X Series PLC

The X series is a motion-control PLC with stable performance and long lifetime, 100% developed by Raynen Technology.

The full X Series portfolio includes X1/X2/X3/X6 and X series (relay-output CPU controller, expansion modules and BD extension boards. The excellent expansion compatibility is optimized for multi-industry processes and customized development. X series PLC is ideal for OEM equipment, small automatic control projects and IoT intelligent terminals.

「Advantages」

- Rich interface types
- Strong expansion capabilities
- Powerful motion control functionality
- Excellent axis control performance
- Fast processing speed
- Compact hardware design
- Comprehensive product portfolio

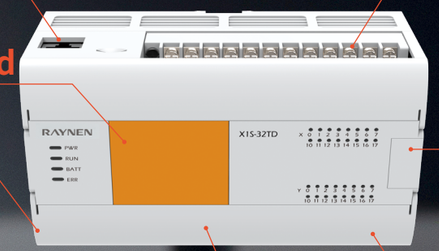
「Naming Rules」

X3 - 32 T D - E 0

① ② ③ ④ ⑤ ⑥

① Product Series	② IO Points	③ Output type
Economic CPU: X1 Standard CPU X2 Enhanced CPU: X3 Bus-type CPU: X6 Relay-type: X	16: 8DI/8DO 24: 14DI/10DO 32: 16DI/16DO 40: 24DI/16DO 60: 36DI/24DO	T: Transistor Output R: Relay Output
④ Power Supply Type	**⑤ Communication Interface**	**⑥ Customization**
D: DC24V A: AC220V	E: Network Port N: Bus Type	0: Null

「Interface Definition」



Ethernet port
MODBUS-TCP Protocol

2-8 channel
High-Speed Input

Extension Interface **BD Board**

Max **7** pcs
Extension Module

Communication Interface **RS232**
RS485

Output I/O
Relay output
/Transistor output

Pin Identification	Function
24V+/24V-	24VDC power supply
24V/0V	DC power supply
●	Null
COMn	the common input port
X0-Xn	Input signal port
COMn	Output common port
Y0-Yn	Output signal port

X1 Economic PLC

Overview

- ▲ Simple motion control functions: pulse output and high-speed counting.
- ▲ Real-time clock (RTC), supports permanent data retention after power-failure.
- ▲ Supports 1 x BD board

■ Advantages

Rich Interfaces

RJ45/RS232/485

Input & Output

2-channel High-speed Counter
2axis 60K High-speed Pulse

BD Expansion

Supports
1x BD Board

Technical Parameters

Item	Electrical Specifications				
	X1-16TD	X1-24TD	X1-32TD	X1-40TD	X1-60TD
Power consumption	6W	7W	8W	9W	11W
Rated input voltage	DC24V				
Input voltage range	DC 20.4V ~ 28.8V				
Power-loss tolerance	Instant power loss < 5ms				
Power fuse	60V 2A				
Surge current	12A，⩽ 0.5ms @ 28.8V DC				
DC24V power supply	< 300mA				
Operating temperature	-10°C ~ 60°C（Horizontal Installation）, -10°C ~ 50°C（Vertical Installation）				
Storage temperature	-20°C ~ 80°C				
Relative humidity	5 ~ 95%，non condensing (RH grade 2, compliant with IEC 61131-2)				
Protection level	IP20				
EMC compatibility	Noise suppression, compliant with IEC 61000-6-2				
Vibration	Compliant with IEC60068，Part2-6/10up58Hz				
Withstand voltage	1.5kV AC, 1 min, all terminals to ground				
	0.5kV AC, 1 min, all terminals to ground				
Insulation resistance	⩾ 5 MΩ @ DC500V, all terminals to ground				
Ground connection	Class D grounding, ground resistance ⩽ 100 Ω; No common grounding with high-power electrical systems				
Operating environment	No corrosive or flammable gases; low concentration of conductive dust.				
Operating altitude	⩽ 2000 m; Operating under pressure higher than atmospheric pressure is prohibited to avoid malfunction.				

Technical Parameters

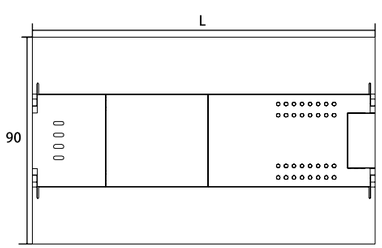
Item		Digital Input Specifications				
		X1-16TD	X1-24TD	X1-32TD	X1-40TD	X1-60TD
Input points		8	14	16	24	36
High-speed counting		Single-phase 60 kHz (2-CH); AB phase 30 kHz (1-CH)				
Input connection		Modular terminal block (M3 screws)				
Input type		Sink /Source				
Input voltage range		DC20.4V ~ DC28.8V				
Input impedance	X0-X2	2.4K				
	X3-	5.6K				
ON input inductive current	X0-X2	> 5mA				
	X3-	> 2.4mA				
OFF input inductive current		<1mA				
Input response time		<=4.5ms				
Input signal type		No voltage contact input				
		Sink input: NPN open-collector transistor				
		Source input: PNP open-collector transistor				
Input circuit isolation		Optocoupler isolation				
Input status indicator		The LED on the panel lights up when the optocoupler is activated.				

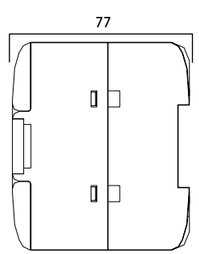
Item		Transistor Output Specifications				
		X1-16TD	X1-24TD	X1-32TD	X1-40TD	X1-60TD
Output points		8	10	16	16	24
Max. pulse frequency		60kHz (Single-ended, 2 axes)				
Output connection		Modular terminal block (M3 screw)				
Output type		Transistor / Sink				
External power voltage range		DC 5V ~ DC 30V				
Max. load	Resistive load	0.5A/ Point；0.8A/4 Points				
	Inductive load	12W @ DC 24V				
	Lamp load	High-Speed: 2W / DC24V, Standard: 5W / DC24V				
Min. load		5mA, DC 5V ~ 24V				
OFF leakage current		Less than 0.1mA @ DC30V				
ON resistance		High-speed point: Typ. 0.3Ω, Max. 0.6Ω				
Response time	OFF → ON	High-Speed: less than10μs @10mA and above, DC5 ~ 24V				
		Standard: less than 0.2ms @200mA and above, DC24V				
	ON → OFF	High-Speed: less than10μs @10mA and above, DC5 ~ 24V				
		Standard: less than 0.2ms @200mA and above, DC24V				
Output circuit isolation		Optocoupler isolation				
Output indicator		The LED on the panel lights up when the optocoupler is activated.				
Transmission distance (Shielded cable)		500 meters (standard output)				
Transmission distance (Unshielded cable)		150 meters (standard output)				

X1 Series High-speed Counters

Allocation / Input	Single-phase single-counting					AB phase counting	
	C235	C236	C237	C243	C244	C251	C252
X0	U/D			U/D		A	A
X1		U/D		R		B	B
X2			U/D		U/D	R	
X3					R		

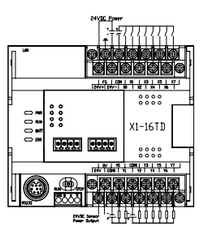
X1 Series Hardware Diagram (Unit: mm)



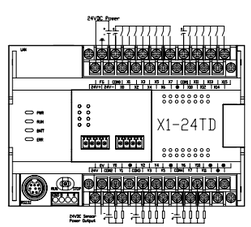


Ordering Number	Length
X1-16TD-E0	104
X1-24TD-E0	132
X1-32TD-E0	150
X1-40TD-E0	165
X1-60TD-E0	210

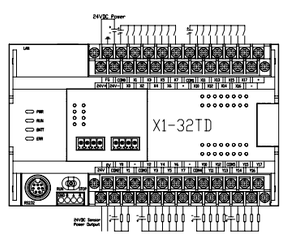
X1 Series Circuit Diagram



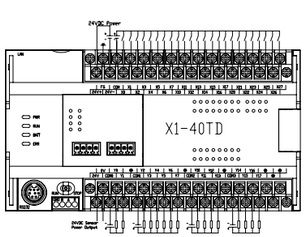
X1-16TD-E0



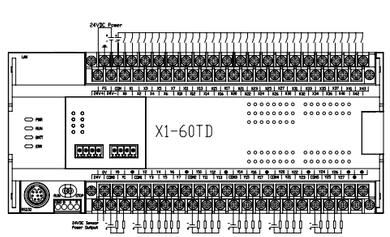
X1-24TD-E0



X1-32TD-E0



X1-40TD-E0



X1-60TD-E0

X2 Standard Type PLC

Overview

▲ Motion functions: linear interpolation, 2-axis high-speed pulse output, high-speed counter.

▲ Real-time clock (RTC), supports permanent data retention after power-failure.

▲ Supports 1 BD board, max. 7 expansion modules.

■ Product superiority

Rich Interfaces
RJ45/RS232/485

Input & Output
3-channel High-speed Counter
2 axis 200K High-speed Pulse

Expansion Modules
Up to 7 expansion modules

BD Expansion
Supports
1 x BD Board

X2 Series Technical Parameters

Item	Electrical Specifications			
	X2-24TD	X2-32TD	X2-40TD	X2-60TD
Power consumption	10W	12W	12W	14W
Rated input voltage	DC24V			
Input voltage range	DC 20.4V ~ DC 28.8V			
Power-loss tolerance	Instant power loss < 5ms			
Power fuse	60V / 2A			
Surge current	12A, ≤ 0.5ms @28.8V DC			
DC24V power input	< 300mA			
DC5V power input	< 800mA			

Item		Digital Input Specifications			
		X2-24TD	X2-32TD	X2-40TD	X2-60TD
Input Points		14	16	24	36
High-speed counter		Single-phase: 200 kHz (3-CH); AB phase: 100 kHz (3-CH)			
Input type		Sink /Source			
Input signal voltage range		DC20.4V ~ 28.8V			
Input Impedance	X0-X5	3.3K			
	X6-X7	5.6K	3.3K		
	X10 -	-	5.6K		
ON input induction current	X0-X5	>5mA			
	X6-X7	4mA	>5mA		
	X10 -	-	> 4mA		
OFF input induction current		>1mA			

X2 Series Technical Parameters

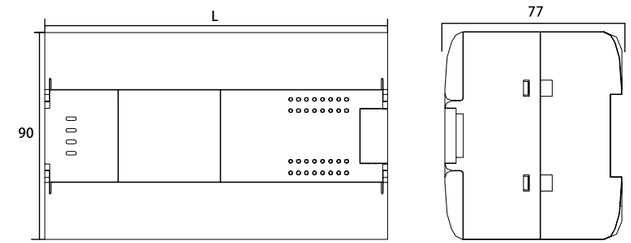
Item	Digital Input Specifications			
	X2-24TD	X2-32TD	X2-40TD	X2-60TD
Input response time	< 4.5ms			
Input signal type	No voltage contact input			
	Sink Type: NPN Open-collector type transistor			
	Source Type: PNP Open-collector type transistor			
Input circuit isolation	Optocoupler isolation			
Input status indicator	The LED on the panel lights up when the optocoupler is activated.			

Item		Transistor Output Specifications			
		X2-24TD	X2-32TD	X2-40TD	X2-60TD
Output Points		10	16	16	24
Max. pulse frequency		200KHz (Single-ended, 2-axis)			
Output type		Transistor/ Sink Output			
Output voltage range		DC5V ~ DC30V			
Max. load	Resistive load	0.5A/channel			
	Inductive load	12W/DC24V			
	Lamp load	5W/DC24V			
Min. load		5mA（DC5 ~ 24V）			
Response time	OFF → ON	High-speed: less than 5μs @10mA and above, DC5 ~ 24V			
		Standard: less than 0.2ms @200mA and above, DC24V			
	ON → OFF	High-speed: less than 5μs @10mA and above, DC5 ~ 24V			
		Standard: less than 0.2ms @200mA and above, DC24V			
Output circuit isolation		Optocoupler isolation			
Output indicator		The LED on the panel lights up when the optocoupler is activated.			

X2 Series High-speed counters

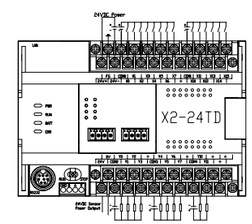
Allocation / Input	Single-phase single counting								Single-phase double counting				AB phase counting			
	C235	C236	C237	C238	C239	C240	C243	C244	C246	C247	C248	C249	C251	C252	C253	C254
X0	U/D						U/D		U			U	A	A		
X1		U/D					R		D			D	B	B		
X2			U/D					U/D		U		R	R		A	
X3				U/D				R		D		S			B	
X4					U/D			S			U					A
X5						U/D					D					B

X2 Series Hardware Diagram (Unit: mm)

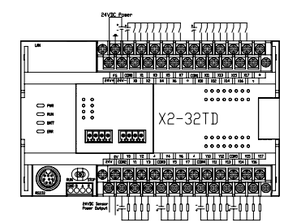


Ordenng Number	Length
X2-24TD-E0	132
X2-32TD-E0	150
X2-40TD-E0	165
X2-60TD-E0	210

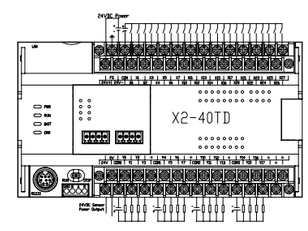
X2 Series Circuit Diagram



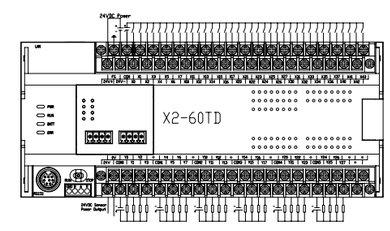
X2-24TD-E0



X2-32TD-E0



X2-40TD-E0



X2-60TD-E0

X3 Enhanced PLC

X3 Series Overview

▲ Motion control: 2–6 axis high-speed pulse output, high-speed counter, linear & circular interpolation

▲ Real-time clock (RTC), supports permanent data retention after power-failure.

▲ Supports max. 7 expandable modules

■ Advantages

Rich Interfaces
RJ45/RS232/485

Input & Output
3-8 Channel High-speed Counter
2-6 Axis 200K High-speed Pulse

Expansion Modules
Up to 7 expansion modules

BD Expansion
Supports
1 x BD Board

X3 Series Performance Parameters

Item	Electrical Specifications				
	X3-16TD	X3-24TD	X3-32TD	X3-40TD	X3-60TD
Power consumption	10W	12W	12W	13W	14W
Rated input voltage	DC24V				
Input voltage range	DC 20.4V ~ DC28.8V				
Power-loss tolerance	Instant power loss <5 ms				
Power fuse	60V / 2A				
Surge current	12A，≤ 0.5ms @28.8V DC				
DC24V power input	< 300mA				
DC5V power input	<800mA				

Item		Digital Input Specifications				
		X3-16TD	X3-24TD	X3-32TD	X3-40TD	X3-60TD
Input Points		8	14	16	24	36
High-speed counter		Single-phase: 200 kHz [3-CH] AB phase: 100 kHz [3-CH]	Single-phase: 200 kHz [4-CH]; AB phase: 100 kHz [4-CH]			Single-phase: 200 kHz [8-CH] AB phase: 100 kHz [4-CH]
Input type		Sink type / source type				
Input signal voltage range		DC 20.4V ~ DC 28.8V				
Input impedance	X0-X5	3.3K				
	X6-X7	5.6K	3.3K			
	X10-	-	5.6K			
ON input induction current	X0-X5	>5mA				
	X6-X7	4mA	>5mA			
	X10-	-	>4 mA			

X3 Series Performance Parameters

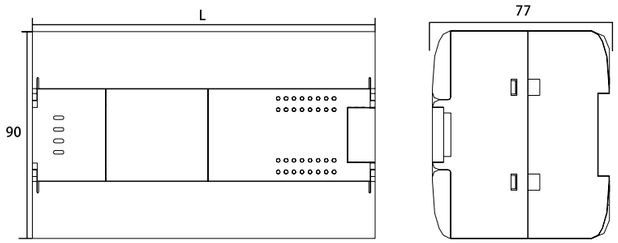
Item	Digital Input Specifications				
	X3-16TD	X3-24TD	X3-32TD	X3-40TD	X3-60TD
OFF input induction current	>1mA				
Input response time	<4.5ms				
Input signal type	No voltage contact input				
	Sink Type: NPN Open-collector transistor				
	Source Type: PNP Open-collector transistor				
Input circuit isolation	Optocoupler isolation				
Input status indicator	The LED on the panel lights up when the optocoupler is activated.				

Item		Transistor Output Specifications				
		X3-16TD	X3-24TD	X3-32TD	X3-40TD	X3-60TD
Output points		8	10	16	16	24
Max. pulse frequency		200KHz (Single-ended, 2-axis)	200KHz (Single-ended, 4-axis)			200KHz (Single-ended, 6-axis)
Output type		Transistor / Sink				
Output voltage range		DC5V ~ 30V				
Max. load	Resistive load	0.5A/channel				
	Inductive load	12W/DC24V				
	Lamp load	5W/DC24V				
Min. Load		5mA, DC5V ~ DC 24V				
Response time	OFF → ON	High-speed: less than 5μs @10mA and above, DC5 ~ 24V				
		Standard: less than 0.2ms @200mA and above, DC24V				
	ON → OFF	High-speed: less than 5μs @10mA and above, DC5 ~ 24V				
		Standard: less than 0.2ms @200mA and above, DC24V				
Output circuit isolation		Optocoupler isolation				
Output indicator		The LED on the panel lights up when the optocoupler is activated.				

X3 Series High-speed Counters

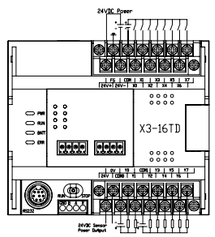
Allocation / Input	Single-phase single counting											Single-phase doublecounting					AB phase counting				
	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255
X0	U/D								U/D			U			U		A	A			
X1		U/D							R			D			D		B	B			
X2			U/D							U/D			U		R		R		A		
X3				U/D						R			D		S				B		
X4					U/D					S				U		U				A	
X5						U/D					U/D			D		D				B	
X6							U/D				R					R					A
X7								U/D			S					S					B

X3 Series Hardware Diagram (Unit: mm)

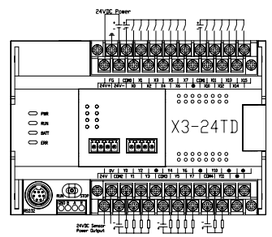


Ordering Number	Length
X3-16TD-E0	104
X3-24TD-E0	132
X3-32TD-E0	150
X3-40TD-E0	165
X3-60TD-E0	210

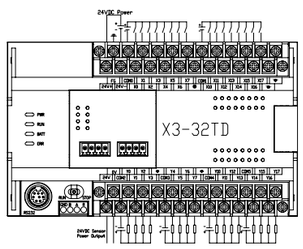
X3 Series Circuit Diagram



X3-16TD-E0



X3-24TD-E0



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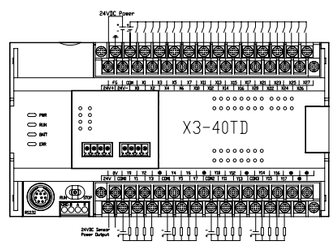
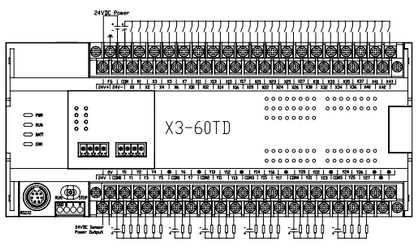


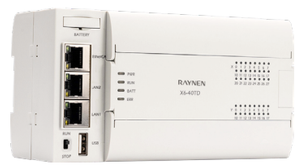
X3-40TD-E0



X3-60TD-E0

X6 Bus-Type PLC

X6 Series Overview



- ▲ Supports EtherCAT bus communication,
- ▲ Up to 16 EtherCAT axes.
- ▲ Powerful motion functions: linear & circular interpolation, electronic cam, S-curve, flying shear, rotary cut, follow-up, continuous interpolation.
- ▲ Real-time clock (RTC), supports permanent data retention after power-failure.
- ▲ Supports maximum 7 expansion modules.

■ Advantages

Rich Interfaces
2x RJ45 ports
RS485 EtherCAT bus

I/O Functions
4-channel high-speed counters
4-axis 200K high-speed pulse

Expandable Modules
Up to 7 expansion modules

Motion Control Commands
Linear&circular interpolation, electronic cam,S-caurve,flying, flying shear,rotar,rotary cutting, geating,gearing,continuous & interpolationwemmandas.

X6 Series Performance Parameters

Item	Electrical Specifications
	X6-40TD
Power consumption	13W
Rated input voltage	DC24V
Input voltage range	DC 20.4 ~ 28.8V
Power-loss tolerance	Instant power loss < 5ms
Power fuse	60V 2A
Surge current	12A, ≤ 0.5ms @28.8V DC
DC24V power input	< 300mA
DC5V power input	< 800mA

Item		Digital Input Specifications
		X6-40TD
Input points		24
High-speed counter		Single-phase: 200 kHz (4-CH); AB phase: 100 kHz (4-CH)
Input type		Sink/ Source
Input voltage range		DC20.4V ~ DC28.8V
Input impedance	X0-X5	3.3K
	X6-X7	3.3K
	X10-...	5.6K
ON input induction current	X0-X5	>5mA
	X6-X7	>5mA
	X10-...	>4mA

X6 Series Technical Parameters

Item	Digital Input Specifications
	X6-40TD
OFF input induction current	> 1mA
Input response time	< 4.5ms
Input signal type	No voltage contact input
	Sink Type: NPN open-collector transistor
	Source Type: PNP open-collector transistor
Input circuit isolation	Optocoupler isolation
Input status indicator	The LED on the panel lights up when the optocoupler is activated.

Item		Transistor Output Specifications
		X6-40TD
Output points		16
Max. Pulse frequency		200KHz (Single-ended, 4-axis)
Output type		Transistor/Sink output
Output voltage range		DC5V ~ DC30V
Max. load	Resistive load	0.5A/ channels
	Inductive load	12W/DC24V
	Lamp load	5W/DC24V
Min. load		5mA, DC5 ~ DC24V
Response time	OFF → ON	High-speed: less than 5μs @10mA and above, DC5 ~ 24V
		Standard: less than 0.2ms @200mA and above, DC24V
	ON → OFF	High-speed: less than 5μs @10mA and above, DC5 ~ 24V
		Standard: less than 0.2ms @200mA and above, DC24V
Output circuit isolation		Optocoupler isolation
Output indicator		The LED on the panel lights up when the optocoupler is activated.

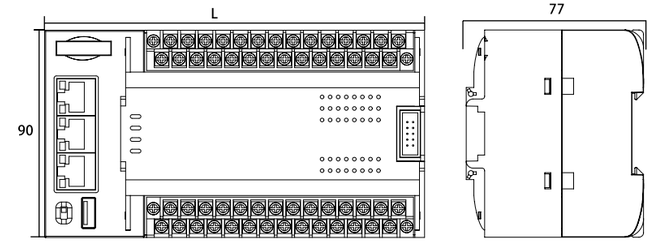
X6 Series high-speed counters

Allocation / Input	Single-phase single counting											Single-phase double-counting				
	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250
X0	U/D								U/D			U			U	
X1		U/D							R			D			D	
X2			U/D							U/D			U		R	
X3				U/D						R			D		S	
X4					U/D					S				U		U
X5						U/D					U/D			D		D
X6							U/D				R					R
X7								U/D			S					S

X6 Series High-speed Counters

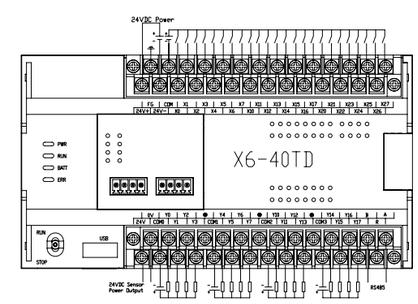
Allocation / nput	AB phase Counting												
	C251	C252	C253	C254	C255	C227	C228	C229	C230	C231	C232	C233	C234
X0	A	A											
X1	B	B											
X2	R		A										
X3			B										
X4				A									
X5				B									
X6					A								
X7					B								
X10						U/D				U			
X11							U/D			D	U	A	
X12								U/D			D	B	A
X13									U/D				B

X6 Series Hardware Diagram (Unit: mm)



Ordering Number	Length
X6-40TD-N0	165

X6 Series Circuit Diagram



X6-40TD

X Relay-type PLC

X Relay Series Overview

- ▲ Efficient data processing capacity
- ▲ 3-channel high-speed counting capabilities;
- ▲ Real-time clock (RTC), supports permanent data retention after power-failure.
- ▲ Supports 1 BD board, and up to 7 expansion modules.

■ Advantages

Rich Interfaces
RJ45/RS232/485

I/O Functions
3-channel high-speed counters

Expandable Modules
Up to 7 expansion modules

BD Expansion
Supports 1 x BD board

X Series PLC Technical Parameters

Item		Electrical Specifications				
		X-16RA	X-24RA	X-32RA	X-40RA	X-60RA
Power consumption		10W	12W	12W	13W	14W
Working Voltage	Min.	100Vac				
	Typical.	220Vac				
	Max.	240Vac				
Max. input voltage		AC 85V ~ AC100V, AC 240V ~ AC264V				
Power-loss tolerance		Instant power loss <5 ms				
Power fuse		60V 2A				
Surge current		12A，<0.5ms @28.8V DC				
DC24V power supply		<300mA				
DC5V power supply		<800mA				

Item		Digital Input Specifications				
		X-16RA	X-24RA	X-32RA	X-40RA	X-60RA
Input points		8	14	16	24	36
High-speed counter		Single-phase: 200 kHz [3-CH]; AB phase: 100 kHz [3-CH]				
Input mode		PNP/NPN				
Input voltage range		DC20.4V ~ DC28.8V				
Input impedance	X0-x5	3.3K				
	X6-x7	5.6K	3.3K			
	X10-...	-	5.6K			
On input induction current	X0-x5	>5mA				
	X6-x7	4mA	>5mA			
	X10-...	-	>4 mA			
OFF input induction current		>1mA				

X series PLC Technical Parameters

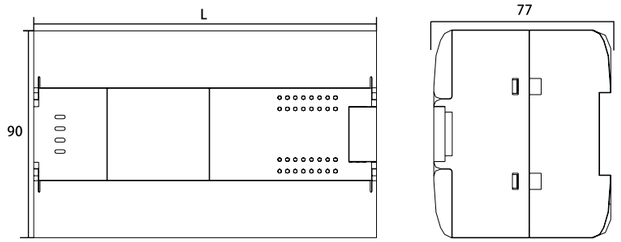
Item	Digital Input Specifications				
	X-16RA	X-24RA	X-32RA	X-40RA	X-60RA
Input response time	< 4.5ms				
Input signal type	No voltage contact input				
	Sink Type: NPN Open-collector transistor				
	Source Type: PNP Open-collector transistor				
Input circuit isolation	Optocoupler isolation				
Input status indicator	The LED on the panel lights up when the optocoupler is activated.				

Item	Output Specifications				
	X-16RA	X-24RA	X-32RA	X-40RA	X-60RA
Output points	8	10	16	16	24
Output type	Dry contact				
Rated output voltage	220VAC				
Output voltage range	5 ~ 30VDC 5 ~ 250VAC				
Max. Inrush current	5A 4s 10% duty cycle				
Rated current per point	<2A				
Lamp load [max.]	30W DC/200WAC				
Response time (24V, 2K load)	10ms				
Closed contact resistance	0.2Ω（new contact）				
Max. Pulse frequency	1Hz				
Mechanical lifetime	10,000,000 times under non-load				
Contact endurance	100,000 operations under rated load				
Transmission distance (shield cable)	500 meters (standard output)				
Transmission distance (unshielded cab	150 meters (standard output)				

X Series High-Speed Counter

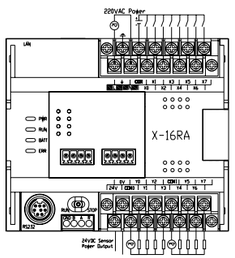
Allocation / Input	Single-phase single counting								ingle-phase double counting				AB phase counting			
	C235	C236	C237	C238	C239	C240	C243	C244	C246	C247	C248	C249	C251	C252	C253	C254
X0	U/D						U/D		U			U	A	A		
X1		U/D					R		D			D	B	B		
X2			U/D					U/D		U		R	R		A	
X3				U/D				R		D		S			B	
X4					U/D			S			U					A
X5						U/D					D					B

X Series PLC Hardware Diagram (Unit: mm)

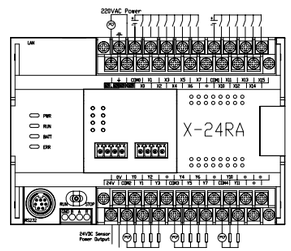


Ordering Number	Length
X-16RA-E0	104
X-24RA-E0	132
X-32RA-E0	150
X-40RA-E0	165
X-60RA-E0	210

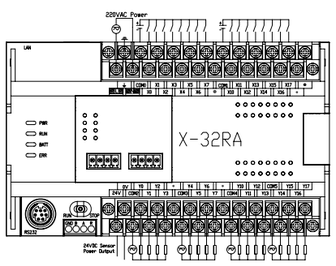
X Series PLC Circuit Diagram



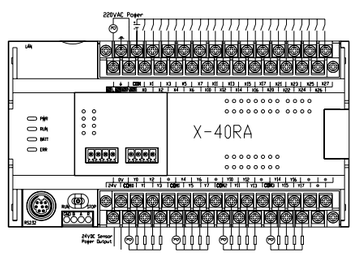
X-16RA-E0



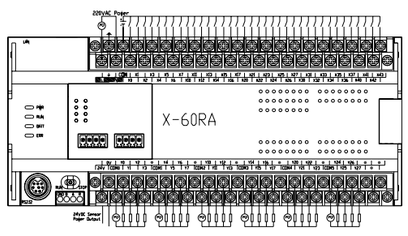
X-24RA-E0



X-32RA-E0



X-40RA-E0



X-60RA-E0

Ordering Information

■ X Series PLC Controller

No	Ordering Number	Product description
X1 Economic PLC		
1	X1-16TD-E0	X1 PLC controller，8DI/8DO transistor output，2-ch 60kHz high-speed pulse, DC 24V
2	X1-24TD-E0	X1 PLC controller，14DI/10DO transistor output，2-ch 60kHz high-speed pulse，DC 24V power supply
3	X1-32TD-E0	X1 PLC controller，16DI/16DO transistor output，2-ch 60kHz high-speed pulse，DC 24V power supply
4	X1-40TD-E0	X1 PLC controller，24DI/16DO transistor output，2-ch 60kHz high-speed pulse，DC 24V power supply
5	X1-60TD-E0	X1 PLC controller，36DI/24DO transistor output，2-ch 60kHz high-speed pulse，DC 24V power supply
X2 Standard PLC		
1	X2-24TD-E0	X2 PLC controller，14DI/10DO transistor output，2-ch 200kHz high-speed pulse，Supports linear interpolation，DC 24V power supply
2	X2-32TD-E0	X2 PLC controller，16DI/16DO transistor output，2-ch 200kHz high-speed pulse，Supports linear interpolation，DC 24V power supply
3	X2-40TD-E0	X2 PLC controller，24DI/16DO transistor output，2-ch 200kHz high-speed pulse，Supports linear interpolation，DC 24V power supply
4	X2-60TD-E0	X2 PLC controller，36DI/24DO transistor output，2-ch 200kHz high-speed pulse，Supports linear interpolation，DC 24V power supply
X3 Enhanced PLC		
1	X3-16TD-E0	X3 PLC controller，8DI/8DO transistor Output，2-ch 200kHz high-speed pulse，supports linear/arc interpolation，DC 24V power supply
2	X3-24TD-E0	X3 PLC controller，14DI/10DO transistor Output，4-ch 200kHz high-speed pulse, supports linear/arc interpolation，DC 24V power supply
3	X3-32TD-E0	X3 PLC controller，16DI/16DO transistor Output，4-ch 200kHz high-speed pulse, supports linear/arc interpolation, DC 24V power supply
4	X3-40TD-E0	X3 PLC controller，24DI/16DO transistor Output，4-ch 200kHz high-speed pulse, supports linear/arc interpolation，DC 24V power supply
5	X3-60TD-E0	X3 PLC controller，36DI/24DO transistor Output，6-ch 200kHz high-speed pulse, supports linear/arc interpolation，DC 24V power supply
X6 Bus-type PLC		
1	X6-40TD-N0	X6 PLC controller，24DI/16DO transistor output，4-ch 200kHz high-speed pulse, support EtherCAT BUS, max.16-axis，supports linear/arc interpolation, follow shear, flying shear, electronic CAM, DC24V power supply
X Relay-type PLC		
1	X-16RA-E0	Relay-type PLC controller，8DI/8DO relay output, AC 220V power supply
2	X-24RA-E0	Relay-type PLC controller，14DI/10DO relay output，AC 220V power supply
3	X-32RA-E0	Relay-type PLC controller，16DI/16DO relay output，AC 220V power supply
4	X-40RA-E0	Relay-type PLC controller，24DI/16DO relay output，AC 220V power supply
5	X-60RA-E0	Relay-type PLC controller，36DI/24DO relay output，AC 220V power supply

X Series Expansion Module

Overview

X-series PLC controllers deliver powerful logic processing, data calculation and high-speed response performance. They support abundant expansion modules such as AD/DA conversion units, digital I/O modules, analog modules and temperature acquisition modules. The expansion modules are widely used in process control systems for temperature, flow, liquid level and pressure monitoring.

Expansion Module Parameters

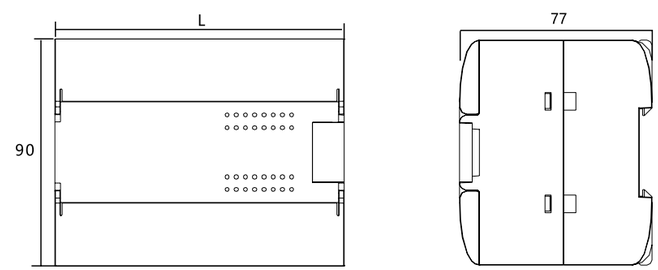
No.	Order Number	Product description
X Series Digital Module		
1	X-E16X-00	X Series digital input expansion module, 16 DI, 24V DC
2	X-E32X-00	X Series digital input expansion module, 32 DI, 24V DC
3	X-E16YT-00	X Series digital output expansion module, 16 DO, Transistor
4	X-E16YR-00	X Series digital output expansion module, 16 DO, Relay
5	X-E32YT-00	X Series digital output expansion module, 32 DO, Transistor
6	X-E8X8YT-00	X Series digital input/output expansion module, 8DI/8DO, Transistor
7	X-E8X8YR-00	X Series digital input/output expansion module, 8DI/8DO, Relay
8	X-E16X16YT-00	X Series digital input/output expansion module, 16 DI/16 DO, Transistor
9	X-E16X16YR-00	X Series digital input/output expansion module, 16 DI/16 DO, Relay
X Series Analog Module		
1	X-E4AD-01	Analog input expansion module, 4-CH, 16-bit
2	X-E4AD2DA-01	Analog input/output expansion module, 4-CH AI (16-bit) and 2-CH AO (16-bit voltage output/15-bit current output)
3	X-E8AD-00	Analog input expansion module, 8-CH, 16-bit
4	X-E4DA-01	Analog output expansion module, 4-CH,16-bit voltage output and 15-bit current output
5	X-E4RTD-00	Temperature expansion module, 4 thermistors, 16-bit
6	X-E4TC-00	Temperature expansion module, 4 thermocouples, 16-bit
7	X-E8TC-00	Temperature expansion module, 8 thermocouples, 16-bit

Expansion Module Naming Rules

X - E 4 AD 2 DA - 00
① ②③ ④ ⑤ ⑥ ⑦

① Product Series X：X Series	② Control Type E：Expansion Module	③ Input Channels 4：4-channel Input N: n-channel Input
④ Input Type X: Digital Input AD: Analog Input RTD: Hot Resistance TC: Thermocouple	⑤ Output Channels: 2：2-channel output N: n-channel output ⑦ Characteristic 00：null	⑥ Type YT：Digital transistor output TR：Digital relay output DA：Analog voltage output

Expansion Module Hardware Diagram (Unit: mm)

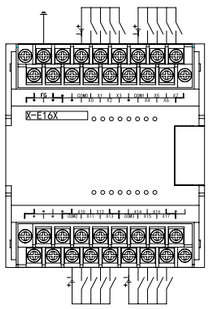


Order Number	Length
16 points	80
32 points	110

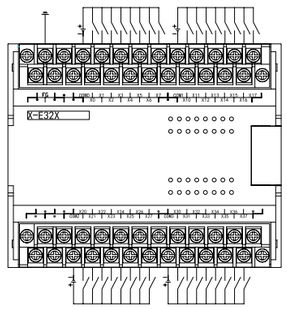
Digital Input Module Parameters

Item	Digital Input Module	
	X-E16X-00	X-E32X-00
Digital input points	16	32
Input type	PNP/NPN	
Rated voltage	24VDC, 4mA	
Maximum continuous voltage	30V DC	
Surge voltage	35VDC，0.5 s	
Logic 1 [Min]	>2.5mA @15VDC	
Logic 0 [Max]	<1mA @5VDC	
Max. leakage current	1mA	
Isolation	Y	
Photoelectric isolation	500VAC, 1 min	

Digital Input Module Wiring Diagram



X-E16X-00

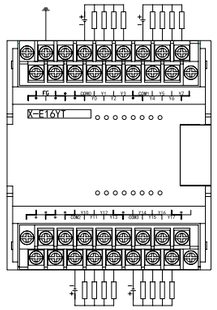


X-E32X-00

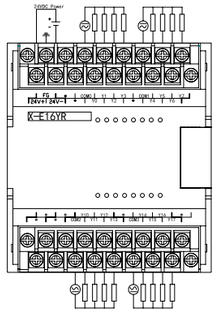
Digital Output Module Parameters

Item		Digital Output Modules		
		X-E16YT-00	X-E32YT-00	X-E16YR-00
Digital output		Transistor output (Sink Type)		Relay output
Output type		Solid-State MOSFET		Dry contact
Electrical circuit isolation		Opto-isolation		Mechanical insulation
Rated voltage		24VDC		24VDC
Circuit voltage range		DC5V~DC28.8V		AC30V or AC250V
Rated current per point (Max.)		0.5A		2A
Lamp load [max]		3.5W/DC24V		30W DC30V 200W AC250V
Response time	OFF → ON	<0.2ms		<10ms
	ON → OFF	<0.2ms		<10ms

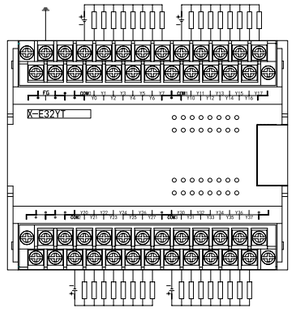
Digital Output Module Wiring Diagram



X-E16YT-00



X-E16YR-00



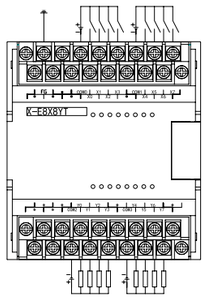
X-E32YT-00

Digital Input/Output Module

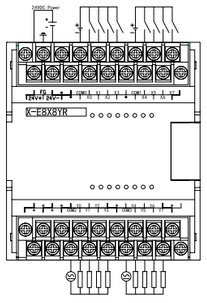
Digital Input/Output Module Parameters

Item		Digital Input/Output Module	
		X-E8X8YT-00 X-E16X16YT-00	X-E8X8YR-00 X-E16X16YR-00
Digital Output Characteristics		Transistor output (Sink type)	Relay output
Output Type		Solid -MOSFET	Dry contact
Electrical circuit isolation		Opto-insulation	Mechanical insulation
Rated voltage		DC24V	DC24V
Circuit voltage range		DC5V ~ DC28.8V	DC30V or AC250V
Rated current per point (Max.)		0.5A	2A
Lamp load [max]		3.5W/DC24V	30W / DC30V 200W / AC250V
Response time	OFF → ON	<0.2ms	<10ms
	ON → OFF	<0.2ms	<10ms

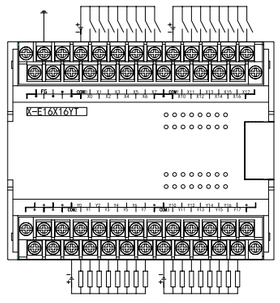
Digital Input/Output Module Wiring Diagram



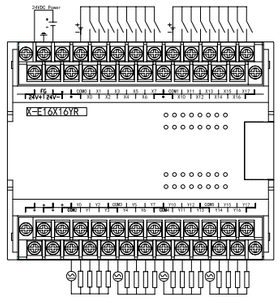
X-E8X8YT-00



X-E8X8YR-00



X-E16X16YT-00



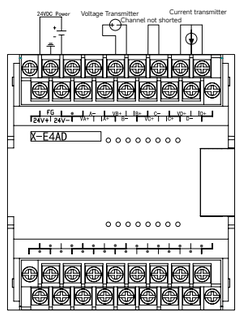
X-E16X16YR-00

Analog Input Module

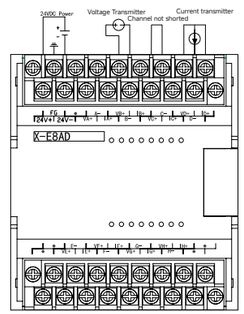
Analog Input Module Parameters

Item		Analog Input Modules	
		X-E4AD-01	X-E8AD-00
Input type		Differential analog input	
Input voltage range	Unipolar	0 ~ 5V，0 ~ 10V	
	Bipolar	±2.5V，±5V，±10V	
Input current range		0 ~ 20mA	
Output data format word range	Unipolar	0 ~ 32000	
	Bipolar	-32000 ~ +32000	
Resolution ratio		16-bit voltage output, 15-bit current output	
Basic error		±0.5%FS	
Load resistance	Voltage output	>5KΩ	
	Current output	<0.5KΩ	
Isolation (field to logic circuit)		>500V	

Analog Input Module Wiring Diagram



X-E4AD-01



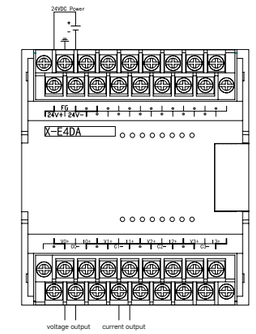
X-E8AD-00

Analog Output & Input/Output Module

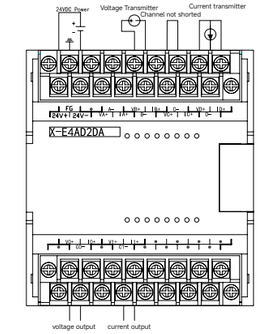
Analog Output & Input/Output Module Parameters

Item		Analog Output	Analog Input/Output
		X-E4DA-01	X-E4AD2DA-01
Output voltage range		0 ~ ±10V	
Output current range		0 ~ 20mA	
Output data format word range	Voltage output	0 ~ 32,000	
	Output current	-32,000 ~ +32,000	
Resolution ratio		16-bit voltage output, 15-bit current output	
Basic error		±0.5%FS	
Load resistance	Voltage output	>5KΩ	
	Output current	<0.5KΩ	
Isolation (field to logic circuit)		>500V	

Analog Output & Input/Output Module Circuit Diagram



X-E4DA-01



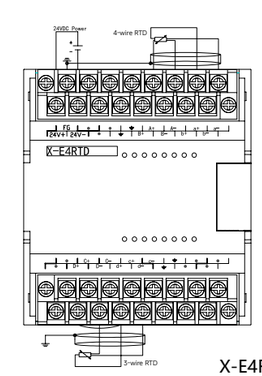
X-E4AD2DA-01

Resistance Temperature Detector (RTD) Expansion Module

RTD Extension Module Parameters

Item	Temperature module
	X-E4RTD-00
Rated voltage	DC 24V
Input voltage	DC 20.4 ~ 28.8V
Input current	35mA（DC 24V）
Inrush current	12A，28.8V DC
Fuse	0.75A 60V Slow-blow
Bus Current	24mA（per module）
Built-in RTD input channels	4
RTD input range	PT100, PT200, PT500, PT1000, NI100, NI120, NI1000
Temperature data format	Actual temp. ×10; Range: -2000 ~ +8500
Resolution	15 bit +1 sign bit
Basic error	0.1% FS
Wiring mode	2-wire, 3-wire, 4-wire
Module refresh cycle	420 ms

RTD Module Wiring Diagram



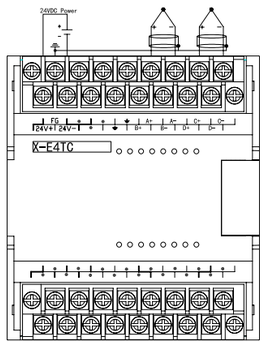
X-E4RTD-00

Thermocouple Module

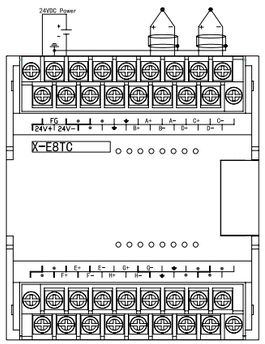
Thermocouple Module Parameters

Item	Thermocouple Modules	
	X-E4TC-00	X-E8TC-00
Rated voltage	DC 24V	
Input voltage	DC 20.4 ~ 28.8V	
Input current	35mA,DC 24V	
Inrush current	12A，28.8V DC	
Fuse	0.75A 60V slow-blow	
Bus current	80mAaper module	
Built-in rtd input channel	4	8
Input range	J、K、T、E、R、S、N	
Temperature data format	Actual Temperature x 10	
Resolution	15 bit +1 Sign bit	
Basic error	J/K/ ±80mV: 0.1% FS E: 0.3% FS T/R/S/N: 0.6% FS	
Module refresh cycle	220 ms	440 ms

Thermocouple Module Wiring Diagram



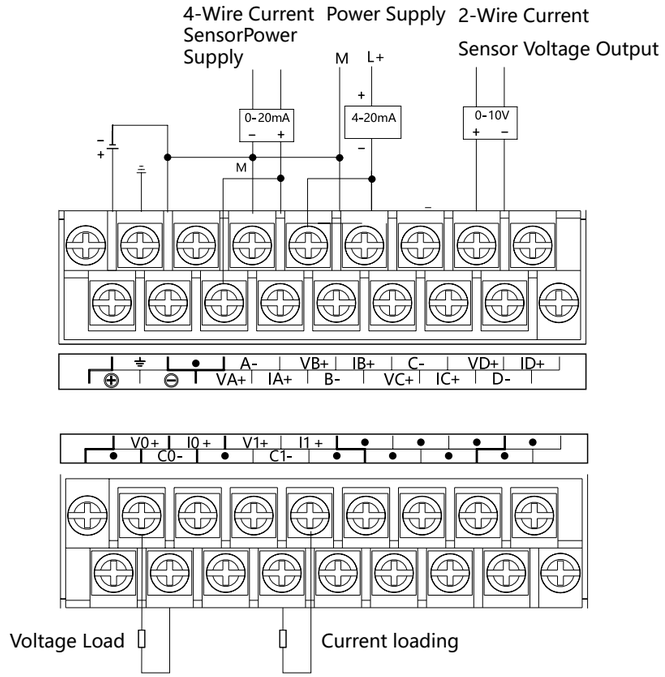
X-E4TC-00



X-E8TC-00

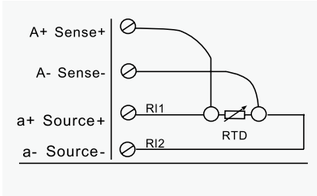
Wiring Diagram Schematic Principle

Reference diagram for analog input/output module

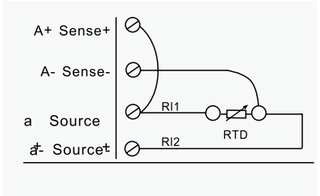


Reference Diagram for Temperature Module

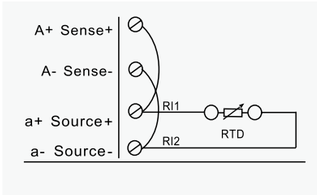
1、Wiring Principle of 4-Wire RTD



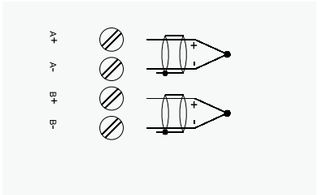
2、 Wiring Principle of 3-Wire RTD



3、Wiring Principle of 2-Wire RTD



4、Wiring Principle of Thermocouples



BD Extension Board

BD Expansion Board Overview

The X Series PLCs support one BD expansion board, and a blank slot cover is equipped as factory default. There’ re various BD board types available for separate purchase. The BD board is compact and easy to mount, it is suitable for small-scale I/O expansion.

No	Model Name	Parameter	Usage
1	X-2DI4DOT-BD01	2DI/4DO transistor，24VDC	2-channel digital input,4-channel transistor output
2	X-4AI-BD01	4AI，15bit current type	4-channel analog current input
3	X-6DI-BD01	6DI，24VDC	6-channel digital input
4	X-6DOT-BD01	6DO, transistor	6-channel digital transistor output
5	X-2RTD-BD	2 RTD temperature module, support PT100	2 Thermistor input
6	X-RS485-BD	1 x RS 485 communication	1 x RS485 communication
7	X-2AI1AO-BD01	2AI，12bit Voltage Type；1AO， 12bit voltage output /11bit current output	2 x analog input， 1 x analog output
8	X-1AI1RTD-BD	1AI，16bit current type；1 thermal resistance, support PT100	1 x analog input，1 x thermistor Input
9	X-2AO-BD01	2AO，12bit voltage output/11bit current output	2 x analog output

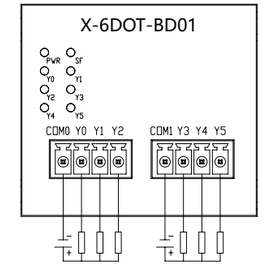
BD Board Naming Rules

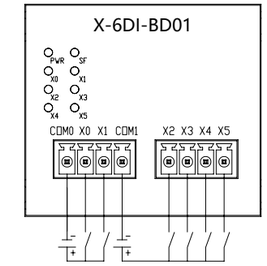
X - 2 DI 2 DOT - BD01

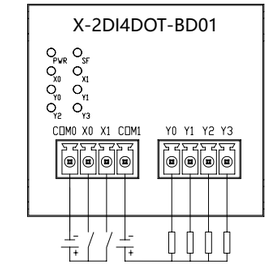
① ② ③ ④ ⑤ ⑥ ⑦

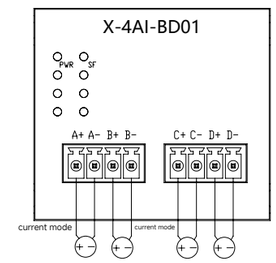
① Product Series X：X Series	② Input Channels 2：2-channel input n：n-channel input	③ Input Type DI： Digital input AI： Analogue input RTD：Resistance Temperature Detector TC： Thermocouple
④ Output Channels 2：2-channel output n：n-channel outBput	⑤ Type DOT： Digital transistor output AOT： Analog current output AOV： Analog voltage output 485： Communication Board	⑥ Characteristic BD：BD Board ⑦ Version 01：Version

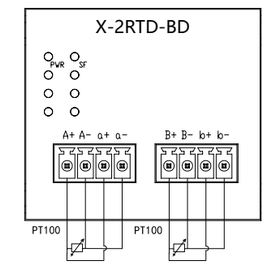
BD Board Wiring Diagram

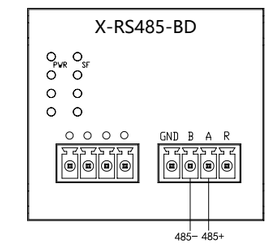


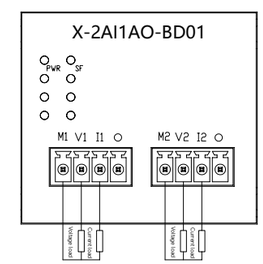


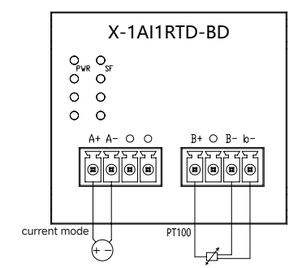


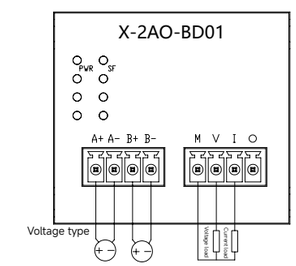












Accessories

Product Overview

X-232-MD8 is a dedicated communication cable for data connection between X Series PLCs and Raynen HMIs, with a standard length of 2 meters.The DB9 end connects to the HMI, and MD8 plug fits to the PLC’ s circular port. paired with X-USB-ADP programming adapter, it can be used for PLC programming and debugging.

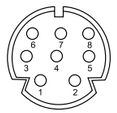
Features

- ▲ DB9 to MD8 communication cable
- ▲ Gold-plated connectors, supports hot plugging
- ▲ Communication extension cable, 2m length

Product Circuit Diagram

DB9	MD8
S G shield	S G shield
2 RXD	4 TXD
3 TXD	1 RXD
5 GND	2 GND
	7 GND

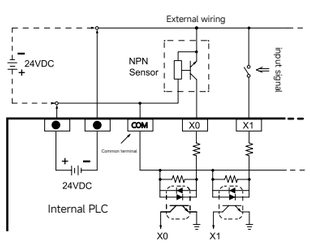
HMI Side



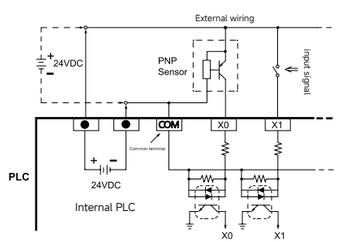
PLC Side

Input/Output and Wiring Diagram

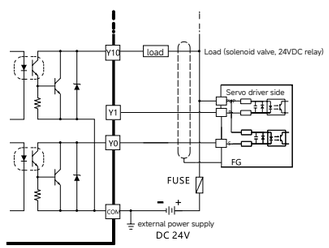
Wiring Diagram



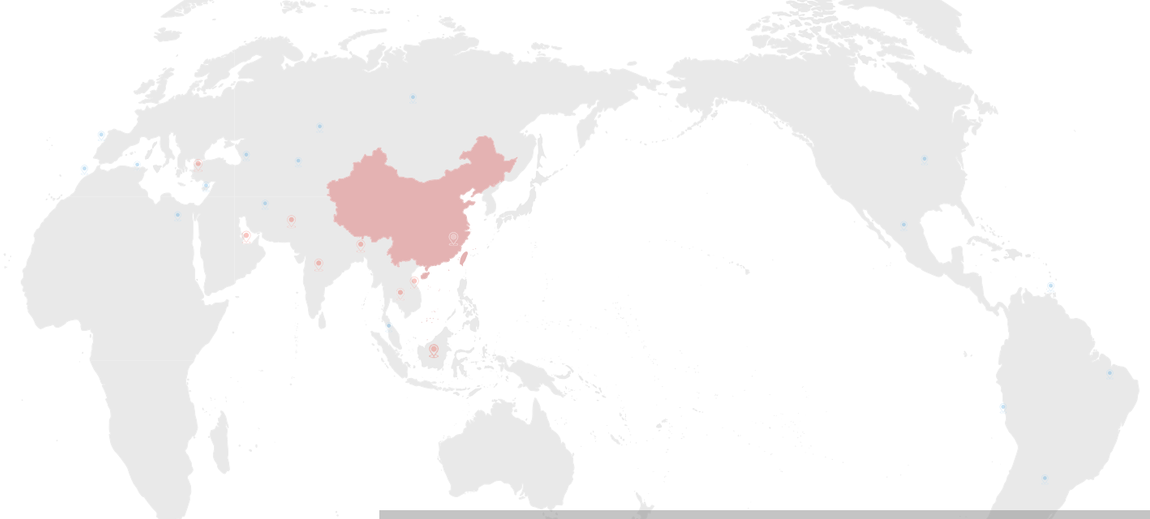
24VDC NPN Type



24VDC PNP Type



Resistor Tye (NPN)



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