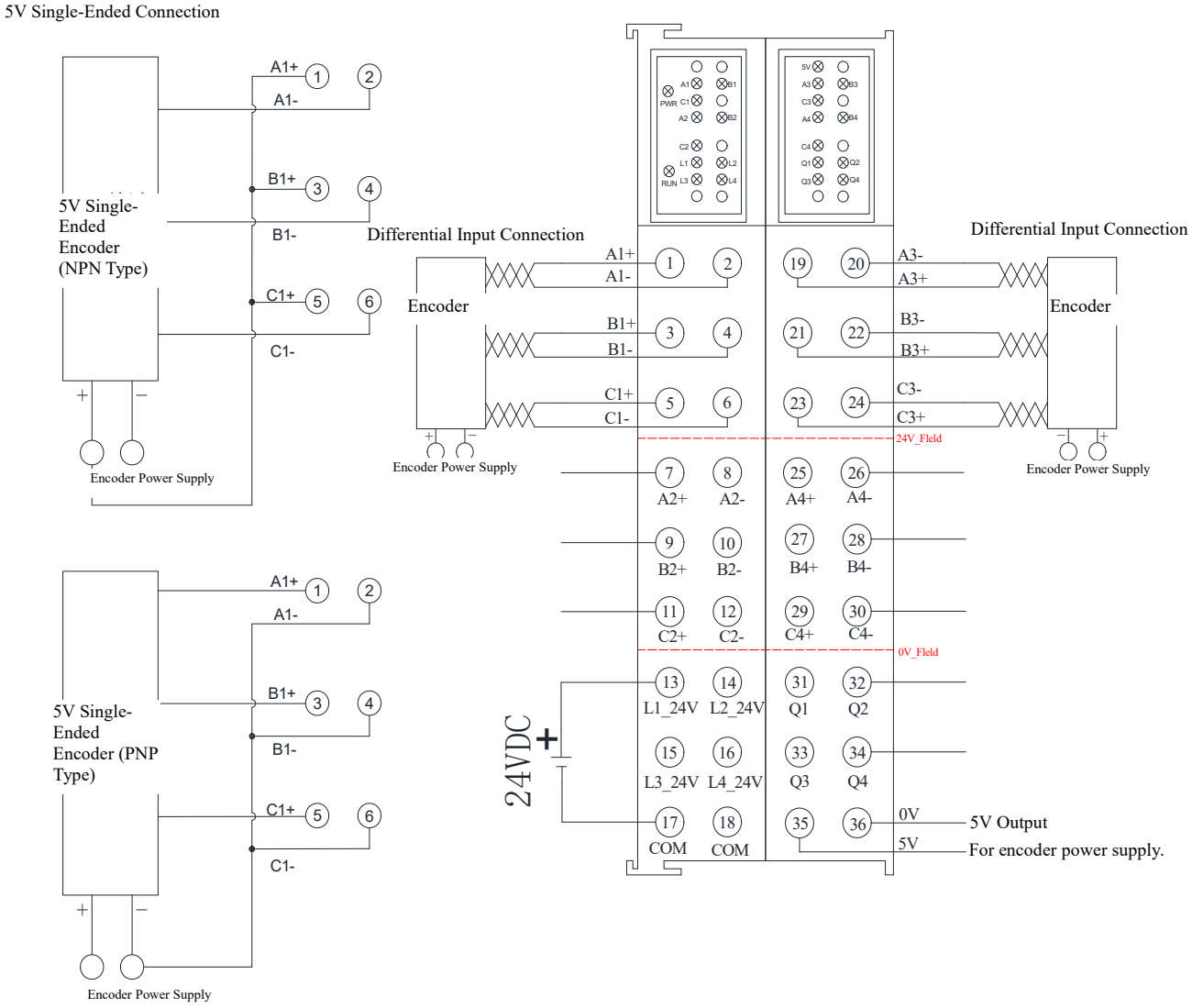
15.2.1. SRL5012 Wiring Diagram



The left-side terminals of the module are for 5V encoder signal connection; the right-side terminals are for 24V encoder signal connection.
The Latch channels (L1, L2, L3, L4) are 24V single-ended input channels.

Note: Q1~Q2 are NPN output channels. The wiring examples in the diagram only represent differential and single-ended connections, but do not imply that each channel is limited to the connections as shown in the diagram.

15.2.2. SRL5034 Wiring Diagram



Note: L1, L2, L3, and L4 are 24V single-ended input channels, and Q1~Q4 are NPN output channels. The wiring examples in the diagram only represent differential and single-ended connections, but do not imply that each channel is limited to the connections as shown in the diagram.

15.3. Indicator Description

15.3.1. SRL5012 Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Power supply is abnormal
5V (Green)	5V power output indicator: On: Power output is normal Off: Power output is abnormal
Q1 (Green)	On: Output from Channel 1 gate. Off: No output from Channel 1 gate.
Q2 (Green)	On: Output from Channel 2 gate. Off: No output from Channel 2 gate.
A1	Channel 1, Phase A input indicator
B1	Channel 1, Phase B input indicator
C1	Channel 1, Phase C input indicator
A2	Channel 2, Phase A input indicator
B2	Channel 2, Phase B input indicator
C2	Channel 2, Phase C input indicator
L1	L1 input indicator
L2	L2 input indicator
L3	L3 input indicator
L4	L4 input indicator

15.3.2. SRL5034 Indicator Description

Indicator	Description
PWR (Green)	Module power indicator: On: Power supply is normal Off: Power supply is abnormal
5V (Green)	5V power output indicator: On: Power output is normal Off: Power output is abnormal
Q1 (Green)	On: Output from Channel 1 gate. Off: No output from Channel 1 gate.
Q2 (Green)	On: Output from Channel 2 gate. Off: No output from Channel 2 gate.
Q3 (Green)	On: Output from Channel 3 gate. Off: No output from Channel 3 gate.
Q4 (Green)	On: Output from Channel 4 gate. Off: No output from Channel 4 gate.
A1	Channel 1, Phase A input indicator
B1	Channel 1, Phase B input indicator
C1	Channel 1, Phase C input indicator
A2	Channel 2, Phase A input indicator
B2	Channel 2, Phase B input indicator
C2	Channel 2, Phase C input indicator
A3	Channel 3, Phase A input indicator
B3	Channel 3, Phase B input indicator
C3	Channel 3, Phase C input indicator
A4	Channel 4, Phase A input indicator
B4	Channel 4, Phase B input indicator
C4	Channel 4, Phase C input indicator
L1	L1 input indicator
L2	L2 input indicator
L3	L3 input indicator
L4	L4 input indicator

15.4. Module Terminal Description

15.4.1. SRL5012 Terminal Description

Terminal	Meaning
A1+/A1-	Channel 1, Phase A input terminal
B1+/B1-	Channel 1, Phase B input terminal
C1+/C1-	Channel 1, Phase C input terminal
L1_24V/COM1	LATCH1 input terminal
A2+/A2-	Channel 2, Phase A input terminal
B2+/B2-	Channel 2, Phase B input terminal
C2+/C2-	Channel 2, Phase C input terminal
L2_24V/COM2	LATCH2 input terminal
A1	Channel 1, Phase A input terminal
B1	Channel 1, Phase B input terminal
C1	Channel 1, Phase C input terminal
COM3	Channel 1 Phase A, B, and C input COM
A2	Channel 2, Phase A input terminal
B2	Channel 2, Phase B input terminal
C2	Channel 2, Phase C input terminal
COM4	Channel 2 Phase A, B, and C input COM
L_24V/COM5	LATCH3 input terminal
L_24V/COM6	LATCH4 input terminal
Q1	Channel 1 gated output, NPN
Q2	Channel 2 gated output, NPN
5V/0V	5V DC power output terminal.

15.4.2. SRL5034 Terminal Description

Terminal	Meaning
A1+/A1-	Channel 1, Phase A differential input terminal
B1+/B1-	Channel 1, Phase B differential input terminal
C1+/C1-	Channel 1, Phase C differential input terminal
A2+/A2-	Channel 2, Phase A differential input terminal
B2+/B2-	Channel 2, Phase B differential input terminal
C2+/C2-	Channel 2, Phase C differential input terminal
A3+/A3-	Channel 3, Phase A differential input terminal
B3+/B3-	Channel 3, Phase B differential input terminal
C3+/C3-	Channel 3, Phase C differential input terminal
A4+/A4-	Channel 4, Phase A differential input terminal
B4+/B4-	Channel 4, Phase B differential input terminal
C4+/C4-	Channel 4, Phase C differential input terminal
L1_24V	LATCH1 input terminal
L2_24V	LATCH2 input terminal
L3_24V	LATCH3 input terminal
L4_24V	LATCH4 input terminal
COM	LATCH input COM
5V/0V	5V DC power output terminal.
Q1	Channel 1 gated output, NPN
Q2	Channel 2 gated output, NPN
Q3	Channel 3 gated output, NPN
Q4	Channel 4 gated output, NPN

15.5. RXPDO Parameter Description

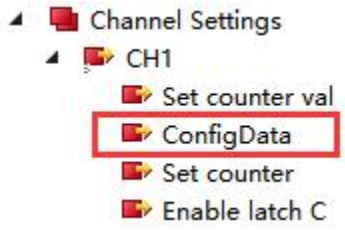
Input parameters	Data type	Meaning
CHx		
Counter value	UDINT	Current count value, with the highest bit as the sign bit (actually signed data).
C Latch value	UDINT	Current count value latched in Phase C according to the configuration.
CHx Status		
input A	BOOL	Phase A input
input B	BOOL	Phase B input
input C	BOOL	Phase C input
Counter overflow	BOOL	1: Current count value overflow; 0: After count value overflow, continue counting upward exceeding 5000.
Counter underflow	BOOL	1: Current count value underflow; 0: After count value underflow, continue counting downward exceeding 5000.
Set counter done	BOOL	1: Effectively set the current counter value; 0: Set the counter value to 0;
Latch C valid	BOOL	1: Flag bit for Phase C input latched; 0: No latching performed;
Others		
Latch1	BOOL	1: Signal input detected on Latch1 channel; 0: No signal input on Latch1 channel;
Latch1 valid	BOOL	1: Flag bit for Latch1 signal successfully latched; 0: No latching performed;
Latch1 value	UDINT	Current count value for Latch1 signal latched according to the configuration.
Latch2	BOOL	1: Signal input detected on Latch2 channel; 0: No signal input on Latch2 channel;
Latch2 valid	BOOL	1: Flag bit for Latch2 signal successfully latched; 0: No latching performed;
Latch2 value	UDINT	Current count value for Latch2 signal latched according to the configuration.
Latch3	BOOL	1: Signal input detected on Latch3 channel; 0: No signal input on Latch3 channel;
Latch3 valid	BOOL	1: Flag bit for Latch3 signal successfully latched; 0: No latching performed;
Latch3 value	UDINT	Current count value for Latch3 signal latched according to the configuration.
Latch4	BOOL	1: Signal input detected on Latch4 channel; 0: No signal input on Latch4 channel;
Latch4 valid	BOOL	1: Flag bit for Latch4 signal successfully latched; 0: No latching performed;
Latch4 value	UDINT	Current count value for Latch4 signal successfully latched according to the configuration.

15.6. TXPDO Parameter Description

Parameters	Data type	Meaning
CHx		
Set counter value	UDINT	Current set counter value
ConfigData	BYTE	Bit0~Bit7 configuration for module operation mode
Set counter	BIT	On the rising edge, set the "Set counter value" to the current "Counter value"
Enable latch C	BIT	1: Latch "Counter value" to "Latch value" on the rising edge of Phase C input **Latch only once. To restart latching, set this parameter to 0 and then back to 1 (to avoid invalid abnormal latching caused by interference).**
Clear cnt val	BIT	**Clear channel counter value**
Clear flow flag	BIT	**Clear channel overflow and underflow flags**
Gate threshold0	UDINT	**Gated comparison value 0**
Gate threshold1	UDINT	**Gated comparison value 1**
Latchx Ctrl		
ConfigData	BYTE	**Latch mode configuration**
Enable latch extern on positive edge	BIT	1: Latch "Counter value" to "Latch value" on the rising edge of Latch **Latch only once. To restart latching, set this parameter to 0 and then back to 1 (to avoid invalid abnormal latching caused by interference).**
Enable latch extern on negative edge	BIT	1: Latch "Counter value" to "Latch value" on the falling edge of Latch **Latch only once. To restart latching, set this parameter to 0 and then back to 1 (to avoid invalid abnormal latching caused by interference).**

15.7. Parameter Configuration Description (Channel)

15.7.1. SRL5012



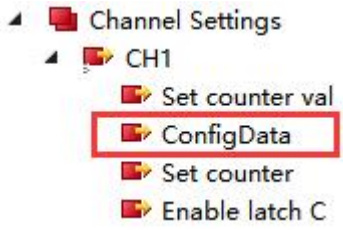
Operating mode		
Bit / Operating mode	**Bit1**	**Bit0**
AB-phase quadrature 4x frequency counting	0	0
AB-phase quadrature single frequency counting	0	1
Pulse + direction counting (A: Pulse B: Direction; Counts down when B is at high level, and counts up when B is at low level)	1	0

Working signal		
Bit / Operating mode	**Bit3**	**Bit2**
5V	0	0
24V	0	1

Gated output configuration			
Bit / Gated mode	**Bit6**	**Bit5**	**Bit4**
Gated Output Mode 1	0	0	1
Gated Output Mode 2	0	1	1
Gated Output Mode 3	1	0	1
Gated Output Mode 4	1	1	1

Filter configuration	
Bit / Filter configuration	**Bit7**
Disable filtering	0
Enable filtering	1

15.7.2. SRL5034



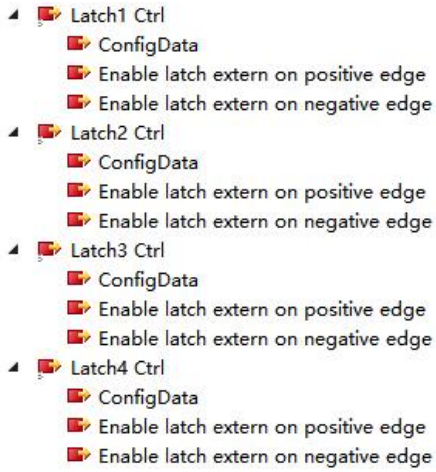
Operating mode				
Bit / Operating mode	**Bit3**	**Bit2**	**Bit1**	**Bit0**
AB-phase quadrature 4x frequency counting	---	---	0	0
AB-phase quadrature single frequency counting	---	---	0	1
Pulse + direction counting (A: Pulse B: Direction; Counts down when B is at high level, and counts up when B is at low level)	---	---	1	0

Gated output configuration			
Bit / Gated mode	**Bit6**	**Bit5**	**Bit4**
Gated Output Mode 1	0	0	1
Gated Output Mode 2	0	1	1
Gated Output Mode 3	1	0	1
Gated Output Mode 4	1	1	1

Filter configuration	
Bit / Filter configuration	**Bit7**
Disable filtering	0
Enable filtering	1

15.8. Parameter Configuration Description (Latch)

The parameters of SRL5012 and SRL5034 are identical. The following description takes SRL5034 as an example. For the SRL5012, please refer to the following parameter configuration. In the Latch channel, ConfigData can be used to set the channel latching parameters:



15.8.1. SRL5012

Latch mode configuration				
Bit / Value	Bit3	Bit2	Bit1	Bit0
Latch channel latches counting channel 1	---	---	---	0
Latch channel latches counting channel 2	---	---	---	1

15.8.2. SRL5034

Latch mode configuration				
Bit / Value	Bit3	Bit2	Bit1	Bit0
Latch channel latches counting channel 1	---	---	---	0
Latch channel latches counting channel 2	---	---	---	1
Latch channel latches counting channel 3	---	---	1	0
Latch channel latches counting channel 4	---	---	1	1

Parameters	Data type	Meaning
Latchx Ctrl		
ConfigData	BYTE	**Latch mode configuration**
Enable latch extern on positive edge	BIT	1: Latch “Counter value” to “Latch value” on the rising edge of Latch **Latch only once. To restart latching, set this parameter to 0 and then back to 1 (to avoid invalid abnormal latching caused by interference).**
Enable latch extern on negative edge	BIT	1: Latch “Counter value” to “Latch value” on the falling edge of Latch **Latch only once. To restart latching, set this parameter to 0 and then back to 1 (to avoid invalid abnormal latching caused by interference).**

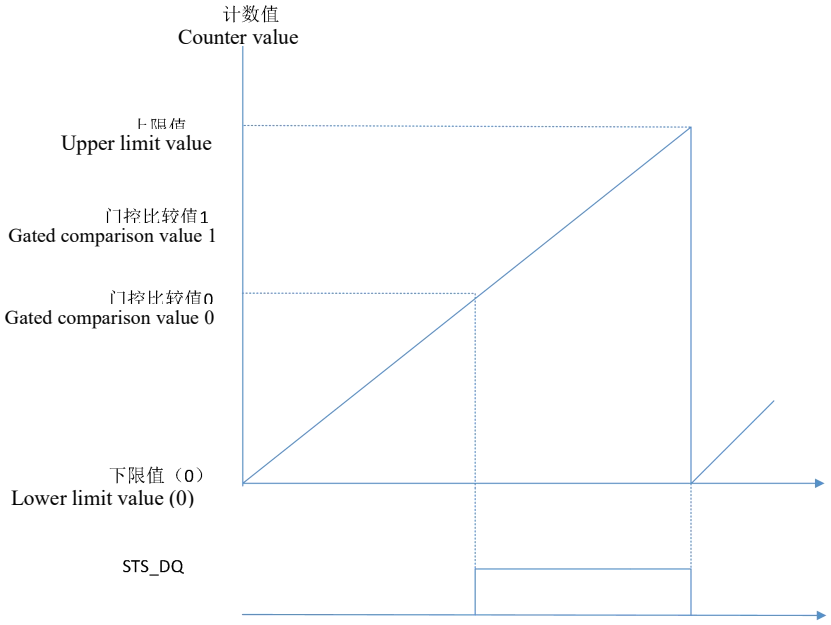
15.9. Gated Output Mode Description

15.9.1. Gated Output Mode 1

Compare between the comparison value and the counter upper limit:

Gated comparison value 0 < counter value < counter upper limit (i.e., **2^{32}- 1**): output from the gate (i.e., Q channel).

Counter lower limit (i.e., 0) < counter value < gated comparison value 0: no output from the gate (i.e., Q channel).



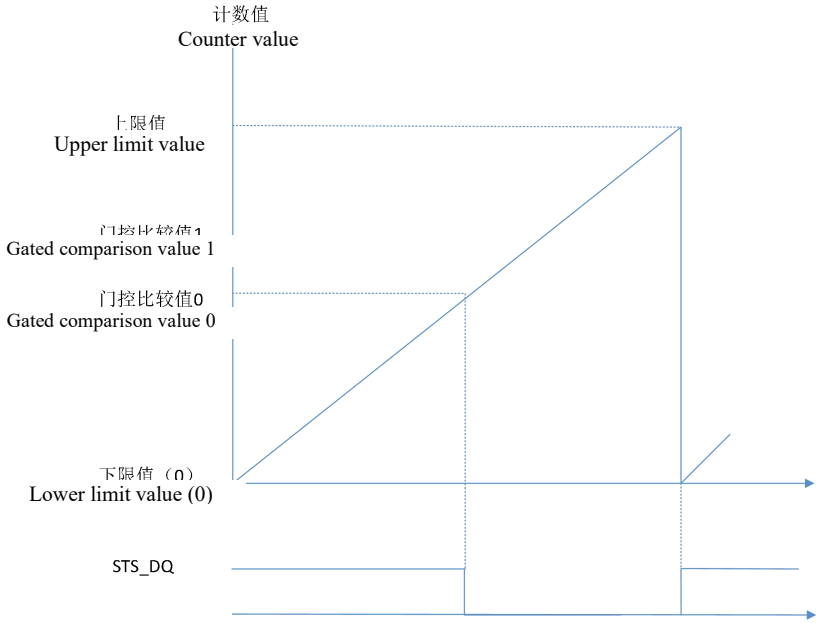
Note: The value for the gated comparison value 1 must be set greater than the gated comparison value 0; otherwise, the output will be abnormal.

15.9.2. Gated Output Mode 2

Compare between the comparison value and the counter upper limit:

Gated comparison value 0 < counter value < counter upper limit (i.e., 2^{32}- 1): no output from the gate (i.e., Q channel).

Counter lower limit (i.e., 0) < counter value < gated comparison value 0: output from the gate (i.e., Q channel).



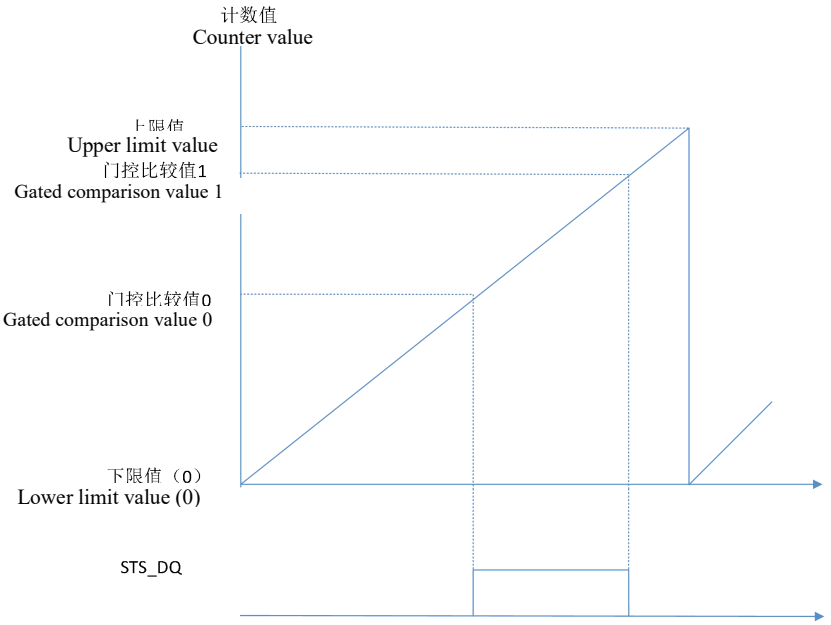
Note: The value for the gated comparison value 1 must be set greater than the gated comparison value 0; otherwise, the output will be abnormal.

15.9.3. Gated Output Mode 3

Compare between the comparison value 0 and the comparison value 1:

Gated comparison value 0 < counter value < gated comparison value 1: output from the gate (i.e., Q channel).

Counter lower limit (i.e., 0) < counter value < gated comparison value 0, or gated comparison value 1 < counter value < upper limit value (i.e., **2^{32}- 1**): no output from the gate (i.e., the Q channel).



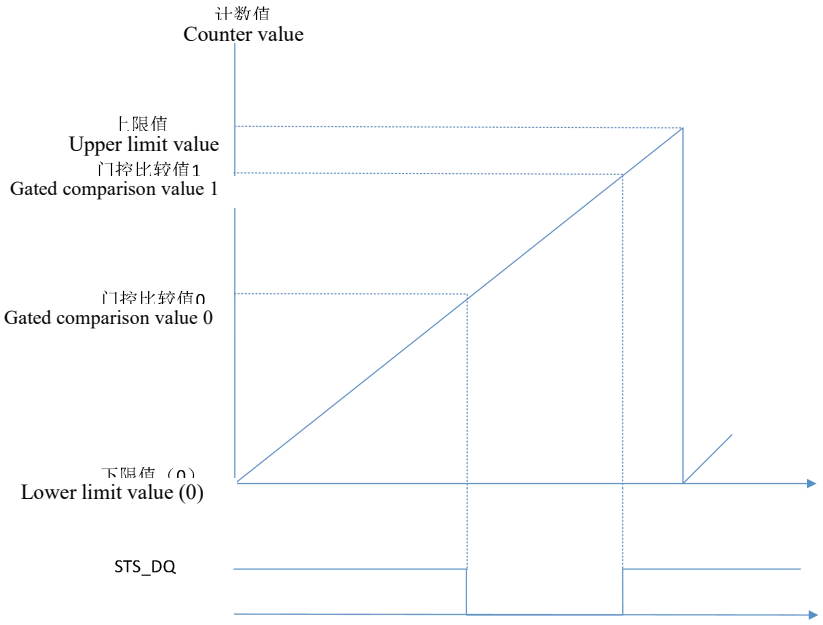
Note: The value for the gated comparison value 1 must be set greater than the gated comparison value 0; otherwise, the output will be abnormal.

15.9.4. Gated Output Mode 4

Compare between the comparison value 0 and the comparison value 1:

Gated comparison value 0 < counter value < gated comparison value 1: no output from the gate (i.e., Q channel).

Counter lower limit (i.e., 0) < counter value < gated comparison value 0, or gated comparison value 1 < counter value < upper limit value (i.e., 2^{32}- **1**): output from the gate (i.e., Q channel).



Note: The value for the gated comparison value 1 must be set greater than the gated comparison value 0; otherwise, the output will be abnormal.

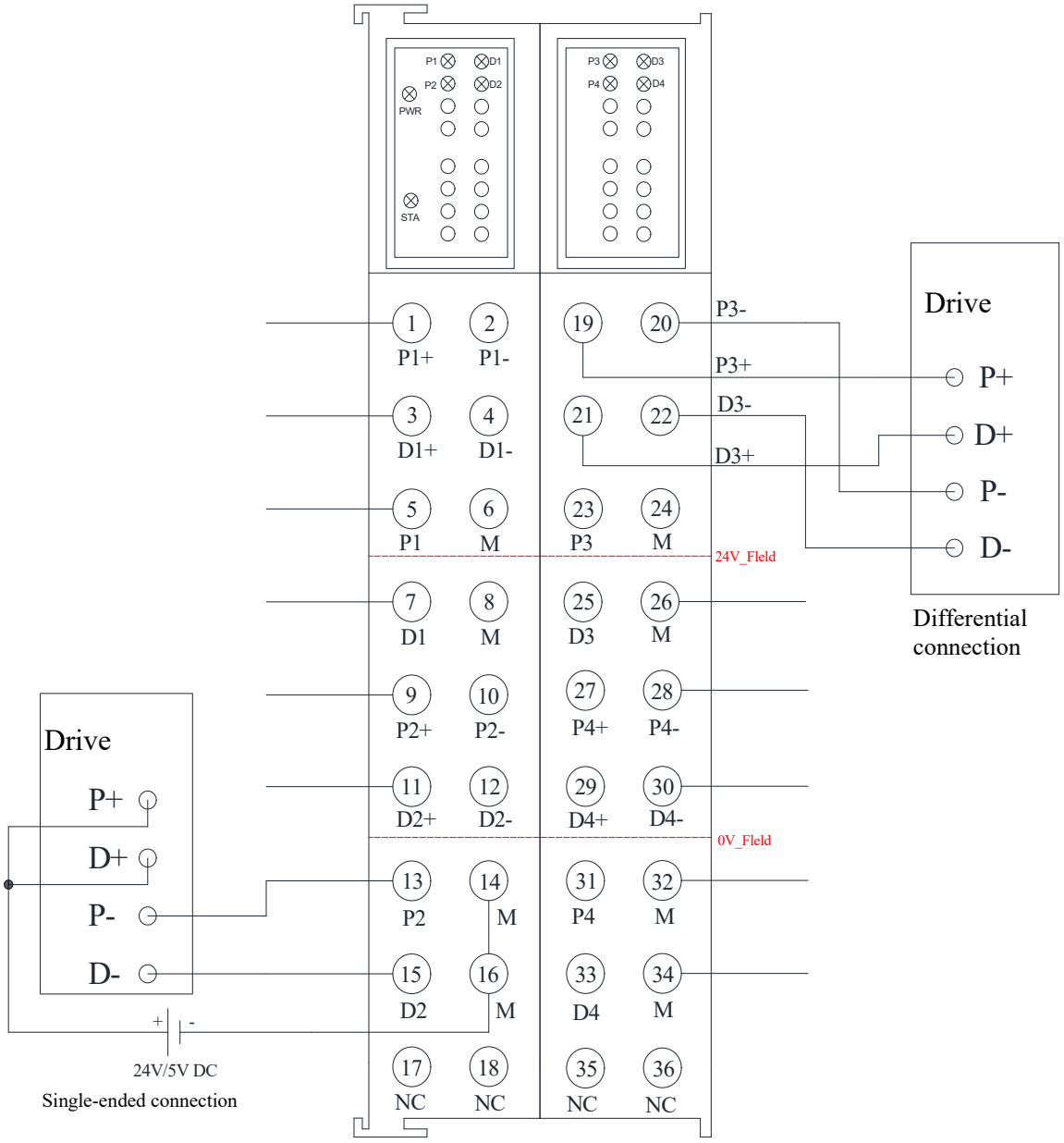
16. SRL5234 High-speed Pulse Output Terminal

The module features 4-axis PTO output, NPN output, single-ended maximum 400KHZ, and differential output maximum 1MHZ. The relevant parameters can be configured via XML file.

16.1. Electrical Specifications

Model	SRL5234
Technical specifications	
High-speed pulse output channel	4 channels
Bus 5VDC consumption current	165.5mA
Signal output	NPN output
	Differential 5V, maximum 1MHz
	Single-ended, 24V maximum 200KHz or 5V maximum 400KHz
Signal type	Pulse + direction
Isolation	
Between channels and buses	Existent
Display indicator	Power supply green LED display
System power diagnosis and warning	Supported
Environmental conditions	Operating temperature: -20~60℃; relative humidity: 5%~90% (non-condensing)
Storage temperature	-40~60 °C
Dimensions (L × W × H)	30×80×100(mm)

16.2. Electrical Wiring Diagram



① Differential output only supports 5VDC

②Single-ended (output/input) supports 24VDC and 5VDC

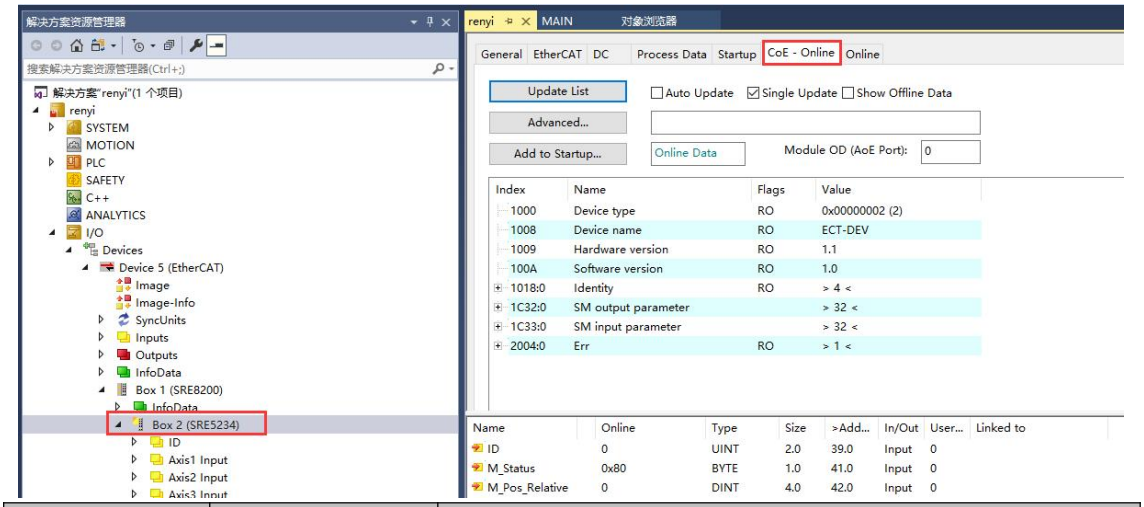
16.3. Wiring Terminal Description

Terminal	Meaning
P1+	Axis 1 differential output, positive pulse signal
P1-	Axis 1 differential output, negative pulse signal
D1+	Axis 1 differential output, positive direction signal
D1-	Axis 1 differential output, negative direction signal
P2+	Axis 2 differential output, positive pulse signal
P2-	Axis 2 differential output, negative pulse signal
D2+	Axis 2 differential output, positive direction signal
D2-	Axis 2 differential output, negative direction signal
P3+	Axis 3 differential output, positive pulse signal
P3-	Axis 3 differential output, negative pulse signal
D3+	Axis 3 differential output, positive direction signal
D3-	Axis 3 differential output, negative direction signal
P4+	Axis 4 differential output, positive pulse signal
P4-	Axis 4 differential output, negative pulse signal
D4+	Axis 4 differential output, positive direction signal
D4-	Axis 4 differential output, negative direction signal
P1	Axis 1 single-ended output, pulse signal
D1	Axis 1 single-ended output, direction signal
P2	Axis 2 single-ended output, pulse signal
D2	Axis 2 single-ended output, direction signal
P3	Axis 3 single-ended output, pulse signal
D3	Axis 3 single-ended output, direction signal
P4	Axis 4 single-ended output, pulse signal
D4	Axis 4 single-ended output, direction signal
M	Single-ended output COM

16.4. Indicator Description

Indicator	Meaning
PWR (Green)	Module power indicator On: Module is powered normally; Off: no power supply or abnormal power supply
RUN (Green)	Communication indicator: On: Normal communication Off: Abnormal communication
P1	Axis 1 pulse output: The indicator will light up when there is a signal; otherwise it will turn off.
P2	Axis 2 pulse output: The indicator will light up when there is a signal; otherwise it will turn off.
P3	Axis 3 pulse output: The indicator will light up when there is a signal; otherwise it will turn off.
P4	Axis 4 pulse output: The indicator will light up when there is a signal; otherwise it will turn off.
D1	Axis 1 direction output: The indicator will light up when there is a signal; otherwise it will turn off.
D2	Axis 2 direction output: The indicator will light up when there is a signal; otherwise it will turn off.
D3	Axis 3 direction output: The indicator will light up when there is a signal; otherwise it will turn off.
D4	Axis 4 direction output: The indicator will light up when there is a signal; otherwise it will turn off.

16.5. COE Parameter Description



Parameters	Data type	Description
2004:01	Err 24v_nf	Bit0： 1: Channel 24V power supply abnormal; 0: Normal.

16.6. PDO Parameter Description

Item	Sub-item	Data type	Meaning
Axis（1-4）Input	M_Status	Byte	Module status. M_Status[6:0]： 000_0000: Module in idle state 000_0010: Module in running state 000_0110: Module in software emergency stop state 000_1000: Module pulse transmission completed state 1xx_xxxx: Startup operation flag M_Status[6]: Module operation flag bit. When M_ctrl changes from 0 to 1, the flag signal is set to 1. Only writing 1 to bit6 of the controller Mctrl can clear the flag signal. M_Status[7]： 0: Invalid 1: After Mctrl RUN command reset, when the flag is detected as 1, the Mctrl RUN command can be set to initiate module pulse output
	M_Pos_Relative	DINT	Relative running position.
	M_Spd	UDINT	Current module speed.
	M_ERROR	Byte	0: Normal Bit0: The starting speed is greater than the running speed. Bit2: Mode error
Axis（1-4）Output	M_Ctrl	Byte	BIT0: RUN, command execution enable, starting on the rising edge, and stopping on the falling edge. BIT1: UPDATE, set to 1 to update operational parameters during motor operation (AccTime, DecTime, Spdss, Spdset, and Posset parameters) BIT2: ESTOP, emergency stop command. Upon receiving this command, the module immediately stops pulse output without any acceleration or deceleration. Default is 0. When emergency stop is required, set this bit to 1. This bit must be reset to 0 before the next operation. BIT3: Reserved; BIT4: Alarm clear. BIT5: Direction bit in the speed mode. In the speed mode, control forward or reverse direction. BIT6: The run flag is cleared and the module completes startup. M_Status[6] will be set. If the PLC detects the flag signal as 1 (closed-loop detection), it indicates that the module has successfully sent pulses. When the next pulse needs to be sent, this clear command should be used to reset the run flag before initiating the next run detection. BIT7: Reserved;

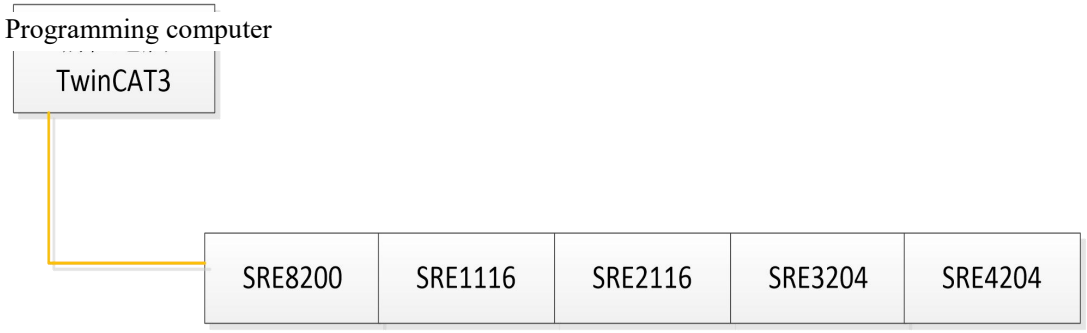
Item	Sub-item	Data type	Meaning
	Work_Mode	Byte	0: Relative position output mode 1: Speed mode Other: Relative position mode Note: When changing the WorkMode, M_Ctrl must be set to 0.
	AccTime	UINT	Acceleration time (ms). It is used to set the acceleration
	DecTime	UINT	Deceleration time (ms). It is used to set the deceleration
	SpdSs	UDINT	User-defined starting or stopping speed (Hz), data range 0~4000000
	SpdSet	UDINT	User-defined operating speed (Hz), data range 0~4000000
	PosSet	DINT	User-defined position, unit: pulse count

17. Usage Example

17.1. Instructions for the SRL8200 Coupler Communication with Beckhoff Master

17.1.1. Communication Connection

The communication connection diagram is as shown below:



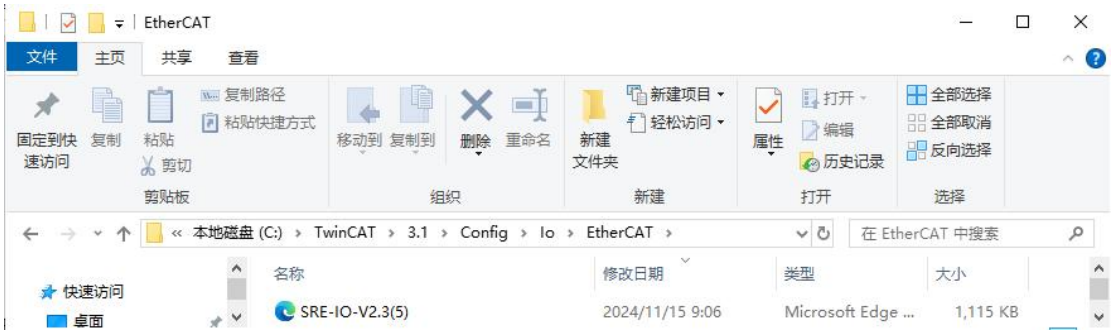
17.1.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL1116	1	Digital Input Terminal
SRL2116	1	Digital Output Terminal
SRL3204	1	Analog Input Terminal
SRL4204	1	Analog Output Terminal
Ethernet cable	Several	
24V switching power supply	1	

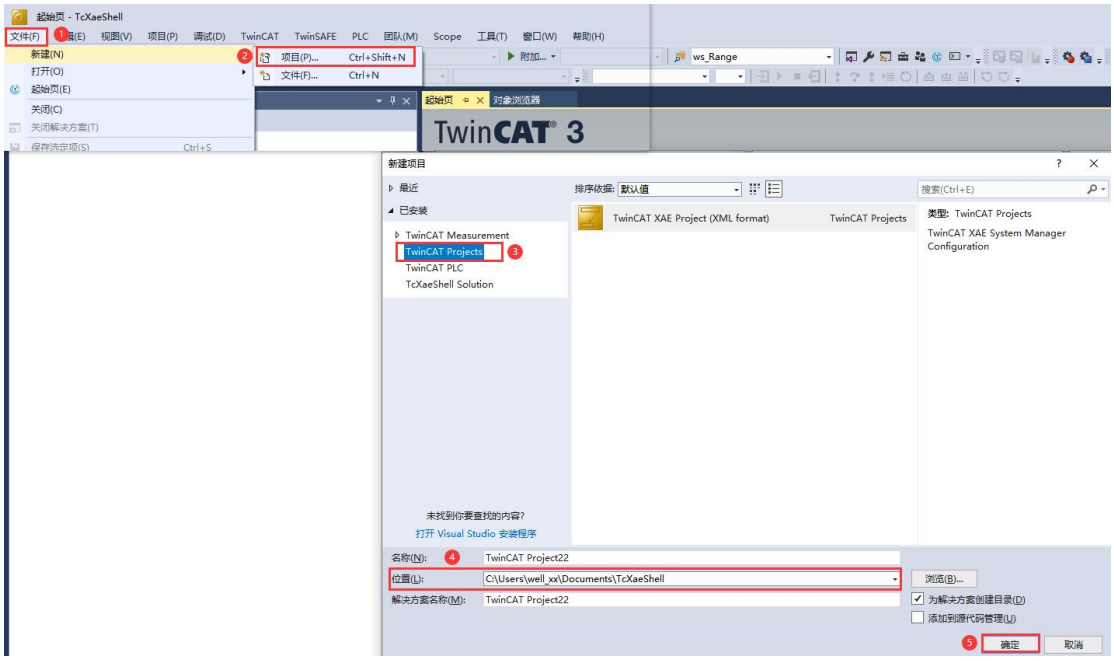
17.1.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:

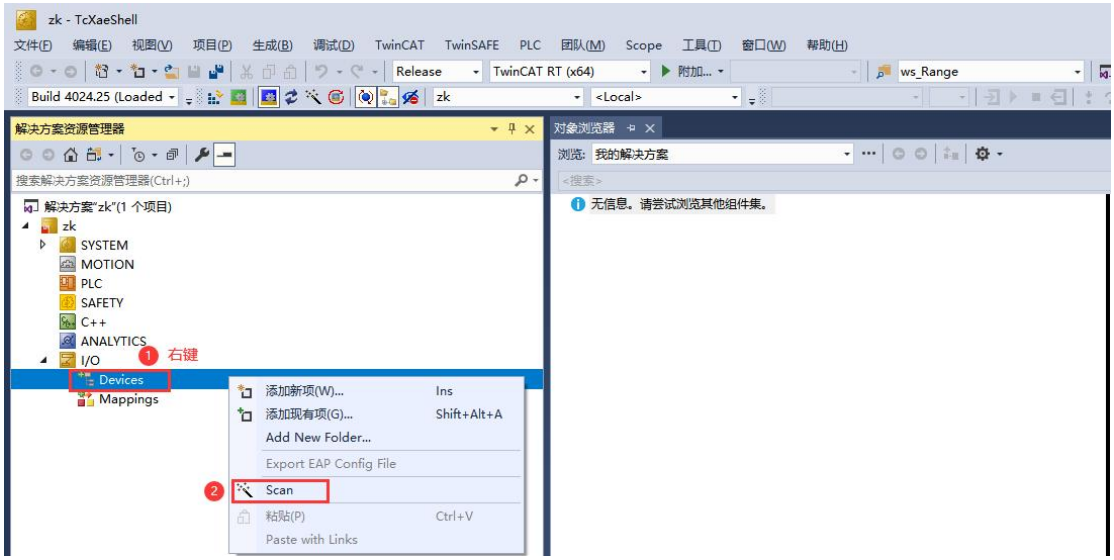


17.1.4. New Project and Configuration

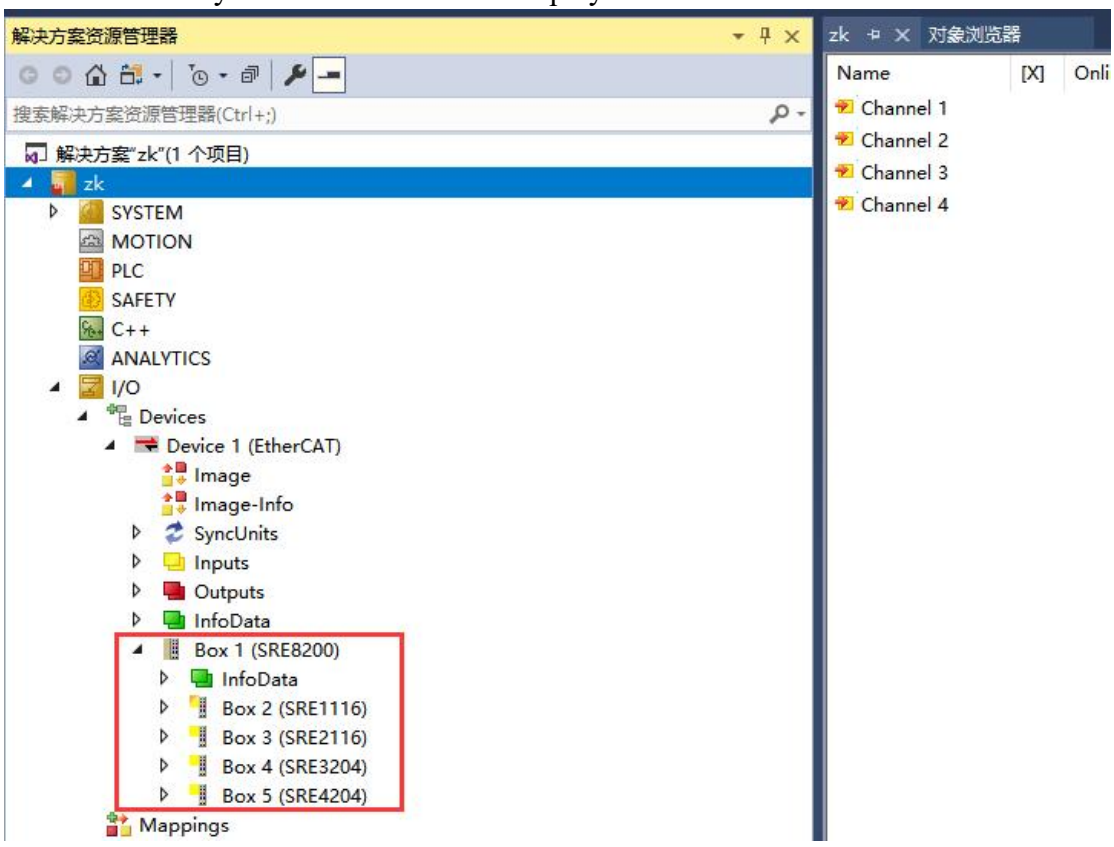
Open TwinCAT3 software and create a new project as shown below:



Scan the SRL8200 connected to the computer and its extension I/O terminals into the project. Click I/O > Devices > Scan, as shown in the following figure:



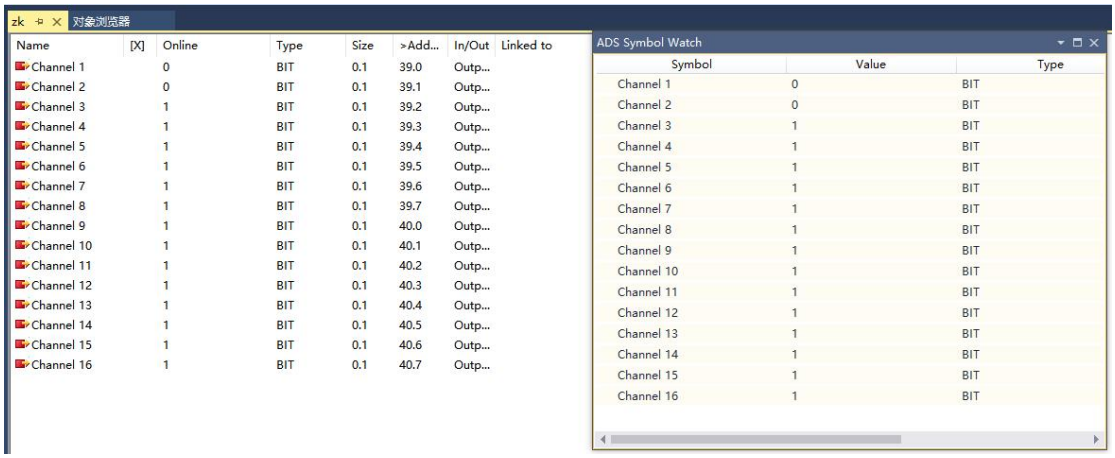
Successfully scanned modules are displayed as shown below:



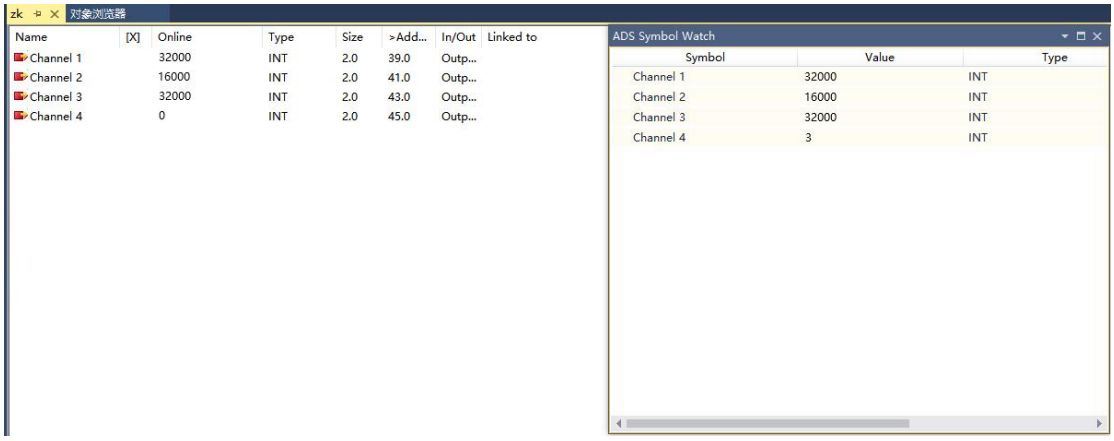
17.1.5. Data Monitoring

Select the IO terminal to be monitored in TwinCAT3 and choose the data to be monitored:

Digital input/output:



Analog input/output:

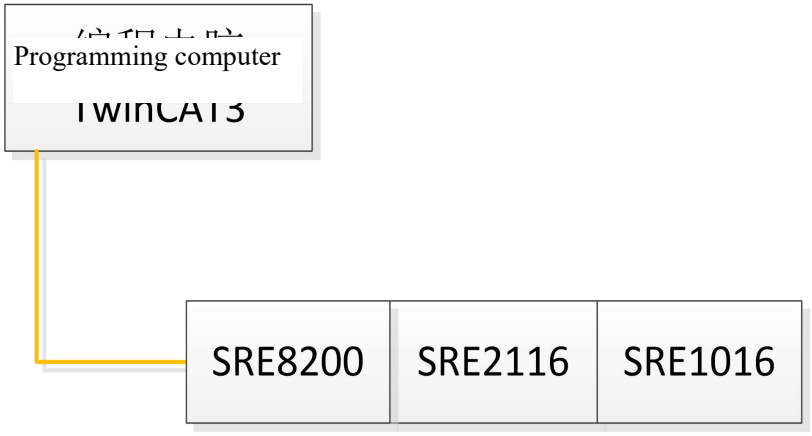


17.2. Example of SRL2116 Communication with TwinCAT3

This example briefly introduces how the SRL8200 coupler is connected with SRL2116 and SRL1016, enabling data monitoring through Beckhoff. Digital input and digital output can be connected and used with referenced to this example.

17.2.1. Communication Connection

The communication connection diagram is as shown below:



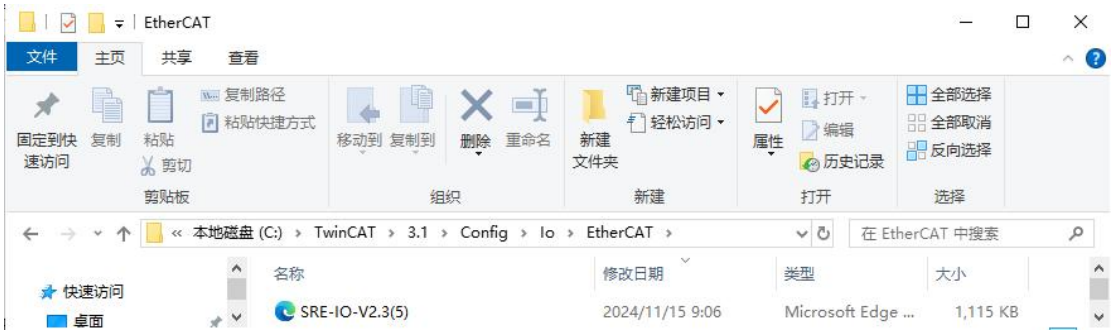
17.2.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL2116	1	High-performance digital output terminal
SRL1016	1	High-performance digital input terminal
Ethernet cable	1 piece	
24V switching power supply	1	

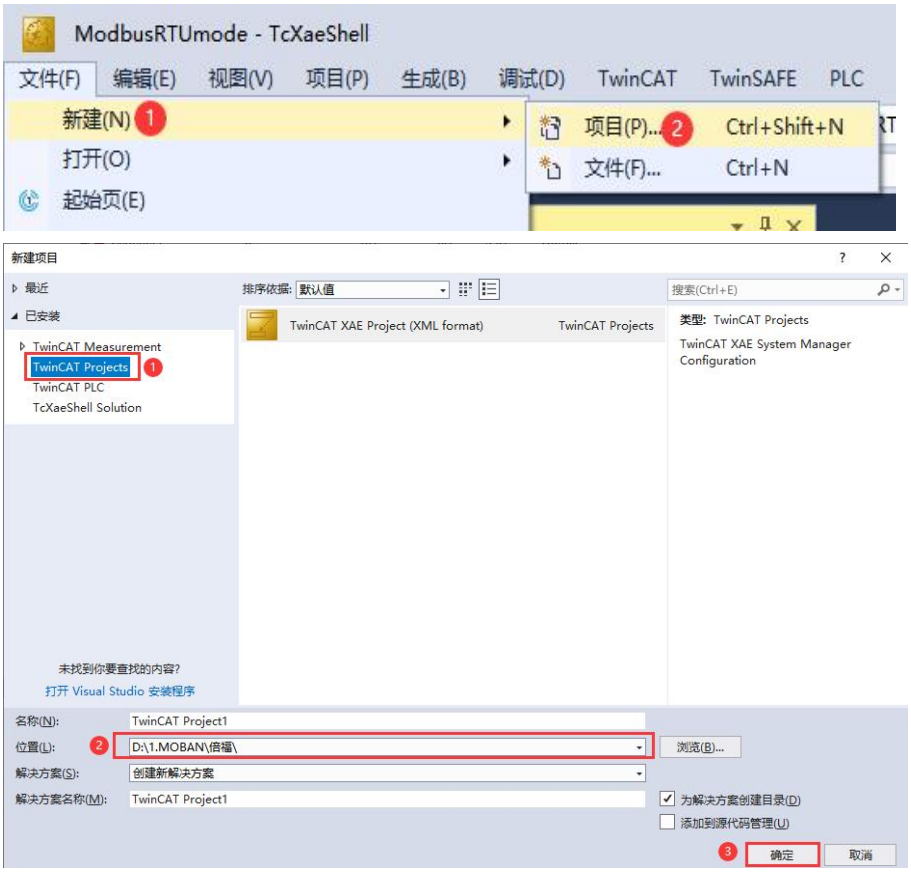
17.2.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:

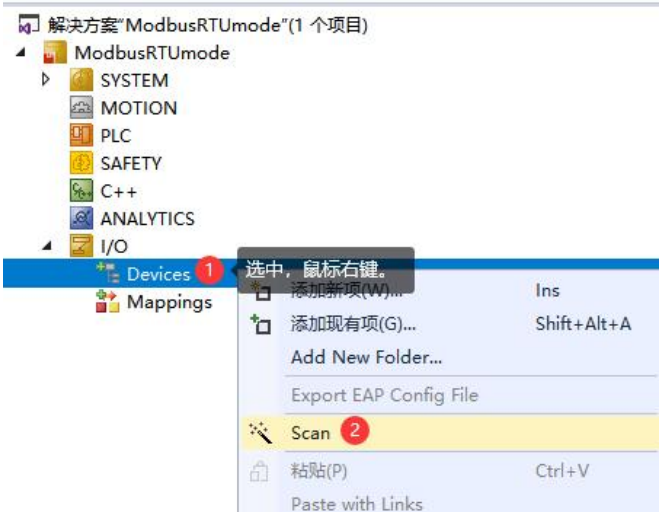


17.2.4. New Project and Configuration

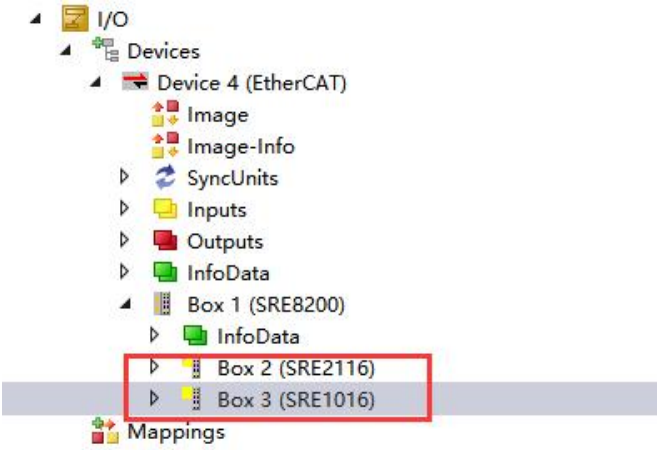
Open TwinCAT3 software and create a new project as shown below:



Scan the ECT coupler SRL8200 connected to the computer and its extension I/O into the project. Click I/O > Devices > Scan, as shown in the following figure:

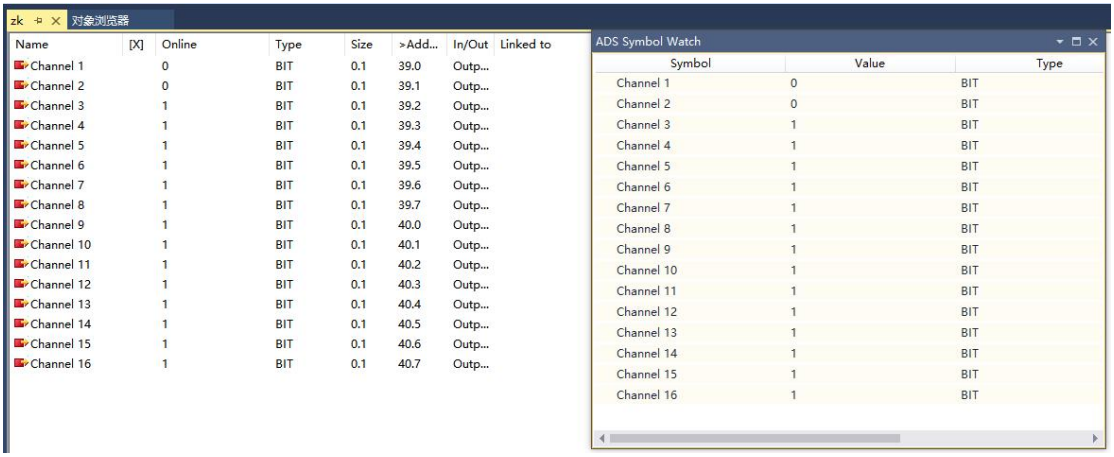


Successfully scanned modules are displayed as shown below:



17.2.5. Data Monitoring

Select the IO terminal to be monitored in TwinCAT3 and choose the data to be monitored:



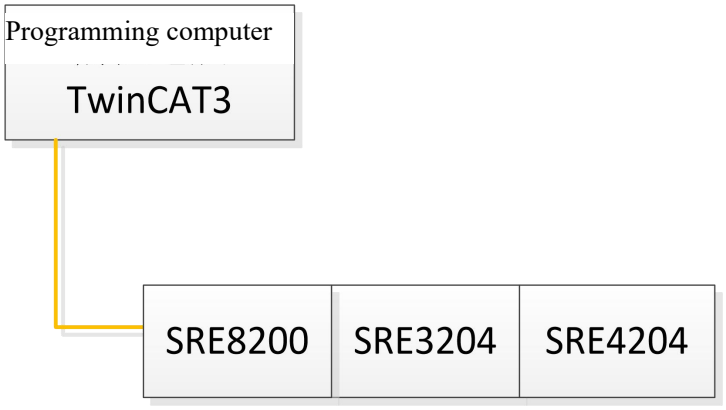
17.3. Example of SRL3204 Communication

17.3.1. Example of Communication with TwinCAT3

This example briefly introduces how the SRL8200 coupler is connected with SRL3204 and SRL4204, enabling data monitoring through Beckhoff. Analog input and output can be connected and used with reference to this example.

17.3.1.1. Communication Connection

The communication connection diagram is as shown below:



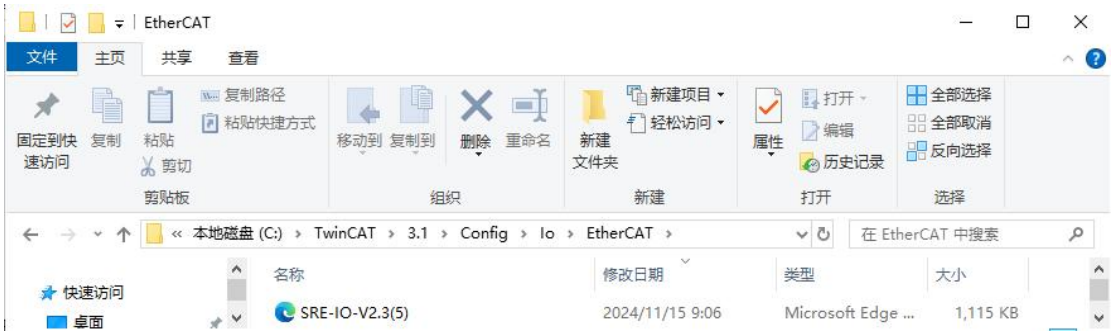
17.3.1.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL3204	1	High-performance analog input terminal
SRL4204	1	High-performance analog output terminal
Ethernet cable	1 piece	
24V switching power supply	1	

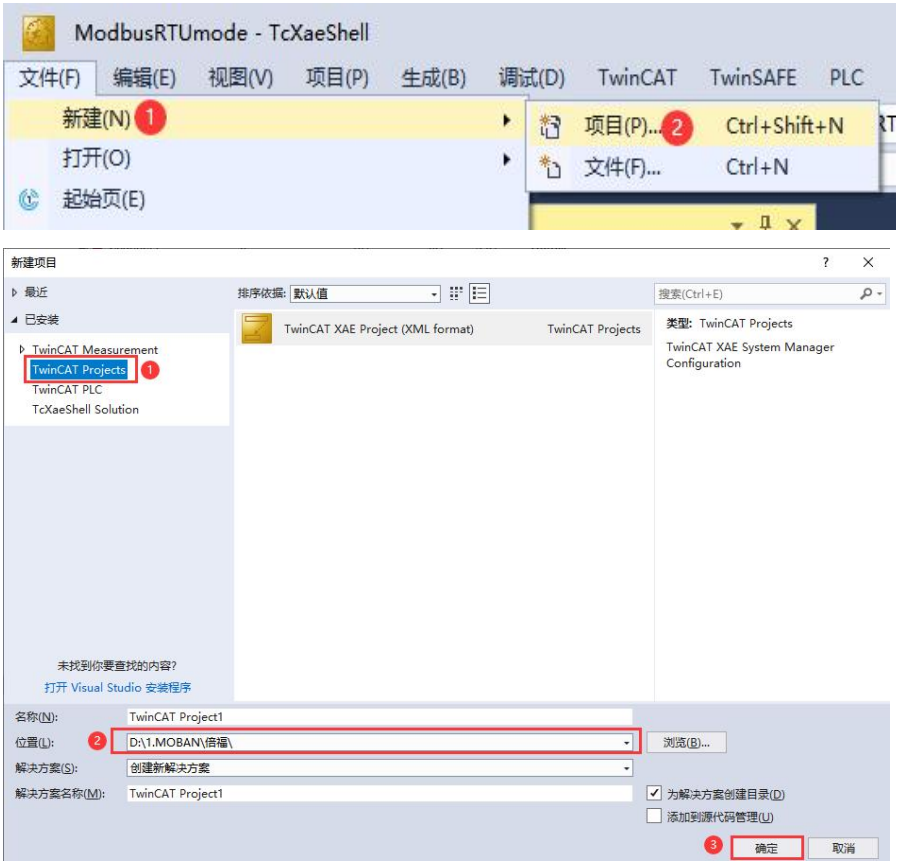
17.3.1.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:

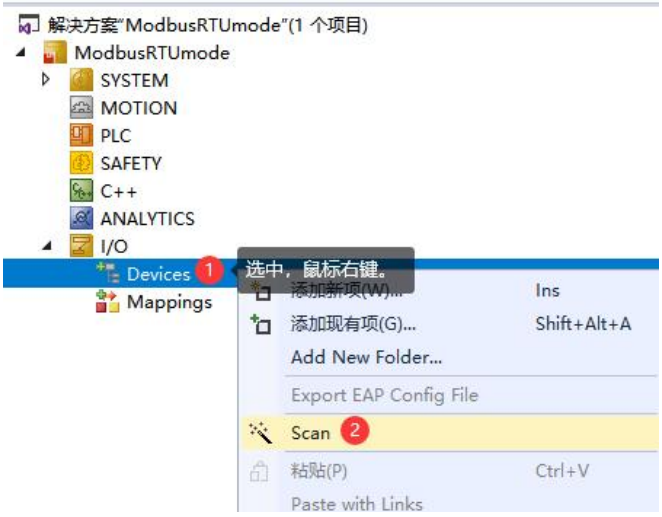


17.3.1.4. New Project and Configuration

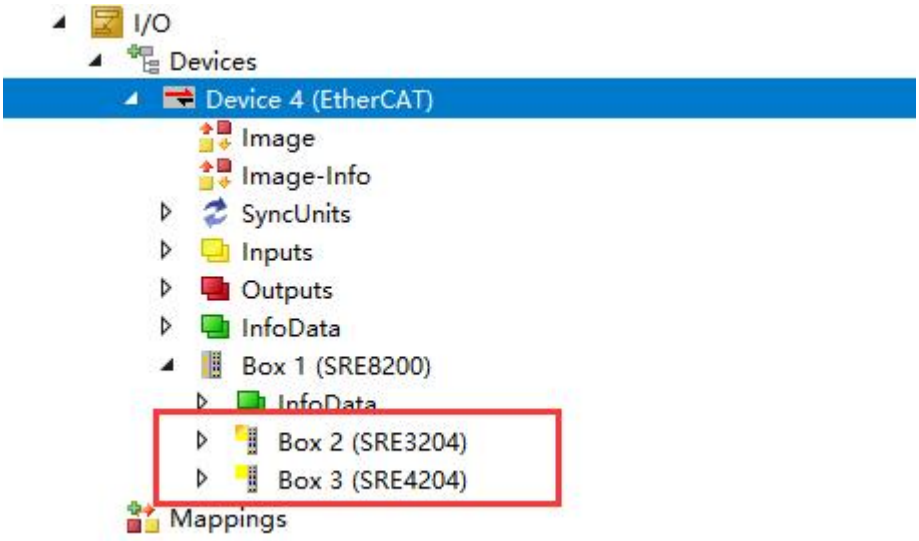
Open TwinCAT3 software and create a new project as shown below:



Scan the SRL8200 connected to the computer and its extension I/O into the project. Click I/O > Devices > Scan, as shown in the figure below:

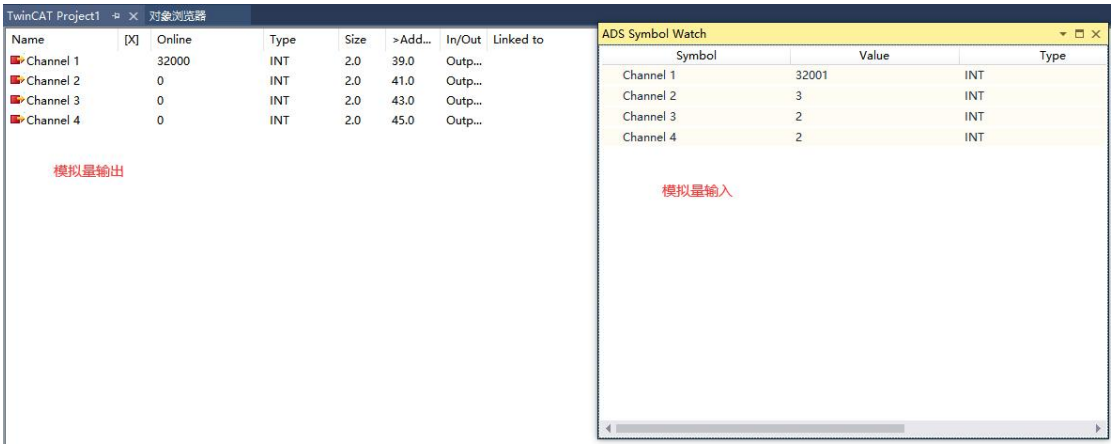


Successfully scanned modules are displayed as shown below:



17.3.1.5. Data Monitoring

Select the IO terminal to be monitored in TwinCAT3 and choose the data to be monitored:

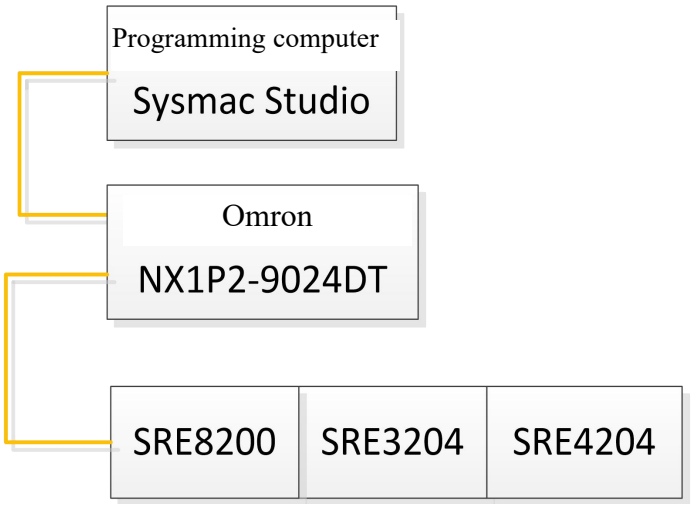


17.3.2. Example of Communication with Omron

This example briefly introduces how the SRL8200 coupler is connected with SRL3204 and SRL4204, enabling data monitoring through Omron. Analog input and output terminals can be connected and used with reference to this example.

17.3.2.1. Communication Connection

The communication connection diagram is as shown below:



17.3.2.2. Hardware Configuration

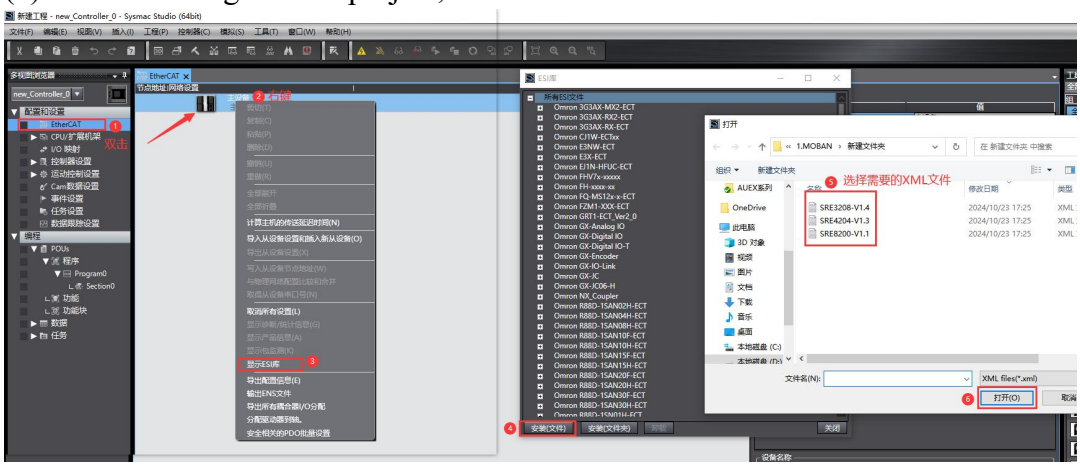
The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install the Sysmac Studio software
SRL8200	1	EtherCAT communication coupler
SRL3204	1	High-performance analog input terminal
SRL4204	1	High-performance analog output terminal
Ethernet cable	1 piece	
24V switching power supply	1	

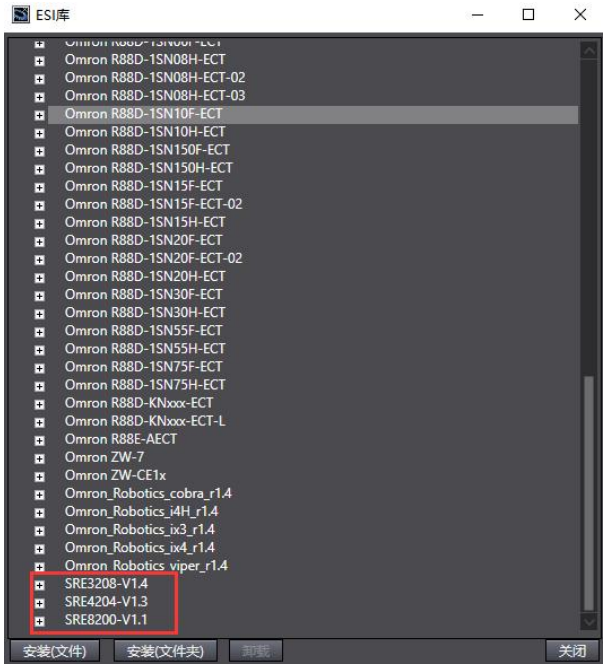
17.3.2.3. Create a new project to install the XML file.

(1) Create a new project, and select the CPU model to be used. In this example, the NX1P2-9024DT is used.

(2) After creating a blank project, install the XML file.



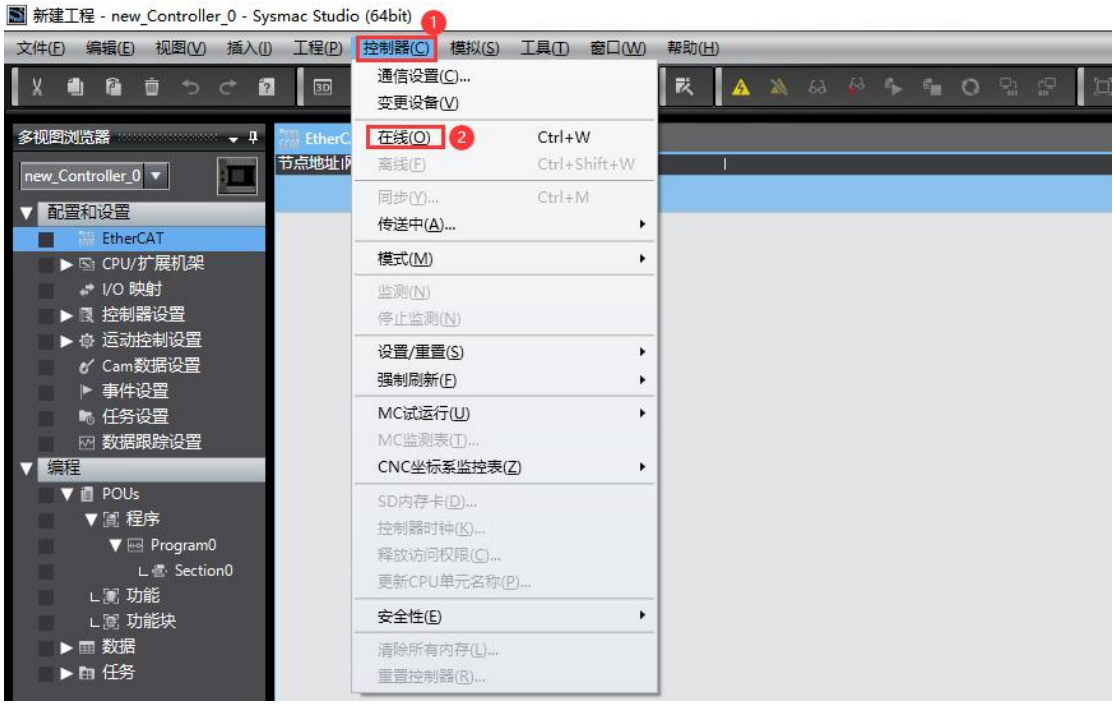
(3) After installation, pull down to view the installed XML file

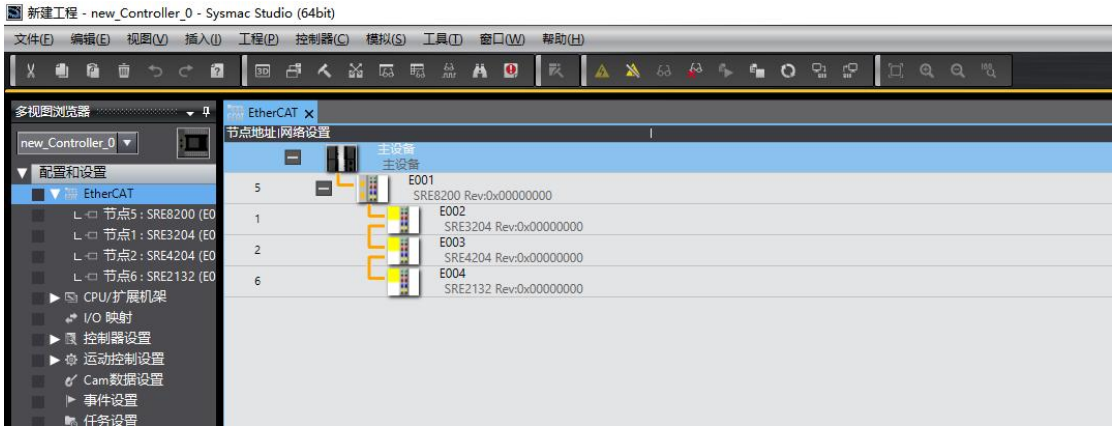


17.3.2.4. Configuration project

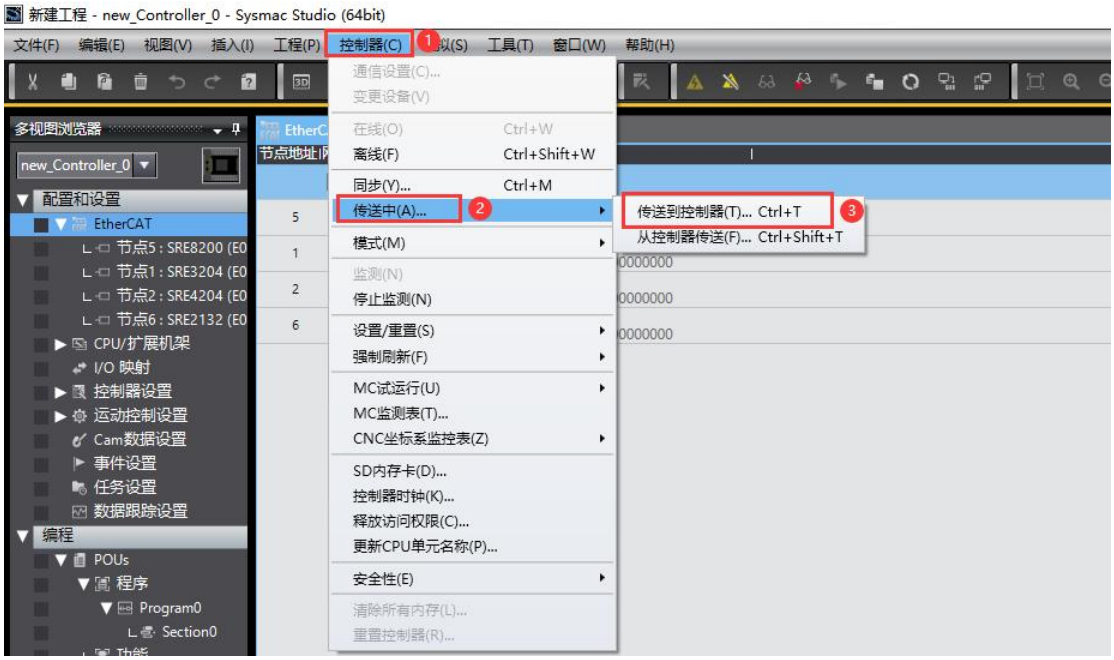
(4) Establish a connection between the programming computer and the Omron controller. In this example, the IP address of the Omron controller is 192.168.250.1, and the IP address of the programming computer is 192.168.250.111. Test whether the communication between the programming computer and the Omron controller is normal, as shown in the following figure:

(5) After confirming normal communication between the programming computer and the controller, set the controller to the online status and scan the coupler along with the connected extension modules into Sysmac Studio.



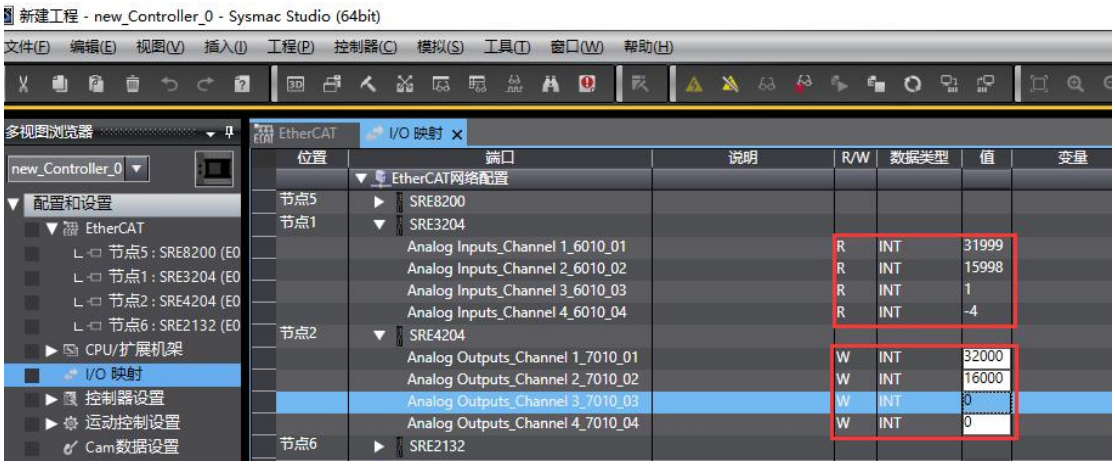


(6) Transmit to CPU after successful scanning



17.3.2.5. Data Monitoring

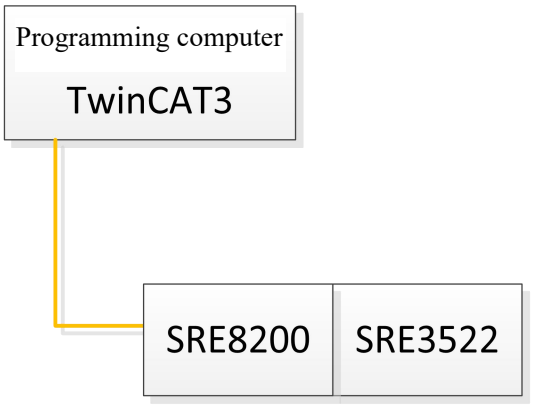
(7) Click I/O mapping to monitor data of the connected modules



17.4. Example of SRL3522 Communication with TwinCAT3

17.4.1. Communication Connection

The communication connection diagram is as shown below:



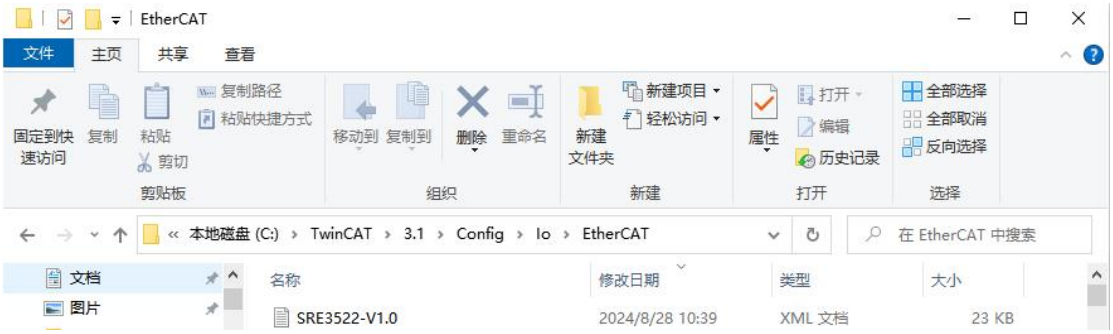
17.4.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL3522	1	Analog fast acquisition module
Signal Generator	1	
Ethernet cable	1 piece	
24V switching power supply	1	

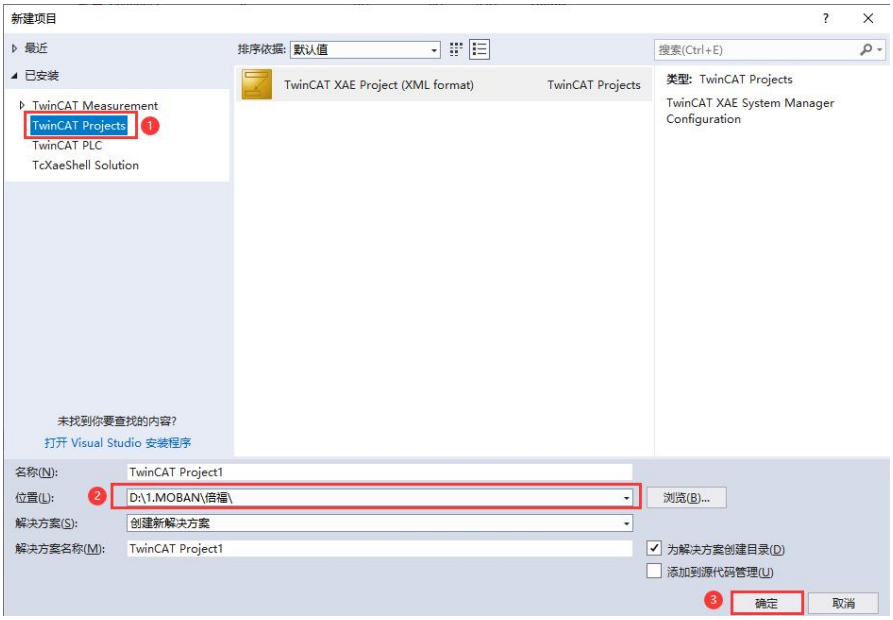
17.4.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:

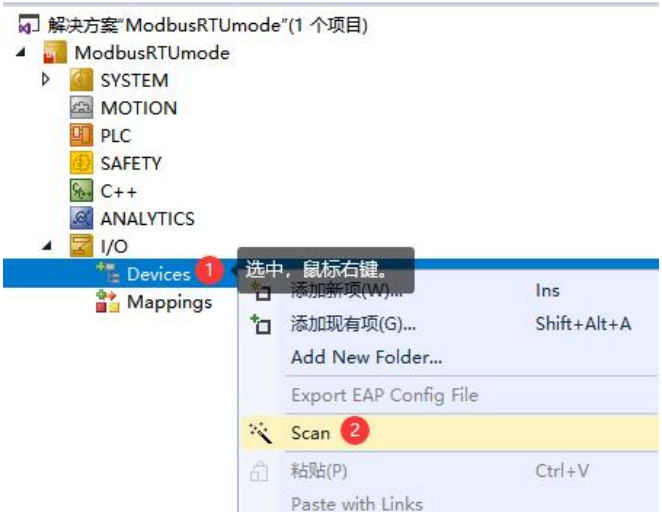


17.4.4. New Project and Configuration

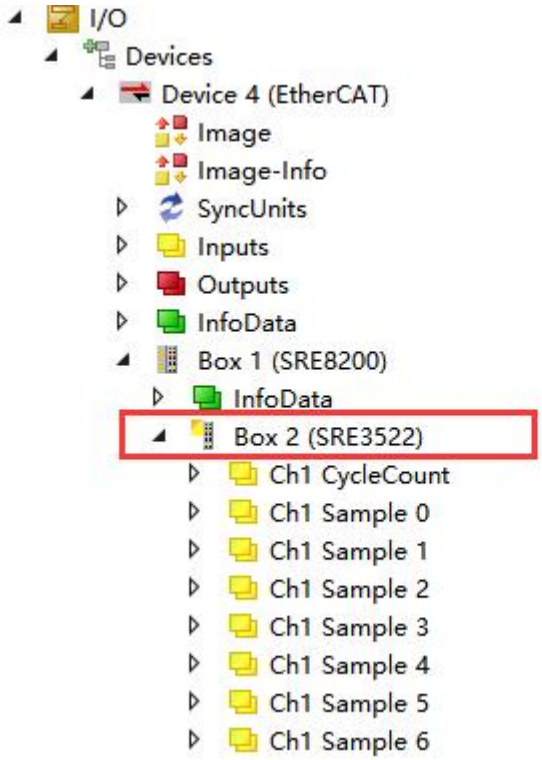
Open TwinCAT3 software and create a new project as shown below:



Scan the SRL8200 connected to the computer and its extension I/O into the project. Click I/O > Devices > Scan, as shown in the figure below:

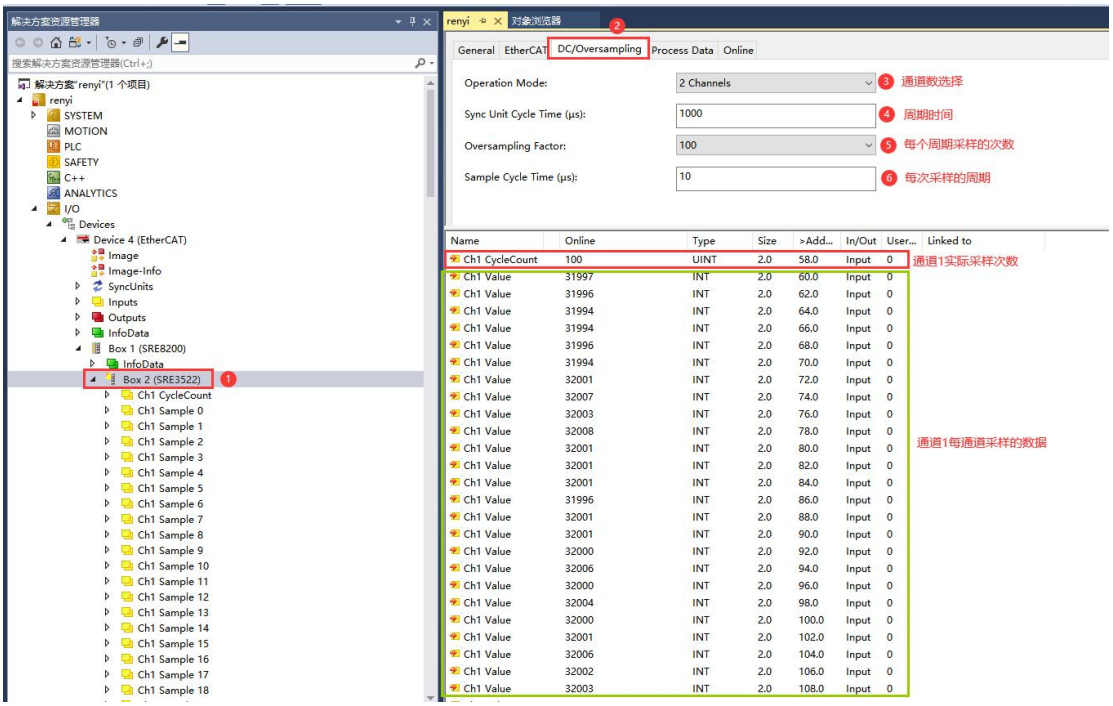


Successfully scanned modules are displayed as shown below:



17.4.5. Data Monitoring

Select the desired channel on TwinCAT3 for data monitoring:

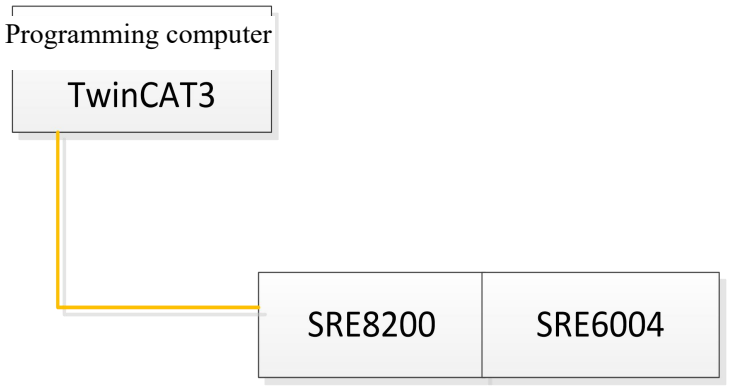


17.5. Example of SRL6004 Communication with TwinCAT3

This example introduces the basic usage of SRL8200 coupler connected with SRL6004 serial port module. Through Beckhoff, data monitoring is performed on the SRL6004 serial port module, enabling data exchange in SRL6004 master/slave and free port modes. SRL6002 can be connected with reference to this example.

17.5.1. Communication Connection

The communication connection diagram is as shown below:



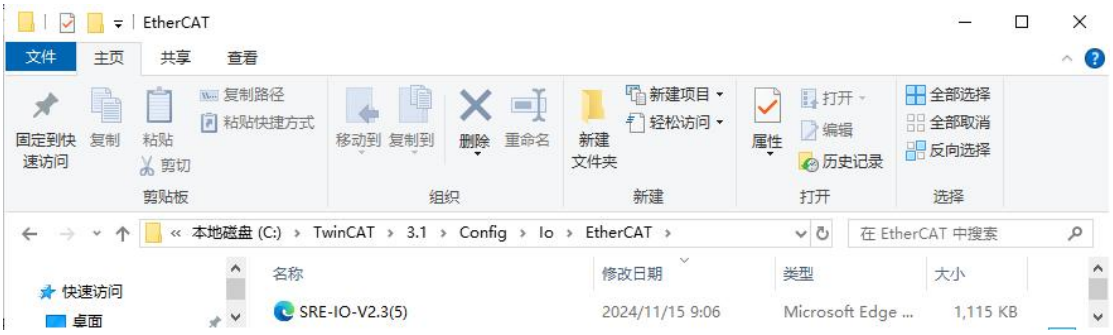
17.5.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL6004	1	High-performance serial port module
Ethernet cable	1 piece	
24V switching power supply	1	

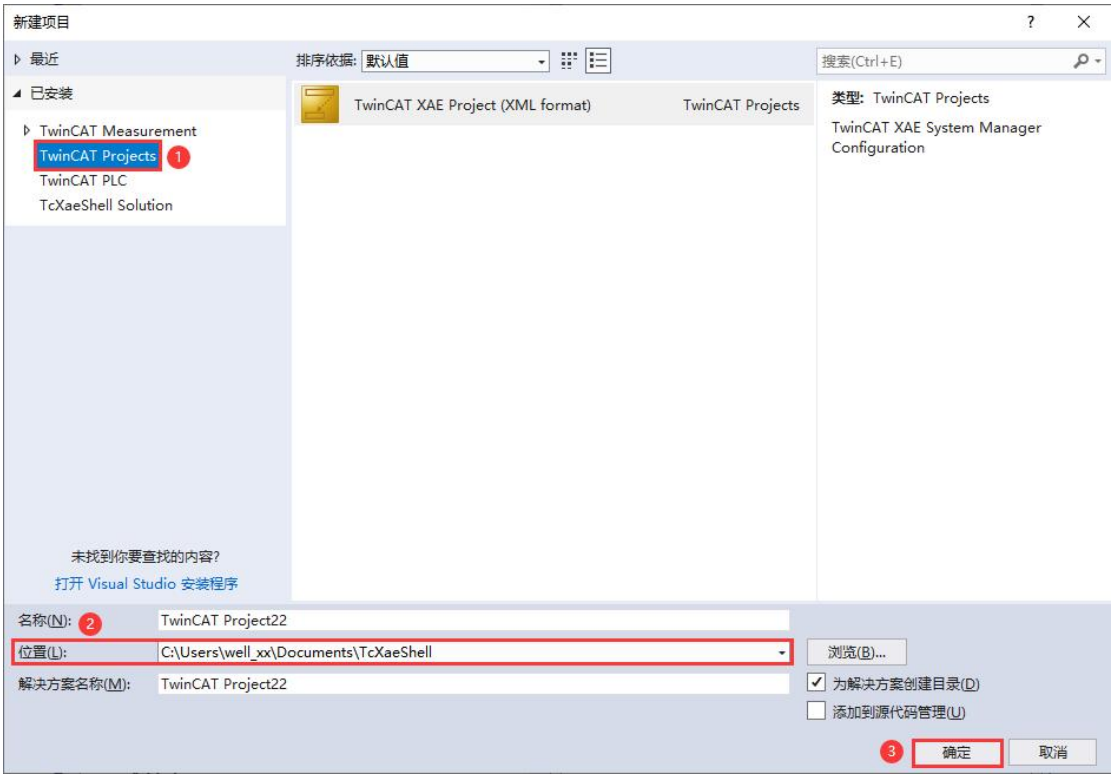
17.5.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:

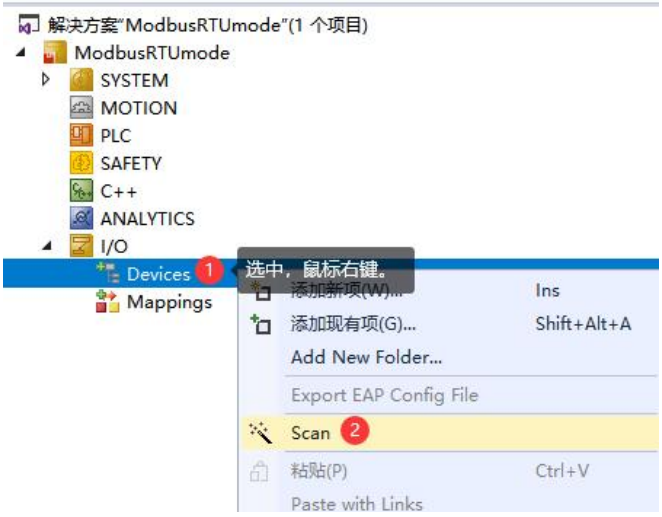


17.5.4. New Project and Configuration

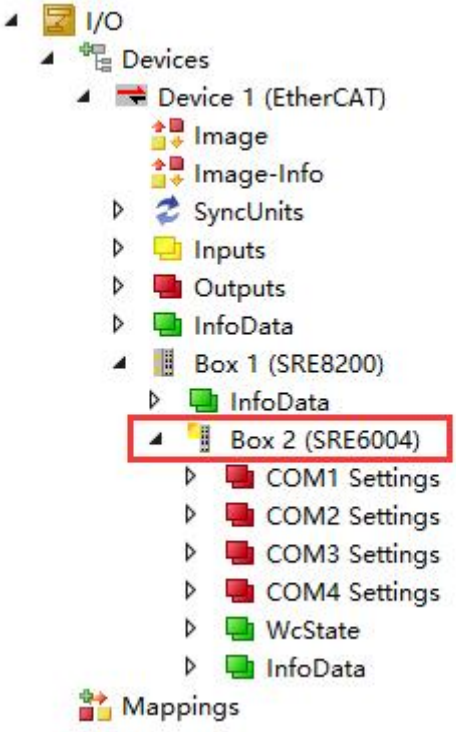
Open TwinCAT3 software and create a new project as shown below:



Scan the SRL8200 connected to the computer and the connected SRL6004 serial port module into the project. Click I/O > Devices > Scan, as shown in the following figure:



Successfully scanned modules are displayed as shown below:

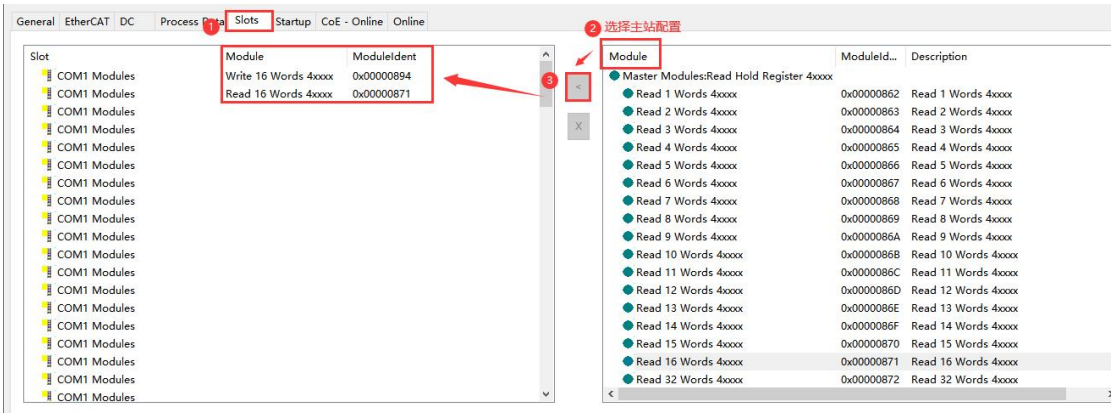


17.5.5. SRL6004 for Modbus RTU Communication

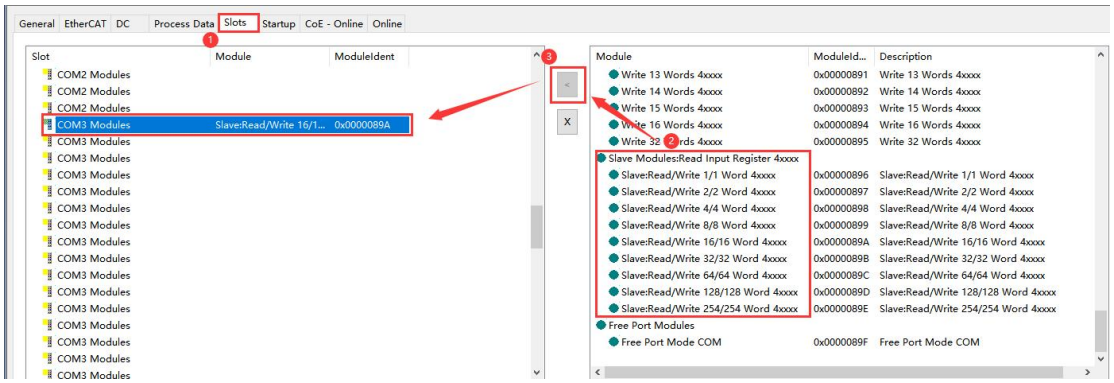
This example illustrates Modbus RTU communication between COM1 and COM3 on SRL6004 using RS232 connection. COM1 is set as the Modbus RTU master, while COM3 acts as the slave. The interaction data is as follows:

(1) Add the relevant configurations for COM1 master and COM3 slave

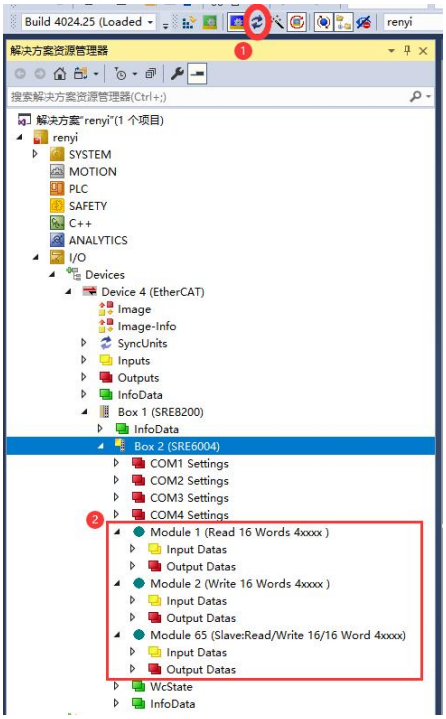
1. Configure COM1 as Modbus RTU master. Add the master parameter configuration, as shown in the following figure:



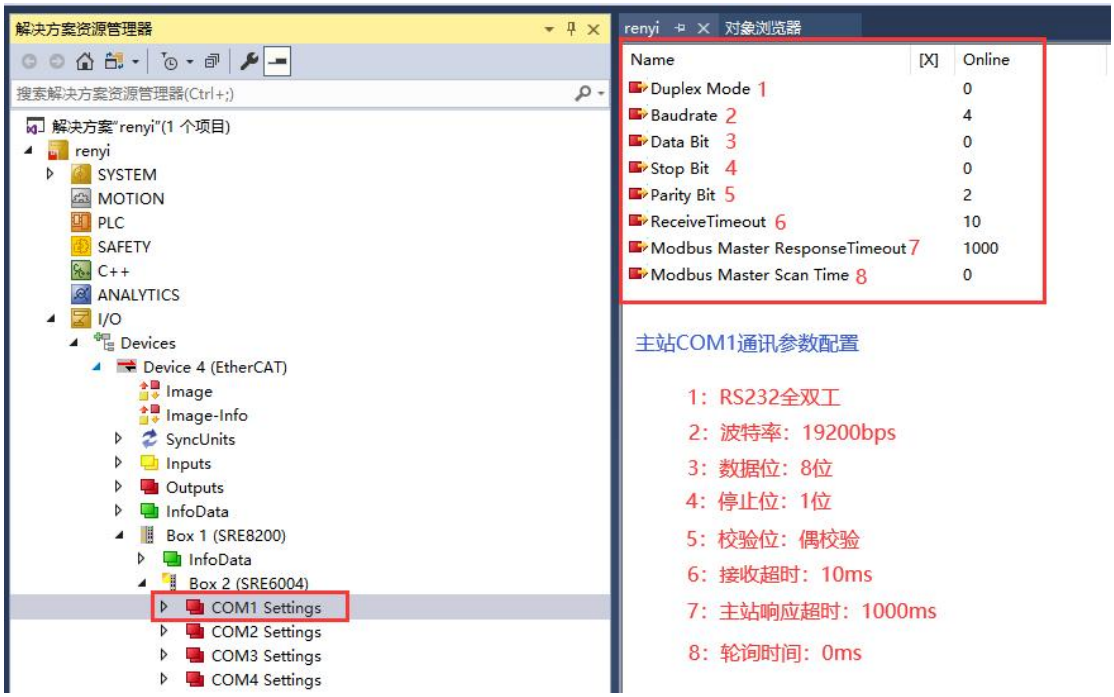
2. Configure COM3 as Modbus RTU slave. Determine the slave read/write address based on the added byte count. The data area allowing read operations for the master is 40001~40017. The data area allowing write operations for the master is 40257~40273. The parameter configuration is as shown below:

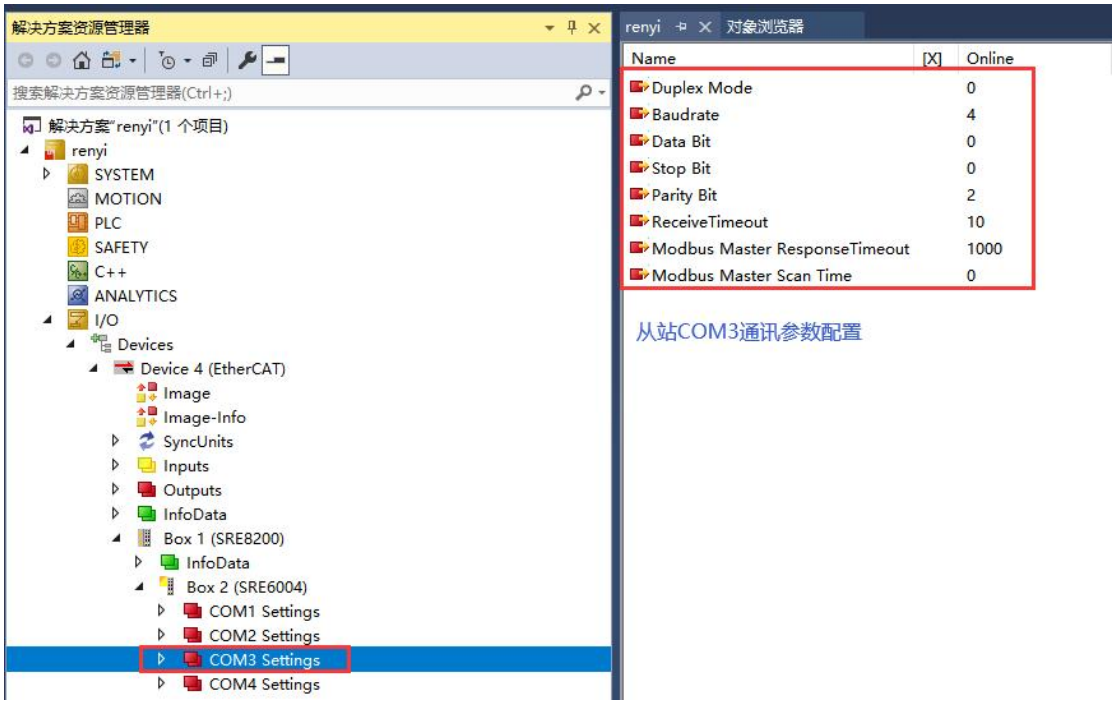


(2) After configuration, click “Refresh IO” and check whether the module status is “OP”. If it shows “OP”, the configuration is correct; otherwise, it is incorrect.

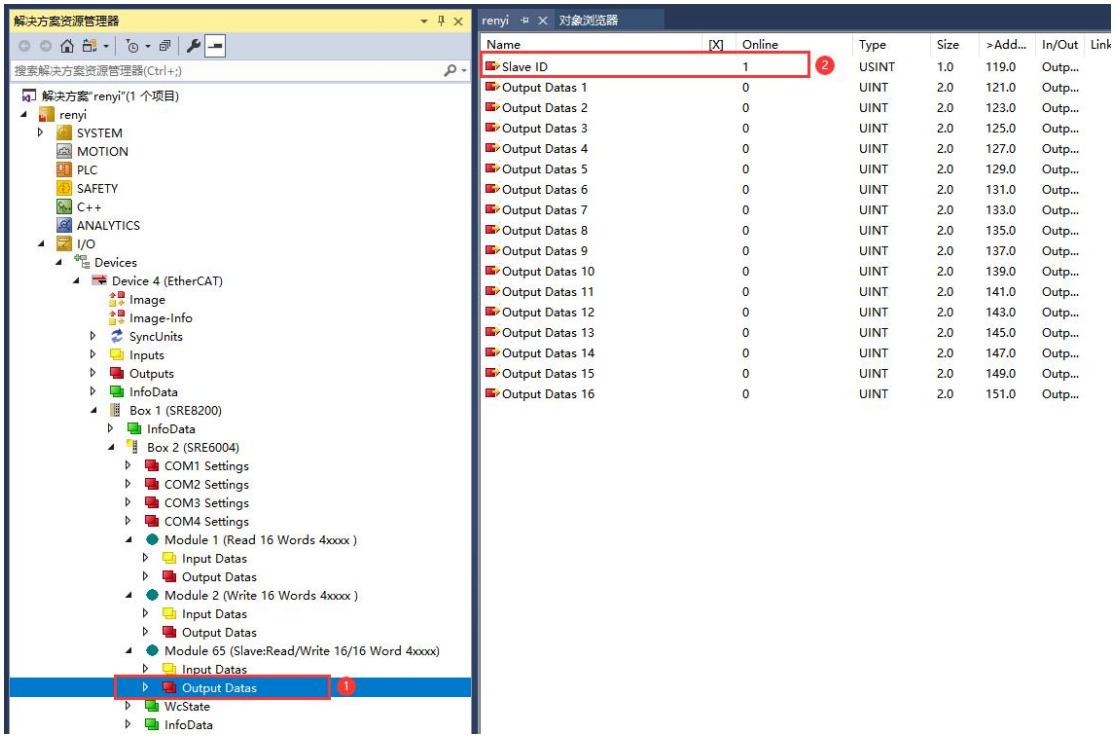


(3) Configure the communication parameters for COM1 and COM3. The parameters must be identical. Otherwise, the communication will be abnormal, as shown below:

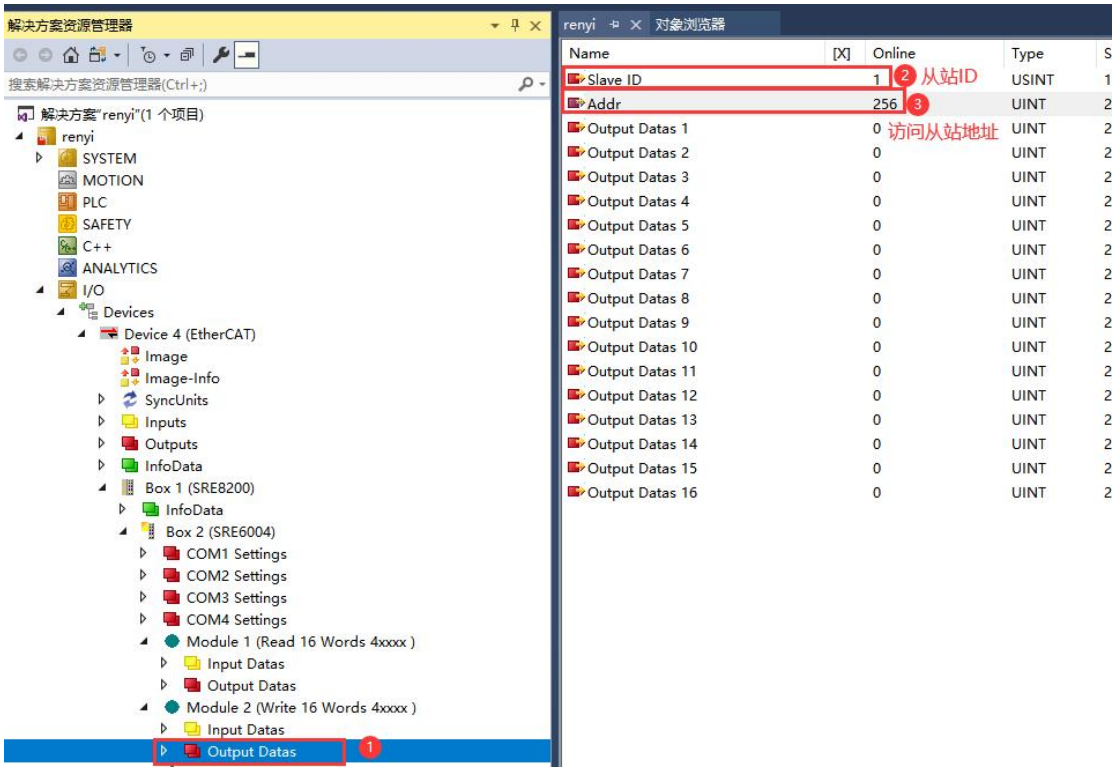


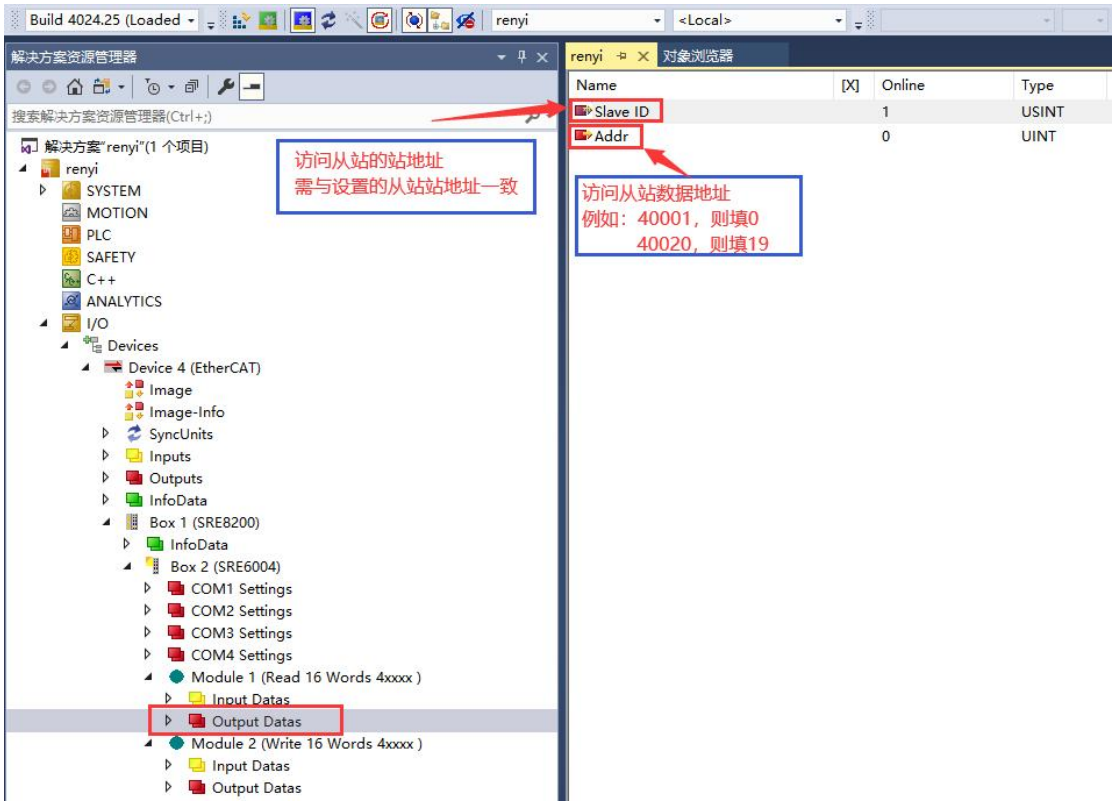


(4) Configure the station address for COM3 slave

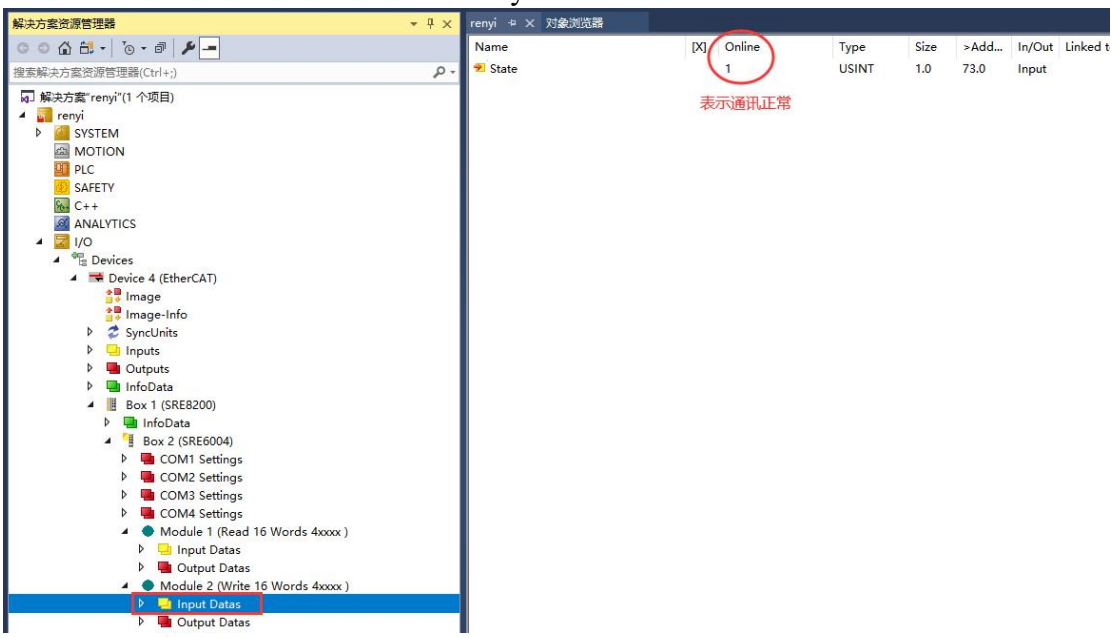


(5) Set COM1 master to access the data from COM3 slave

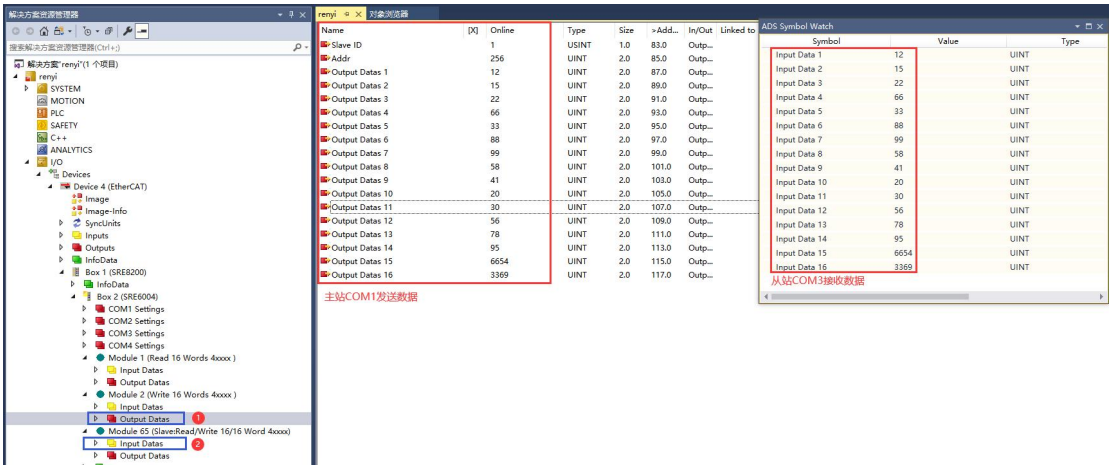


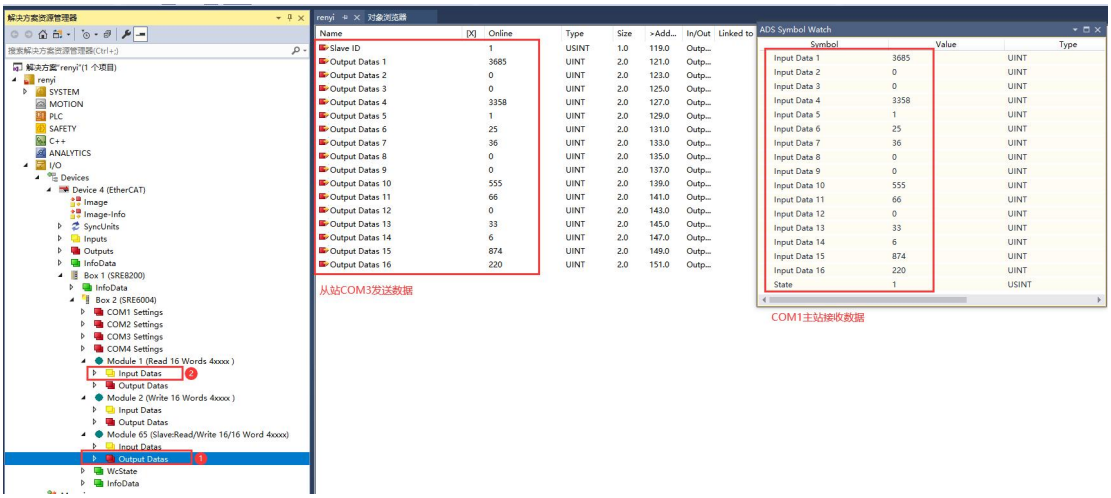


(6) After configuring the communication parameters for COM1, check the module status. If the status displays 1, it indicates that the communication is normal and the data can be transmitted normally:



(7) After completing the above configuration, data transmission and reception can be performed:

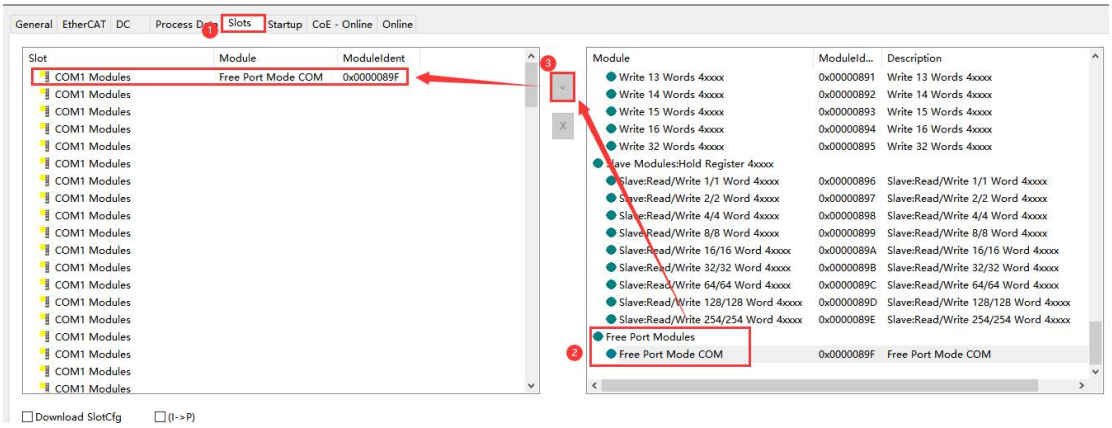


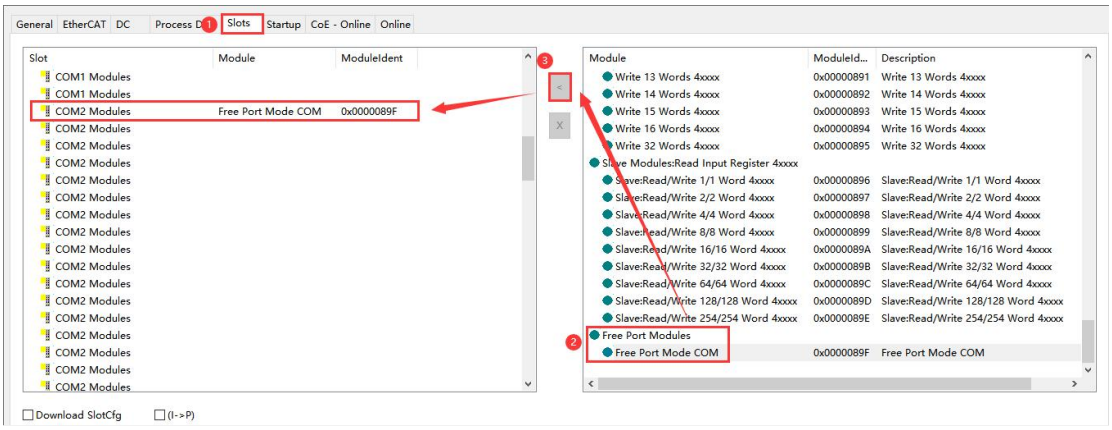


17.5.6. SRL6004 for Free Port Communication

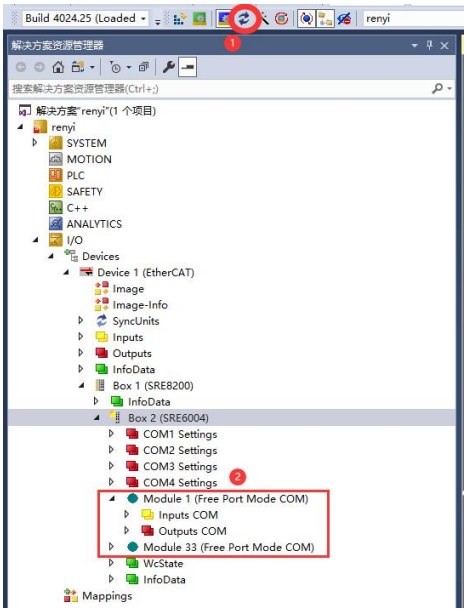
This example demonstrates the free port communication between COM1 and COM2 on SRL6004 using RS232 connection. COM1 transmits data while COM2 receives it. The interaction data is as follows:

(1) Configure COM1 and COM2 in the free port mode. The parameter settings are shown in the following figure:

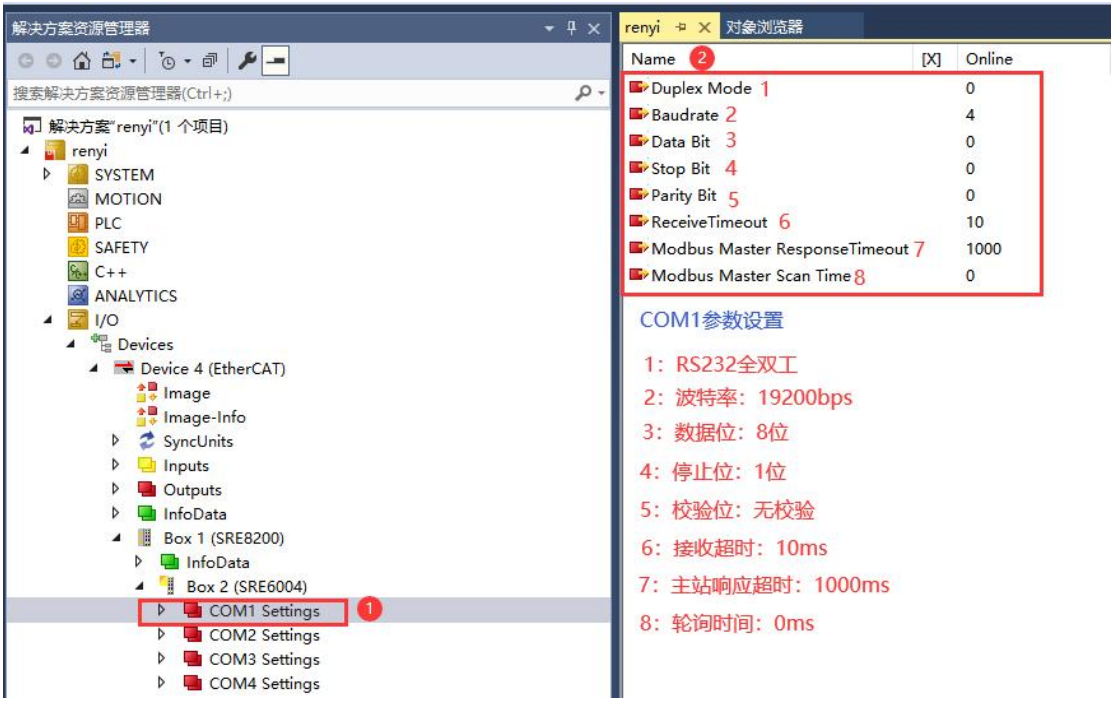


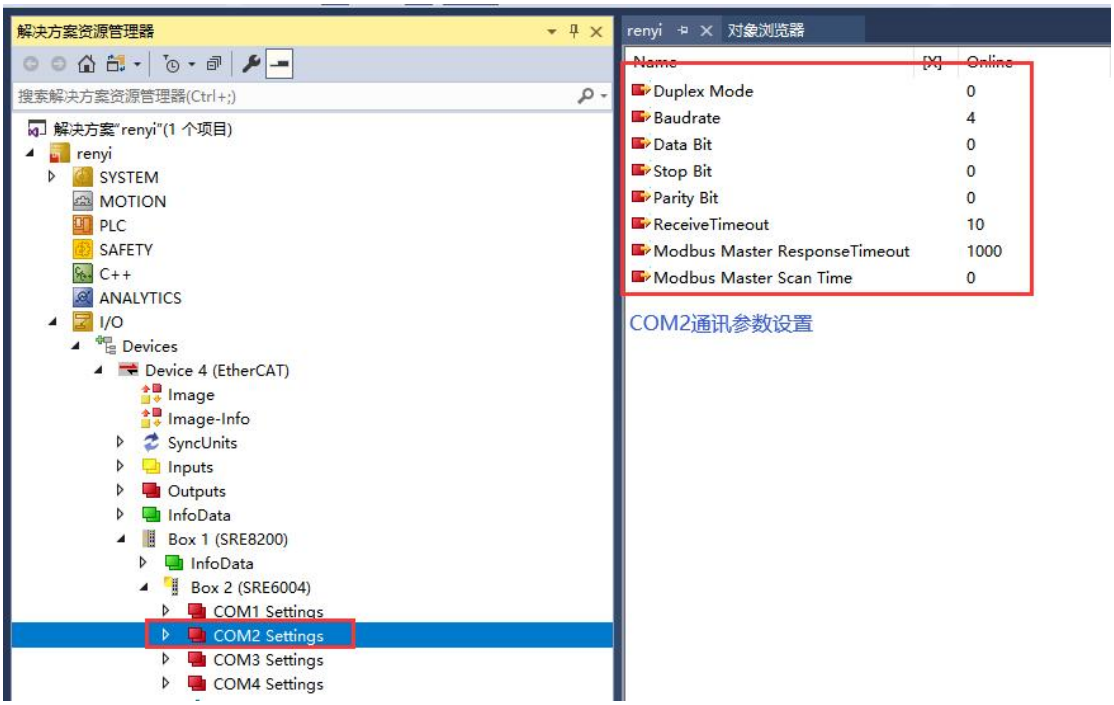


After configuration, click “Refresh IO” and check whether the module status is “OP”. If it shows “OP”, the configuration is correct; otherwise, it is incorrect.

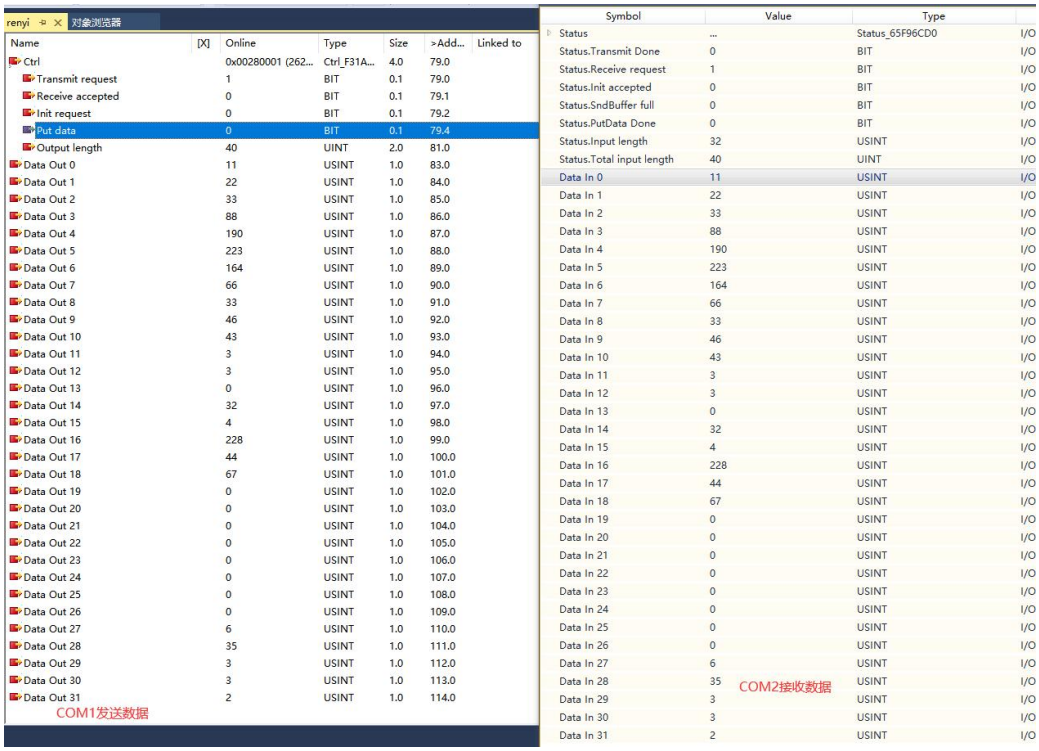


(2) Configure the communication parameters for COM1 and COM2. When using the free port communication for COM1 and COM2, the baud rate, parity, and stop bits of the communication parameters must be set consistently; otherwise, normal communication cannot be achieved, as shown in the figure below:





(3) Data Monitoring



Note: When using the free port communication, it is recommended to initialize the serial port before receiving or transmitting data. After successful initialization, the initialization control word "Init request" must be set to 0; otherwise, the serial port cannot transmit or receive data normally.

Transmit data:

(1) Initialize the serial port. When the control word "Init" request of COM1 is set to 1 and the status word "Init accepted" of COM1 displays 1, the initialization

has been complete.

(2) Set the sent data length by writing 40 into the control word "Output length" of COM1.

(3) Write the data to be sent, from 1 to 32, to Data Out 0 to Data Out 31 in sequence. (A maximum of 32 bytes of data can be written to the transmit buffer at a time. If the length of the data to be sent is greater than 32 bytes, the data needs to be written to the transmit buffer in batches and then sent out all at a time. For example, to transmit 40 bytes of data, write the data to the transmit buffer in two batches and then send out all 40 bytes at a time.)

(4) Set the control word "Transmit request" of COM1 to 1, and simultaneously set the control word "Put data" to 1.

(5) Read the status word "PutData Done" of COM1. When PutData Done is 1, it indicates that 32 bytes have been successfully written into the transmit buffer. Then set the control word "Put data" to 0.

(6) Write values 33~40 to Data Out 0-Data Out 7 sequentially, and then set the control word "Put data" to 1.

(7) When the status word "Transmit Done" of COM1 is 1, it indicates that the current data frame has been successfully sent. Then set the control words "Transmit request" and "Put data" to 0; the current frame transmission is completed.

Receive data:

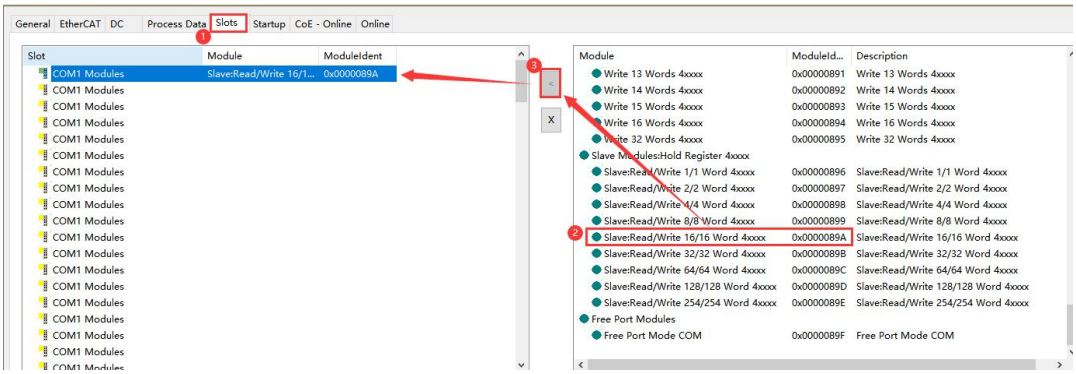
(1) When the module receives data, the status word "Receive request" of COM2 is 1, and "Input length" is 32, indicating that the current receivable data is 32. "Total input length" displays a total length of 40;

(2) Reading Data In 0-Data In 31 allows access to the first 32 bytes. Set the control word "Receive accepted" of COM2 to 1. At the moment, when the status word "Receive request" of COM2 is read as 0, set the control word "Receive accepted" of COM1 to 0. After setting it to 0, the status word "Receive request" of COM1 displays 1, and "Input length" shows 8, indicating there are 8 bytes of data to be received.

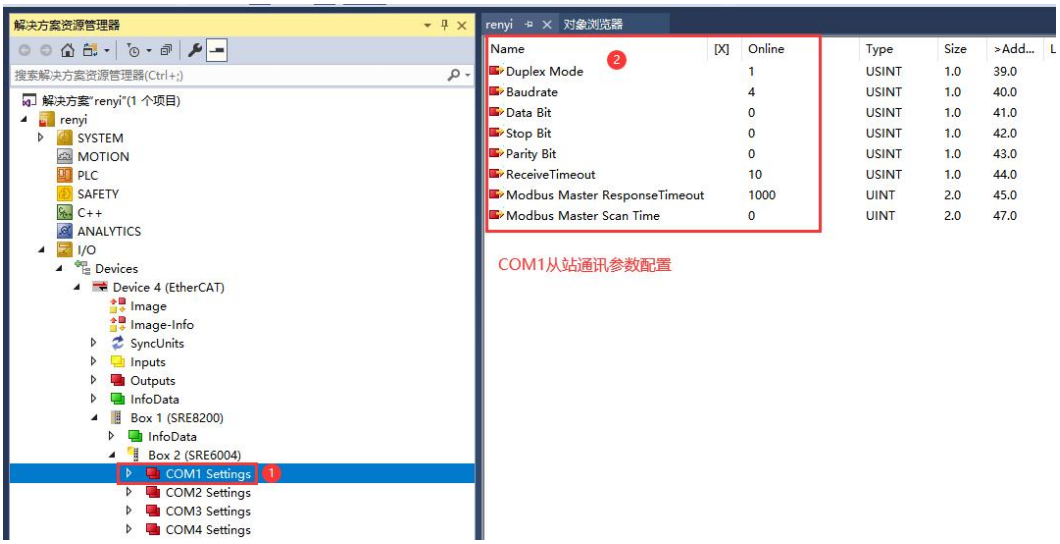
(3) At the moment, reading Data In 0-Data In 7 allows access to the next 8 bytes. After reading, set the control word "Receive accepted" of COM1 to 1. When the status word "Receive request" of COM1 is read as 0, set the control word "Receive accepted" of COM2 to 0. After setting it to 0, the status word "Receive request" of COM1 displays 0. The current data frame reception is completed.

17.5.7. SRL6004 as Modbus Slave

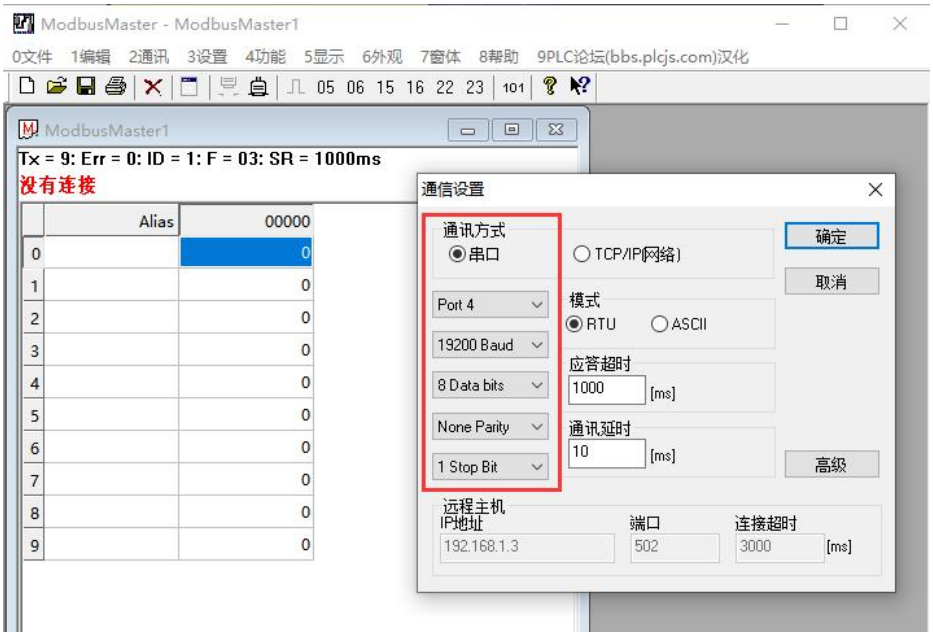
(1) Set COM1 as slave



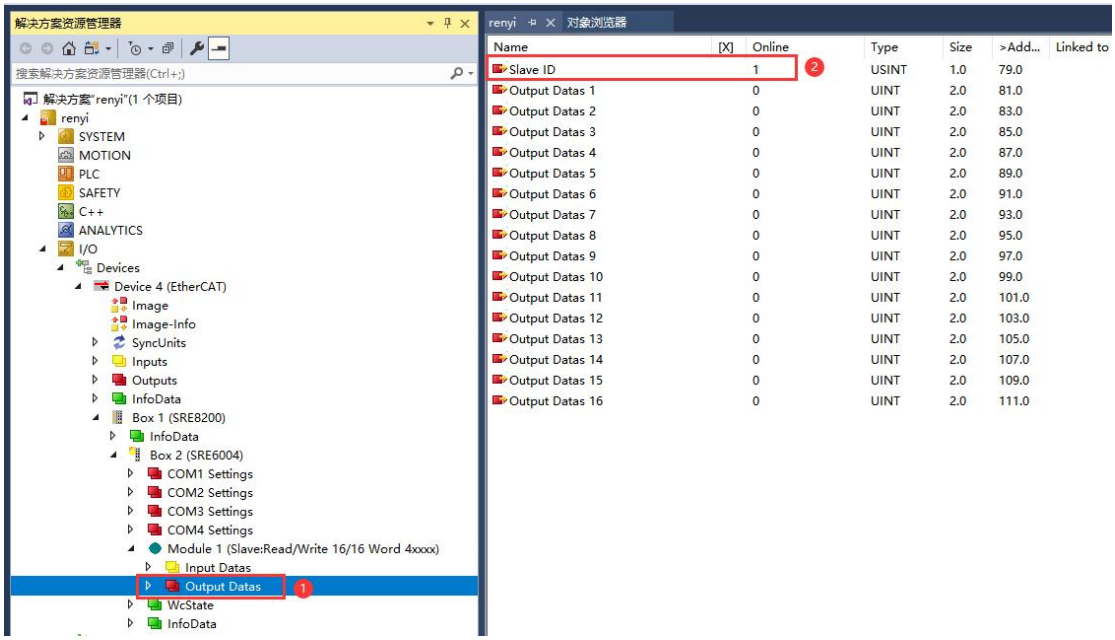
(2) Configure the communication parameters for the COM1 slave



(3) Configure the communication parameters for the Modbus Master, which must be the same as that of the COM1 slave; otherwise, the communication will fail

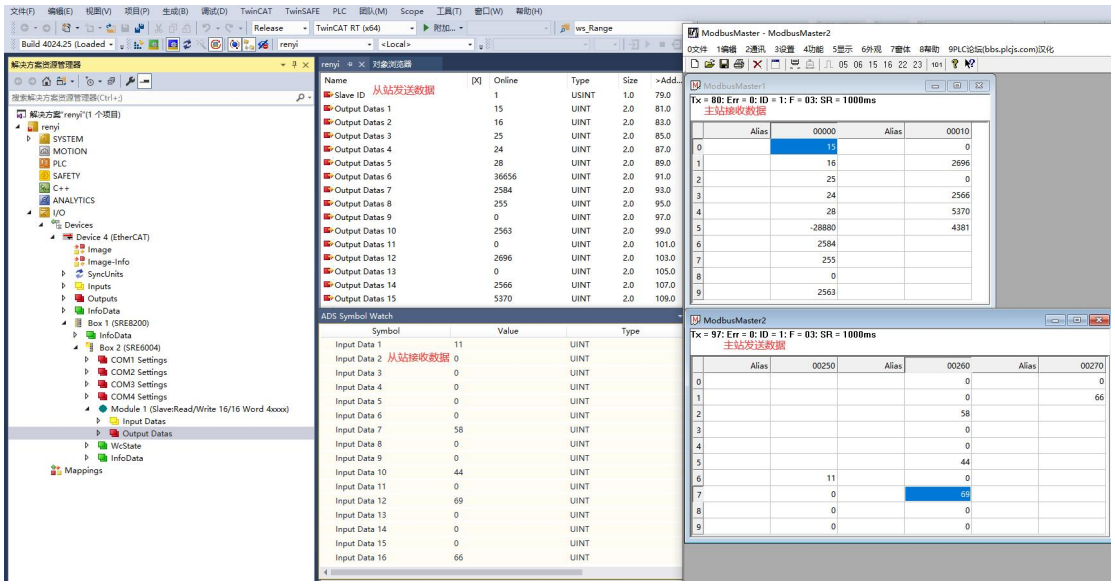


(4) Set the ID of Slave



(5) Data interaction: As shown in the figure, the master reads the data from SRL6004 addresses 40001~40017:

The master writes the data to SRL6004 addresses 40257~40273:

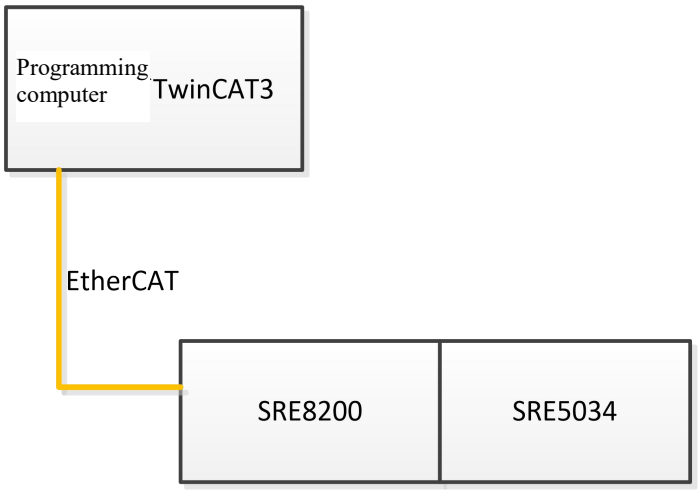


17.6. Example of SRL5034 Communication with TwinCAT3

This example briefly introduces the usage of SRL5034 module behind SRL8200 coupler. SRL5012 can be connected with reference to this example. The operation process is as follows:

17.6.1. Communication Connection

The communication connection diagram is as shown below:



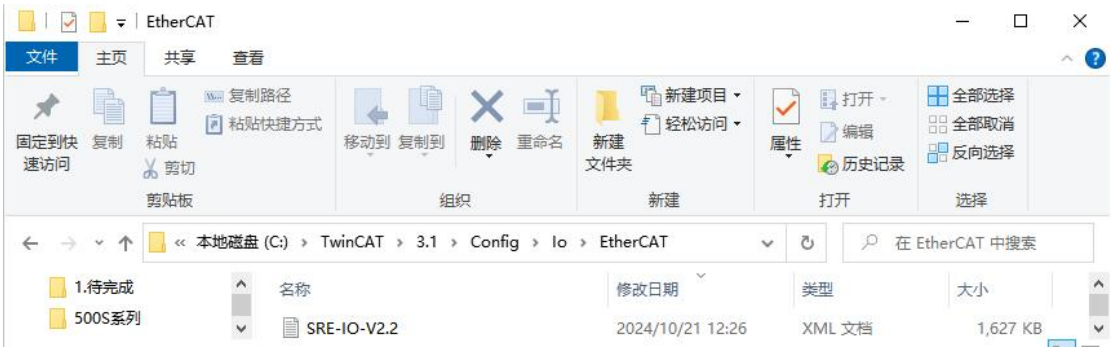
17.6.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL5034	1	Count module
Ethernet cable	Several	

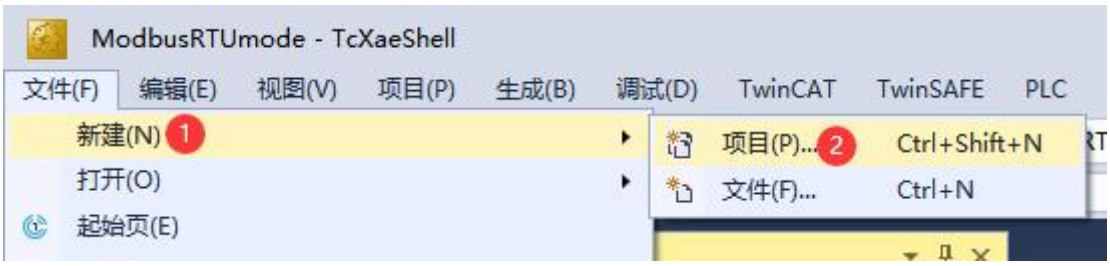
17.6.3. Install XML File

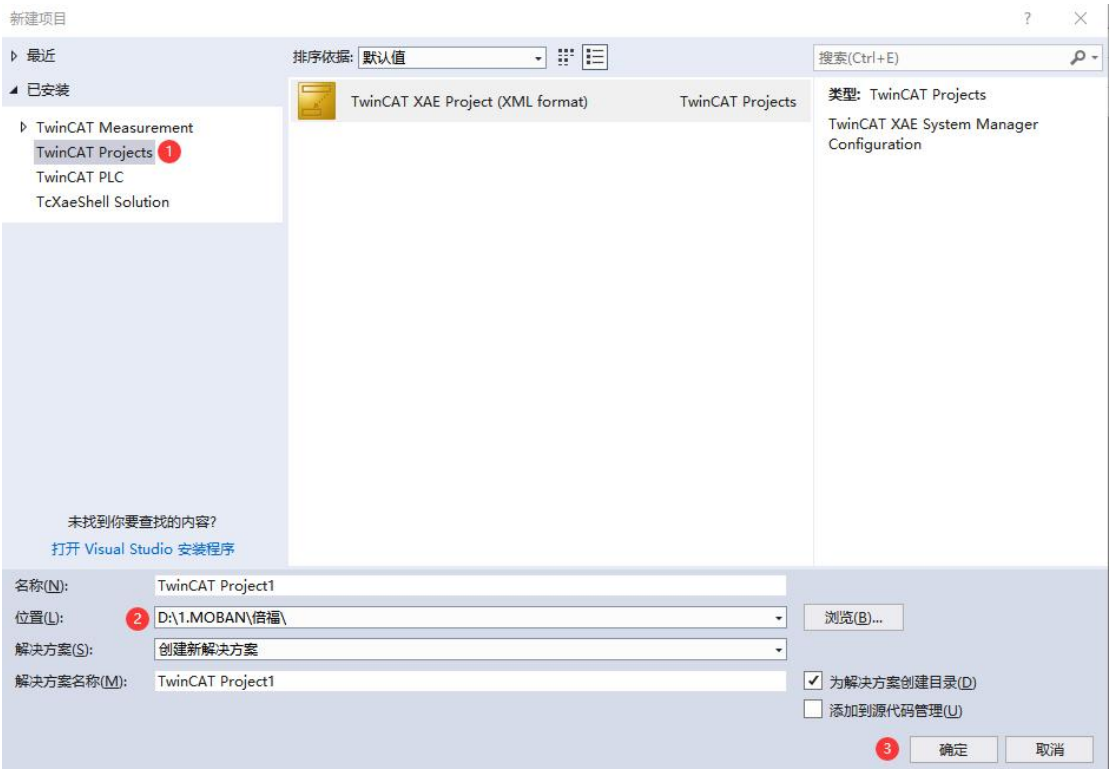
Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:



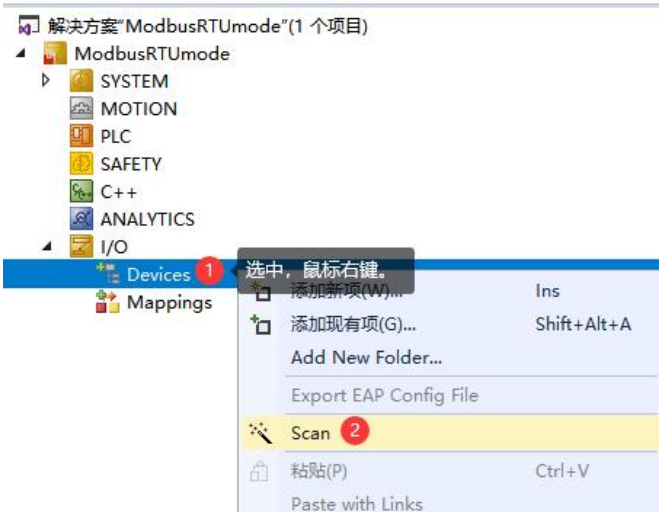
17.6.4. New Project and Configuration

Open TwinCAT3 software and create a new project as shown below:

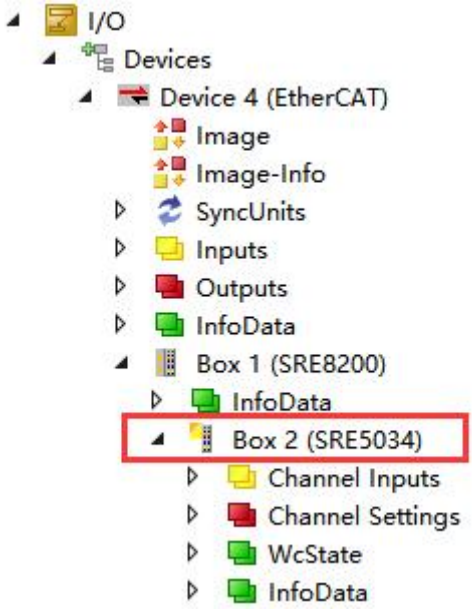




Scan the SRL8200 connected to the computer and its high-speed count module SRL5034 into the project. Click I/O > Devices > Scan, as shown below:

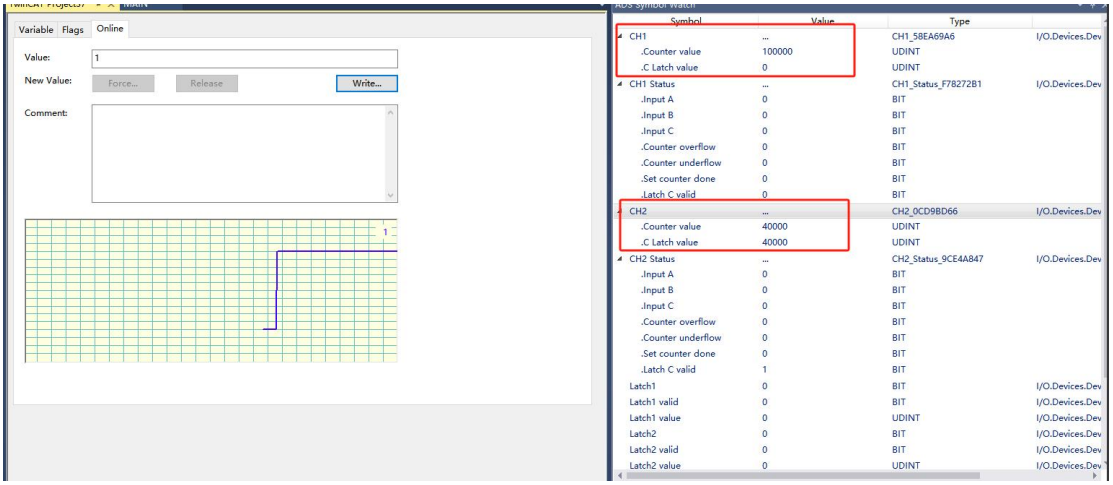


Successfully scanned modules are displayed as shown below:



17.6.5. Data Monitoring

Select the IO terminal to be monitored on TwinCAT3, and choose the channel to be monitored, as shown in the following figure:

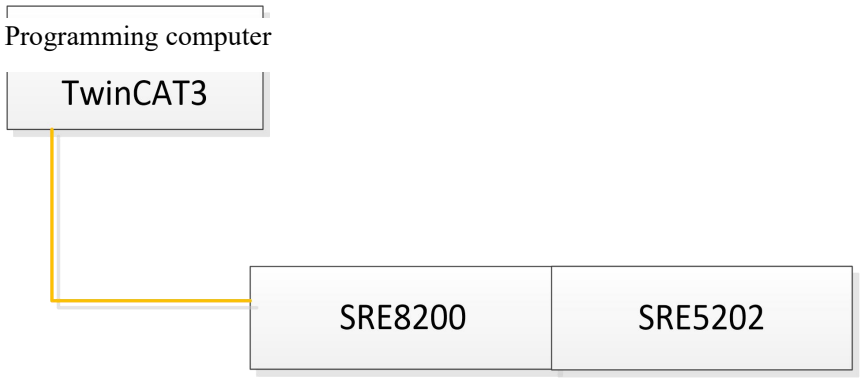


17.7. Example of SRL5202 Communication with TwinCAT3

This example demonstrates the communication connection using SRL8200 extended with SRL5202, enabling data monitoring of SRL5202 module through Beckhoff. SRL5204 can be connected and used with reference to this example.

17.7.1. Communication Connection

The communication connection diagram is as shown below:



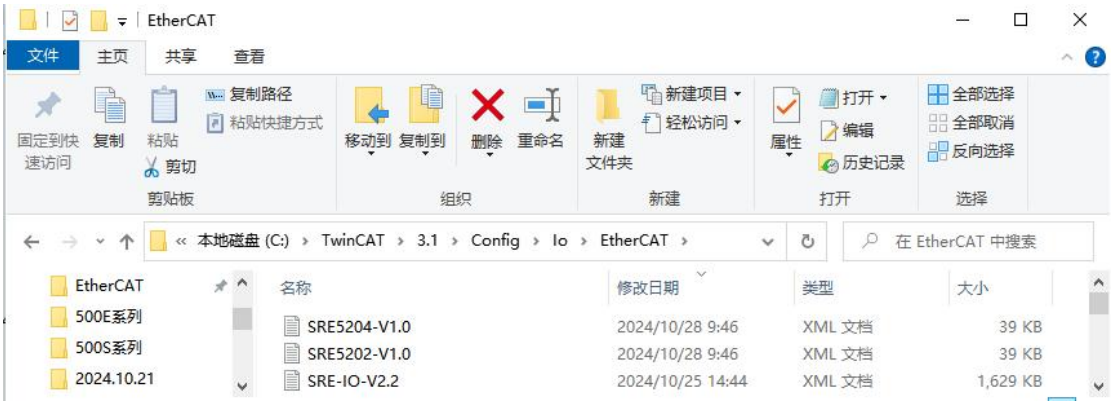
17.7.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL5202	1	
Ethernet cable	1 piece	
24V switching power supply	1	

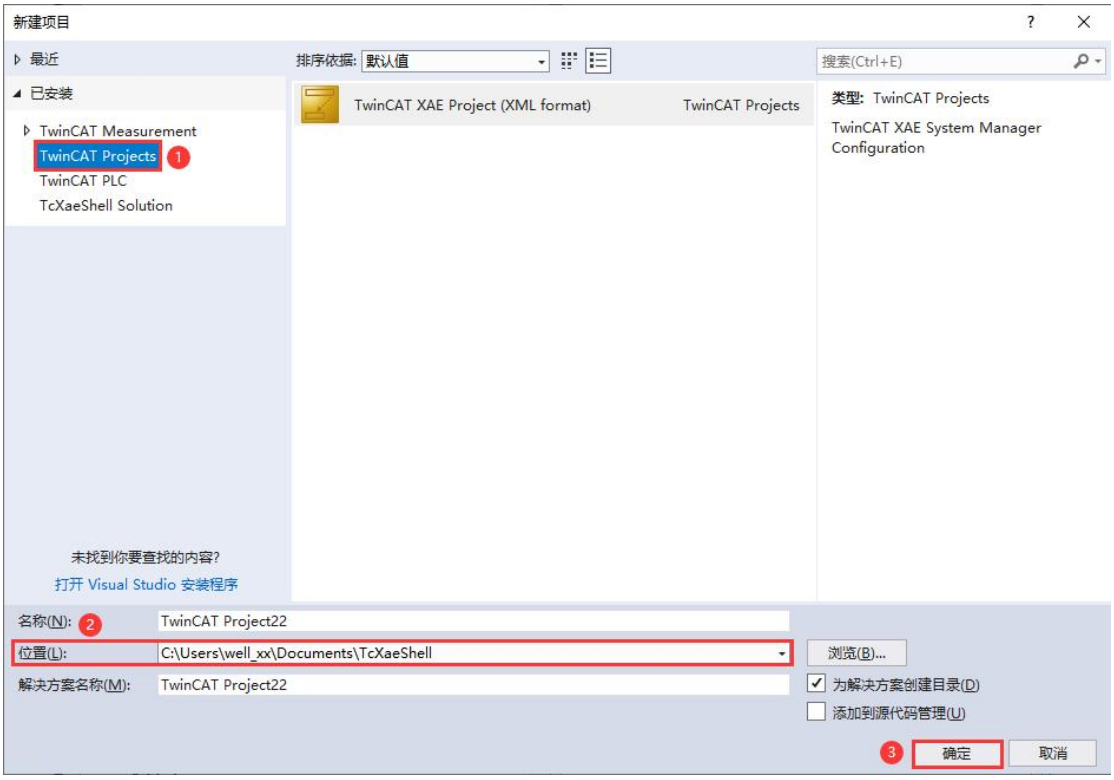
17.7.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:

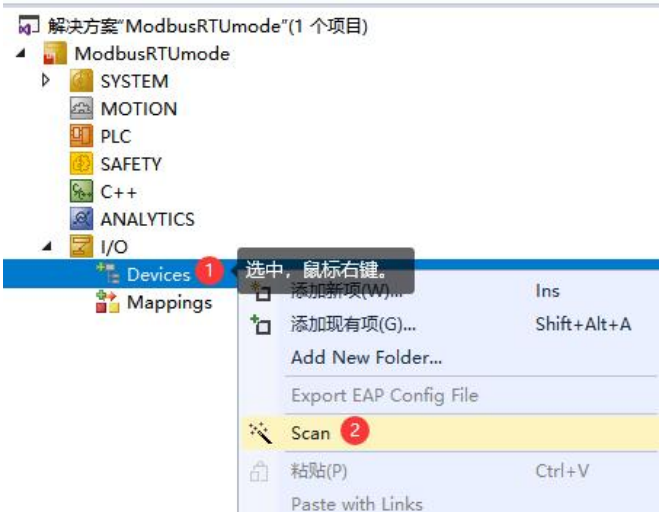


17.7.4. New Project and Configuration

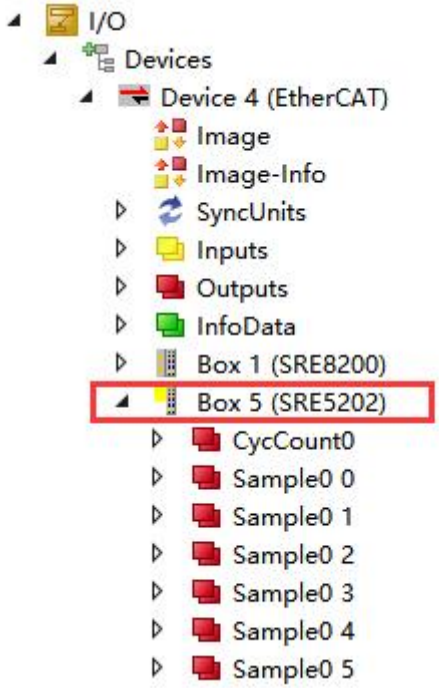
Open TwinCAT3 software and create a new project as shown below:



Connect the SRL8200 coupler to the computer, scan the extended SRL5202 module into the project, and then click I/O > Devices > Scan, as shown below:



Successfully scanned modules are displayed as shown below:

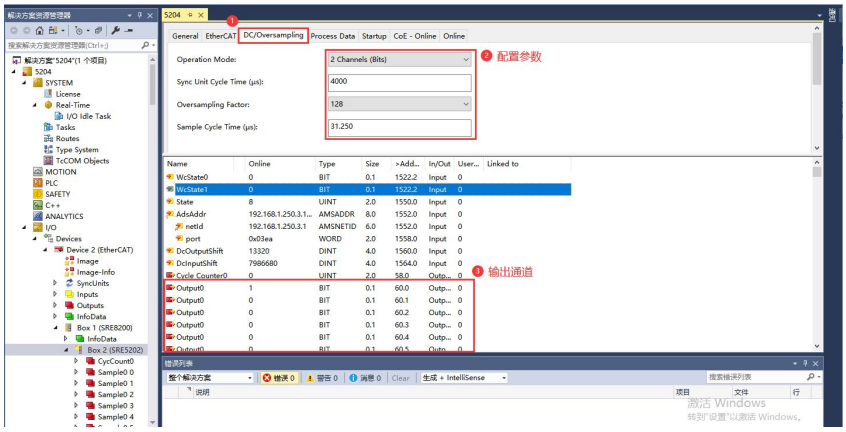


17.7.5. Data Monitoring

According to the actual requirements, the parameters of SRL5202 can be configured through the DC/Oversampling parameter setting panel.

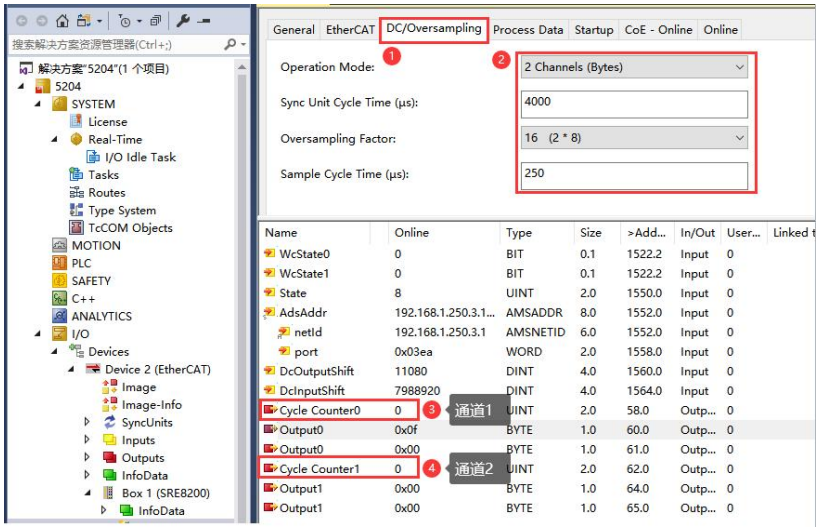
(1) Sampling data via Bit type:

For example: select 2 Channels (Bits), 128Bit, meaning that the process oversampling factor for SRL5202 Channel 1 and Channel 2 is 128Bit. This means selecting two channels with a total cycle time of 4000us. Set channel output. Based on the total cycle time and oversampling factor, the sampling cycle time is 31.250us. Setting the channel to 1 will make it continuously output according to the sampling cycle time.

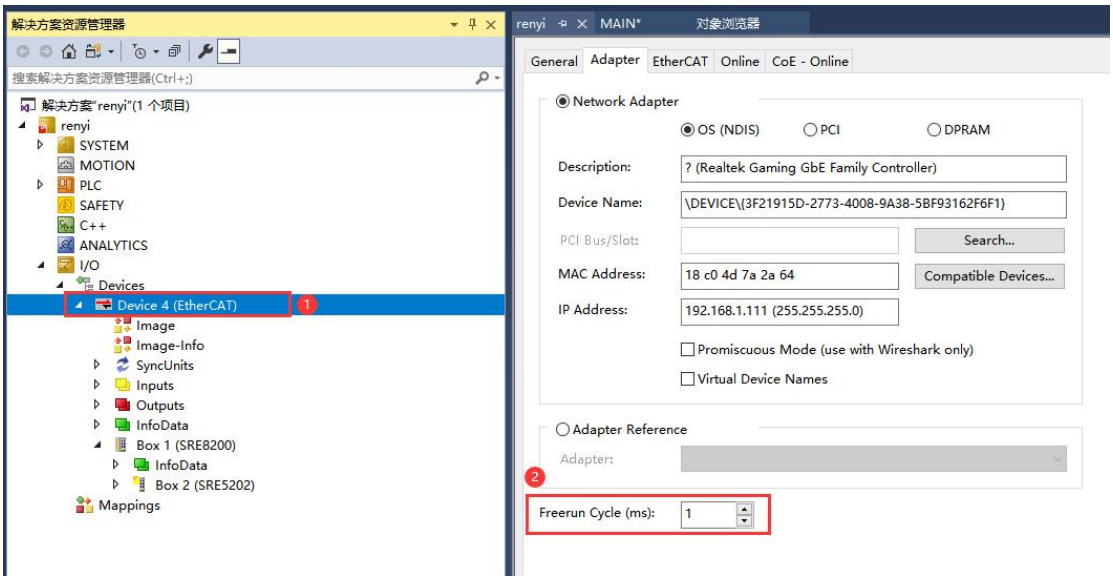


(2) Sampling data via Byte type:

For example: select 2 channels (Bytes), 16 (2*8), meaning that the oversampling factor for SRL5202 Channel 1 and Channel 2 is 2Byte (16Bit). This means selecting two channels. Based on the total cycle time and oversampling factor, the sampling cycle time is 250us. As shown below, setting the first 8 bits of Channel 1 as 1 will make it continuously output according to the sampling cycle time.



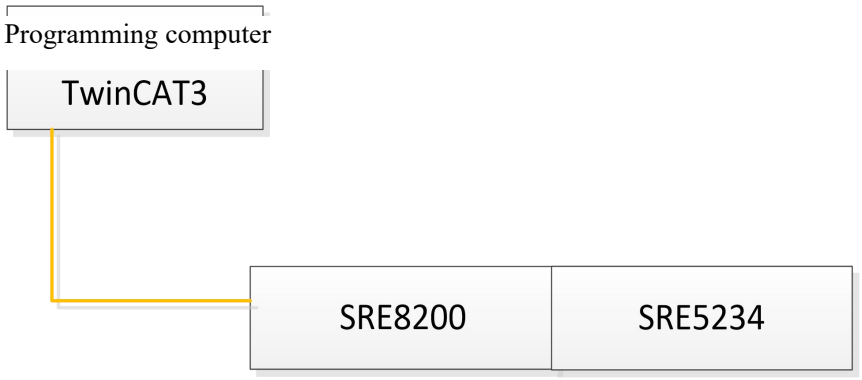
The total cycle time is set via Freerun Cycle (ms).



17.8. Example of SRL5234 Communication with TwinCAT3

17.8.1. Communication Connection

The communication connection diagram is as shown below:



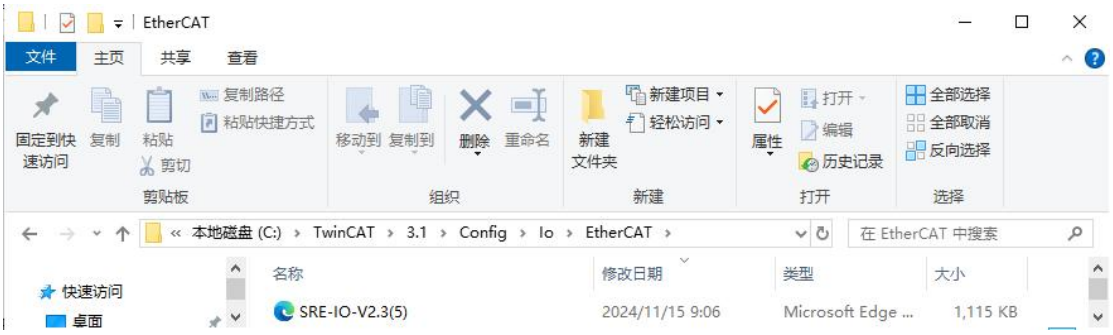
17.8.2. Hardware Configuration

The hardware configuration is shown in the following table:

Hardware	Quantity	Remarks
Programming computer	1	Install TwinCAT3 software
SRL8200	1	EtherCAT communication coupler
SRL5234	1	
Ethernet cable	1 piece	
24V switching power supply	1	

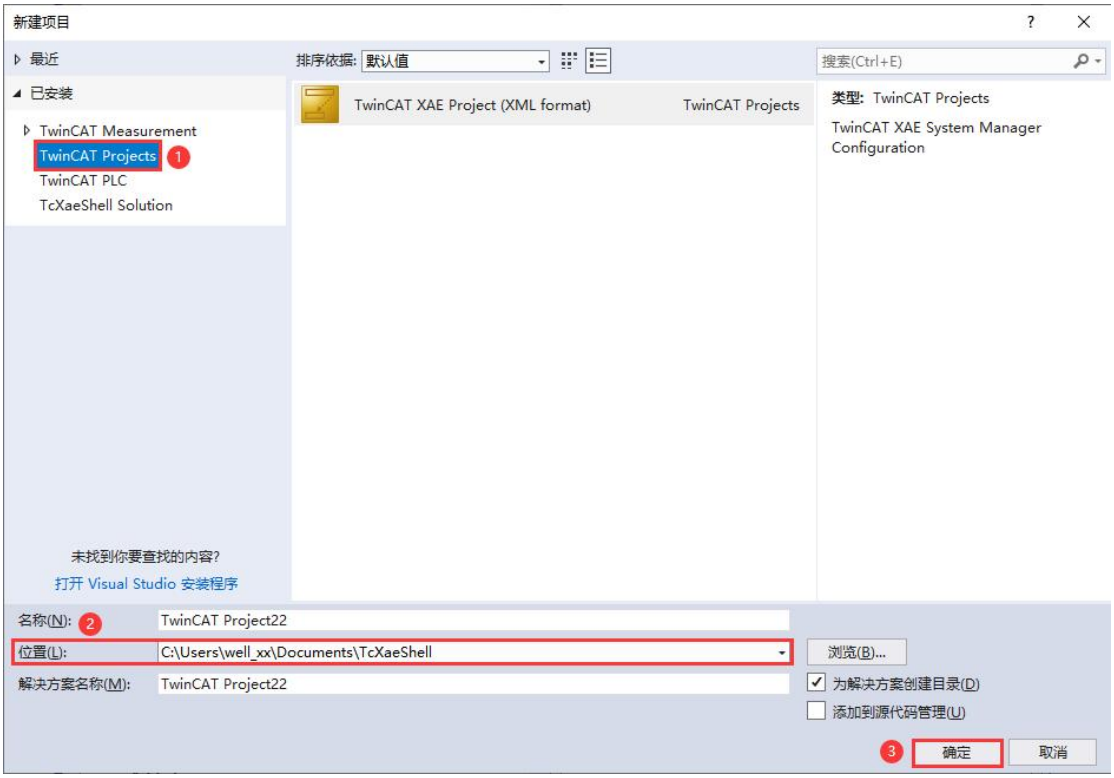
17.8.3. Install XML File

Install the XML file into TwinCAT3. The default folder in the example is "C:\TwinCAT\3.1\Config\Io\EtherCAT", as shown in the following figure:



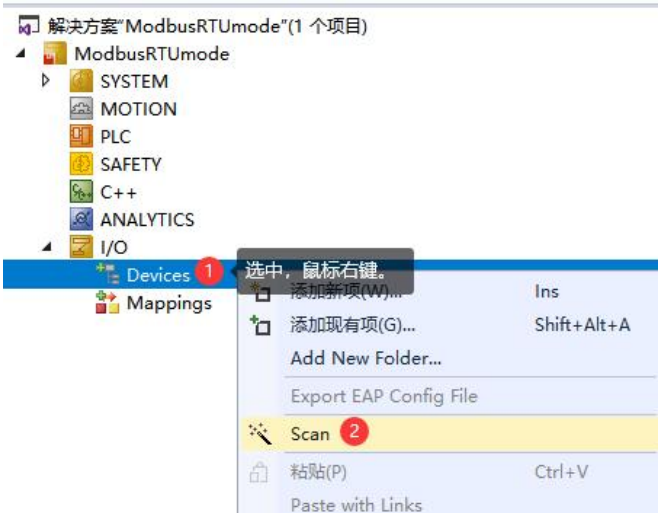
17.8.4. New Project and Configuration

Open TwinCAT3 software and create a new project as shown below:

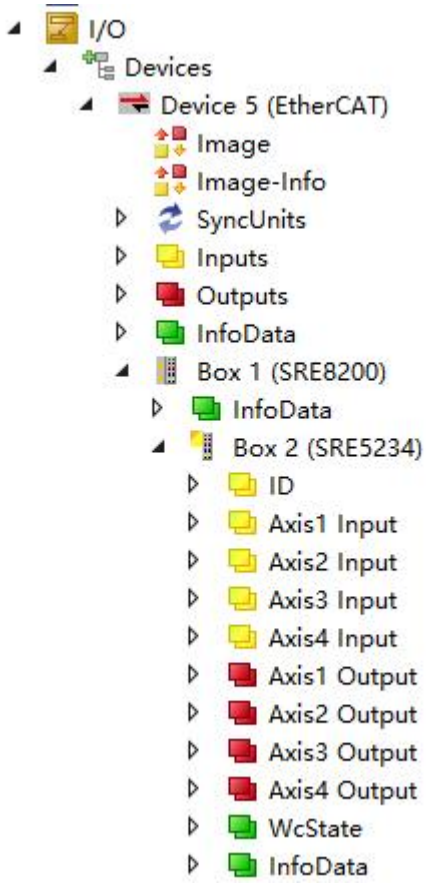


Connect the SRL8200 coupler to the computer, scan the extended SRL5202

module into the project, and then click I/O > Devices > Scan, as shown below:

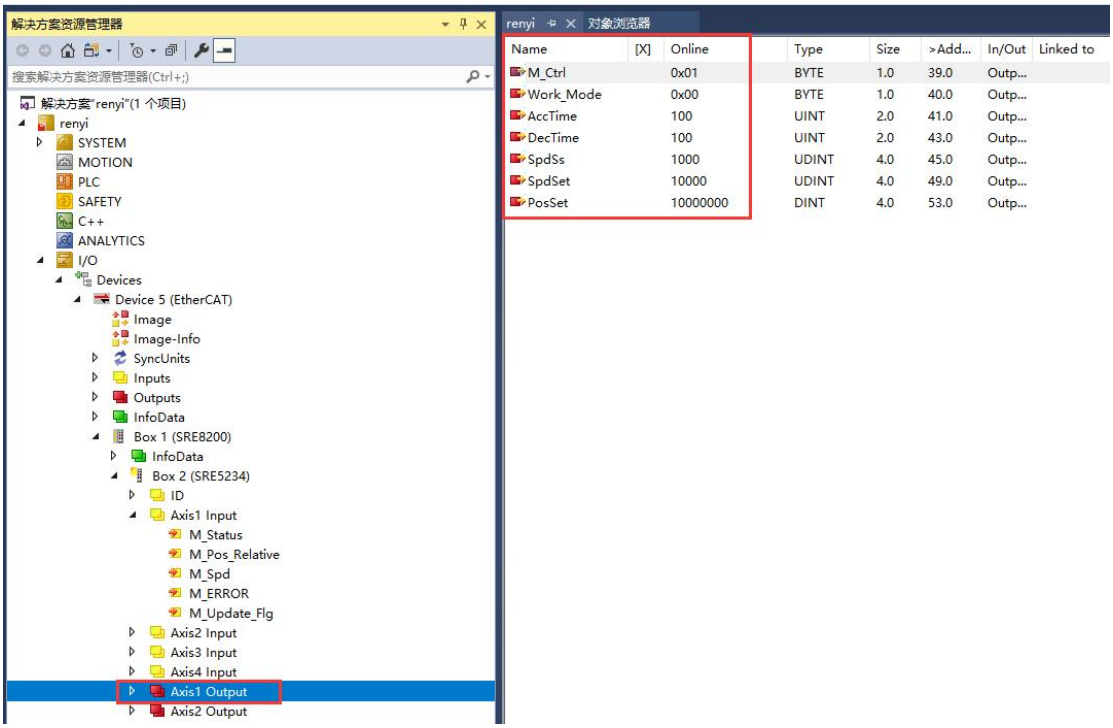


Successfully scanned modules are displayed as shown below:

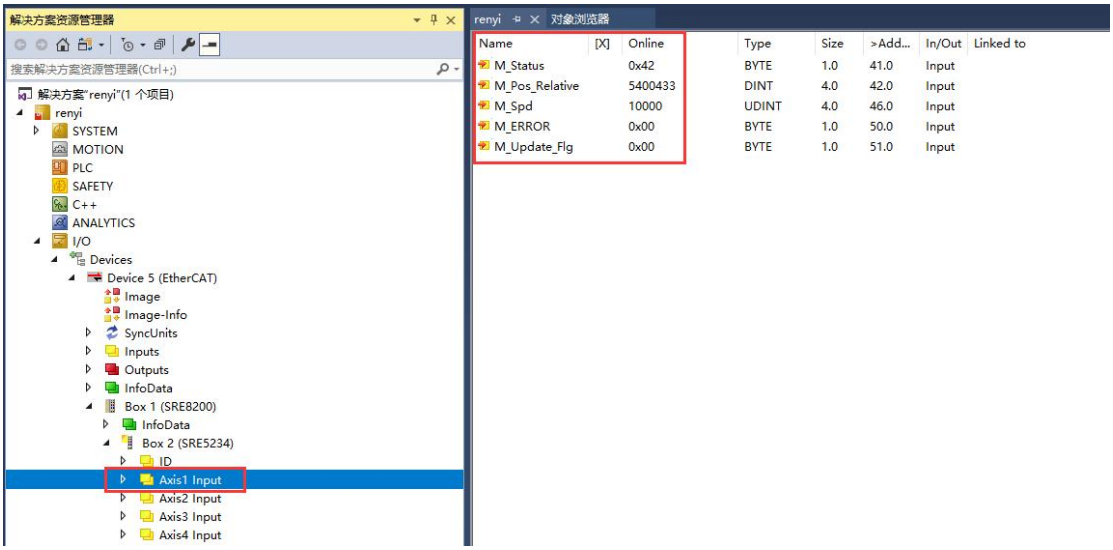


17.8.5. Data Monitoring

On TwinCAT3, select the IO terminal to be monitored, choose Axis 1 for monitoring, and configure the parameters. After parameter configuration, set the control word to 1 to indicate the start of output, as shown in the example below:



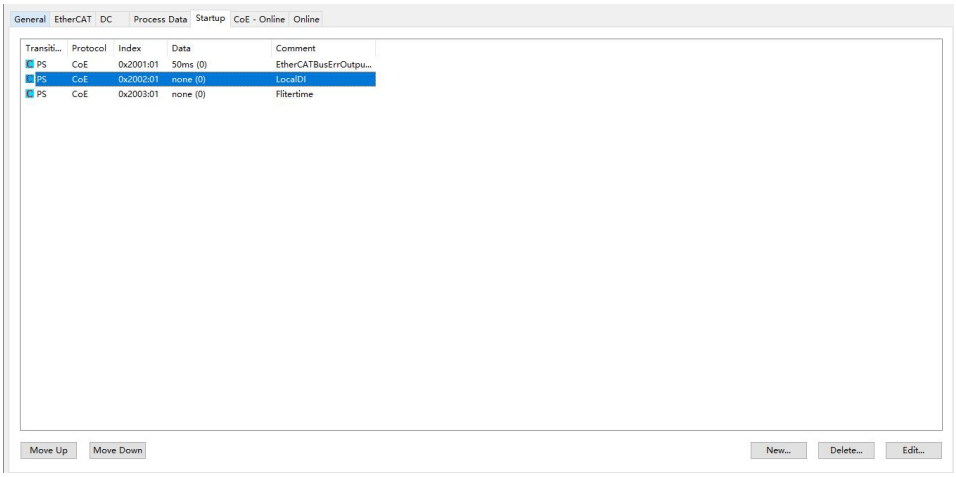
You can view parameters and monitor axis operation status through the corresponding axis in Axis Inputs, as shown in the figure below:



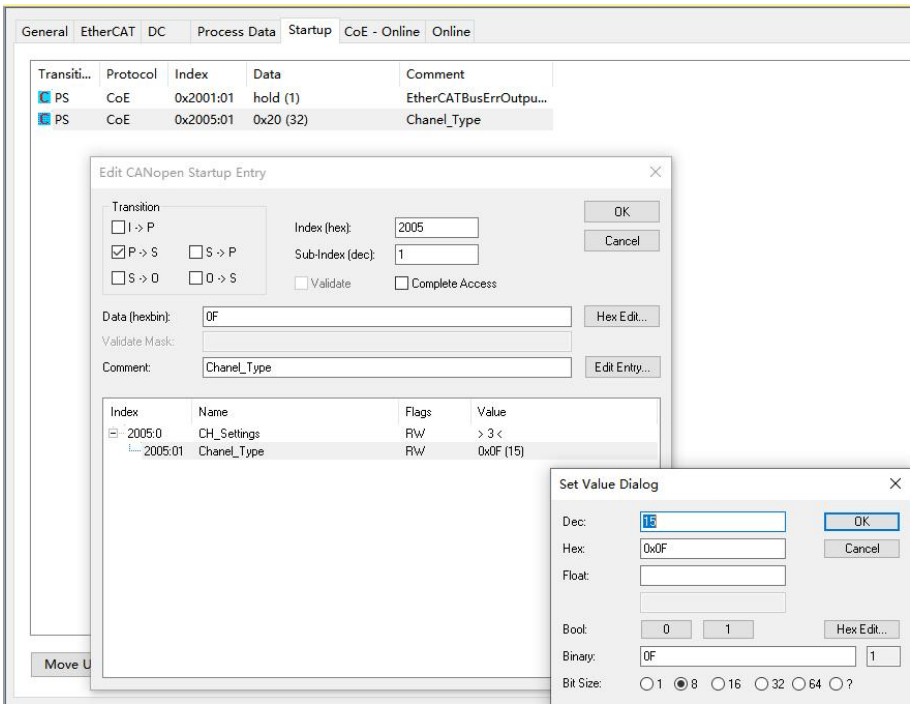
Appendix Configuration Parameter Description

TwinCAT3 Startup Function Description

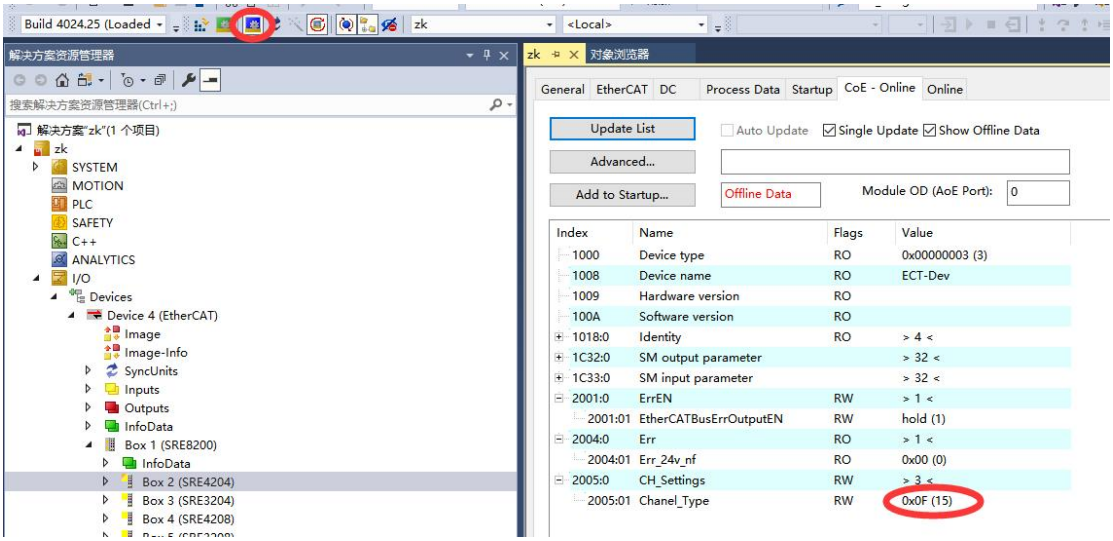
The parameters of the extension module are not able to be saved in COE. The configuration of the extension I/O module will be reset to the factory settings every time the extension I/O module is rescanned or powered on again. Set the parameters of the extension IO terminal in the startup item. Each communication writes parameters to the coupler. In the same project, after repeated power-on, the parameter configuration of the extension module remains unchanged.



For example, configure the range of CH1-CH4 channels of SRL4204 to 0-20mA/0-10V



After completing parameter configuration, refresh to update data to COE parameters. The parameters will take effect at this time and remain active after power-off, but revert to the original configuration after rescanning the device.

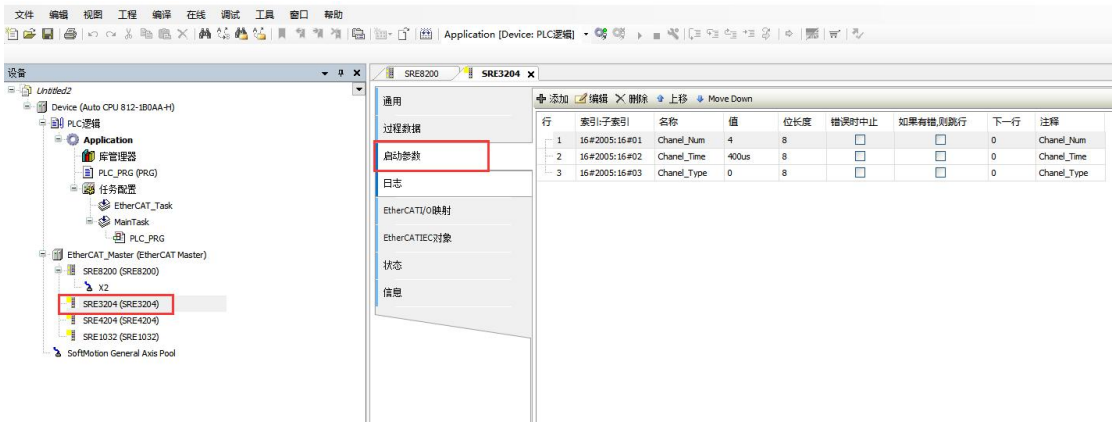


Note: When configuring parameters for SRL3204/SRL3208, different parameters can only be set under different parameter directories. For example: clicking the first parameter directory to set the first parameter in the directory, while clicking the second parameter directory to set the second parameter in the directory. If the same parameter is configured under three different directories, it will be overwritten by the last parameter and only the final configured parameter will be executed.

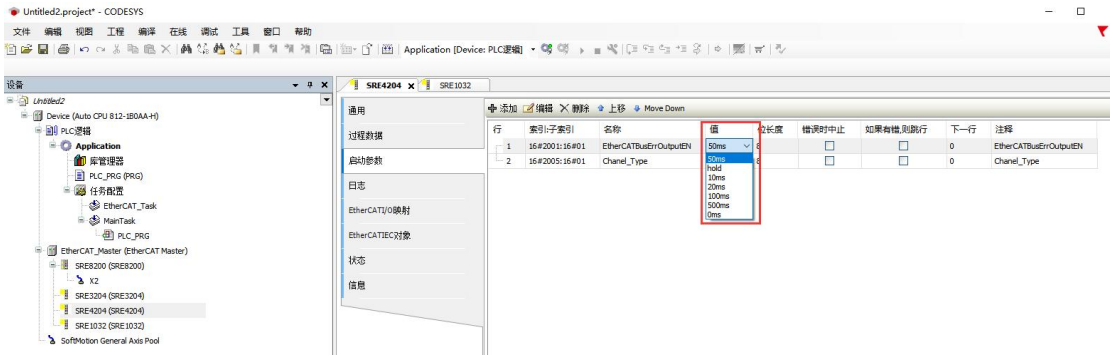
Settings of Extended Module Parameters in Codesys Startup Parameter

The parameters of the extension module are not able to be saved. The configuration of the extension I/O module will be reset to the factory settings every time the extension I/O module is scanned or powered on again. Set the parameters for the extension IO terminals in the startup parameters. Each communication writes parameters to the coupler. In the same project, even after repeated power-on, the parameter configurations of the extension modules remain unchanged.

Scan the device, click the module requiring parameter modification, and select “Startup parameters” to view the adjustable parameter content.



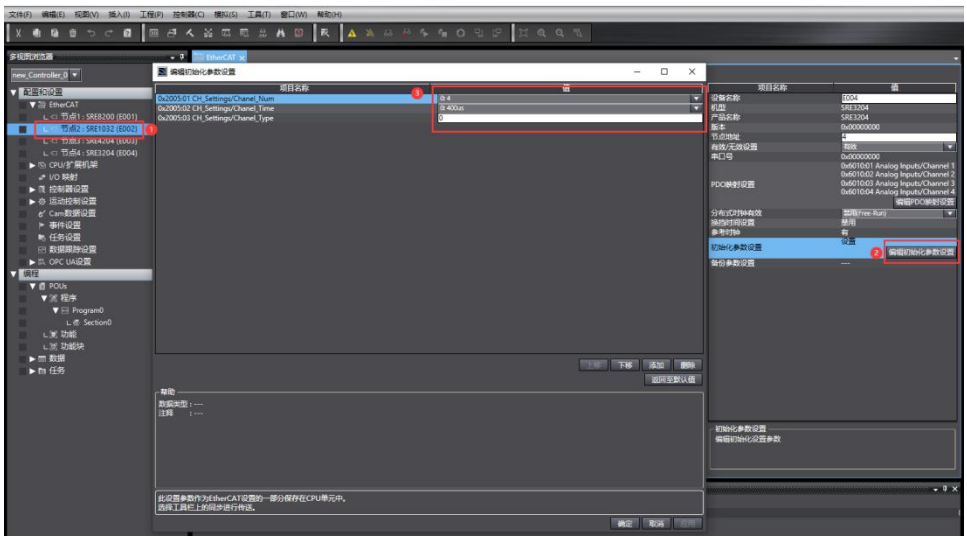
Modify the parameters via the dropdown menu. After modification, download the parameters to apply the changes.



Settings of Sysmac Studio Initialization Parameters

The parameters of the extension module are not able to be saved. The configuration of the extension I/O module will be reset to the factory settings every time the extension I/O module is scanned or powered on again. Set the parameters for the extension IO terminals in the startup parameters. Each communication writes parameters to the coupler. In the same project, even after repeated power-on, the parameter configurations of the extension modules remain unchanged.

After scanning the device, click the module requiring parameter modification, and select "Edit initialization parameter settings".



Select the parameters via the dropdown box