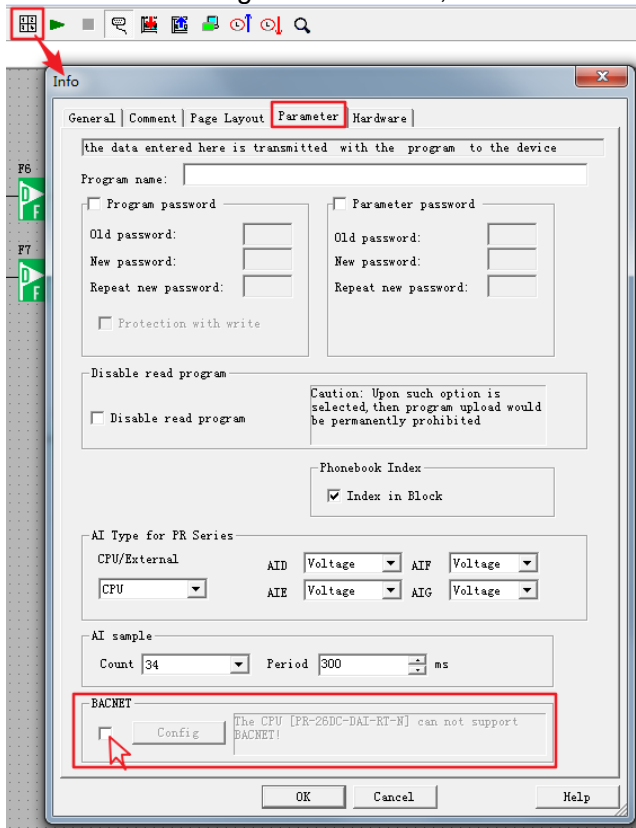# Rievtech PLC BACnet MSTP parameter configuration method and usage examples

NOTE:
(1)Ethernet PLC with firmware version number >=V1.57 supports BACnet.
(2) Only xLogic with version number >=V3.4.3.7 supports BACnet.
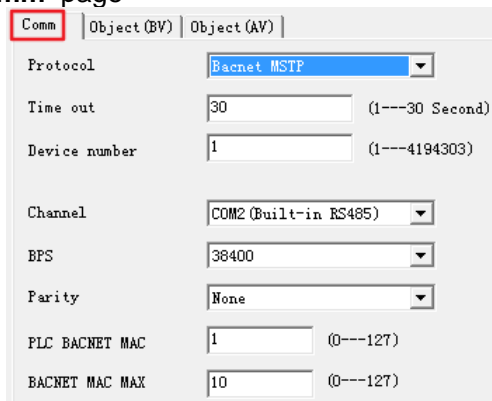
1. Set PLC BACnet MSTP

Open the BACnet configuration window, as shown in the figure below:

Select the check box, the 'Config' button becomes available, then click this button, the configuration window pops up, as shown in the figure below. Divided into 3 pages: 'Comm', 'Object(BV)' and 'Object(AV)', the following three pages are introduced respectively.
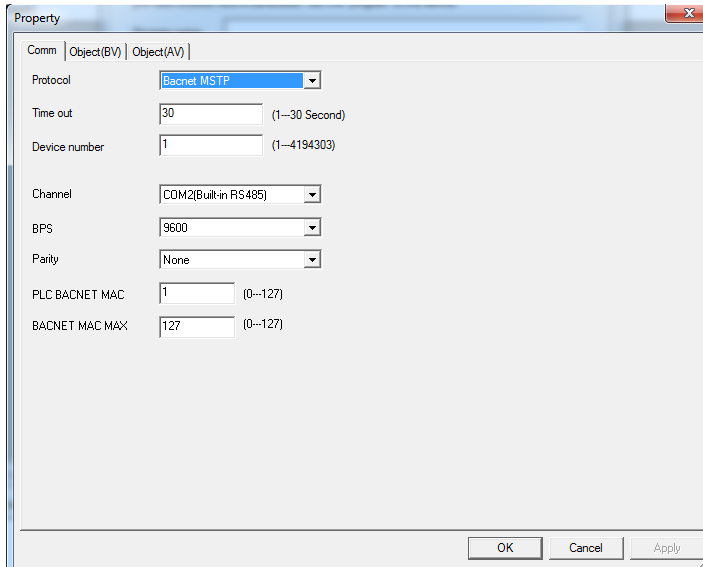
'Comm' page

'Protocol'

Select BACnet protocol, there are 2 options: 'Bacnet MSTP' for RS485 communication and 'Bacnet IP' for Ethernet communication. Here select 'Bacnet MSTP'.

'Time out'

A value from 1 -- 30 (Second) can be set.

'Device number'

A value from 1 to 41943303 can be set, and its uniqueness needs to be guaranteed. **'Channel'**

Select the RS485 channel supported by the PLC. The number of RS485 channels supported by different models is also different. The distribution of com ports on the PLC is shown in the figure below, taking PR-26DC-DAI-RT-N as an example:
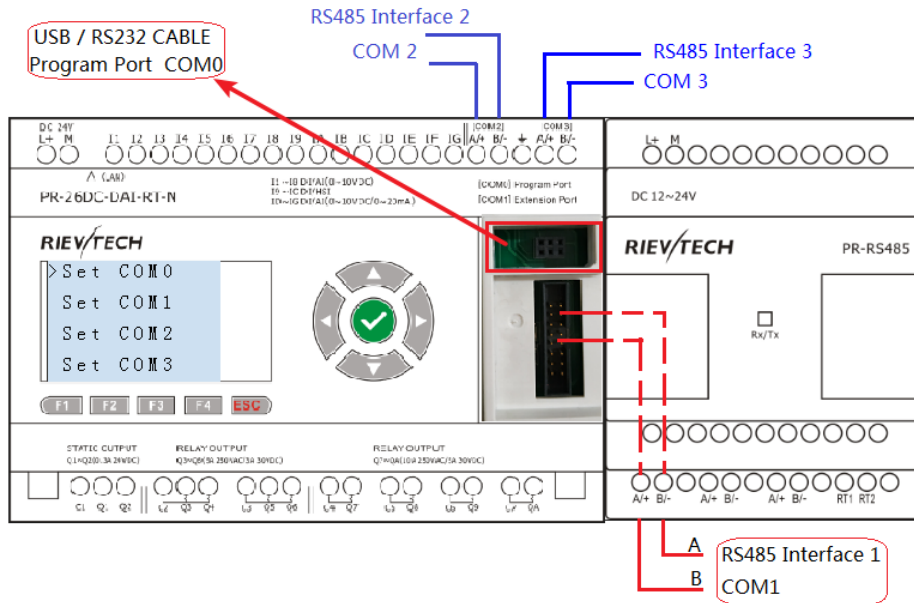
'BPS'

Set the baud rate for RS485 communication. Different coms have different baud rate options. The default baud rate of PLC is 9600.

'Parity'

There are three options: None, Odd, and Even, and the PLC defaults to None.
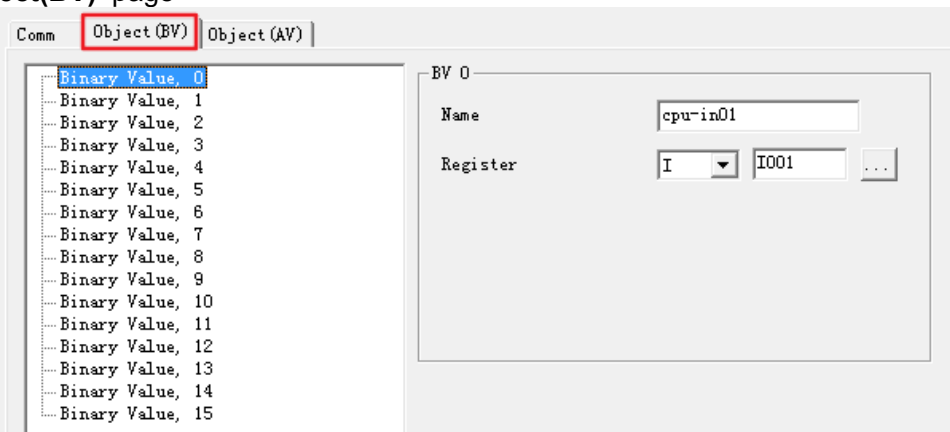
'PLC BACNET MAC'

It is necessary to ensure that the MAC of each device is unique, and a value from 0 to 127 can be set.

'BACNET MAC MAX'

The default value is 127, which sets the maximum mac value of BACnet devices in the network. The input range is 0 --127. Set the appropriate value according to the requirement.

'Object(BV)' page

16 digital objects can be set on this page, and an I, Q or F register can be assigned to each object.   Registers of type 'I' can only be read, not written.   Registers of type 'Q' and 'F' support read/write. But in the program in the PLC, the input pins of their blocks need to be suspended, so that the write operation can be successful.

First select 'Binary Value, 0' in the list on the left, set the name of the object on the right, and assign a register to it.   'Name' only allows up to 8 commonly used characters.

'Object(AV)' page
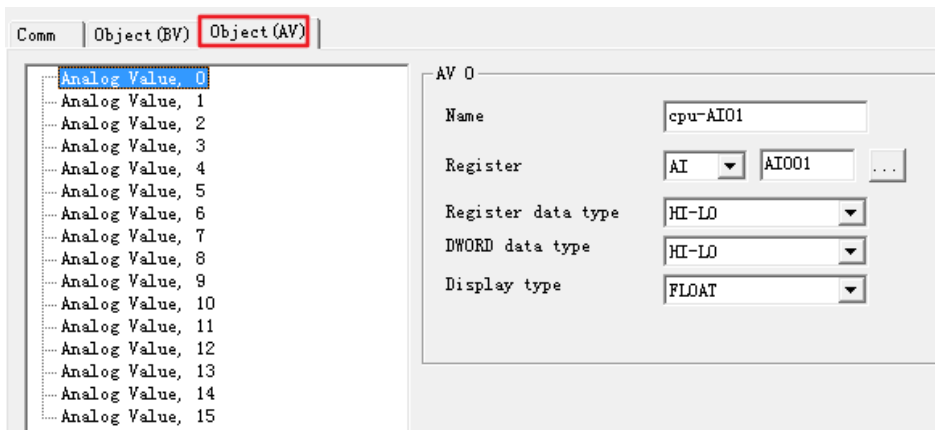
Similarly, 16 analog objects can be set on this page, and an AI, AQ, AF or VW register can be assigned to each object.   The 'AI' register can only read values, but cannot write values. AQ, AF and VW support read/write, and only when the input pins of these register blocks are floating, the write value operation can be successful.

The operation steps are the same as the BV page.

'Register data type'

The byte order when providing the value in register, you can choose 'HI-LO' and 'LO-HI' modes.

'DWORD data type'

The byte order of DWORD data, you can choose 'HI-LO' and 'LO-HI' modes.

'Display type'

Select the data format when displaying values, only support 'FLOAT'.

After configuring all the parameters, click the 'OK' button in the lower right corner, as shown in the figure below. Then download the BACnet settings to the PLC along with the xLogic program, and the settings will take effect after the PLC restarts.
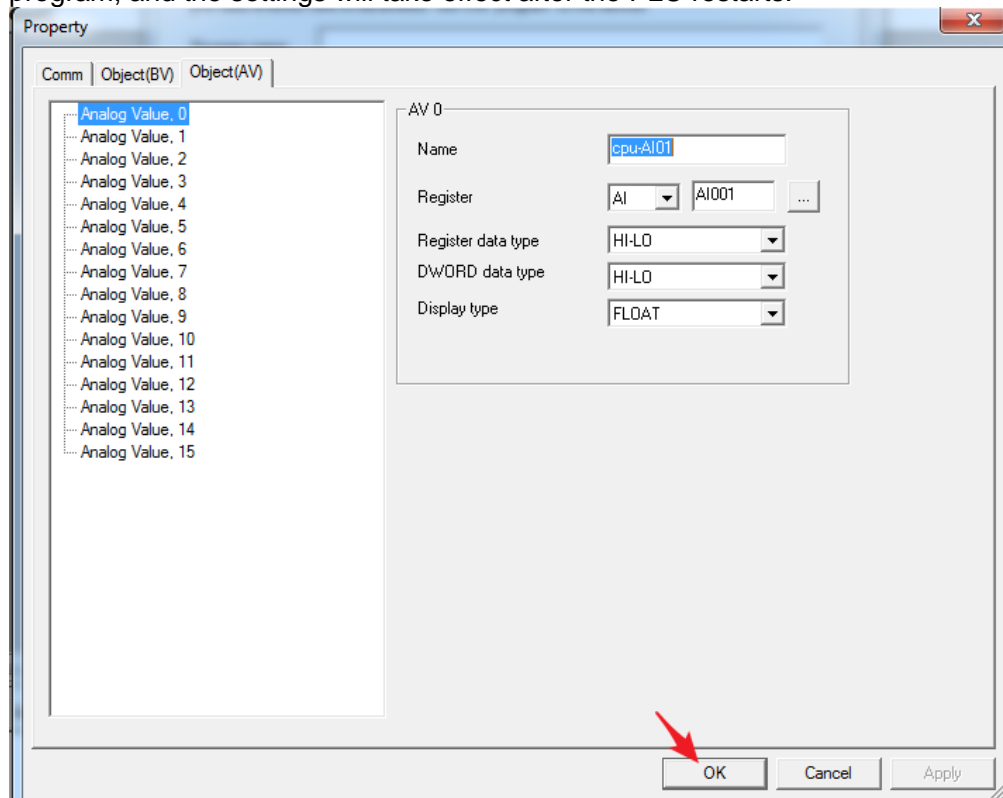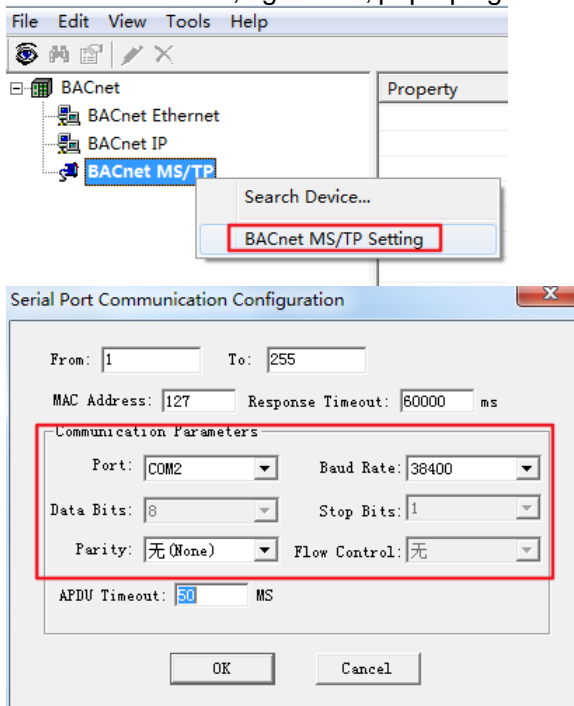
2. BACnetScan software reads and writes PLC registers

After completing the above PLC parameter settings, open the BACnetScan software (only for demonstration, you can use other software with the same function), as shown in the figure below:
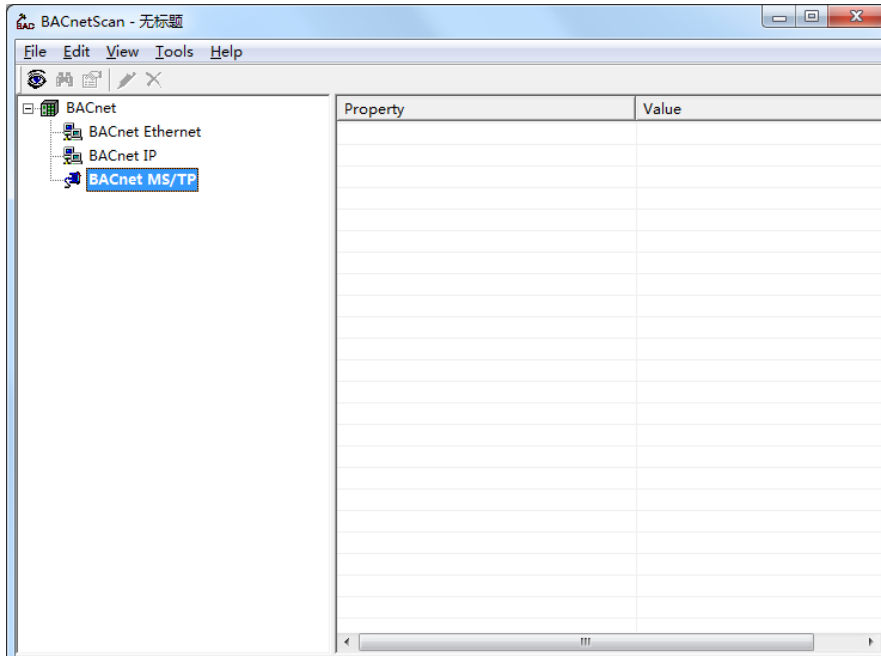

Select 'BACnet MS/TP', right-click, pop-up right-click menu, select 'BACnet MS/TP Setting'.

In the above dialog box, the value of 'MAC Address' cannot conflict with the MAC address of other devices, and the default value is 127.
The parameters in 'Communication Parameters' need to be the same as those in the PLC, as shown in the figure below. Note that COM2 here is the COM port corresponding to the RS485 channel on the PC, which is different from COM2 in the figure below.
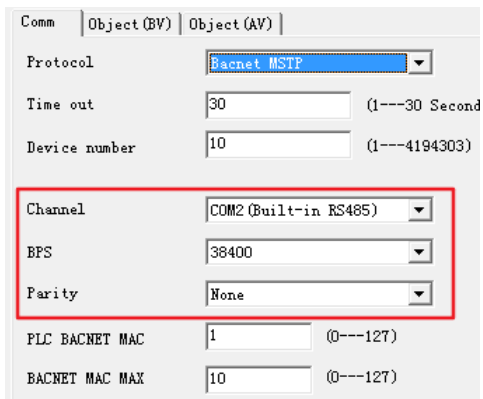
After setting, click the 'OK' button below.

Then select the 'Search Device...' option in the right-click menu, as shown in the figure below.
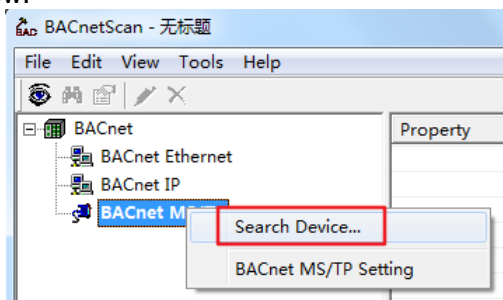

At this time, some prompts will be displayed in the prompt bar, and all found devices will be listed under the option of 'BACnet MS/TP', as shown in the figure below, and the message bar will prompt 'BACnet MS/TP 'Device: 1' is found'.
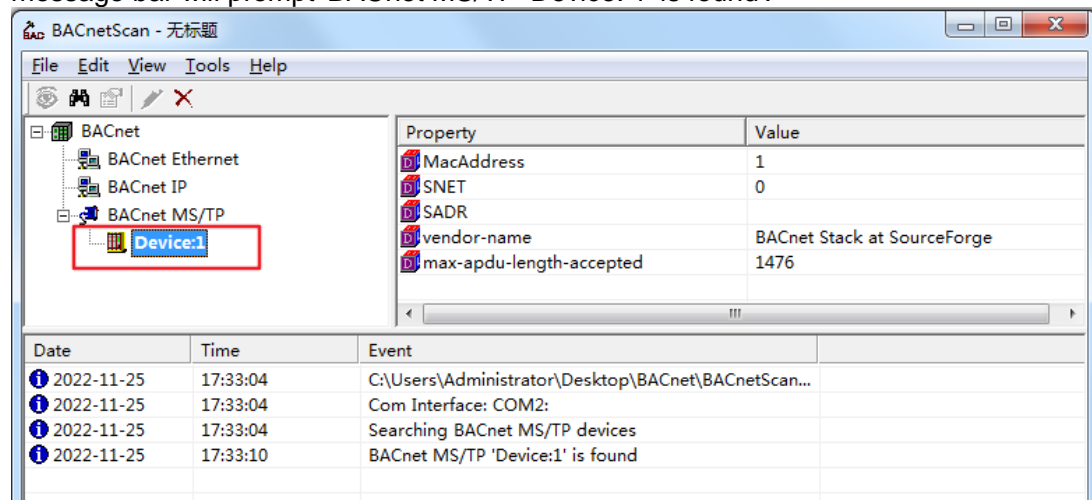
Select 'Device: 1', right-click, pop up the right-click menu, and select the 'Search Object' option.
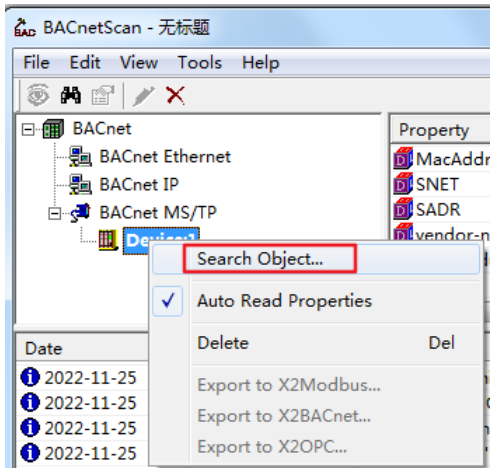
BACnetScan will list all the searched Objects under the Device: 1 option, as shown in the figure below:
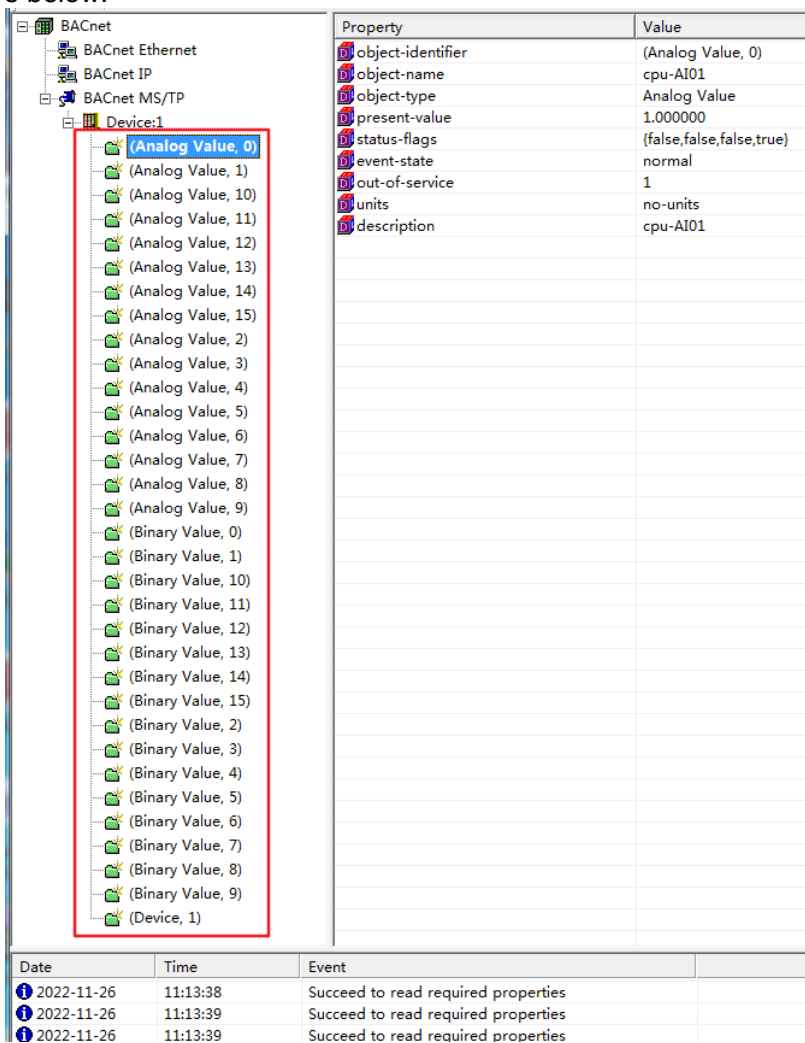
All 16 Binary Values and 16 Analog Values of the PLC will be listed, even if they are not used.

Both the name and value of 'Analog Value, 0' can be found in the property bar on the right, as shown in the figure below.

Select the 'present-value' attribute, right-click, and select the 'Read Present Value' option in the right-click menu to update the current value of PLC AI01.

Select the 'Write Present Value' option in the right-click menu to write the value of PLC AF1 as shown in the figure below:

Enter a new value in the 'Value' of the pop-up window, and then click the 'Set' button to write the new value into AF1.

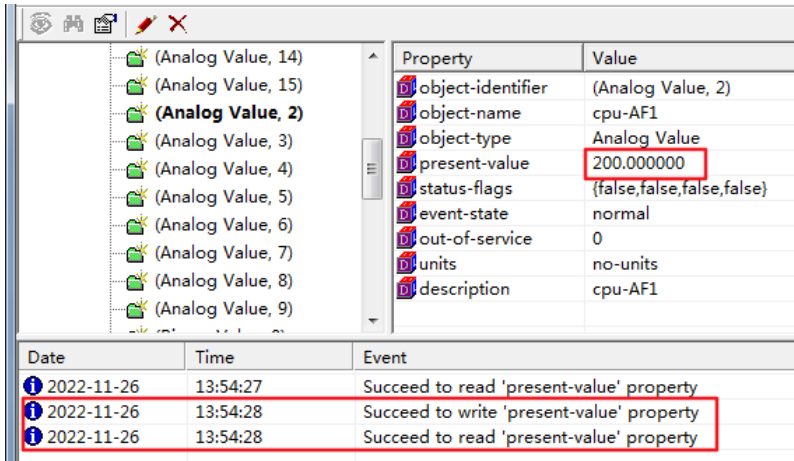Write operations have priorities 1-16, with the minimum priority being 16.

After the writing is successful, the value of 'present-value' will change to a new value, and the information column will prompt 'Succeed to write 'present-value' property'.
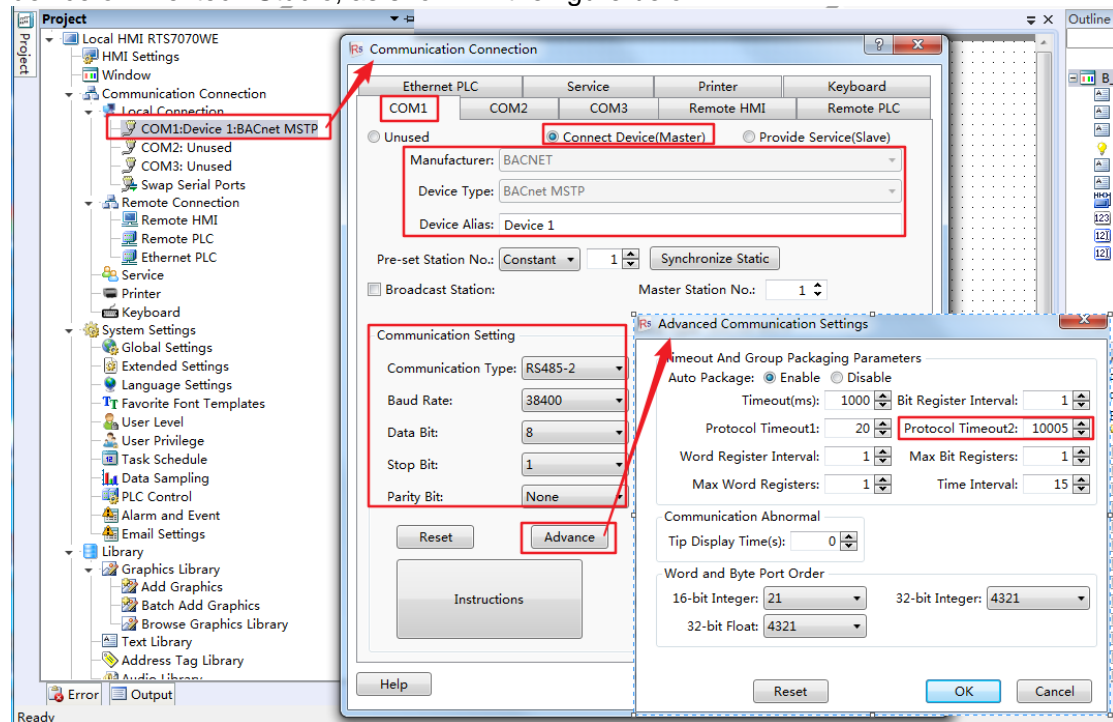
3. HMI communicates with PLC through BACnet MSTP protocol

(1) Add BACnet device

The COM2 of the PLC is connected to the serial port COM1 of the HMI. Add BACnet MSTP device on Rievtech Studio, as shown in the figure below.


Double-click COM1 under 'Local Connection' and check the 'Connect Device (Master)' option. Select 'BACNET' for 'Manufacturer' and 'BACnet MSTP' for 'Device Type'.

The parameters of 'Communication Setting' are the same as in PLC.

Pay attention when filling in the value of 'Protocol Timeout2' in 'Advance'. Take '127005' as an example. Its first 3 digits '127' indicate that the maximum MAC in the network is 127. This value cannot be set too large, otherwise it will affect the communication efficiency. It is recommended to be the same as the parameters in the PLC, for example, it is 10 in this example. The last 3 digits '005' are the MAC of the HMI. This value cannot be the same as the MAC of other BACnet. It is recommended that all MAC values be used in order from small to large.
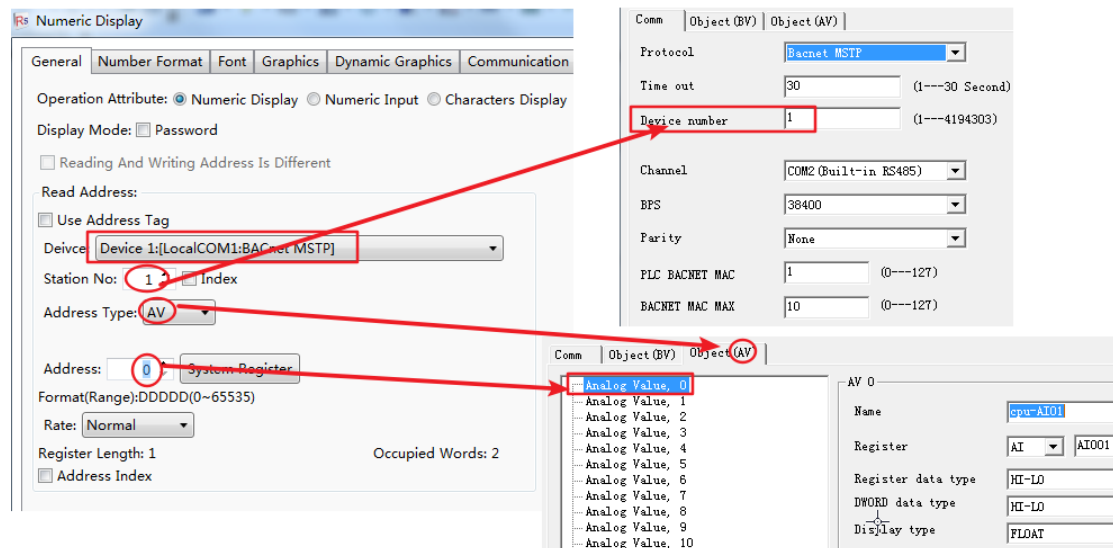
After the setting is complete, click the 'OK' button.
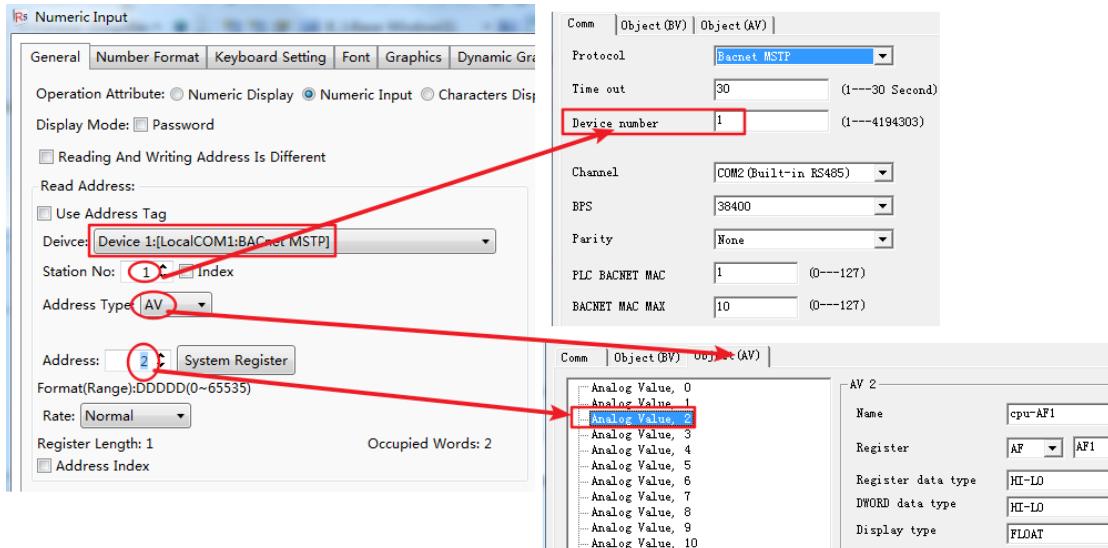
(2) Add components
Bit element
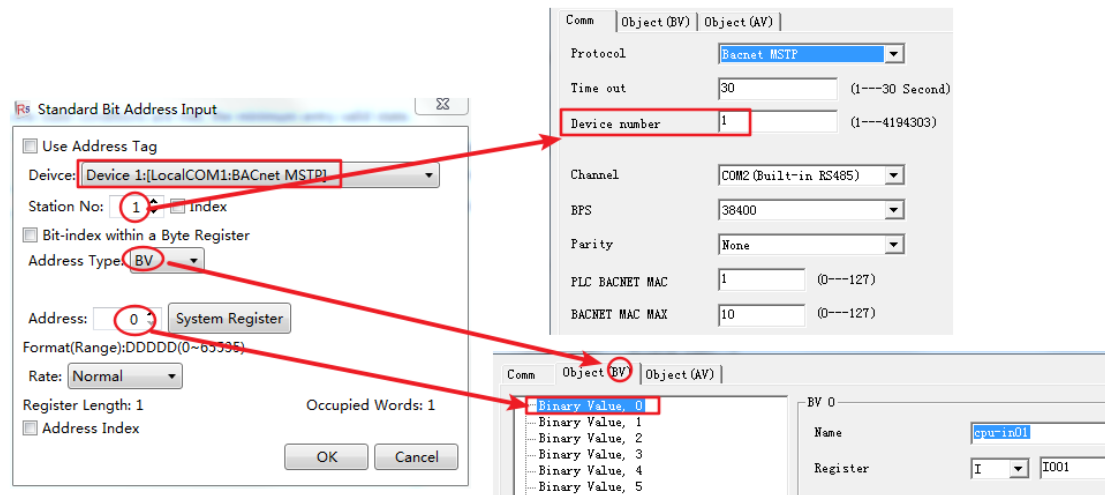
The value of 'Station No.' comes from the 'Device number' in the PLC parameter.
'BV0' is 'Binary Value,0', and so are other registers.

Word element

The value of 'Station No.' comes from the 'Device number' in the PLC parameter.
'AV0' is 'Analog Value,0', and so are other registers.

The value of 'Station No.' comes from the 'Device number' in the PLC parameter.
'AV2' is 'Analog Value,2', and so are other registers.

In addition, it should be noted that the values are all in 'float' format, so the display format of the character components is as follows:
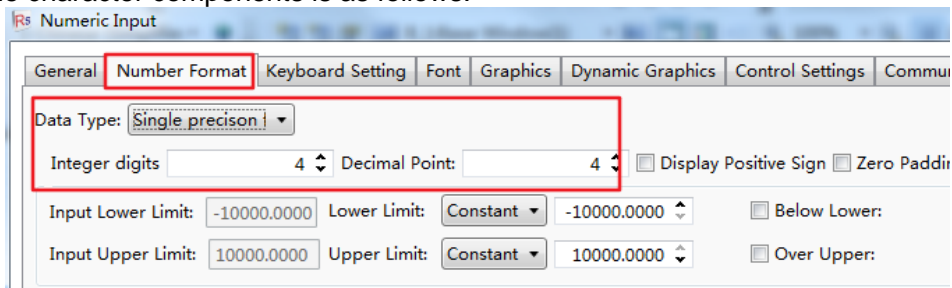
After adding the components, download the program to the HMI, and observe whether there are communication timeouts, communication errors and other prompts.

RS485-2 PIN