Appendix :

PX series monitoring platform instructions

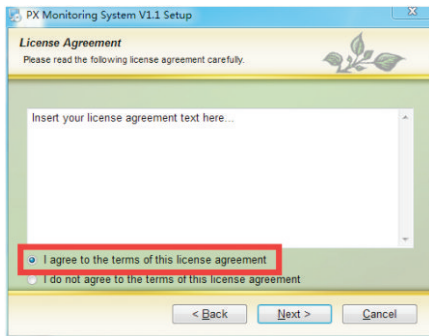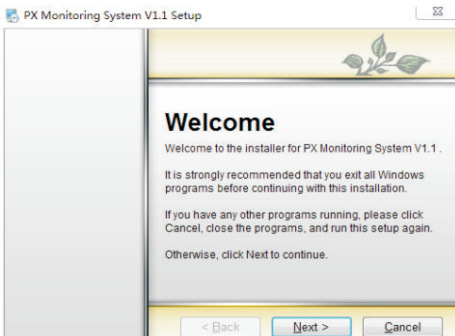### 1 Software installation :

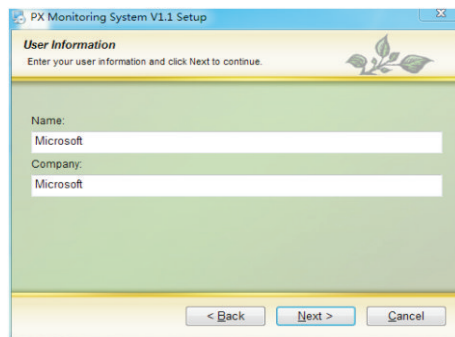Download files from Carspa official website on location www.carspa.cc :

PX Monitoring System V1.1.exe ,
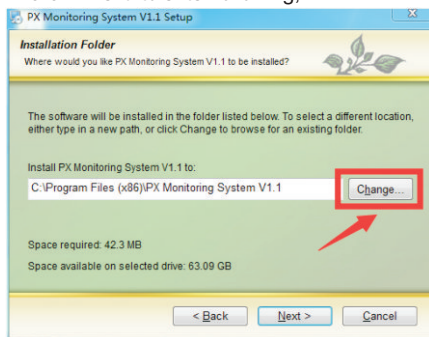
As below : PX Monitoring System V1.1

▼ Double click "°" to install,enter the interface as follows:

▼ Click "Next" to enter following picture,

▼ Double click "°" to install,enter the interface as follows:

▼ Fill in the user name and company name , click "Next" to enter following,

► Click "Change..." to confirm the installation path which is recommended to default. Then the following interface will appear. Click "Next" until installation is completed. Click "Finish" to complete the installation.
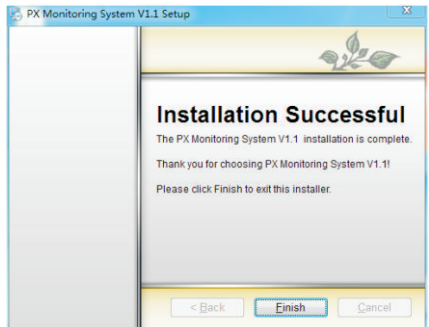
▶ 2 RS485 Isolated converter driver installation (This step can be ignored if it has already installed) :

If it is a converter with our company, please go to our website to download , Or, find the following figure from RS485 isolation converte : CDM21224_Setup.exe file , double click to install。
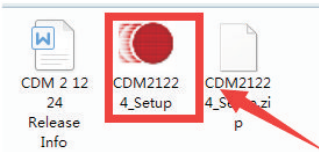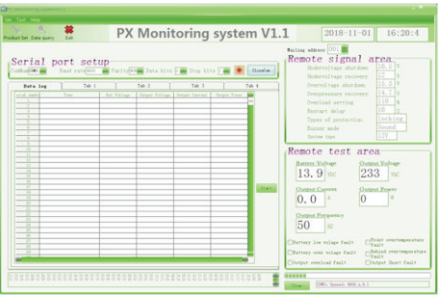

▶ 3 Login monitoring platform :

After confirming that product is connected to the RS485 isolation converter and PC, click: Start - All Programs - PX Monitoring System V1.1, the interface is as follows:
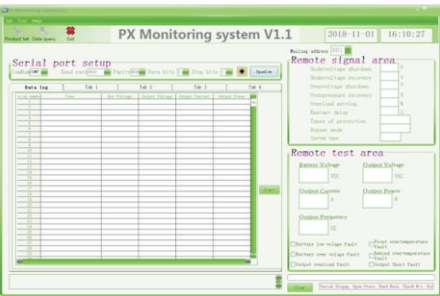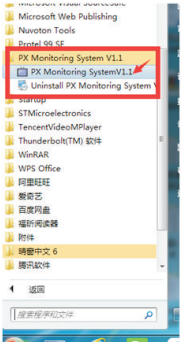
◀ After startup, login monitoring interface is as follows:

◀ Select the serial port number "ComNum" corresponding to the RS485 converter, click to open the serial port button "OpenCom", exit the system, click "Exit" or the upper right corner "X", the operation monitoring data interface is as shown below:

Communication protocol

1-1 Overview

This product uses Modbus-RTU communication protocol, RS485 interface , Modbus protocol defines check code, data sequence, etc. , these are all necessary for specific data exchange。 Modbus protocol uses master-slave acknowledgment connection (half duplex) on one communication line , this means that the signal is transmitted in the opposite direction on a separate communication line。 First, the signal of the host computer is addressed to a unique terminal device (slave) , then, the response signal sent by the terminal device is transmitted to the host in the opposite direction。

Modbus protocol only allows communication between host (PC, etc.) and terminal device, and does not allow data exchange between independent terminal devices , so that each terminal device does not occupy the communication line when they initialize, but only responds to the inquiry signal reaching the local machine

1-1-1. Transfer method

Information transmission is asynchronous, and the communication information transmitted between the master and the slave is in bytes , including 1 start bit, 8 data bits (the smallest valid bit is sent first), no parity, 1 stop bit。

1-1-2.Information frame format

Address code	Function code	Data area	CRC check code
1 byte	1 byte	n bytes	2 bytes

Address code：The address code is composed of one byte (8-bit binary code) at the beginning of the frame, and the decimal is 1 to 255。These bits indicate the address of the user-specified terminal device that will receive the host data from it。The address of each terminal device must be unique, and only the addressed terminal will respond to the query containing the address。When the terminal sends back a response, the slave address data in the response tells the host which terminal is communicating with it。

Function code：The function code tells the terminal which terminal is performing what function。The following table lists the function codes used in this series of instruments, as well as their meaning and function。

Data area：The data area contains the data required by the terminal to perform a specific function or the data collected by the terminal in response to the query。The content of these data may be numeric, reference address or set value。For example, the function code tells the terminal to read a register, and the data area needs to indicate which register to start and how many data to read. The embedded address and data vary according to the type and the different contents between the slaves。

CRC check code：The error check field (CRC) occupies two bytes and contains a 16-bit binary value。The CRC value is calculated by the transmitting device and then appended to the data frame. The receiving device recalculates the CRC value when receiving the data, and then compares it with the value in the received CRC field. If the two values are not equal, it occurs error。

1-2. Read registers data enumeration

This feature allows the user to obtain data and system parameters collected and recorded by the device。The host can read one or more register values and can read up to 12 register values at a time (cannot exceed the defined address range)。

Slave address	1-255
Function code	0x03
Start register address high	0x00
Start register address low	0-23
Register length high	0x00
Register length low	1-12
CRC Check low	
CRC Check high	

The following example is the basic data collected from machine-readable 3 from the 01 (the data frame takes up 2 bytes per address) output voltage, output current, output frequency, where the output voltage address is 0001H, the output current The address is 0002H, and the address of the output frequency is 0003H。

Host sending:

Slave address	0X01
Function code	0x03
Start register address high	0x00
Start register address low	0x01
Register length high	0x00
Register length low	0x03
CRC Check low	0x54
CRC Check high	0x0B

Slave response：

Slave address	0X01
Function code	0x03
Register length	0x06
Register high	0x00
Register low	0xE3
Register high	0x00
Register low	0xE6
Register high	0x00
Register low	0x32
CRC High length	0x84
CRC Low length	0x81

Indicate：

Output voltage(V)： Convert 0x00+0xE3 to decimal equal to 227

Output current(A)： Convert 0x00+0xE6 to decimal equal to 230/100=2.3

Output frequency(Hz)： Convert 0x00+0x32 to decimal equal to 50

1-3. Address parameter list

Register address	Data content	Data description	Type
0000	Battery voltage	(Register high + register low)/10	Word
0001	Output voltage	Register high + register low	Word
0002	Output current	(Register high + register low)/100	Word
0003	Output frequency	Register high + register low	Word
0004	Restart delay value	Register high + register low	Word
0005	Low voltage protection value	Register high + register low	Word
0006	Low voltage recovery value	Register high + register low	Word
0007	Over voltage protection value	Register high + register low	Word
0008	Over voltage recovery value	Register high + register low	Word
0009	Overload ratio value	Register high + register low	Word
0010	Mode setting value	See the mode setting table for details.	Word
0011	Fault information	See the fault information table for details	Word

1-3-1.Mode setting value register correspondence table

Bit	15	14	13	......	5	4	3	2	1	0
Name	Reserved						MODE1	MODE0	Reserved	

Bit	Detail
0-1	Reserved
2	MODE0: Overload short circuit mode 0 : Automatic restart 1 : Lock no output, need to restart
3	MODE1: Alarm sound mode 0 : Early warning/fault sound 1 : Silent
4-15	Reserved

1-3-2 Fault information register correspondence table

Bit	15	14	13	......	9	8	7	6	5	4	3	2	1	0
Name	Reserved						FAULT2	Reserved		FAULT1		FAULT0		

Bit	Detail
0-1	FAULT0: Battery over voltage error 00：Normal 01：Low voltage 10：Over voltage
2-3	FAULT1: Over temperature error 00：Normal 01：Front-end circuit over temperature 10：Back-end circuit over temperature 11：Both front and backend over temperature
4-5	Reserved
6-7	FAULT3: Output error 00：Normal 01：Over load 10：Shirt circuit
8-15	Reserved

1.4 Communication interface wiring

Please connect product communication interface A to RS485 converter communication interface A; B to RS485 converter communication interface B; be sure to pay attention to the A and B wiring when wiring, otherwise it will not be able to communicate normally. (G is the communication cable shield terminal block, can be connected or not)