SK222XP User Manual

INS0270001 --V1.2

Applicable to the following models：

SK222XP-14R

SK222XP-14T

Catalogue

Chapter 1 Product Overview

1.1Product Overview

The SK222XP is a 14-point PLC with analog input/output, offering low cost and high performance, making it widely used in applications requiring small-scale control. As a compact PLC, it lacks expansion ports and is even more affordab.

1.2 Essential parameter

Classification	SK222XP-14R	SK222XP-14T
Digital Input	Route 8	Route 8
Digital output	6-channel relay	6-channel transistor
Analogue input	Path 2 (voltage or current input switchable)	Path 2 (voltage or current input switchable)
Analog Output	Route 1	Route 1
485 Interface	1 channel	1 channel
Expansion	Not expandable	Not expandable
Power supply	24VDC	24VDC

1.3 Functional characteristics

(1) Full Compatibility: Fully compatible with S7 programming software and instruction sets.

(2) Rich Features: 8 digital input channels; 6 digital output channels; 2 analog input channels with built-in DIP switches,

(3) Configurable for voltage or current input; 1 analog output channel, capable of simultaneously outputting voltage and current.

(4) Bidirectional Input: Digital input ports utilize internal bidirectional optocouplers, supporting both NPN and PNP inputs.

(5) High Precision: Analog inputs employ high-precision AD converters and rail-to-rail operational amplifiers, enabling low-voltage detection.

(6) Comprehensive Communication Ports: 1 PPI communication interface, supporting a baud rate of 187.5 kbps.

(7) Rich Protocol Support: Supports PPI, Modbus, Free Port, and USS protocols.

(8) Robust Clock System: Features a built-in clock battery and dual-circuit power supply design, supporting over 2 years of standby operation with the perpetual calendar.

(9) Reliable Encryption: Encrypted data cannot be cracked, providing complete protection for your programs.

(10) Power-Off Retention: Utilizes FLASH technology for permanent data storage without requiring a battery.

(11) Comprehensive protection: Reverse polarity protection for the power supply; ESD protection for communication ports; short-circuit protection for analog inputs.

(12) PID Support: Supports PID commands, allowing users to easily implement multi-channel PID control.

(13) Independent Power Supply: The power board is built with high-quality components and sufficient power capacity to support multiple sensors;

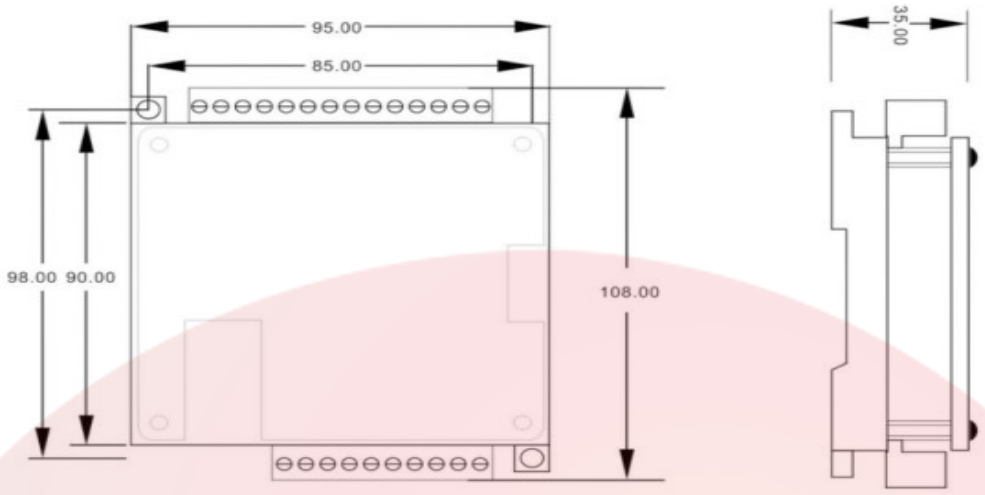
(14) Strong Interference Resistance: Rigorously tested in industrial field and environmental conditions.

(15) High-Speed Pulse Output: Transistor-based model supports 100K high-speed pulse output.

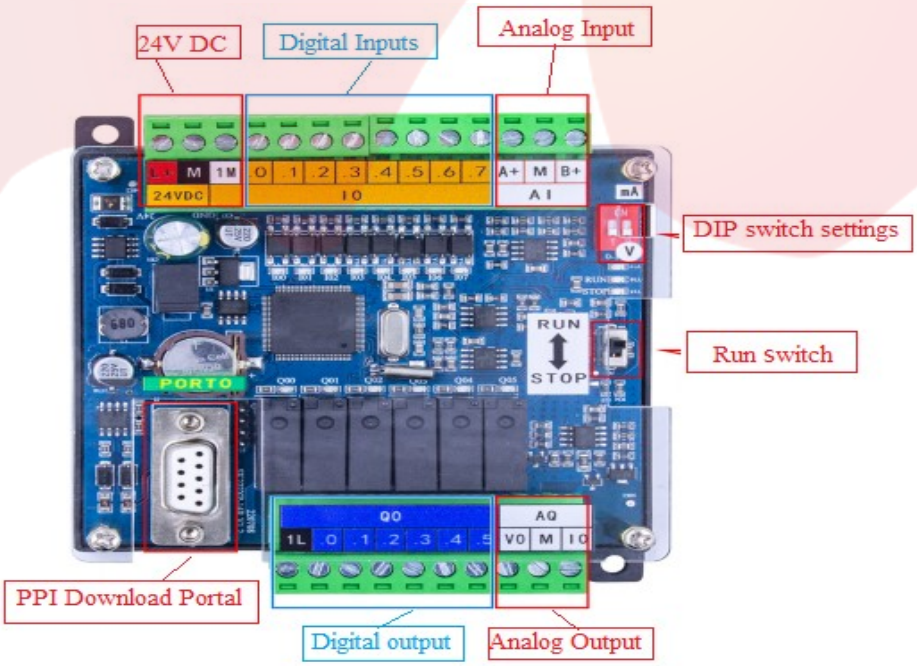
Chapter 2 Product display

2.1 Dimensions and Installation

External dimensions and installation



2.2Front view of the product



Chapter 3 Electrical Design Reference

3.1 Power Supply and Power Consumption

Powered by 24 V DC;

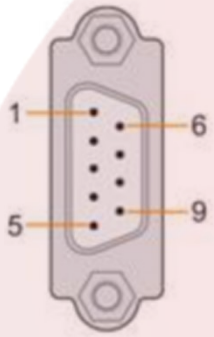
Quiescent current: 10 mA when all output relays are off;

Current increases by 8 mA for each relay activated; total current is 60 mA (1.44 W) when all output relays are on.

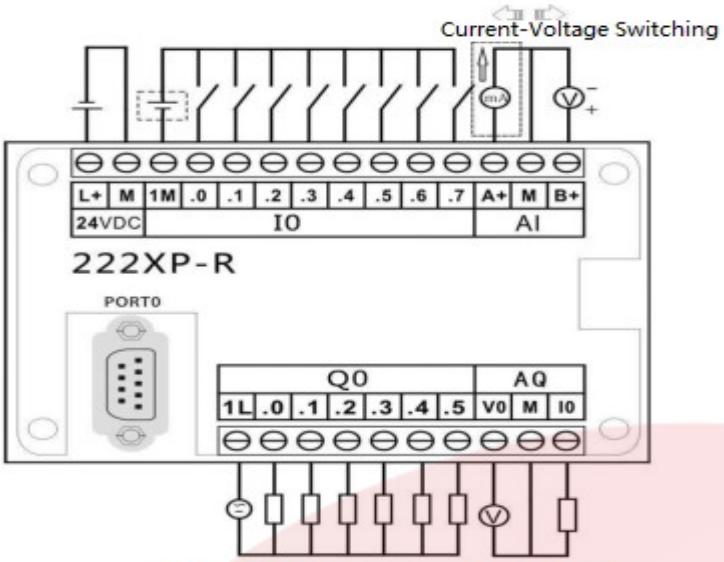
Note: Use a switching power supply with low ripple. If the circuit is subject to strong interference, ensure that appropriate filters are used for filtering.

3.2 Communication Interface Definition

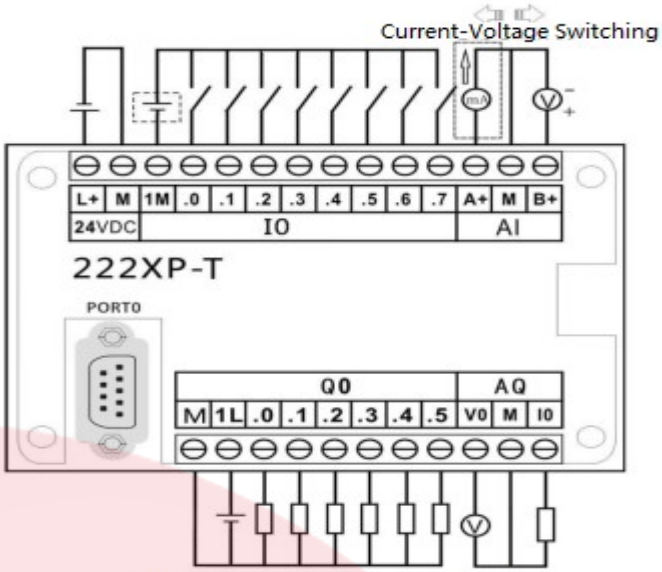
The internal definitions for PORT0 and PORT1 are shown in the figure below

Connector	Pin number	PORT0
	1	Case grounding
	2	24V ground
	3	RS485 Signal A
	4	Send an RTS request
	5	5V ground
	6	+5V
	7	24V ground
	8	RS485 Signal B
	9	NC
	Connector housing	Case grounding

3.3 Mode of connection

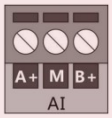
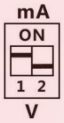


222XP-R (Relay) Wiring Diagram



222XP-T (Transistor Type) Wiring Diagram

3.4Analog Input Description

Analog Input Interface	Terminal Definition	DIP setting
	A+: AIW0 channel, with 0–10 V or 0–20 mA input;	
	M: Common terminal for analog input;	
	B+: AIW2 channel,0–10 V or 0–20 mA input;	

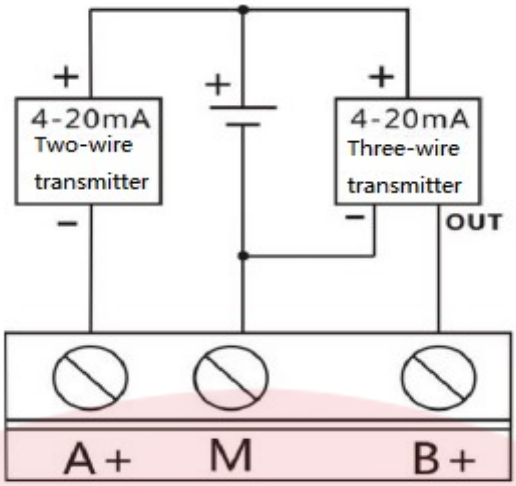
Note: Analog inputs support voltage or current input, selected via the rotary encoder on the right. encoder 1 corresponds to channel A+, while other encoders correspond to channel B+. The ON position enables current input, and the OFF position enables voltage input, as shown in the figure above.

3.5Analog Output Description

Analog output interface	Terminal Definition	/
	V0: AQW0 channel, 0–10 V output;	
	M: Common terminal for analog output;	/
	B+: AQW0 channel with 0-20mA output;	

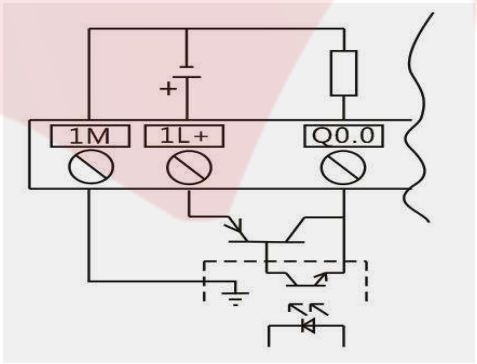
Note: The analog output channel simultaneously outputs both voltage and current, both controlled by AQW0.

3.6 Schematic diagram of wiring for 4-20 mA two-wire and three-wire transmitters

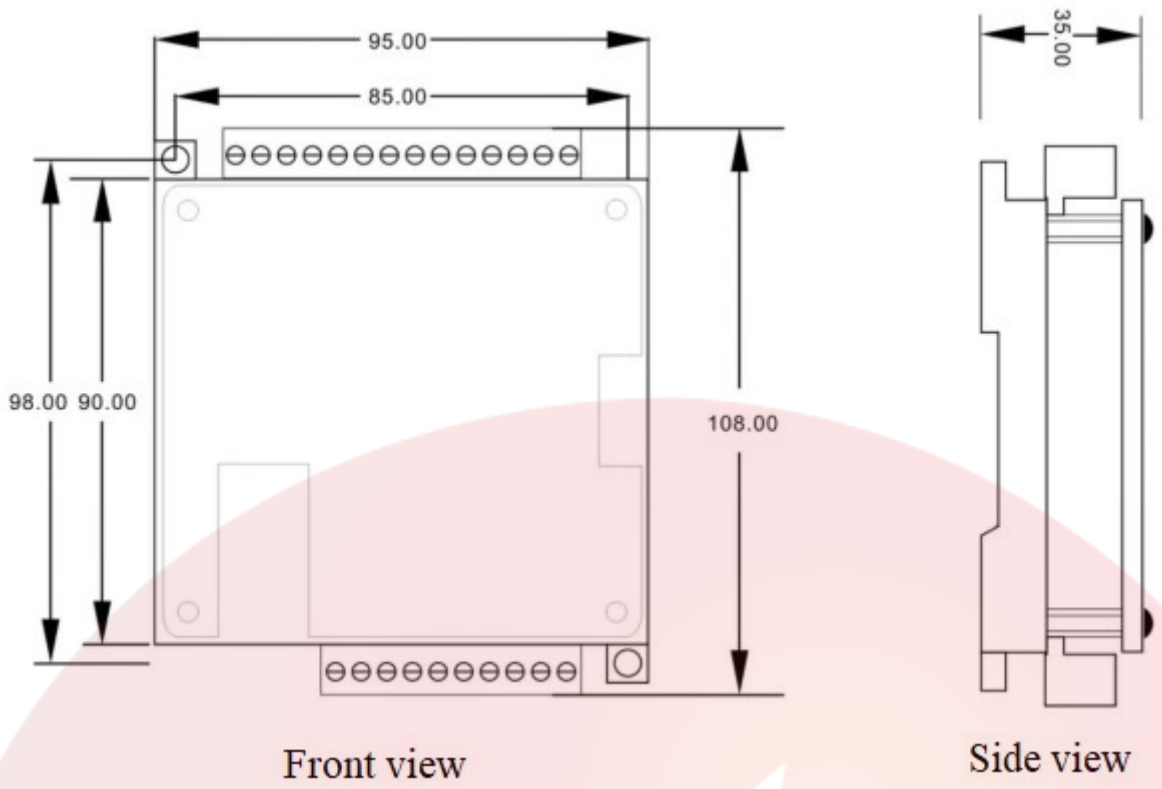


Note: Before receiving the current signal, set the analog input to current input mode using the red rotary switch.

3.7 Internal schematic diagram of the transistor output



3.8 External dimensions and installation



Note: The black base shell features a buckle on its back for attaching to standard rails.

Chapter 4 Technical Parameters

Classification	Subdivision		
	1	2	3
Model	SK222XP-14R/T		
Power consumption	7W		
Storage characteristics	Program memory	16K	/
	Data memory	10K	
IO characteristic	Digital input	8	/
	Digital output	6	
	Digital IO Mapping Area	256（128DI/128DO）	
	Simulation IO Mapping area	64（32AI/32AO）	

	Maximum expansion module	/	
	High-speed pulse input	6 X 30K	
	High-speed pulse output	2 X 100K	
Internal characteristics	Total number of timers	256	/
	Total counter count	256	
	Analog potentiometer	None	
	Time interrupt	2 samples with a resolution of 1 mS	
	Real-time clock	Support, built-in battery	
	Boolean instruction efficiency	0.28uS	
	Floating point instruction efficiency	0.75uS	
Integrated communication functionality	Interface	1 RS-485 standard PPI communication port	/
	PPI Baud rate	9.6k，19.2k and 187.5kbps	
	Free port baud rate	1.2k-115.2kbps	
	Maximum cable length per section	With an isolated repeater: 187.5 kbps achieves 1,000 meters, 38.4 kbps achieves 1,200 meters; without an isolated repeater: 50 meters	
	Maximum number of sites	Each segment has 32 stations, and each network has 126 stations.	
	Maximum number of primary nodes	32	
Power Source Characteristics	Input voltage	DC24V	20.4-28.8VDC
	Input currenton	80mA	/
	Isolation (On-site and Logical)	Do not isolate	
	Sensor voltage	L±1V	

	Current Limit	1.5A peak value: 0.7A standard	
	Ripple noise	DC24V	Power Supply Voltage
	Isolation (Sensor and Logic)	No isolation	/
Digital Input Characteristics	Number of integrated digital input points	8 Input	/
	Input type	PNP/NPN bidirectional	
	Rated voltage	24VDC，4mA	
	Maximum allowable continuous voltage	30VDC	
	Surge voltage	35VDC，0.5s	
	Logic 1 Voltage Range	15V-30VDC	
	Logic 0 voltage range	0-5VDC	
	Input delay	Select a value between 0.2 and 12.8 ms	
	Isolation (On-site and Logical)	Yes	
	Photoelectric isolation	500 VDC, 1 minute	
	High-speed counter input rate	30 kHz (single-phase)	
	Concurrently connected input	All	
	Maximum cable length	500 meters (standard input)	
Digital Output Characteristics	Integrated digital output points	6 output	/
	Output Type	Relay	5A resistive
		Transistor	Leakage type 24V DC single-channel 0.8A
	The rated current of the public side	6A	/

	Connection resistor (contact)	Typical value: 0.2 Ω (maximum value: 0.6 Ω)	
	Optical isolation (from field to isolation)	500VAC, 1 minute	
	The simultaneously connected output	At 60°C, all outputs (horizontal installation); at 50°C, all outputs (vertical installation).	
	Two parallel outputs	Yes, output only when in the same group	
	Block	500 meters	
Analog Input Characteristics	Number of integrated input points on this device	2	/
	Input mode	Single-ended input	
	Analog Input Characteristics	0~10V / 0~20mA	
	Input impedence	Voltage type 30K	Current type 120Ω
	Data format	-32000~32000	/
	Resolution	12-bit signed bit	
	Deviation	In the worst case, from 0 to 55°C	±2.5% of the full range
		Typical 25C	±1.0% of the full range
		Repeatability	±0.05% of the full range
	Simulation to Digital Conversion Time	100ms	/
Analog Output Characteristics	Number of integrated input points on this device	1	/
	Output voltage range	0~10V	
	Output current range	0~20mA	
	Data format	0~32000	

	Deviation	In the worst case, from 0 to 55°C	±3% of the full range
		Typical 25C	±2.5% of the full range
		Repeatability	±1% of the full range
	Conversion time	50uS	/
	Load capacity	0~10V	>5KΩ
		0~20mA	<500Ω
Size	(W *H*D)mm	95x108x35	/

Chapter 5 Warranty Terms

5.1 Warranty period: 12 months

The product comes with a one-year warranty from the date of shipment. During the warranty period, our company provides free repair services for the product.

5.2 Not covered by warranty

- Improper wiring, such as reversing the positive and negative terminals of the power supply
- Use outside the specified voltage range or environmental requirements
- Unauthorized modification of internal components