SMART PDU

& SMART CABINET

USER'S MANUAL

SMART PDU/CABINET

USER’S MANUAL

Catalogue

I. Smart PDU General Function Introduction

Smart PDU have A, B, C, D models. A & B type have the function of remote monitoring and remote controlling: A type can implement total circuit and branch circuit monitoring and controlling; B type only can implement the total circuit monitoring and controlling. C & D type have remote monitoring function: C type can monitor both of the total circuit and branch circuit; D type can only monitor the total circuit. A, B, C, D four types of the corresponding product model are defined respectively: Class A: GMSC; Class B: GMC; Class C: GSM; Class D: GM.

Remote monitoring function include: total current, voltage, branch current (B & D type don't have this function), total power, total electric energy, temperature, humidity, smog, water logging, entrance guard etc.

Remote controlling function include: total circuit switch control, branch circuit switch control, branch circuit time delay switch control, branch circuit timing switch control etc. For the detailed function of all the types, please refer to < SPDU model selection>, here is the product appearance picture as below:

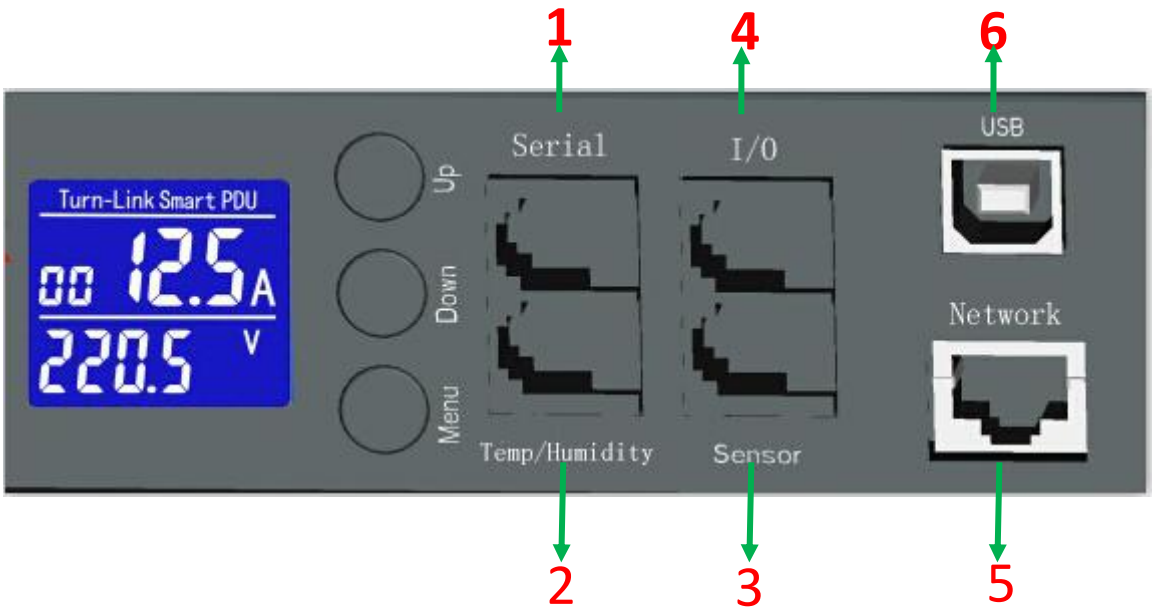
Smart PDU Function List

Main function	Details	Function series			
		Switched		Monitoring	
		A	B	C	D
Monitor	Total current	●	●	●	●
	Outlet load current	●	●	●	
	On/Off state of each outlet	●	●		
	Total power(kw)	●	●	●	●
	Total energy consumption(kwh)	●	●	●	●
	Input voltage	●	●	●	●
	Frequency	●	●	●	●
	Temperature/Humidity	●	●	●	●
	Smoke	●	●	●	●
	Door controlling	●	●	●	●
	Water logging	●	●	●	●
Control	Switch on/off input power		●		
	Switch on/off individual outlet	●			
	Delay switch on/off individual outlet	●			

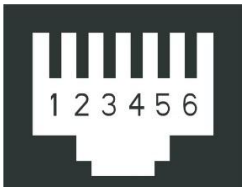
	Timing switch on/off individual outlet	●			
Configure	Set the delay of outlet sequential switching	●			
	Clear the total energy consumption(kwh)	●	●	●	●
Alarm	Total current upper limit	●	●	●	●
	Outlet current upper limit	●	●	●	●
	Temperature/Humidity upper limit	●	●	●	●
	Smoke	●	●	●	●
	Water	●	●	●	●
	Door	●	●	●	●
Alarm method	Buzzer	●	●	●	●
	email	●	●	●	●
	GSM Message(optional)	●	●	●	●
User management	User rights management and software update	●	●	●	●

1.1 Overview

The Smart PDU have Ethernet port, RS485 port, USB-RS232 port, Temp/Humidity port, Senor Port, I/O port etc. The interface definition is as blow:



Input/output Interface instruction: 4 RJ11 ports, the order of corresponding pins are as below:



1、Serial

RS485 Serial communication port is used for local monitoring mainly and can be communicated with RS485 port locally. And also can be matched with HMI (Human Machine Interface) provided by this company. The communication Baud rate is 9600. (Details can be seen on HMI OPERATING INSTRUCTIONS)

1	2	3	4	5	6
GND	485A-	485A-	485A+	485A+	GND

2、 Temp/Humidity

It is temperature and humidity interface. Usually, it (IIC bus type sensor) is optioned by the supplier because too many kinds of sensors in the market. The pins are as follows:

SCL: Clock; SDA: data; GND: Grounding; +5V: Power Positive Pole

1	2	3	4	5	6
GND	GND	SCL	SDA	+5V	+5V

3、Sensor

It is universal transducer Interface and can be used for the sensor signal input such as smog, water logging switch.

1	2	3	4	5	6
+24V	+24V	Water	SMOG	GND	GND

The pins are as follows:

Water: water logging monitor. It is high potential at normal conditions. When it monitored low potential, it will watering alarm; SMOG: Smog monitor. It is high potential at normal conditions. When it monitored low potential, it will SMOG alarm. +24V and GND is power supply.

4、 I/O

It is common digital value input/output. There are two routes for each input and output and can be used for status indicator of entrance guard and output control of dry contact etc.

1	2	3	4	5	6
GND	DI.0	DI.1/DO.0	DI.2	DI.3/DO.1	+24V

DI.0-DI.3 are digital value electrical level input. The input level between 5~24Vdc. These Pins can monitor input signal, when input level is higher than 5VDC, it can be regarded high level 1. Otherwise Low level 0. DO.0、DO.1 can be used output control, when control, it short to GND. The dry contact is used for entrance guard condition monitoring. If the entrance guard is passive switch signal, it can be used by connecting the 24V power simultaneously. DO.0 and DO.1 are the dry contacts output over the ground. The drive capability is not above 200mA, 100Vdc. They are respectively as water logging and smog alarm output.

5、 Network

It is network interface and used for TCP/IP internet network connections.

6、 USB

It is common interface for RS232 port transform to USB port and used as console debugging port.

7、 Key

Function keys instructions

7.1) UP: Page Up to view each loop current respectively, MODBUS protocol device ID, communication baud rate, IP address; Default data: ID=48 ； BAUD=9600 ； IP=192.168.2.188。

7.2) DOWN: Page Down to view each loop current, IP address, baud rate, device ID, etc.

7.3) MENU：Parameter Settings button, detailed setting method is as follows:

1、 Keep pressing "menu" button more than 3 seconds, after hearing the "drop" sound into the set state.

2、Press up and down keys, respectively, to view the ID number (device), BD (baud rate),

the UI (current I limit), 12 a upper limit of class II (current), P11 (upper limit of branch current level I), P12 (shunt current class II cap), UU (voltage upper limit), UL (lower voltage), UT (limit temperature), LT (lower temperature), UH (humidity limit), ED1 (four DI/DO alarm can make), LD1 (four I/O normal setting), EST (smoke, water enabled), LST (smoke, water status Settings), etc. All the parameters.

3、ED1 and EST defaults to zero, when need to enable this feature, please set to 1.

4、LD1 and LST defaults to zero, it indicates that the bit low level accordions normal, high level anomaly; If one is set to 1, show the high level for normal, low level of anomaly. Users have to set up correctly according to the actual use.

5、In the current parameter display page, press "menu" button to enter a state of parameter modification, and the numbers start flashing, then press the up and down key can modify the value, press "menu" button again to confirm.

6、Keep pressing the "menu" button for 5 seconds to exit the set state.

7.4) MENU + DOWN： Keep pressing the two keys at the same time for more than 3 seconds, and the equipment restart, any parameters don't reset at this time.

7.5) MENU+UP: Keep pressing the two buttons at the same time by more than 20 seconds, the equipment restart, and the equipment IP address restore factory Settings: 192.168.2.188.

1.2 Introduction of software operation interface

1.2.1 Login interface

Default login parameters：

IP Address： 192.168.2.55

Name ： 123

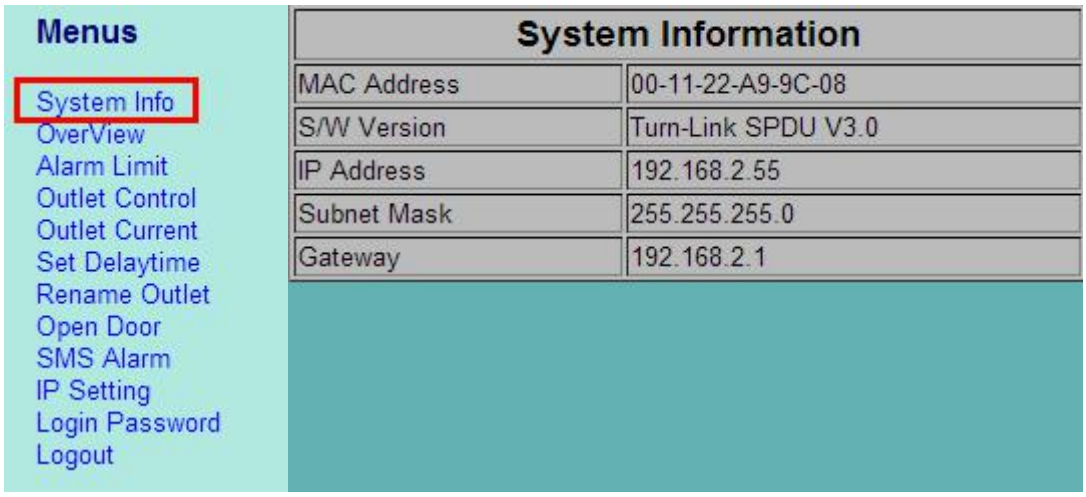
Password ： 123

If the user name or password mistake, it will reminder “error” and require you to login again.

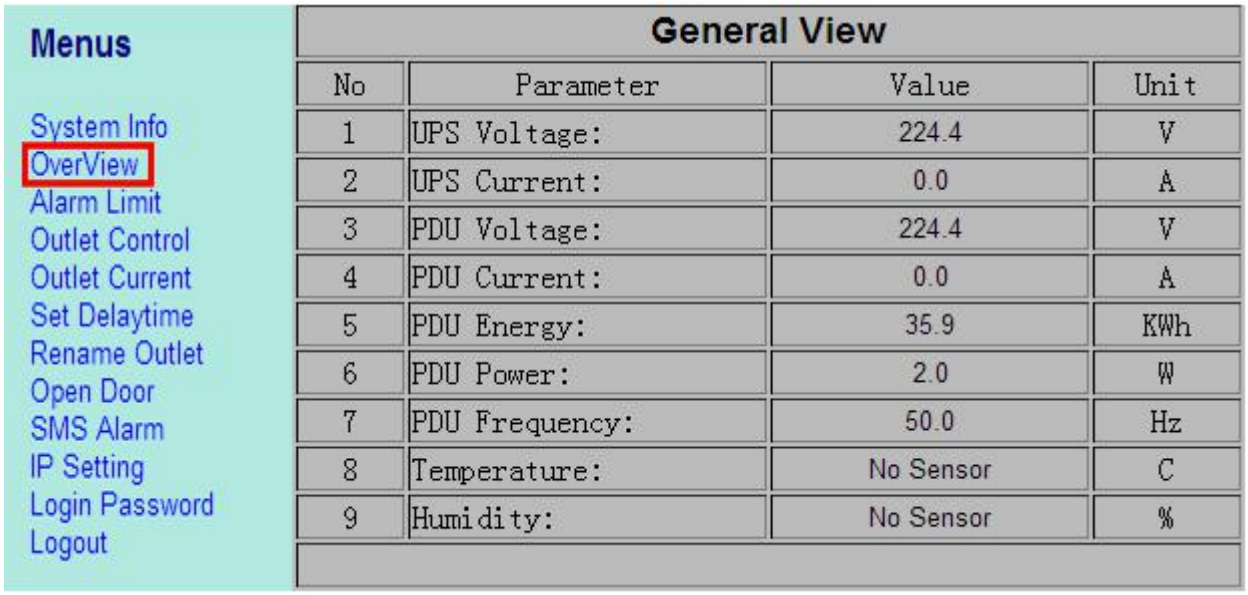
When the equipment starts, the IP address shows on the LCD by 4 pages twice.

1.2.2 System Information Overview

From this interface, the MBC address, S/W Version, IP address , Subnet Mask,Gateway etc. can be checked.



1.2.3 Parameter Overview Interface



Menus

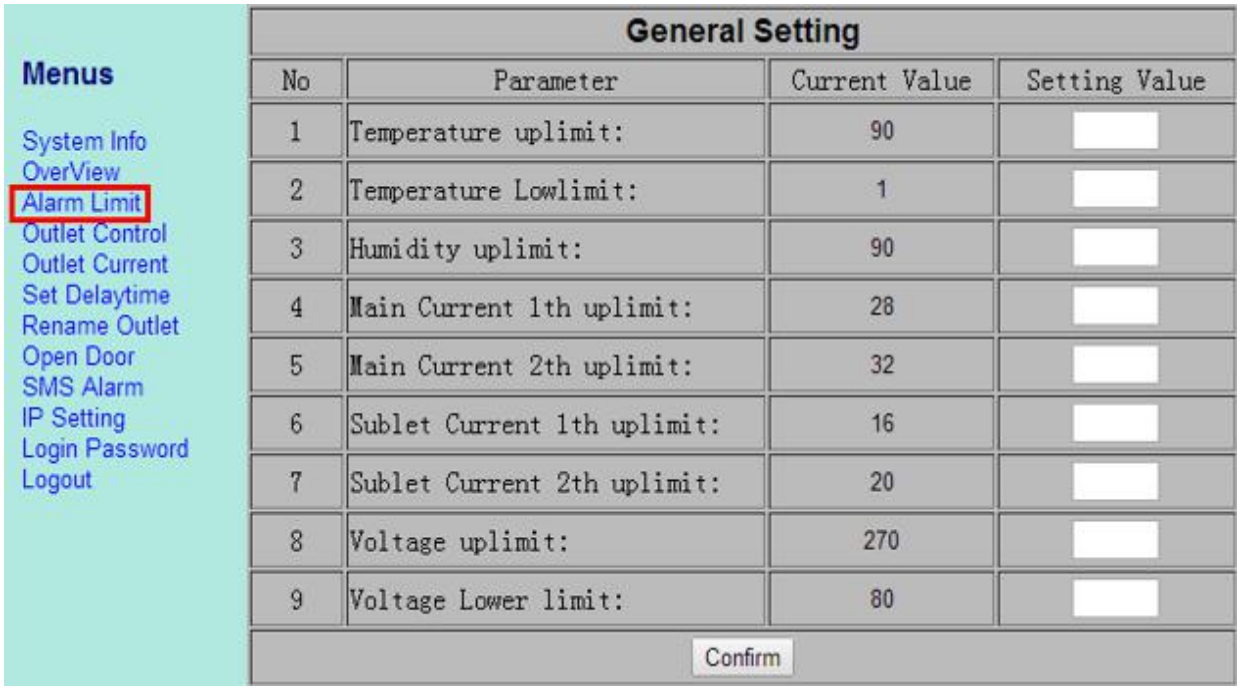
System Info
OverView
Alarm Limit
Outlet Control
Outlet Current
Set Delaytime
Rename Outlet
Open Door
SMS Alarm
IP Setting
Login Password
Logout

General View

No	Parameter	Value	Unit
1	UPS Voltage:	224.4	V
2	UPS Current:	0.0	A
3	PDU Voltage:	224.4	V
4	PDU Current:	0.0	A
5	PDU Energy:	35.9	KWh
6	PDU Power:	2.0	W
7	PDU Frequency:	50.0	Hz
8	Temperature:	No Sensor	C
9	Humidity:	No Sensor	%

From this interface, the voltage, total current, electric energy, power, frequency, temperature humidity etc. can be checked.

1.2.4 Alarm value setting interface



Menus

System Info
OverView
Alarm Limit
Outlet Control
Outlet Current
Set Delaytime
Rename Outlet
Open Door
SMS Alarm
IP Setting
Login Password
Logout

General Setting

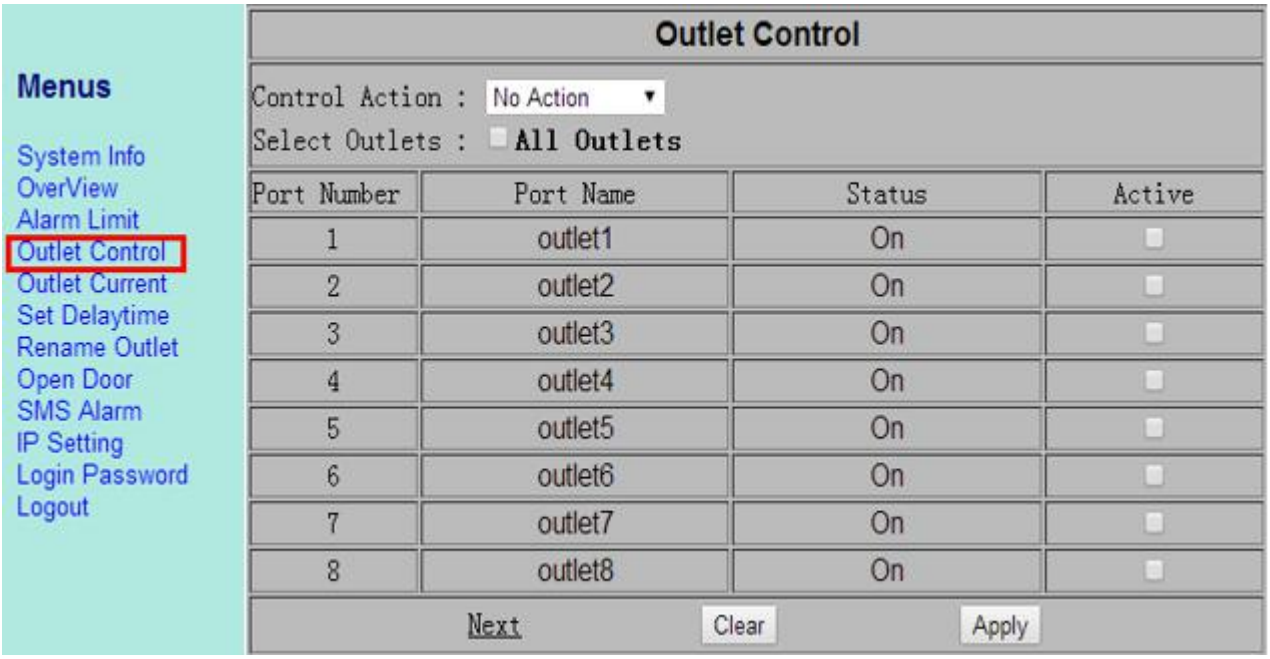
No	Parameter	Current Value	Setting Value
1	Temperature uplimit:	90	
2	Temperature Lowlimit:	1	
3	Humidity uplimit:	90	
4	Main Current 1th uplimit:	28	
5	Main Current 2th uplimit:	32	
6	Sublet Current 1th uplimit:	16	
7	Sublet Current 2th uplimit:	20	
8	Voltage uplimit:	270	
9	Voltage Lower limit:	80	

Confirm

From this interface: the temperature upper limit, temperature lower limit, humidity upper limit,

humidity lower limit, total current upper limit I, total current upper limit II, sublet current upper limit I, sublet current upper limit II etc. can be set.

1.2.5 Remote device control interface



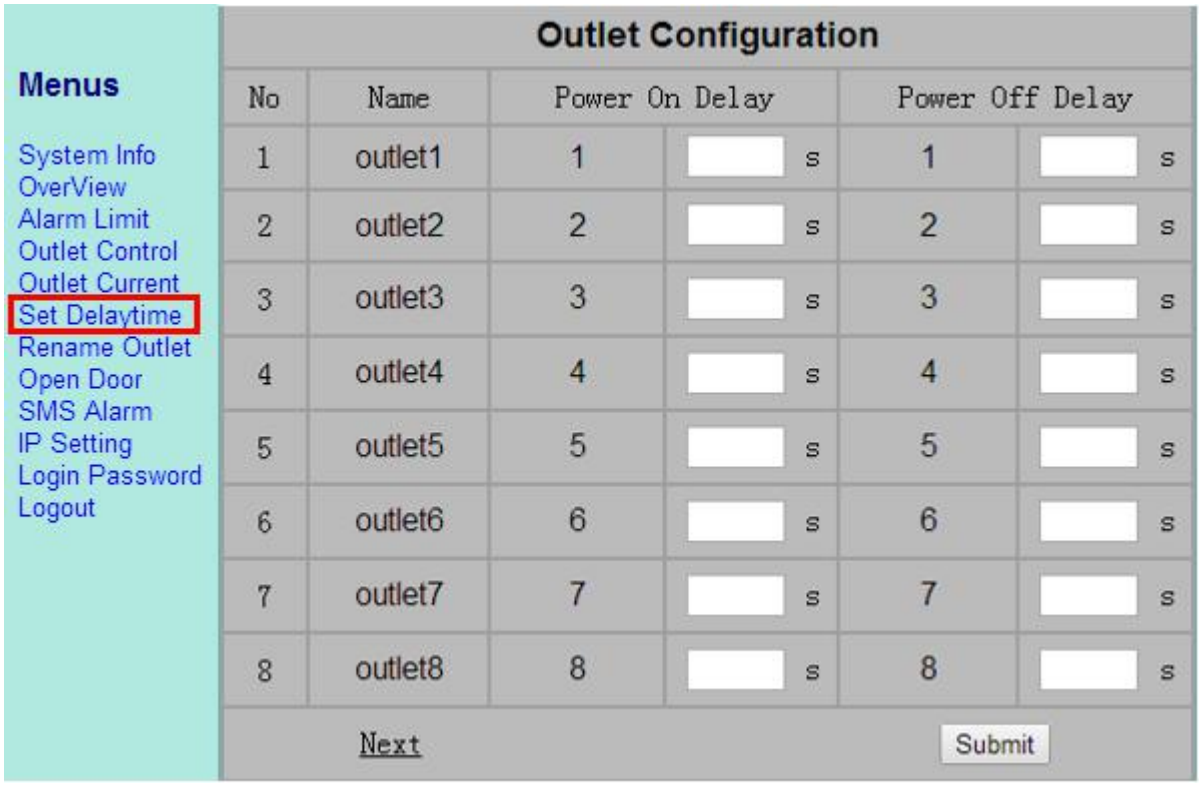
All the outlets or some individual outlets can be selected. The control action include “on immediate”, “on delay”, “off immediate”, “off delay” 4 types. “Delay on/off” action is only available after setting the delay time parameter.

In this page, press the “opendoor” button, then can enter opendoor page. As follow.

1.2.6 Remote open door interface

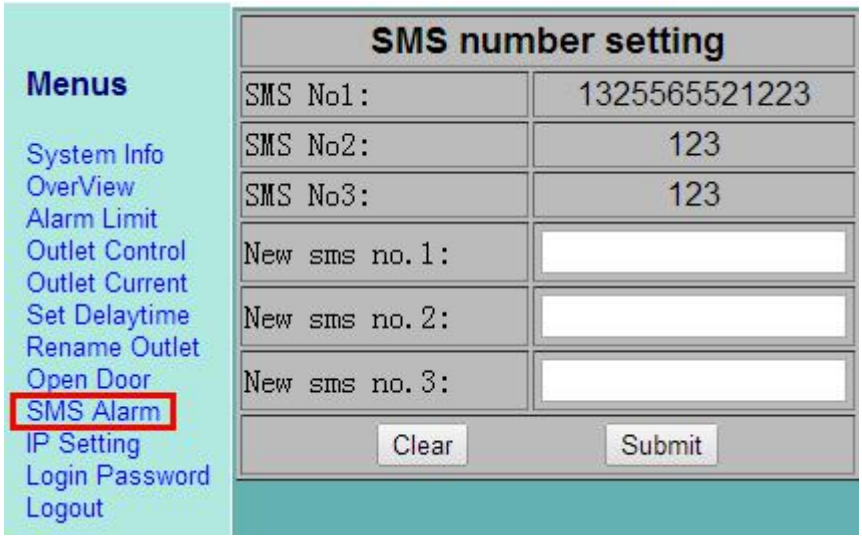
1.2.7 Setting opendoor password

1.2.8 Time delay parameter configuration interface



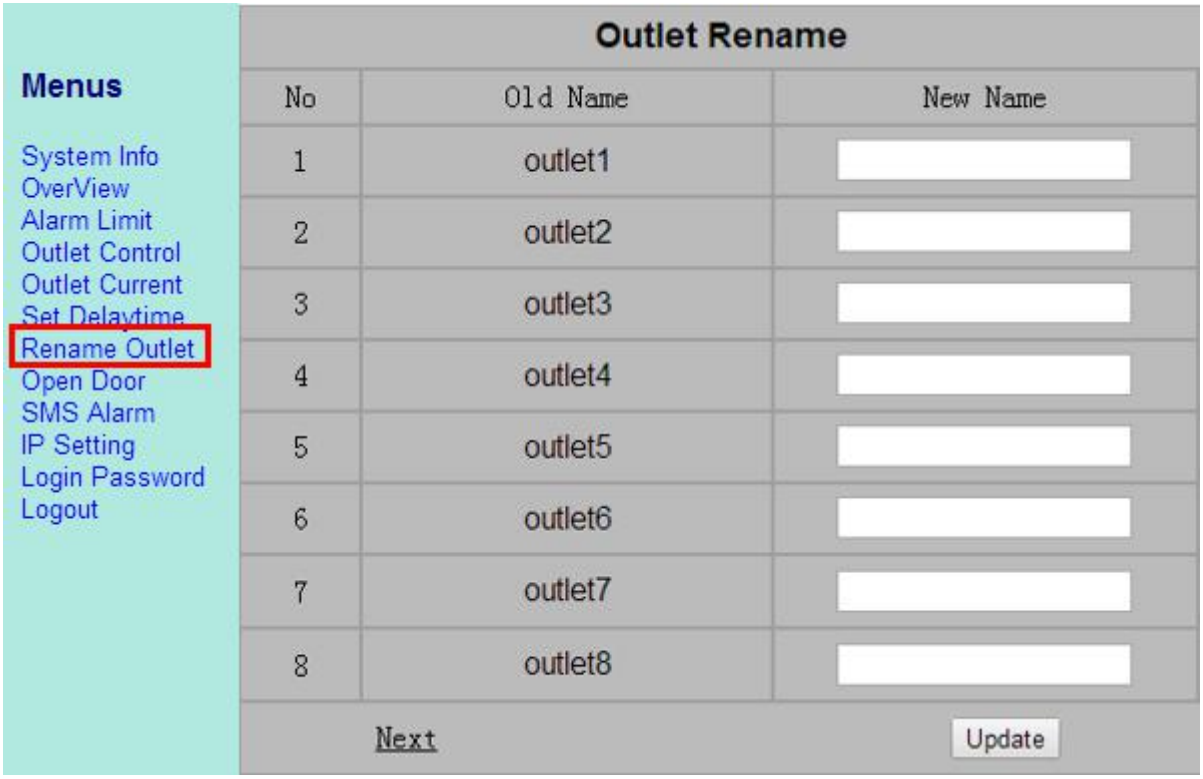
Please fill in the time delay on/off value for each outlet from this interface. The time unit is second and the max value is 999 seconds.

1.2.9 SMS Alarm interface (This function can optional for the user)



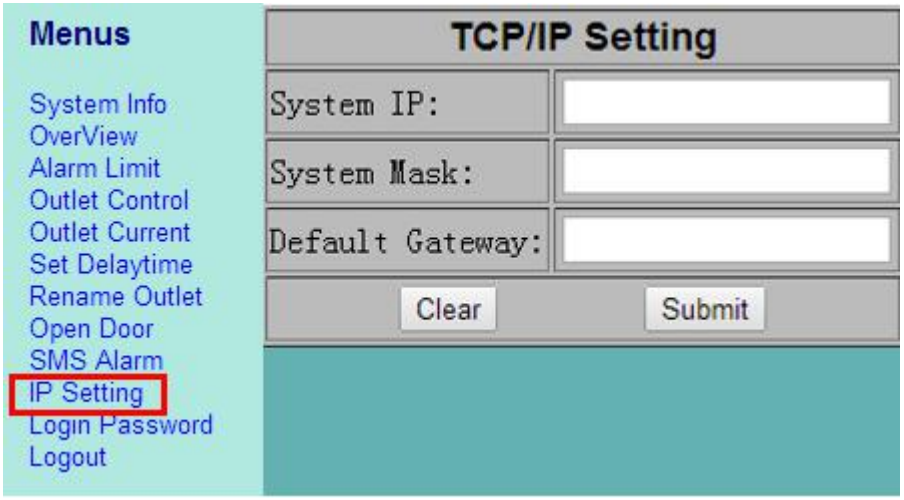
The alarming records can be showed on this interface and the mobile phone number can be set for sending the alarm information by SMS. Once alarming, it can send the detailed alarm information. Can send SMS to three mobile phone every time.

1.2.10 Rename Outlet interface



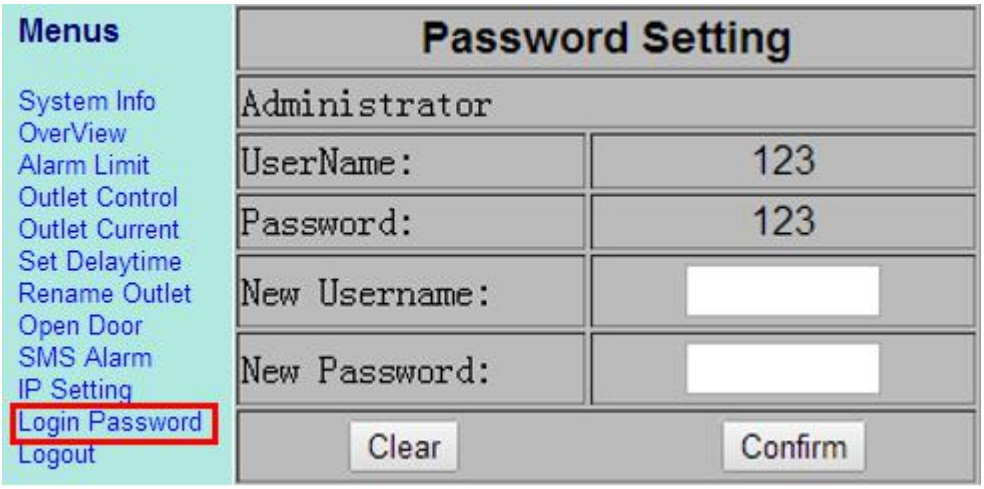
From this interface can rename outlet, total length no more than 20 character.

1.2.11 Revising the IP address



You have to fill in all the information for system IP, system mask and system gateway. When finished it, reboot smart PDU, the new IP address can be used.

1.2.12 Setting for login user name and password



Setting and amending login user name and password can be done on this interface.

1.3 Technical parameters of the device

1、 Working voltage: single phrase 100~250VAC, three phrase 380VAC
2、Maximum power current: 16~63A
3、Working frequency: 50/60Hz

1.4 Smart PDU centralized control system

1.4.1 Through the cascade serial of the master Smart PDU, the slave Smart PDU can be realized remote real-time monitoring and control management for several equipment's power supply in multi cabinets. The functions of Smart PDU are described as above chapters.

1.4.2 Master network Smart PDU: This device was connected to the network devices such as router or interchanger etc. through Ethernet interface, and can be realized TCP/IP remote communications. Meanwhile, it can be connected to the Slave Smart PDU by RS485 serial port and can be cascaded up to 64 pieces Slave Smart PDU in turn.

1.4.3 Slave serial Smart PDU: This device can be connected to the Master network Smart PDU by RS485 serial port, and can be realized serial port communication monitoring and controlling.

II. Smart Cabinet Function Introduction

Smart cabinet system provide the whole plan for cabinet equipment and computer room environment for centralized monitoring and centralized management. It provides the powerful guarantee for equipment to operate safely, reliably, stably and automatic.

2.1、 Smart cabinet system functions

1) Temperature and humidity monitor
   The temperature and humidity value of the environment can be monitored by the built-in temperature/humidity sensor and can be showed on the LCD. It also has alarming function of the out of limit.
2) Smog monitoring
   It can monitor the fire state of environment real-time by the smog sensor. And it will alarm once abnormity happens.
3) Entrance guard management
   It can monitor the cabinet door on/off status by the infrared sensor and the alarm can be set according to the user's need.
4) Automatic illumination of cabinet
   When the door opened, the light in the cabinet will switch on.
5) LCD touch control
   There is a 7-inch LCD in the front of the cabinet. It is used for setting and checking the parameter, conveniently and clearly.
6) Cabinet lighting function
   When the user open and close the cabinet door, the light in the front and rear will switch on automatic. It can prevent the inconvenience of operating because of the weak light.
7) Green energy and low power dissipation
   The smart monitoring system has low power consumption. The leading end of the whole system won't be exceeding 30W, and can save more than 80% energy comparing with the traditional monitoring systems.

2.2、The composition of smart cabinet

smart cabinet is mainly composed of three parts: Smart PDU (Smart Power Distribution Unit), HMI(Human Machine Interface) and cabinet itself. Please find the picture as fls:

HMI is mainly used for locally displaying all the parameters of the smart PDU. The specific functions is introduced as follows:

2.2.1 HMI appearance:

Front view

2.2.2 HMI technical parameters:

Working voltage: DC12V

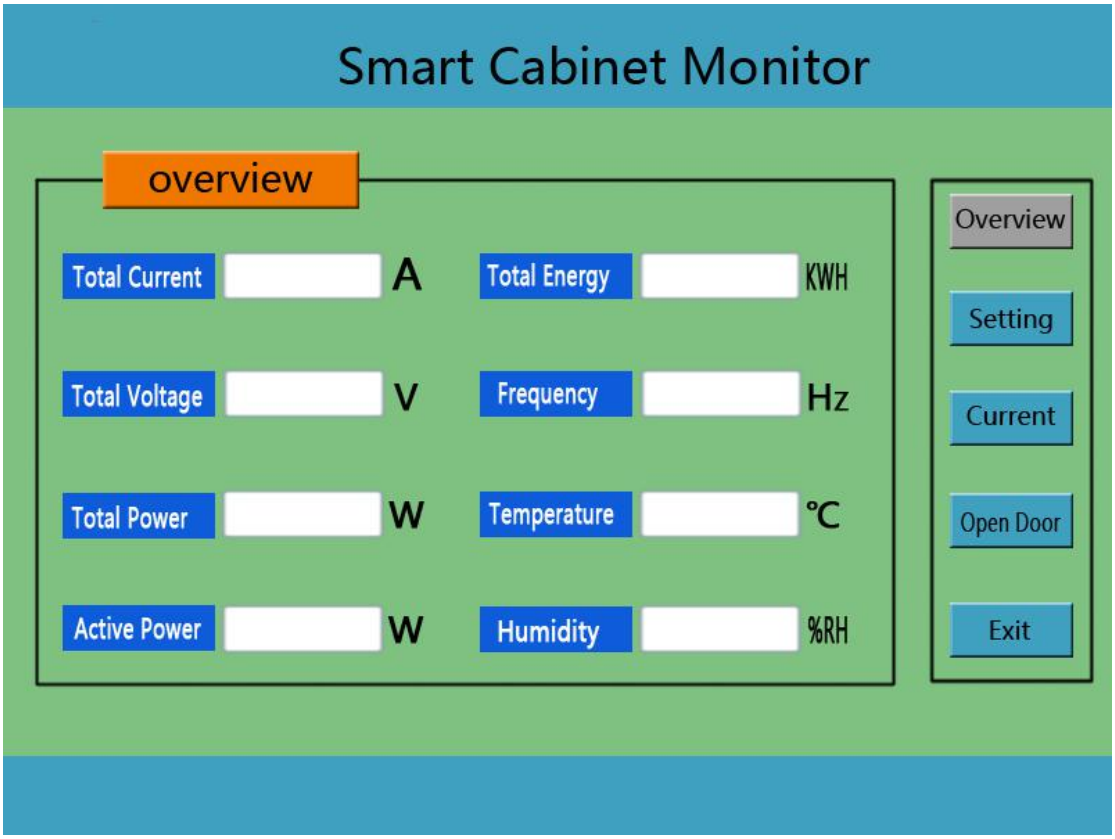
Communication mode: RS232/RS485

TCP/IP: MODBUS

Baud rate: 9600bps

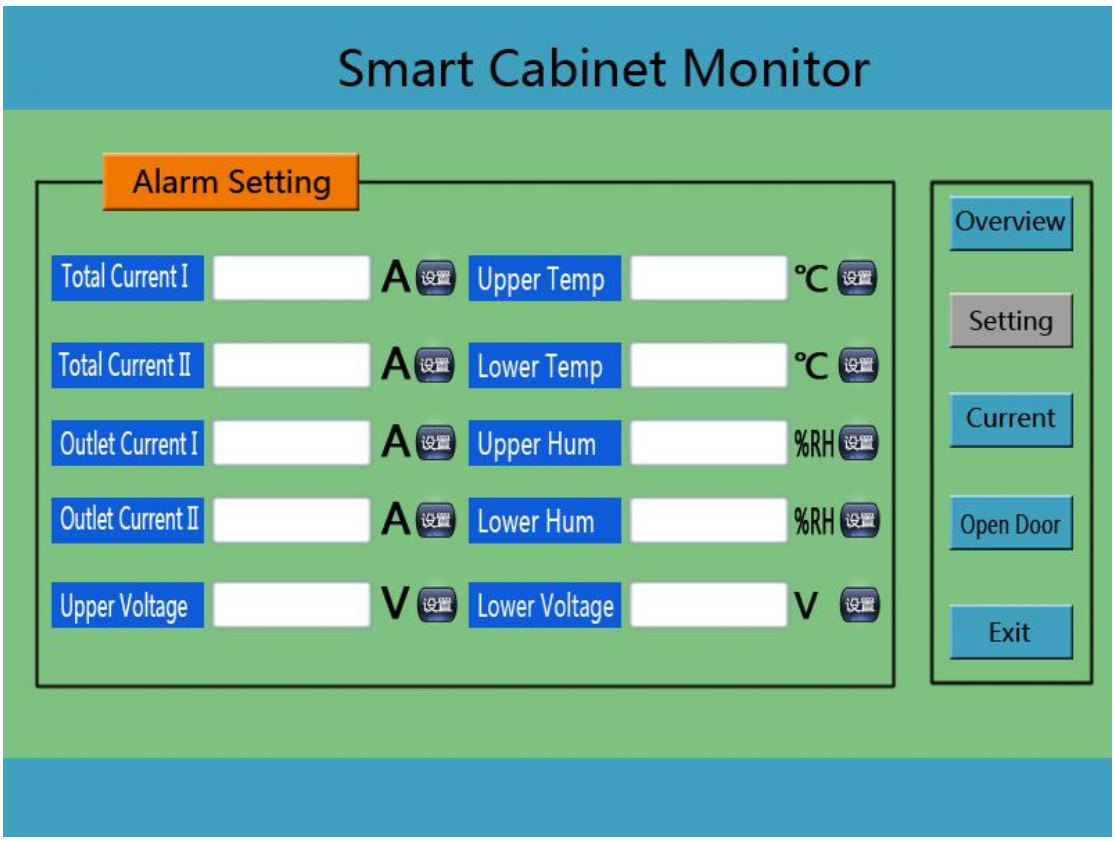
2.2.3 HMI interface introdution

2.2.3.1 The total circuit parameters display interface:

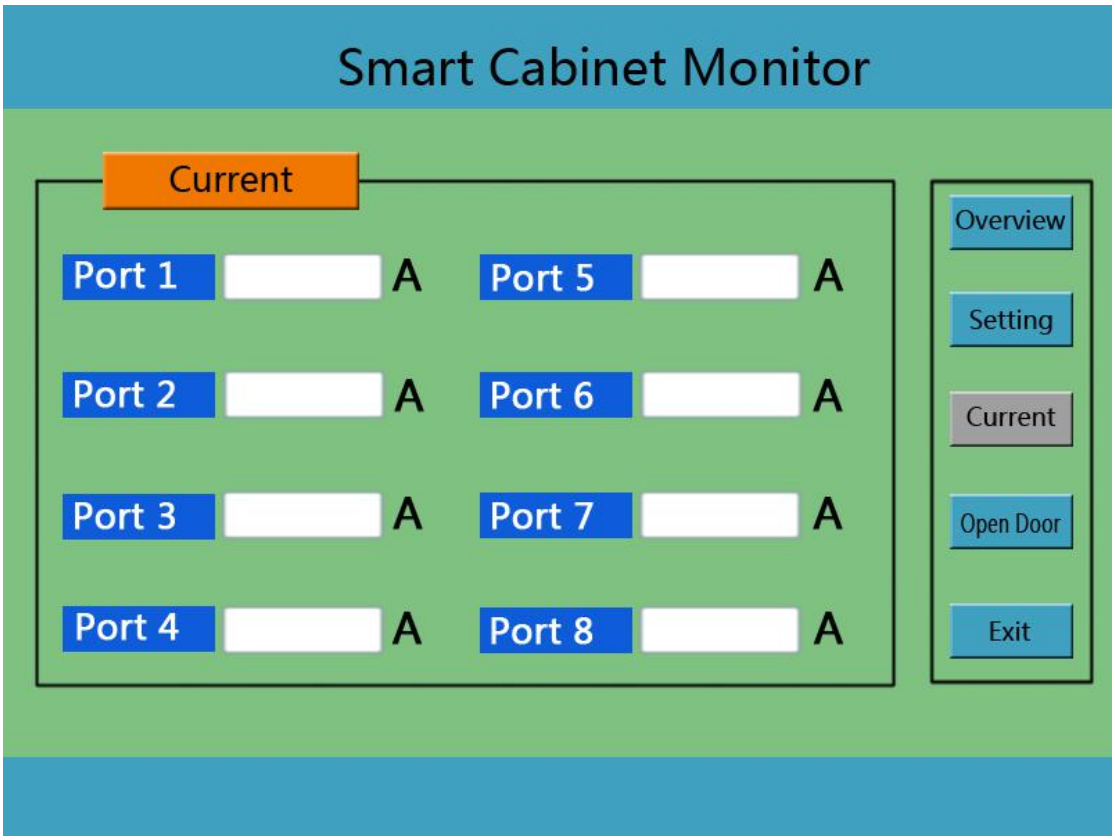


The total circuit parameter display include total current, total electric energy, frequency, temperature and humidity etc;

2.2.3.2 Alarm parameter setting interface:

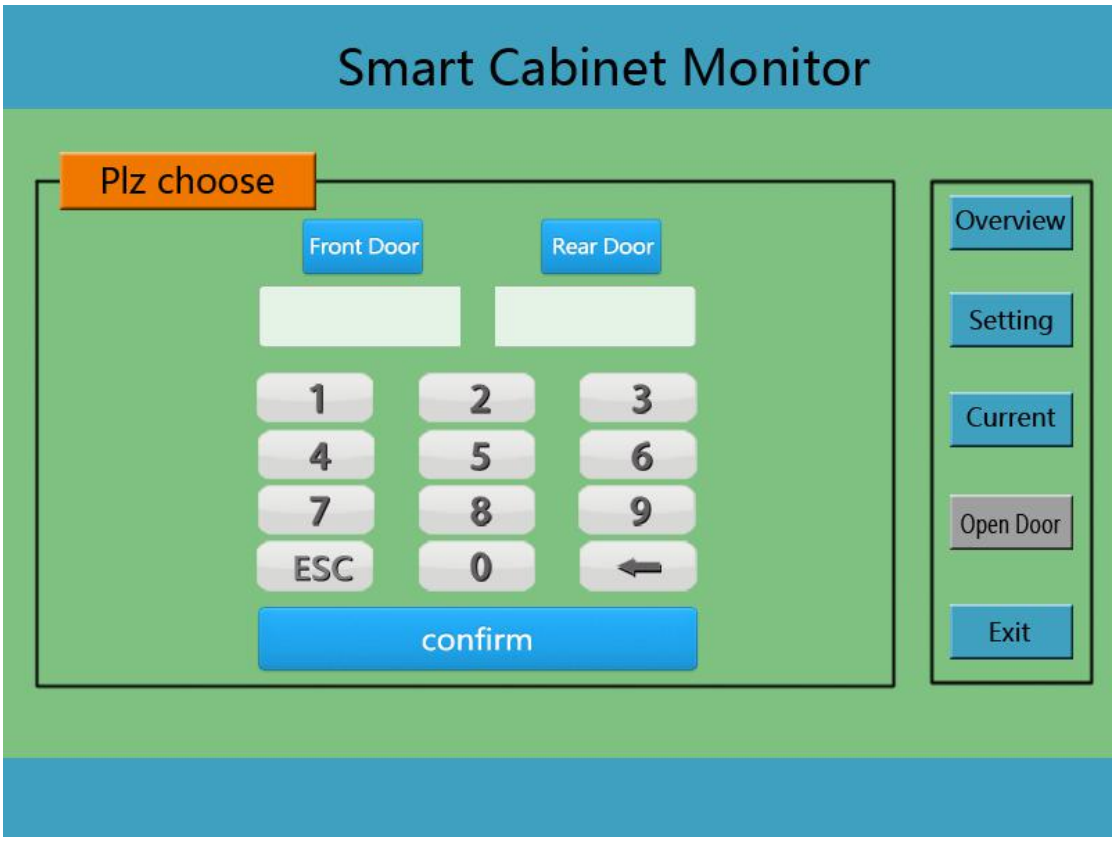


2.2.3.3 Branch current checking interface



If there's branch circuit measurement, this interface can check the branch circuit current.

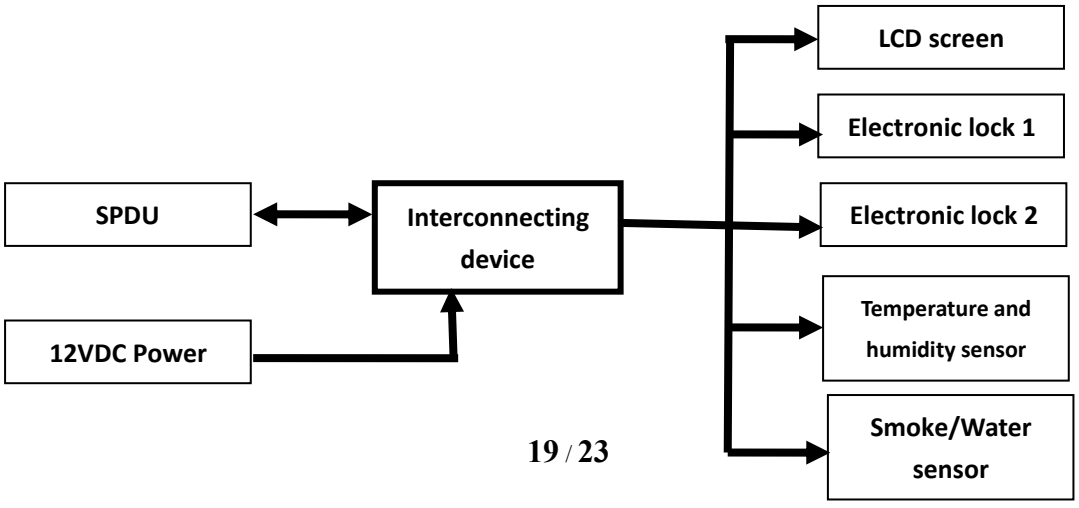
3.3.4、Open Door：



This interface has unlock function for front and rear doors. First, click the "open door" button, and then input the corresponding password to complete the unlock function. The password is made of four numbers from 0 to 9. Password change need to operate via web page.

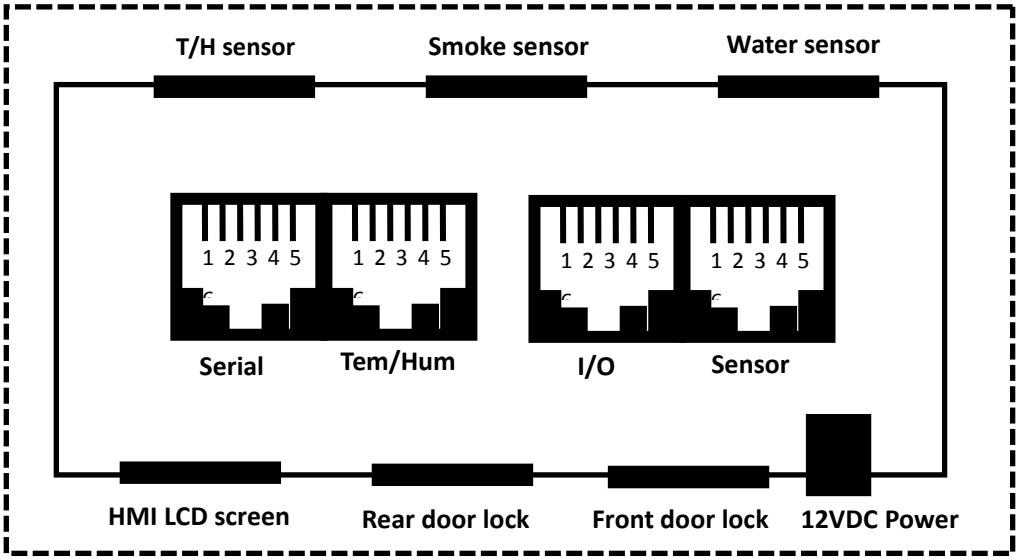
4、Wiring diagram inside the cabinet

The smart cabinet mainly include the following equipments: SPDU, HMI LCD screen, electronic lock (max 2 pieces), temperature and humidity sensor, smoke/water sensor and power adapter etc.

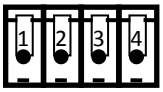


4.1、Interconnecting device

The interconnecting device is a bridge between the PDU and the communication of all the peripherals, and the port of the adapter is introduced as follows:



The "Serial, Tem/Hum, I/O, Sensor" are connected to the SPDU, Each pin functions are as the SPDU interface pin definition. The order of the rest of the six green four-core connector pins is as shown in figure:



4.1.1、HMI LCD interface definition:

1	2	3	4
GND	RS485B	RS485A	VCC(12-24VDC)

4.1.2、Rear door interface definitions：

1	2	3	4
The lock state enter 1	The lock state enter 2	Lock control terminal 1	Lock control terminal 2 (Vcc)

4.1.3、Front door interface definitions：

1	2	3	4
The lock state enter 1	The lock state enter 2	Lock control terminal 1	Lock control terminal 2 (Vcc)

Wiring diagram

4.1.4、Temperature and humidity sensor interface definitions:：

1	2	3	4
VCC	SDA	SCL	GND

4.1.5、Smoke sensor interface definition:

1	2	3	4
GND	(NC)	Smoke In	VCC(12VDC)

Remark：

Smoke sensor parameters：

Working voltage： 12VDC；

Output contact: normally open/closed type;

The output contact connected between “smoke in” and “VCC”；

4.1.6、Water sensor interface definition：

1	2	3	4
GND	(NC)	Water in	VCC(12VDC)

Remark：

Smoke sensor parameters：

Working voltage： 12VDC；

Output contact: normally open/closed type;

The output contact connected between “water in” and “VCC”；

4.2、Reference models of Peripheral

1、Electronic control lock: Ningbo Shengjiu Company

2、Temperature and humidity sensor：SHT10

3、Smoke sensor: Work voltage 12VDC, normally close contacts

4、Water sensor: Work voltage 12VDC, normally close contacts