SAVCH Programmable Logic Controller

E/S series PLC MPU
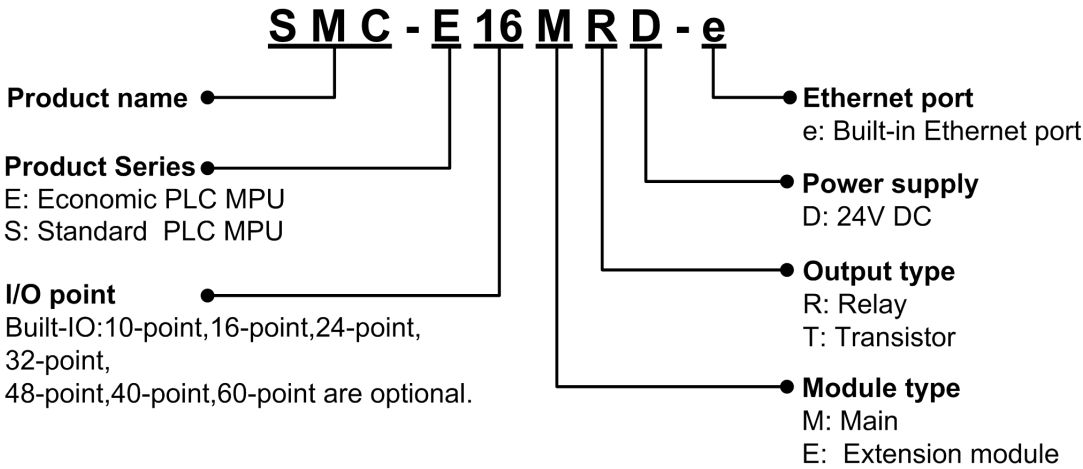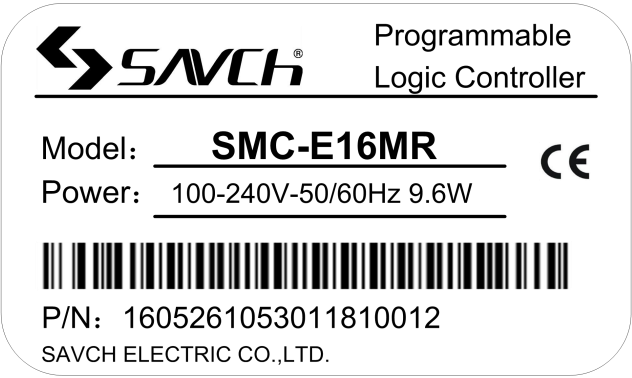
User Manual

Contents

1. Products receiving

All products have been performed with strict test and inspection. After receiving the inverters, the following checks shall be performed.

●To check that SAVCH inverter, an instruction manual is inside of the package

●To check whether model number correspond with model your purchase order.

●To check whether there are damaged parts during transportation and delivering. If there are, do not connect with power supply.

If any of the above checkpoints are not satisfactory, contact your SAVCH ELECTRIC representative for a quick resolution.

2. Model description

Programmable Logic Controller

Model： **SMC-E16MR**

Power： 100-240V-50/60Hz 9.6W

CE

P/N：1605261053011810012

SAVCH ELECTRIC CO.,LTD.

S M C - E 16 M R D - e

Product name

Product Series
E: Economic PLC MPU
S: Standard PLC MPU

I/O point
Built-IO:10-point,16-point,24-point, 32-point,
48-point,40-point,60-point are optional.

Module type
M: Main
E: Extension module

Output type
R: Relay
T: Transistor

Power supply
D: 24V DC

Ethernet port
e: Built-in Ethernet port

3. Product model list & dimensions

Ethernet Model	24VDC	Model	24VDC	Dimension	Figure No.
SMC-E10MRD-e	0.33A	SMC-E10MRD	0.3A	93×95×82mm	Size A
SMC-E10MTD-e	0.33A	SMC-E10MTD	0.3A		
SMC-E16MRD-e	0.34A	SMC-E16MRD	0.31A		
SMC-E16MTD-e	0.34A	SMC-E16MTD	0.31A		
SMC-S16MRD-e	0.56A	SMC-S16MRD	0.53A		
SMC-S16MTD-e	0.58A	SMC-S16MTD	0.55A		

Ethernet Model	24VDC	Model	24VDC	Dimension	Figure No.
SMC-E24MRD-e	0.39A	SMC-E24MRD	0.36A	131×95×82mm	Size B
SMC-E24MTD-e	0.39A	SMC-E24MTD	0.36A		
SMC-S24MRD-e	0.6A	SMC-S24MRD	0.57A		
SMC-S24MTD-e	0.62A	SMC-S24MTD	0.59A		
SMC-E32MTD-e	0.43A	SMC-E32MTD	0.4A		
SMC-E32MRD-e	0.42A	SMC-E32MRD	0.39A		
SMC-S32MRD-e	0.64A	SMC-S32MRD	0.61A		
SMC-S32MTD-e	0.66A	SMC-S32MTD	0.63A		
SMC-E48MRD-e	0.7A	SMC-E48MRD	0.67A	177*95*82mm	Size C
SMC-E48MTD-e	0.71A	SMC-E48MTD	0.68A		
SMC-S48MRD-e	0.72A	SMC-S48MRD	0.69A		
SMC-S48MTD-e	0.74A	SMC-S48MTD	0.71A		
SMC-E60MRD-e	0.77A	SMC-E60MRD	0.74A		
SMC-E60MTD-e	0.77A	SMC-E60MTD	0.74A		
SMC-S60MRD-e	0.78A	SMC-S60MRD	0.75A		
SMC-S60MTD-e	0.8A	SMC-S60MTD	0.77A		

Ethernet Model	220VAC	Model	220VAC	Dimension	Figure No.
SMC-E10MR-e	9.4W	SMC-E10MR	8.8W	93×95×82mm	Size A
SMC-E10MT-e	9.2W	SMC-E10MT	8.6W		
SMC-E16MR-e	10.2W	SMC-E16MR	9.6W		
SMC-E16MT-e	10.3W	SMC-E16MT	9.7W		
SMC-S16MR-e	10.2W	SMC-S16MR	9.6W		
SMC-S16MT-e	10.9W	SMC-S16MT	10.3W		
SMC-E24MR-e	11.5W	SMC-E24MR	10.9W	131×95×82mm	Size B
SMC-E24MT-e	11.3W	SMC-E24MT	10.7W		
SMC-S24MR-e	11.3W	SMC-S24MR	10.7W		
SMC-S24MT-e	11.7W	SMC-S24MT	11.1W		
SMC-E32MT-e	12W	SMC-E32MT	11.4W		
SMC-E32MR-e	12.2W	SMC-E32MR	11.6W		
SMC-S32MR-e	13.1W	SMC-S32MR	12.5W		
SMC-S32MT-e	12.7W	SMC-S32MT	12.1W		
SMC-E48MR-e	15W	SMC-E48MR	14.4W	177*95*82mm	Size C
SMC-E48MT-e	14.3W	SMC-E48MT	13.7W		
SMC-S48MR-e	11.1W	SMC-S48MR	10.5W		
SMC-S48MT-e	10.7W	SMC-S48MT	10.1W		
SMC-E60MR-e	16.6W	SMC-E60MR	16W		
SMC-E60MT-e	17W	SMC-E60MT	16.4W		
SMC-S60MR-e	17.1W	SMC-S60MR	16.5W		
SMC-S60MT-e	17.8W	SMC-S60MT	17.2W		

Size A

Size B   Size C
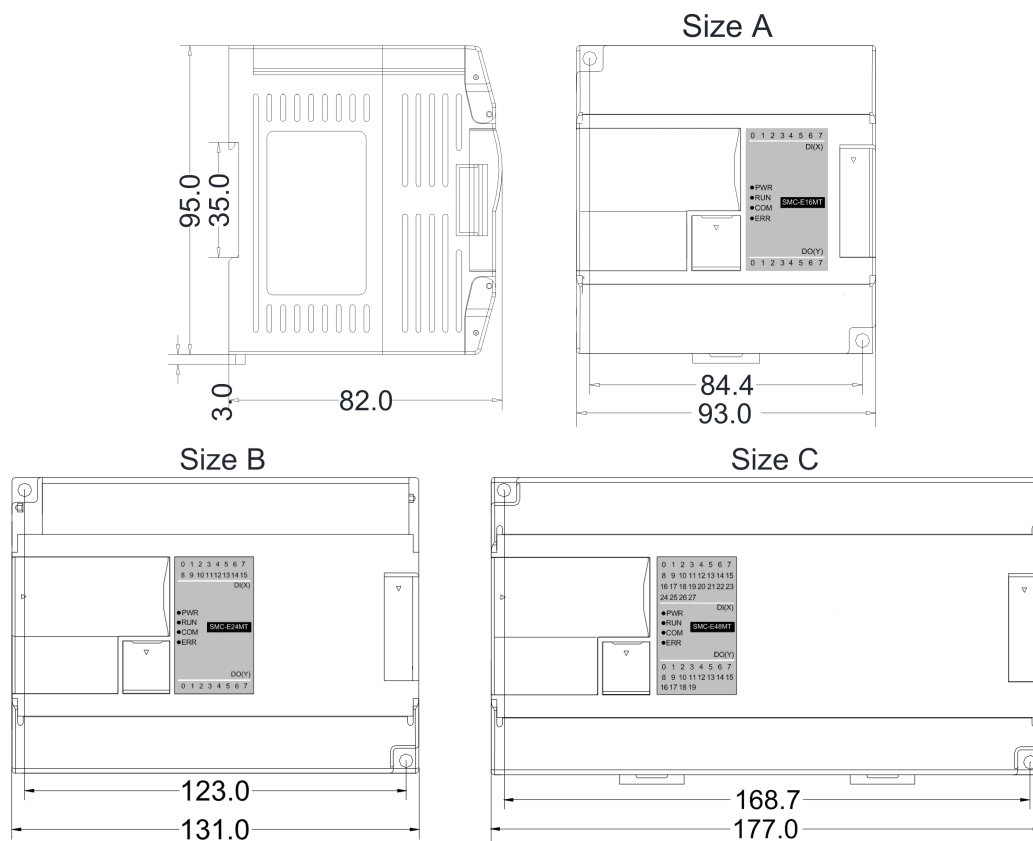
4. Indicator Description

① PWR: Power indicator,green. Continuous ON - Power good; OFF - Power error.

② RUN: Running indicator,green. Continuous ON - PLC is in running state; OFF - PLC was shutdown.

③ COM:Communication indicator,green. Flickering - PLC is in communicating state, the flicker frequency indicates the speed of the communication; OFF - No communication.

④ ERR: Error indicator, red. Continuous ON - Hardware failure; Flickering - Software failure; OFF - Normal state.

According to the different states of the Error indicator, users are recommended to take the following actions:

State of the Error Indicator	Indication Information	Actions to Take
OFF	No error	Nothing
Flicker as below: 0.5 second's on with 0.5 second's off	Firmware abnormal or program error, keep running program is not recommended	Re-upgrade firmware or modify program
Continuous ON	Hardware failure, program is unable to run	Send the PLC back to us for repair

5. Power Supply Specification

Item	AC Power Supply	DC Power Supply
Power Supply Voltage	100~240VAC	DC24V -15%~+20%
Power Supply Frequency	50~60Hz	——
Power Consumption	25VA MAX	——
Instantaneous Surge	20A 1.5ms MAX @220VAC	20A 1.5ms MAX @24VDC
Power Loss Time	20ms or less @220VAC	10ms or less
Fuse	2A, 250VAC	2A, 250VAC
5V Output Voltage (for CPU)	5V, -2%~+2%, 1.2A MAX	5V, -2%~+2%, 1.2A MAX
24V Output Voltage (for output and extension)	24V, -15%~+15%, 500mA MAX	24V, -15%~+15%, 500mA MAX

Item	AC Power Supply	DC Power Supply
24V Output Voltage (for input and peripheral)	24V, -15%~+15%, 200mA MAX	Use external 24VDC power supply
Insulation Type	Transformer isolation or optoelectronic isolation, 1500VAC/1 minute	No Electrical isolation
Power Protection	DC24V output over current	DC input power polarity reverse, over voltage

6. Environmental Specifications for Product

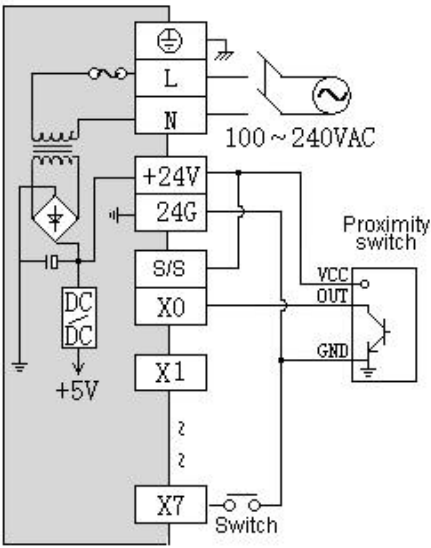| Item	Environment Specification	
Temperature/Humidity	Operating temperature:0~+55℃ Storage temperature:-25~+70℃ Humidity: 5~95%RH, No condensation	
Vibration Resistance	10~57 HZ, amplitude=0.075mm, 57HZ~150HZ acceleration=1G, 10 times each for X-axis, Y-axis and Z-axis	
Impact Resistance	15G, duration=11ms, 6 times each for X-axis, Y-axis and Z-axis	
Interference Immunity	AC EFT:±2500V Surge:±2500V	Interference Immunity
Over Voltage Resistance	1500VAC/1min between AC terminal and PE terminal, 500VAC/1min between DC terminal and PE terminal	
Insulation Impedance	≧5MΩbetween AC terminal and all input/output points to PE terminal @500VDC	
Ground	The third kind of grounding(Connecting to the ground of high voltage system is prohibited)	
Operating environment	Avoid dust, moisture, corrosion, electric shock and external shocks	

7. Digital Input (DI) Specification

Item	Digital Input (DI)
Input Signal	No voltage contact or NPN/PNP
Action driving	ON>3.5mA OFF<1.5mA
Input Impedance	Input Impedance≈4.3KΩ
Maximum Input Current	10mA
Reaction Time	6.4ms DEFAULT, can be configured to 0.8~51.2ms
Insulation Type	Optoelectronic isolation for each channel
Input Indication	LED's lighting indicates ON, no light indicates OFF
Power supply	MPU internal power supply:DC power supply (SINK or SOURCE) 5.3mA@24VDC

8. Digital Output (DO) Specification

Item		Output point type : Relay - R	transistor output T
Maximum load	Resistive Load	2A/1 point, 8A/4 points COM	0.5A/1 point, 2A/4 points COM
	Inductive Load	50VA	5W/DC24V
	Lamp load	100W	12W/DC24V
Minimum Load		10mA	2mA
Voltage Specification		Below 250VAC, 30VDC	30VDC
Drive Capability		Maximum contact capacity: 5A/250VAC	1A MAX, 10 seconds
Reaction Time		Off-on 10ms, On-off 5ms	Off→On 10µs,On→Off 120µs

Insulation Type	Mechanical isolation	Optoelectronic isolation for each channel
Output Indication	LED's lighting indicates ON, no light indicates OFF	
Power Supply	MPU internal 24VDC power supply	

9. Digital Input / Output (DI/DO) Wiring Diagram

NPN Internal power
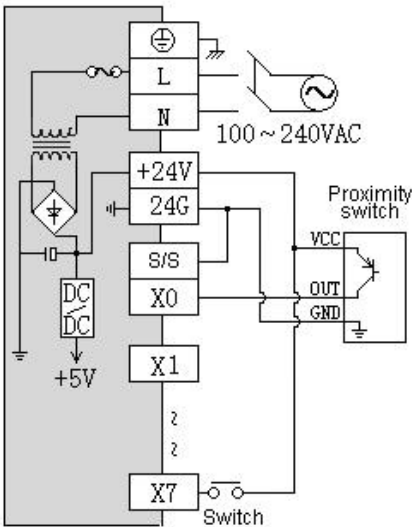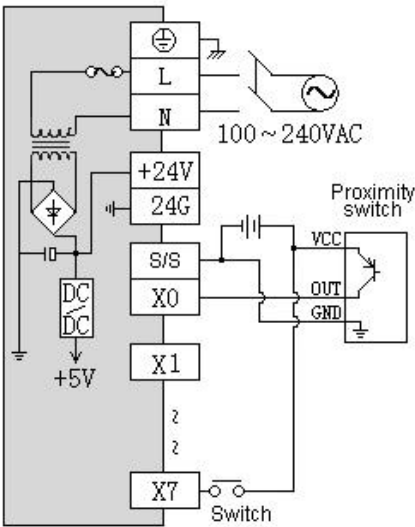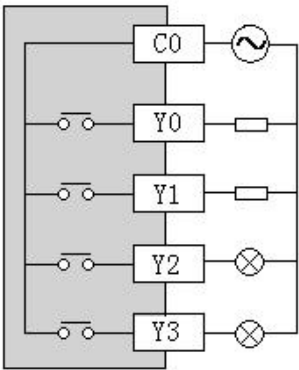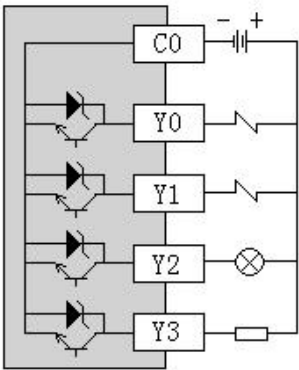

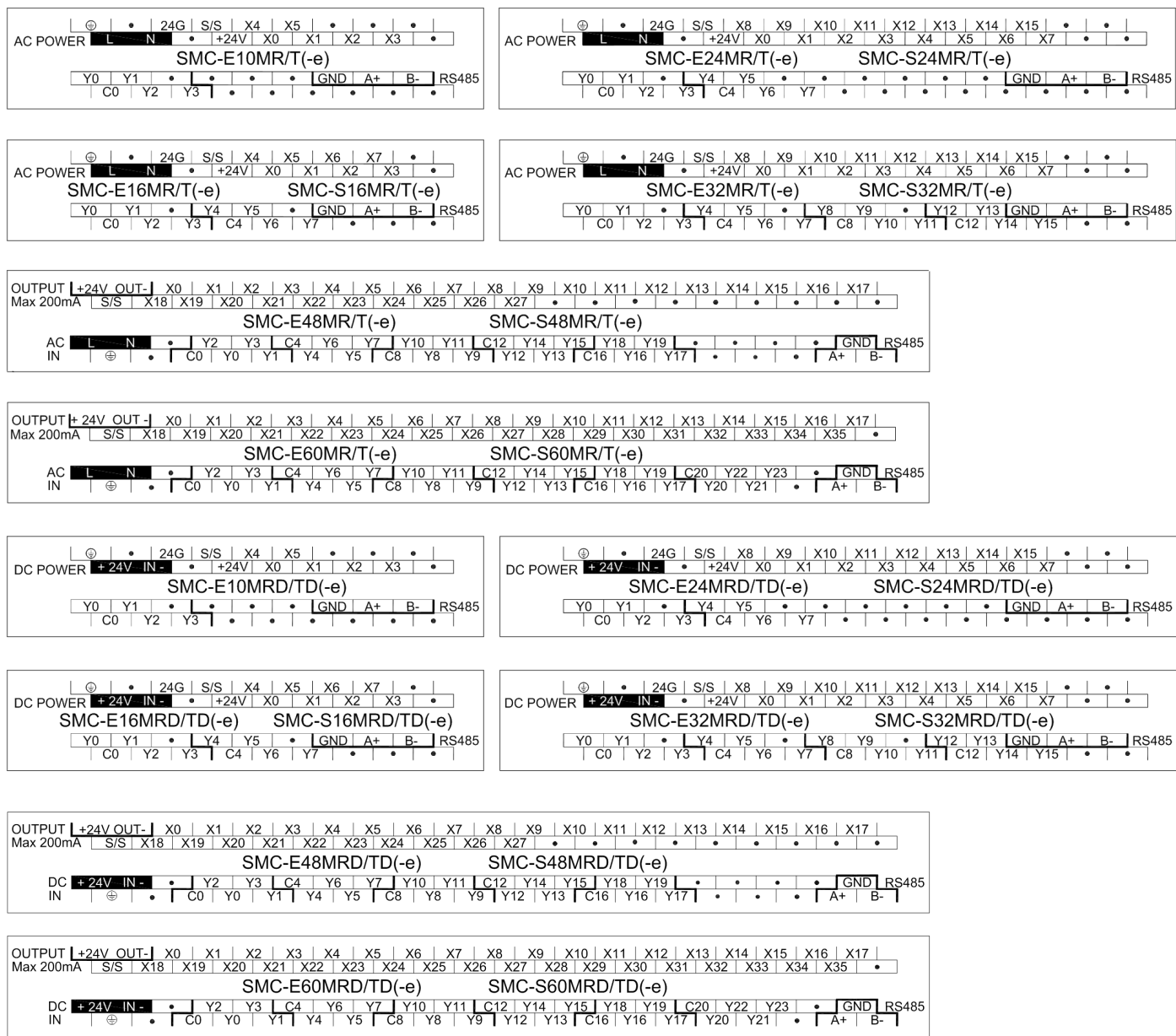NPN External power

PNP Internal power

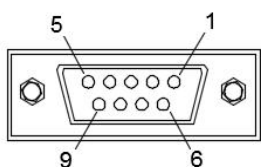PNP External power

AC / DC Relay output

DC NPN Transistor output

10. MPU Terminal Wiring Diagram

```
|⊕| • |24G|S/S|X4|X5| • | • | • |
AC POWER|L  N| • |+24V|X0|X1|X2|X3| • |
           SMC-E10MR/T(-e)
|Y0|Y1| • | • | • | • |GND|A+|B-|RS485
   |C0|Y2|Y3| • | • | • | • |
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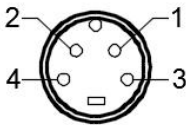
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|⊕| • |24G|S/S|X8|X9|X10|X11|X12|X13|X14|X15| • | • | • |
AC POWER|L  N| • |+24V|X0|X1|X2|X3|X4|X5|X6|X7| • | • |
       SMC-E24MR/T(-e)      SMC-S24MR/T(-e)
|Y0|Y1| • |Y4|Y5| • | • | • | • | • | • |GND|A+|B-|RS485
   |C0|Y2|Y3|C4|Y6|Y7| • | • | • | • | • | • |
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```
|⊕| • |24G|S/S|X4|X5|X6|X7| • | • |
AC POWER|L  N| • |+24V|X0|X1|X2|X3| • |
    SMC-E16MR/T(-e)     SMC-S16MR/T(-e)
|Y0|Y1| • |Y4|Y5| • | • | • |GND|A+|B-|RS485
   |C0|Y2|Y3|C4|Y6|Y7| • | • | • |
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|⊕| • |24G|S/S|X8|X9|X10|X11|X12|X13|X14|X15| • | • | • |
AC POWER|L  N| • |+24V|X0|X1|X2|X3|X4|X5|X6|X7| • | • |
       SMC-E32MR/T(-e)      SMC-S32MR/T(-e)
|Y0|Y1| • |Y4|Y5| • |Y8|Y9| • |Y12|Y13|GND|A+|B-|RS485
   |C0|Y2|Y3|C4|Y6|Y7|C8|Y10|Y11|C12|Y14|Y15| • | • |
```

```
OUTPUT |+24V OUT-|X0|X1|X2|X3|X4|X5|X6|X7|X8|X9|X10|X11|X12|X13|X14|X15|X16|X17|
Max 200mA |S/S|X18|X19|X20|X21|X22|X23|X24|X25|X26|X27| • | • | • | • | • | • | • | • |
              SMC-E48MR/T(-e)       SMC-S48MR/T(-e)
AC |L  N| • |Y2|Y3|C4|Y6|Y7|Y10|Y11|C12|Y14|Y15|Y18|Y19| • | • | • |GND|RS485
IN | ⊕ | • |C0|Y0|Y1|Y4|Y5|C8|Y8|Y9|Y12|Y13|C16|Y16|Y17| • | • |A+|B-|
```

```
OUTPUT |+ 24V  OUT -|X0|X1|X2|X3|X4|X5|X6|X7|X8|X9|X10|X11|X12|X13|X14|X15|X16|X17|
Max 200mA |S/S|X18|X19|X20|X21|X22|X23|X24|X25|X26|X27|X28|X29|X30|X31|X32|X33|X34|X35| • |
              SMC-E60MR/T(-e)       SMC-S60MR/T(-e)
AC |L  N| • |Y2|Y3|C4|Y6|Y7|Y10|Y11|C12|Y14|Y15|Y18|Y19|C20|Y22|Y23| • |GND|RS485
IN | ⊕ | • |C0|Y0|Y1|Y4|Y5|C8|Y8|Y9|Y12|Y13|C16|Y16|Y17|Y20|Y21| • |A+|B-|
```

```
|⊕| • |24G|S/S|X4|X5| • | • | • |
DC POWER|+ 24V  IN -| • |+24V|X0|X1|X2|X3| • |
           SMC-E10MRD/TD(-e)
|Y0|Y1| • | • | • | • |GND|A+|B-|RS485
   |C0|Y2|Y3| • | • | • | • |
```

```
|⊕| • |24G|S/S|X8|X9|X10|X11|X12|X13|X14|X15| • | • |
DC POWER|+ 24V  IN -| • |+24V|X0|X1|X2|X3|X4|X5|X6|X7| • | • |
       SMC-E24MRD/TD(-e)      SMC-S24MRD/TD(-e)
|Y0|Y1| • |Y4|Y5| • | • | • | • | • |GND|A+|B-|RS485
   |C0|Y2|Y3|C4|Y6|Y7| • | • | • | • | • |
```

```
|⊕| • |24G|S/S|X4|X5|X6|X7| • | • |
DC POWER|+ 24V  IN -| • |+24V|X0|X1|X2|X3| • |
    SMC-E16MRD/TD(-e)     SMC-S16MRD/TD(-e)
|Y0|Y1| • |Y4|Y5| • | • | • |GND|A+|B-|RS485
   |C0|Y2|Y3|C4|Y6|Y7| • | • | • |
```

```
|⊕| • |24G|S/S|X8|X9|X10|X11|X12|X13|X14|X15| • | • | • |
DC POWER|+ 24V  IN -| • |+24V|X0|X1|X2|X3|X4|X5|X6|X7| • | • |
       SMC-E32MRD/TD(-e)      SMC-S32MRD/TD(-e)
|Y0|Y1| • |Y4|Y5| • |Y8|Y9| • |Y12|Y13|GND|A+|B-|RS485
   |C0|Y2|Y3|C4|Y6|Y7|C8|Y10|Y11|C12|Y14|Y15| • | • |
```

```
OUTPUT |+24V OUT-|X0|X1|X2|X3|X4|X5|X6|X7|X8|X9|X10|X11|X12|X13|X14|X15|X16|X17|
Max 200mA |S/S|X18|X19|X20|X21|X22|X23|X24|X25|X26|X27| • | • | • | • | • | • | • | • |
              SMC-E48MRD/TD(-e)       SMC-S48MRD/TD(-e)
DC |+ 24V  IN -| • |Y2|Y3|C4|Y6|Y7|Y10|Y11|C12|Y14|Y15|Y18|Y19| • | • | • |GND|RS485
IN | ⊕ | • |C0|Y0|Y1|Y4|Y5|C8|Y8|Y9|Y12|Y13|C16|Y16|Y17| • | • |A+|B-|
```

```
OUTPUT |+24V OUT-|X0|X1|X2|X3|X4|X5|X6|X7|X8|X9|X10|X11|X12|X13|X14|X15|X16|X17|
Max 200mA |S/S|X18|X19|X20|X21|X22|X23|X24|X25|X26|X27|X28|X29|X30|X31|X32|X33|X34|X35| • |
              SMC-E60MRD/TD(-e)       SMC-S60MRD/TD(-e)
DC |+ 24V  IN -| • |Y2|Y3|C4|Y6|Y7|Y10|Y11|C12|Y14|Y15|Y18|Y19|C20|Y22|Y23| • |GND|RS485
IN | ⊕ | • |C0|Y0|Y1|Y4|Y5|C8|Y8|Y9|Y12|Y13|C16|Y16|Y17|Y20|Y21| • |A+|B-|
```

11. Programming Cable Wiring

Rx 2 —— 2 Tx
Tx 3 —— 1 Rx
GND 5 —— 3 GND

Computer side (RS-232) DB9 female   PLC side (COM1)   4 core S terminal male

12. Address Setting

Savch PLC with Ethernet port, the default IP address is: 192.168.1.111, subnet mask: 255.255.255.0, gateway: 192.168.1.1. Hardware DIP dial switch address range: 1-15, the default address is 1.

If you need to set a bigger address range, you can set on the software after connection with PLC, it can be set on the PLC parameter option in the software menu by checking on the "soft address" with the range of 1-254 (the soft address is prior to the hardware dial address).
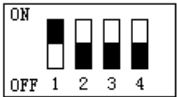
13. Power Supply Wiring

There are two kinds of power supplies for PLC: AC input and DC input. Please pay particular attention to the following notes:

• AC input voltage is 100~240VAC 50/60Hz unless otherwise stated. Connecting any one of the AC input wires to the terminal-L and terminal-N on the MPU will be OK, but for safety's sake, please connect the two wires (Live Wire & Neutral Wire) of AC input to terminal-L and terminal-N respectively.

• ⚠ Any AC110V or AC220V connected to the +24V terminal or input points will permanently damage the PLC.

• Please use wires of 2.5mm or above for the grounding of the MPU.

14. Mounting and installation

The PLC should be secured to an enclosed cabinet while mounting. For heat dissipation, make sure to provide a minimum clearance of 50mm between the unit and all sides of the cabinet. (See the figure.)

Rail Mounting: Use standard 35 mm rail.

Screw Mounting: Each MPU or extension module has two positioning screw holes, the diameter of the hole is 4.5mm. Please refer to the dimension figure for the location of the positioning holes and their spacing.
To avoid over temperature and for a better heat dissipation, do not mount PLC to a position near to the bottom/top of the cabinet. Do not mount PLC in vertical direction.

Extension Module Wiring: Connections between extension modules and connections between module and MPU are achieved through bus.An extension cable will be configured to every extension module, for the connection between two different modules.

Connection methods: turn the right side of extended interface (the last MPU or extension module) over, plug the extension cable in the extended interface, then press down the cover of the extended interface to reset the interface, the extended interface at the right side of the module will be reserved for extension of the next module. Connect all extension modules in turn in the same way.
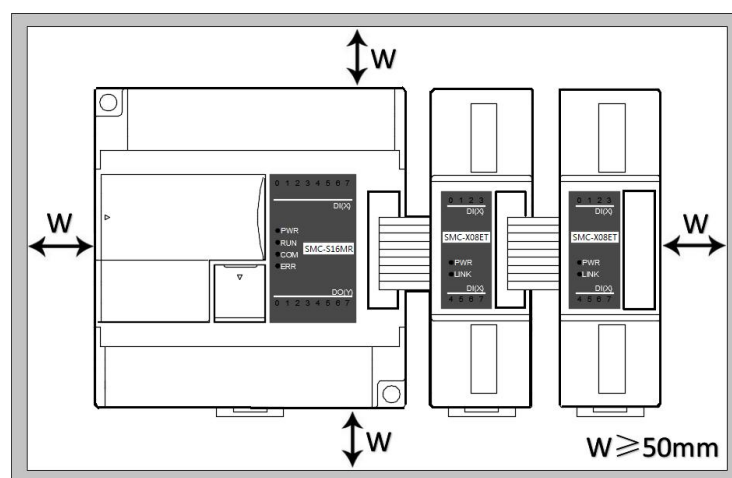
- Innovate for more | win forever
- Industry intelligence | Energy saving | Green power

Savch wechat
Service Number

Quanzhou Factory
Address:3# Zixin Road, Jiangnan Hi-Tech Industrial Park,
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Service Network
Service Hotline：4000-6161-619
Website：www.savch.net

Qualification

Received ISO9001,ISO14001 and OHSAS18001 recognition

Sales service contact address