

# DASYLab Linking to Modbus/TCP

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# Introduction

In this topic, the DASyLab solution with i-8000-MTCP/iP-8000-MTCP via the Modbus/TCP protocol will be presented step by step. We run DASyLab vision 12 to do this demo. You can request data from external devices such like ET-7000, I-7188-MTCP, WISE-7000 via Modbus protocol as well.

Before you run DASyLab, the i-8431/8831-MTCP, iP-8841/8441-MTCP should be set up by Modbus Utility. The NetID is set by dipswitch which is on the right side of the i-8431/8831-MTCP, iP-8841/8441-MTCP. The channel mapping is shown on the list.

The screenshot shows the Modbus Utility software interface. The window title is "Modbus Utility Ver 1.7.2 2012/03/14". The interface includes a menu bar (File, Windows, Client tools, Setting, Help) and a toolbar with icons for Load, Save, Monitor, Log, Scale, Trend, Help, and Exit. The main area is divided into several sections:

- Device Information:** Shows "I-8431" and "NetID=1". A red box highlights "NetID=1" with an arrow pointing to a label "Device Address".
- Range Code:** A table for "Ch0~Ch7" with columns for "Input/Output Range" and "Offset (Dec)".
- Mapping Tables:** Tabs for "DI Mapping", "DO Mapping", "AI Mapping", "AO Mapping", and "Summary". The "AI Mapping" tab is active, showing an "Analog Input" table. A red box highlights the "Address" column header, and another red box highlights the "Comment" column header.

Address	Module	Slot	Channel	Value	Comment
00 [00]	I-8017H/8017HS	2	0	0.24	[08] +/- 10.0V
01 [01]	I-8017H/8017HS	2	1	-0.81	[08] +/- 10.0V
02 [02]	I-8017H/8017HS	2	2	2.75	[08] +/- 10.0V
03 [03]	I-8017H/8017HS	2	3	-1.25	[08] +/- 10.0V
04 [04]	I-8017H/8017HS	2	4	0.002	[08] +/- 10.0V
05 [05]	I-8017H/8017HS	2	5	0.000	[08] +/- 10.0V
06 [06]	I-8017H/8017HS	2	6	1.328	[08] +/- 10.0V
07 [07]	I-8017H/8017HS	2	7	-1.331	[08] +/- 10.0V

Three red boxes with arrows point to specific elements in the interface:

- Box 1: "Device Address" pointing to "NetID=1".
- Box 2: "Register Address" pointing to the "Address" column header in the AI Mapping table.
- Box 3: "Channel type (for scaling)" pointing to the "Comment" column header in the AI Mapping table.

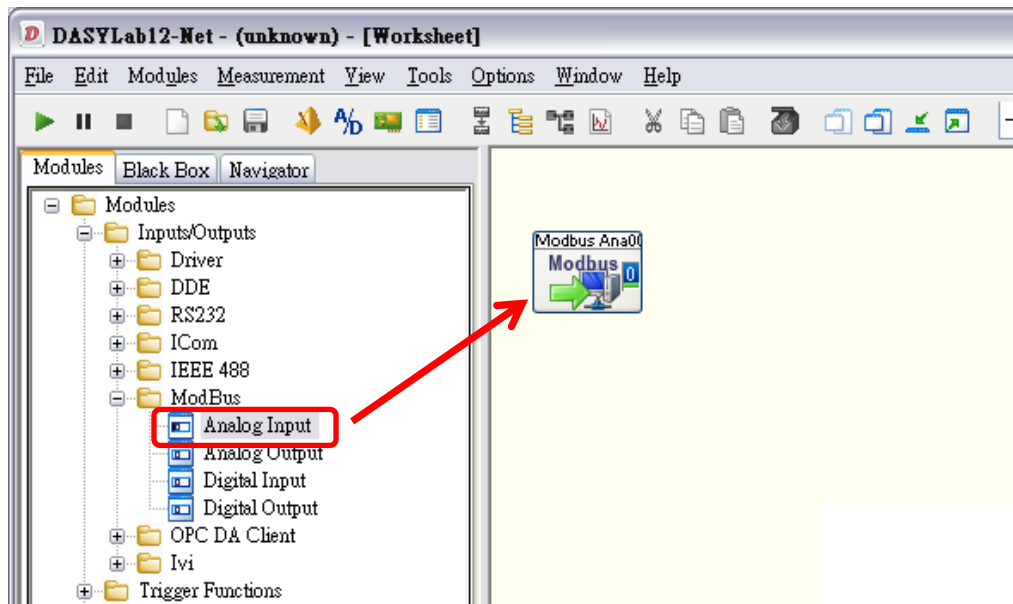
# Add a analog input channel

Step 1. Start up DASyLab

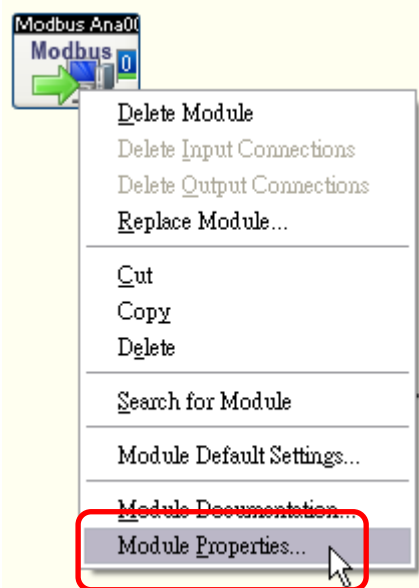
Click Start=>Programs=>DASyLab 12.0=>DASyLab 12.0



Step 2. Drag a Modbus Analog Input module to the worksheet.

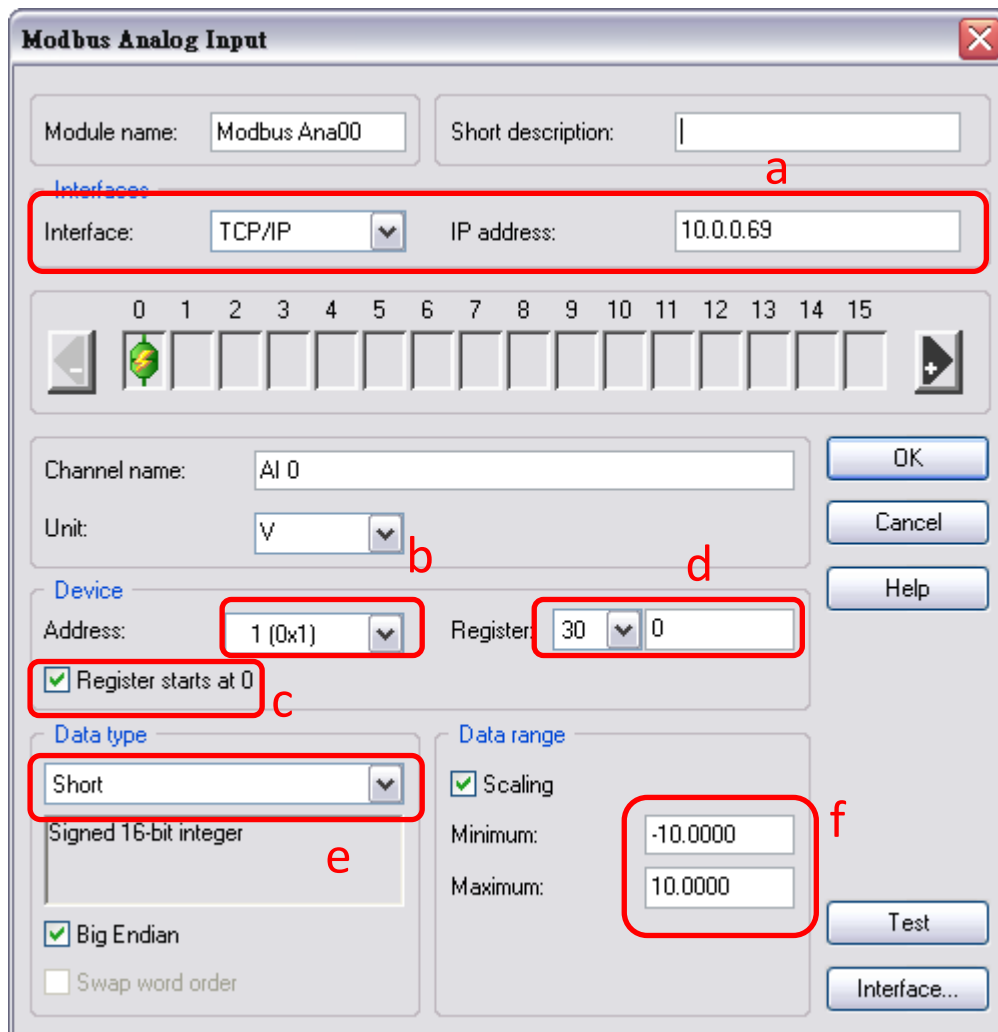


Step 3. Right click the module and choose Module Properties.

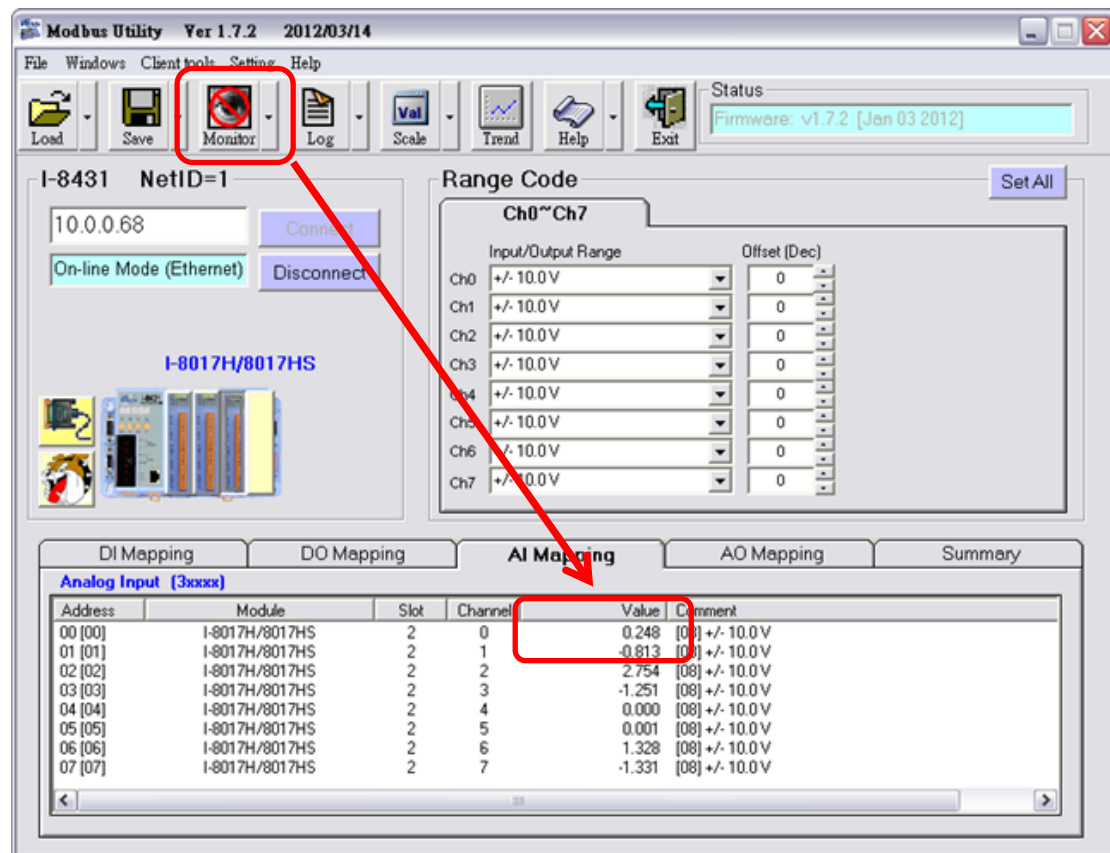
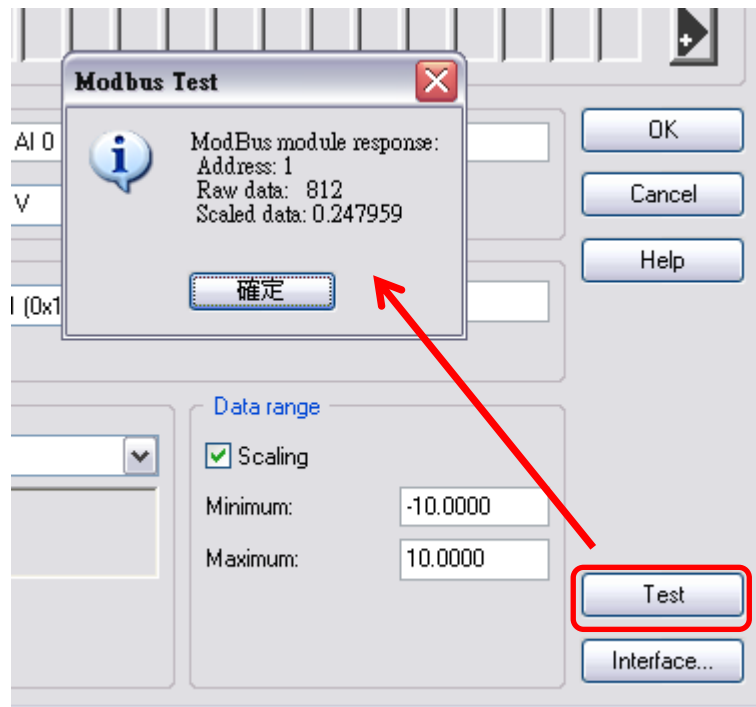


Step 4. Set Modbus Analog Input module properties.

- a. Change Interface to TCP/IP and enter IP address.
- b. Choose the Address: It is the NetID of I-8000-MTCP.
- c. Check register starts at 0.
- d. Enter the register address: You can find the address mapping on Modbus Utility's list. Choose 30 for AI channels. In this demo, we set the register as 30000.
- e. Choose Data Type: In this demo, it is signed 16-bit integer.
- f. Enable Scaling: In this demo, the channel is -10~10V.



Step 5. You can click Test to show the test result, and you can check the data in Modbus Utility as well.



Step 6. You can drag a List Module, a Analog Meter Module, and connect them to run.

The screenshot shows the DASYS Lab12-Net software interface. On the left is a 'Modules' tree with categories like Inputs/Outputs, Mathematics, and Display. The main workspace contains a block diagram with three modules: 'Modbus Ana00', 'Analog Dis00', and 'List00'. The 'Analog Dis00' module is connected to the 'List00' module. A separate window titled 'Analog Displ' shows a scale from -5.0 to 5.0 with a needle pointing to 0.25. Below the diagram is a table window titled 'List00' with the following data:

Meas. number	List 0
0	0.249
1	0.249
2	0.249
3	0.249
4	0.248
5	0.249
6	0.249
7	0.249
8	0.249
9	0.248
10	0.249
11	0.248
12	0.248
13	0.250
14	0.249
15	...

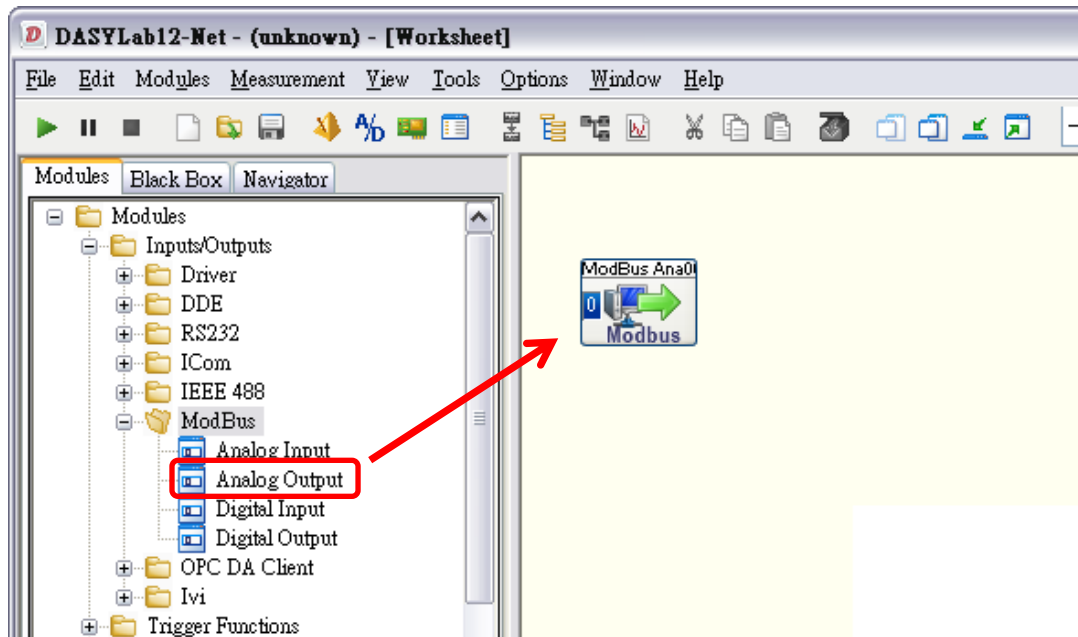
At the bottom left, a log window shows the following messages:

```
[2012-05-17 11:31:42] MODBUS.DLL loaded. (Kernel)
[2012-05-17 11:31:42] Opcc.dll loaded. (Kernel)
[2012-05-17 11:31:45] ivi.dly loaded. (Kernel)
```

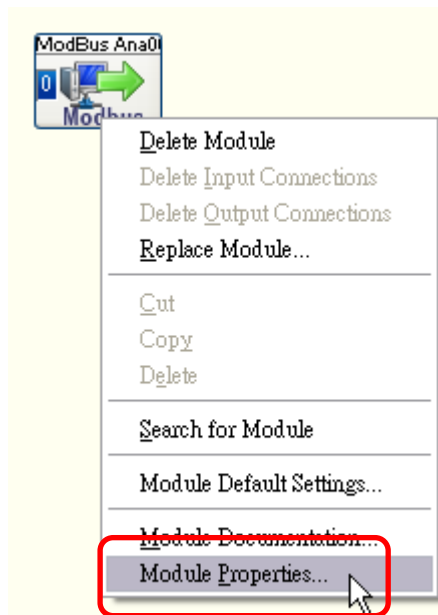
The system clock at the bottom right indicates 01:38:14 PM.

## Add a analog output channel

Step 1. Drag a Modbus Analog Output module to the worksheet.



Step 2. Right click the module and choose Module Properties.



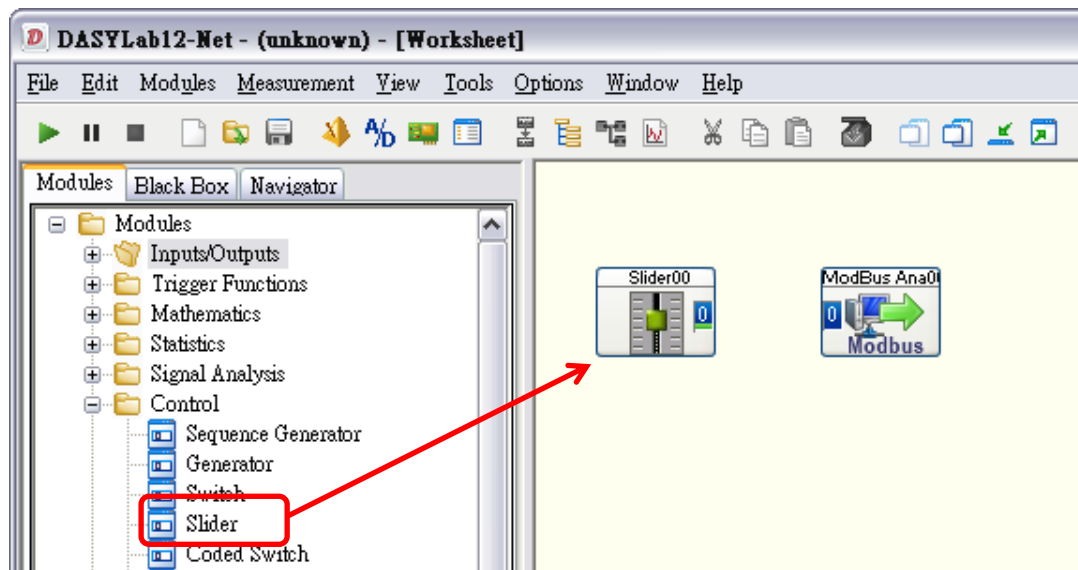
Step 3. Set Modbus Analog Output module properties.

- a. Change Interface to TCP/IP and enter IP address.
- b. Choose the Address: It is the NetID of I-8000-MTCP.
- c. Check register starts at 0.
- d. Enter the register address: You can find the address mapping on Modbus Utility's list.
- e. Choose Data Type: In this demo, it is Word Unsigned 16-bit integer.
- f. Enable Scaling: In this demo, the channel is -10~10V.

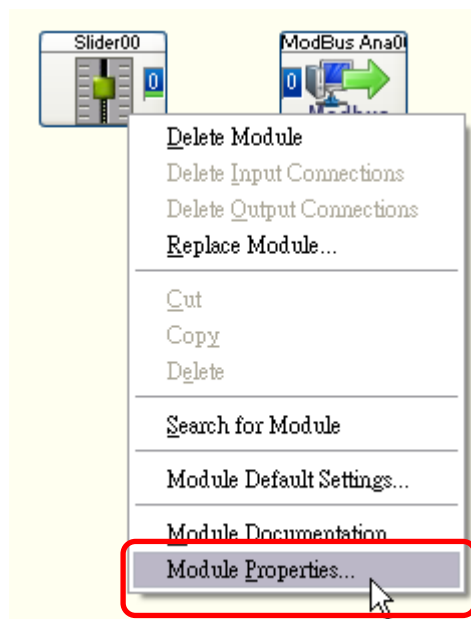
The screenshot shows the 'Modbus Analog Output' configuration window. The 'Module name' is 'ModBus Ana00'. The 'Short description' field is empty. Under the 'Interfaces' section, the 'Interface' is set to 'TCP/IP' and the 'IP address' is '10.0.0.68:502'. A row of 16 channel status icons is visible, with the first icon (channel 0) highlighted in green. The 'Channel name' is 'AO 0' and the 'Unit' is 'V'. In the 'Device' section, the 'Address' is '1 (0x1)' and the 'Register' is '0'. The 'Register starts at 0' checkbox is checked. Under 'Data type', 'Word' is selected, and 'Unsigned 16-bit integer' is listed below. The 'Big Endian' checkbox is checked, and 'Swap word order' is unchecked. In the 'Data range' section, the 'Scaling' checkbox is checked, and the 'Minimum' and 'Maximum' values are '-10.0000' and '10.0000' respectively. Buttons for 'OK', 'Cancel', 'Help', and 'Interface...' are located on the right side of the dialog.



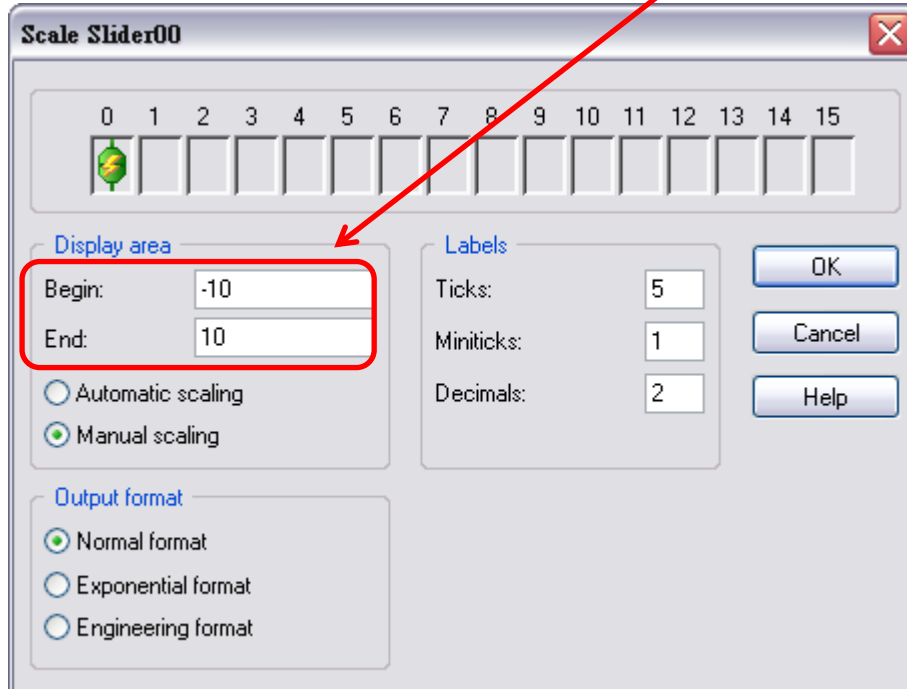
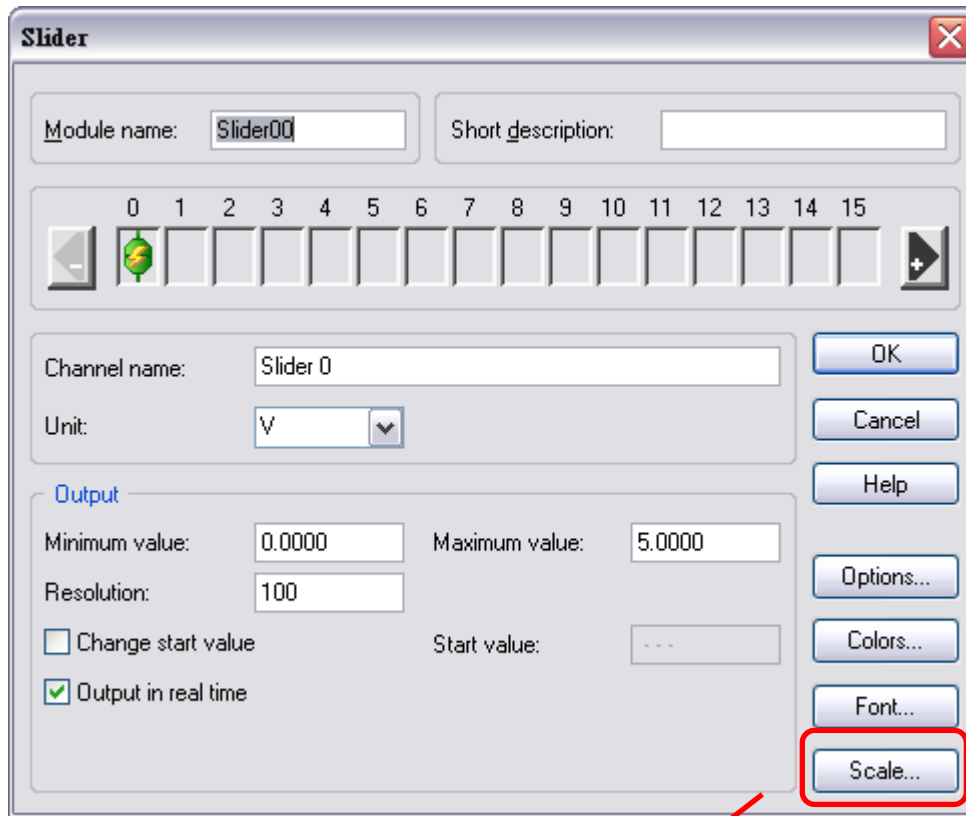
Step 4. Drag a Slider Control.



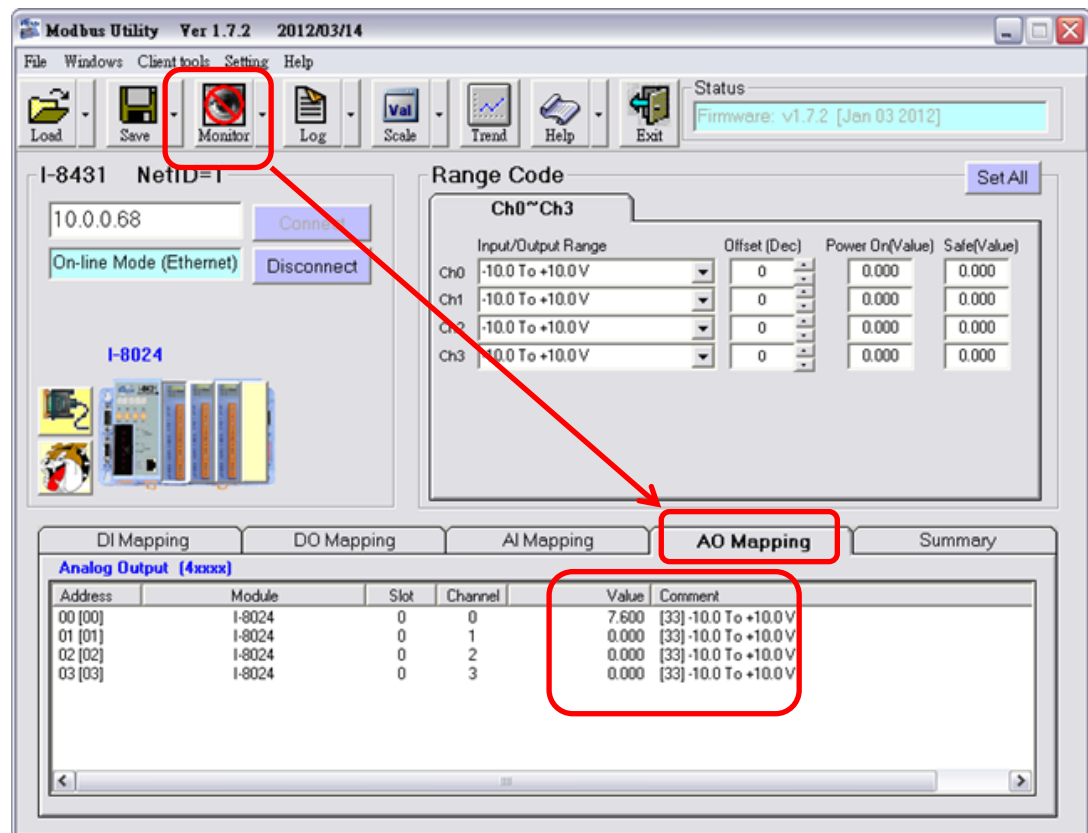
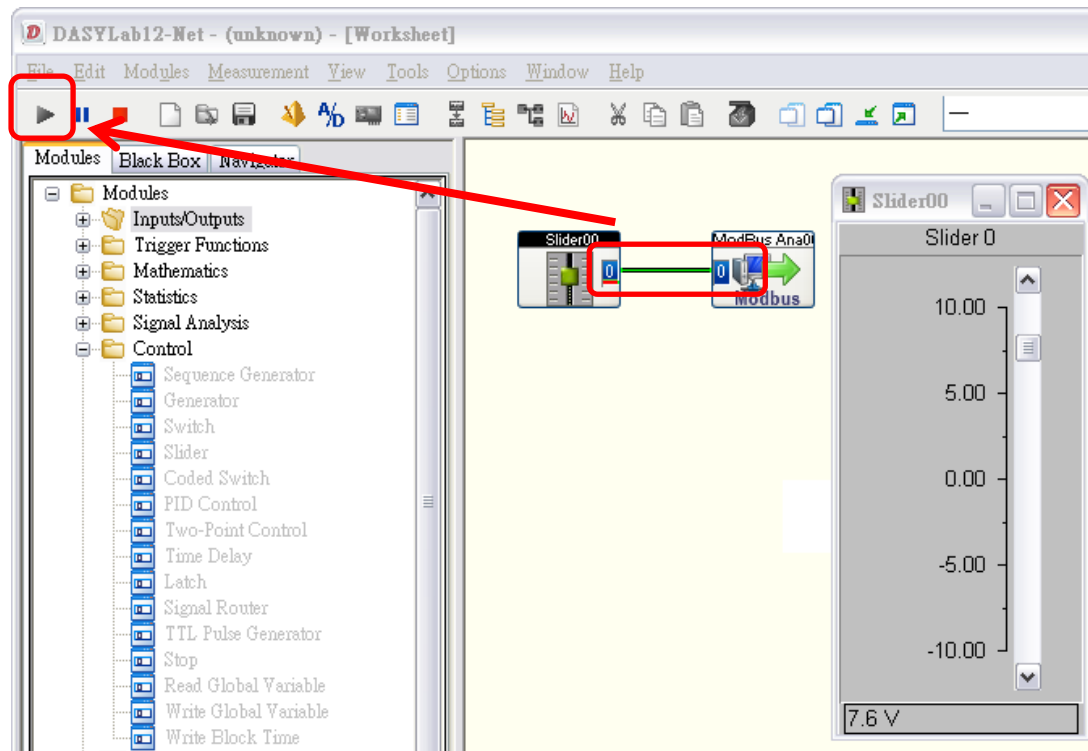
Step 5. Right click Slider Control and choose Module Properties.



Step 6. Click Scale button and set the Begin/End values.

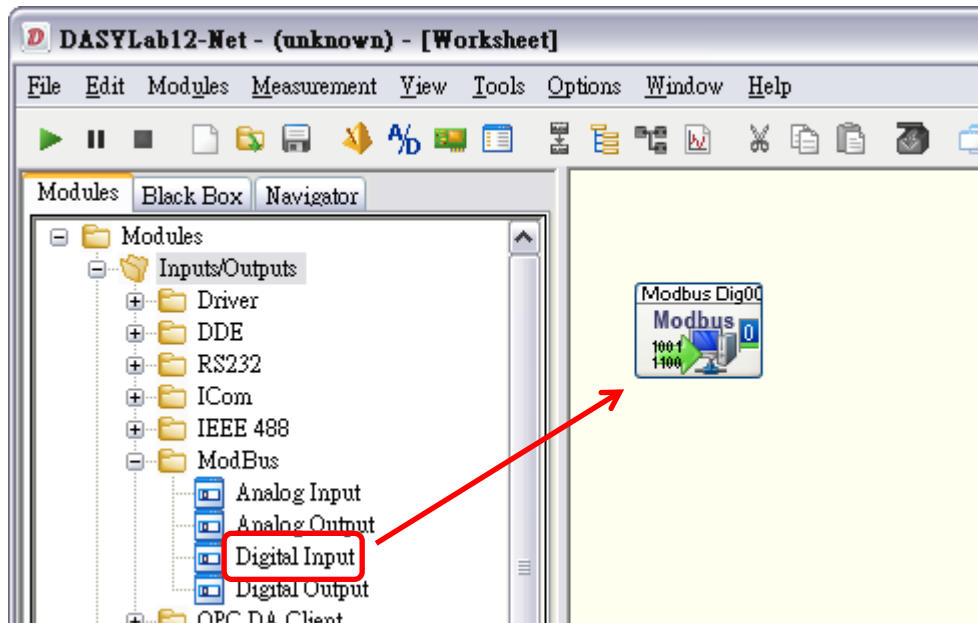


Step 7. Connect Slider Control to Analog Output module, and start to run. You can check the output value in Modbus Utility.

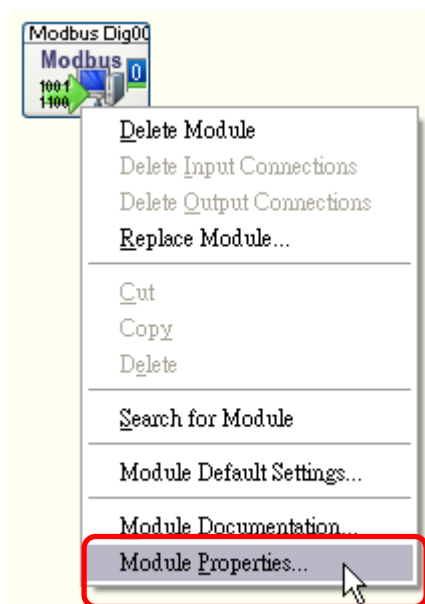


## Add a digital input channel

Step 1. Drag a Digital Input module

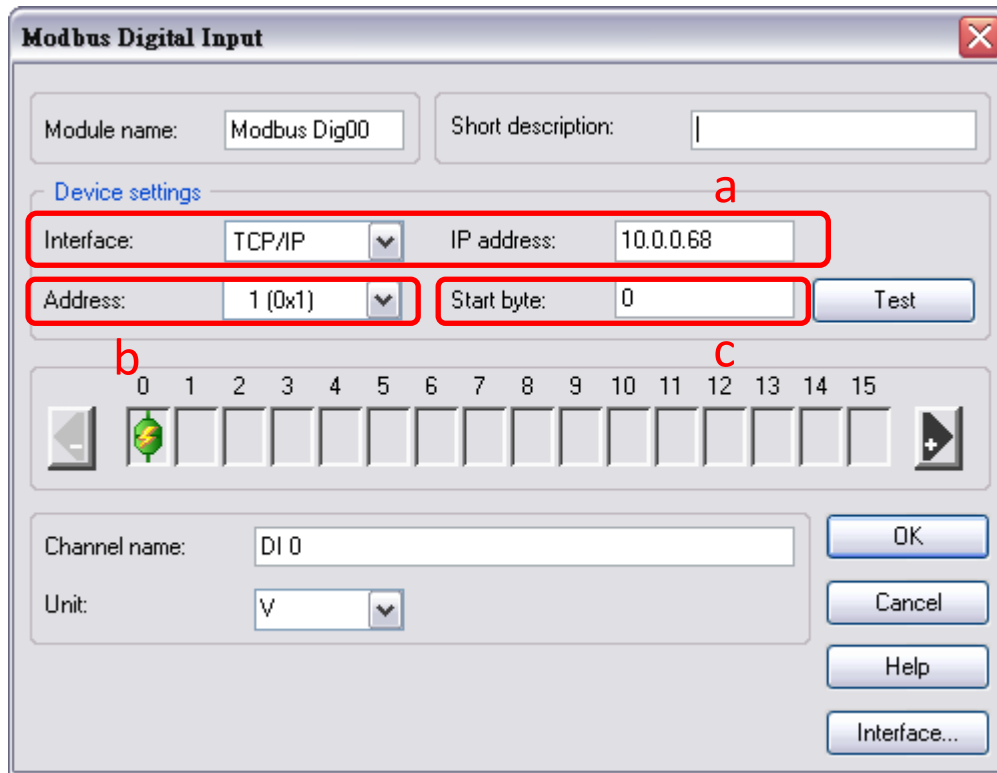


Step 2. Right click the module and choose Module Properties.

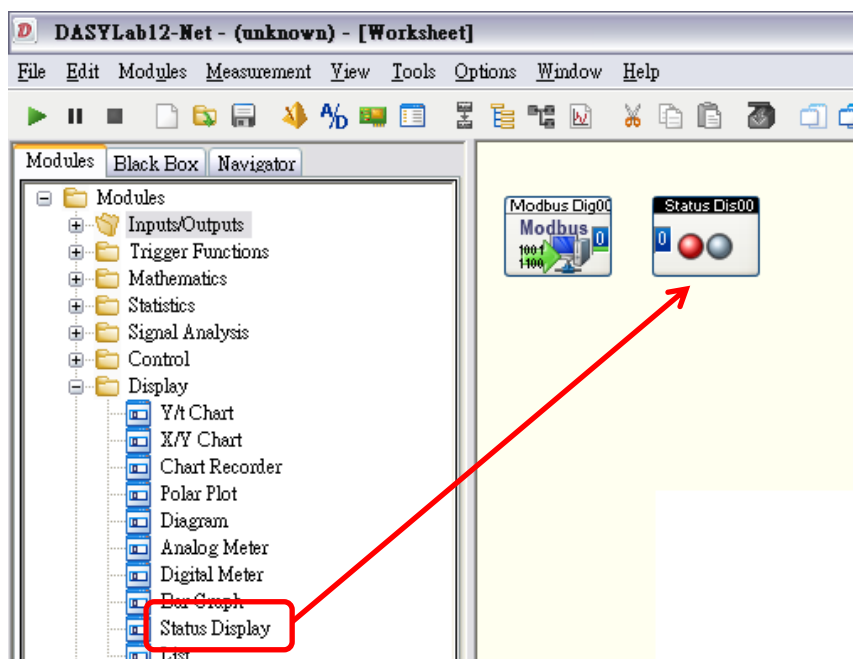


Step 3. Set Modbus Digital Input module properties.

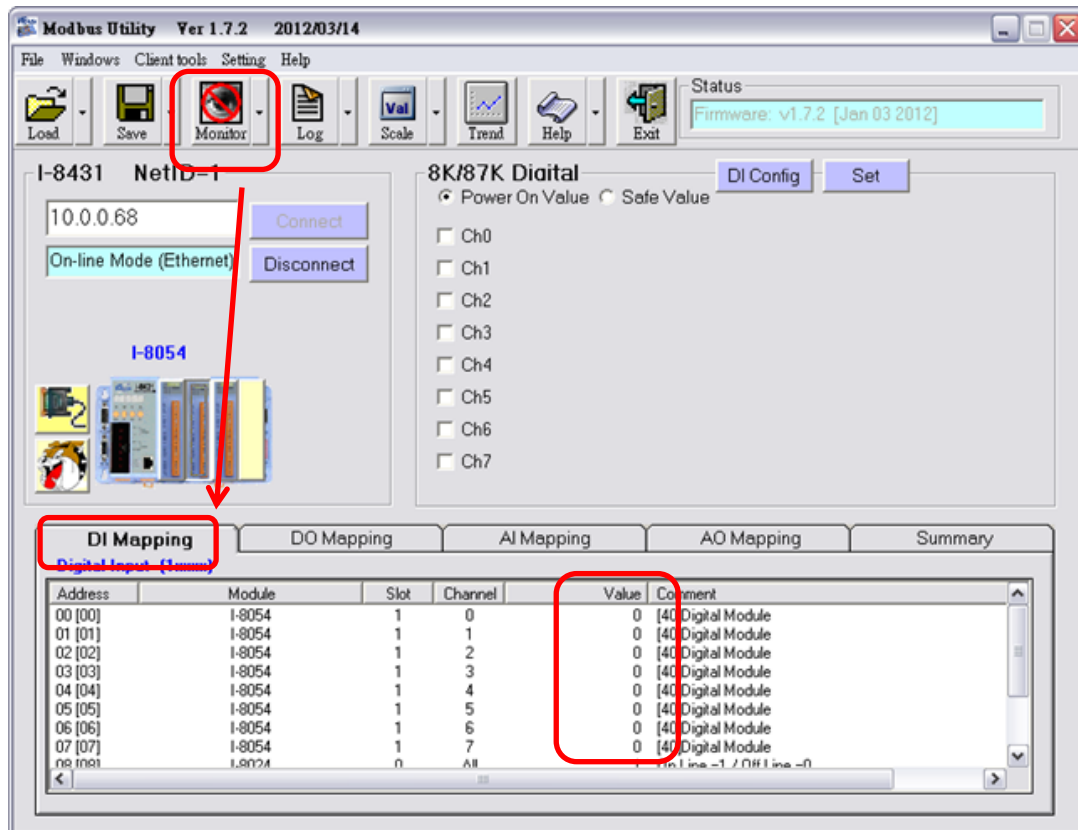
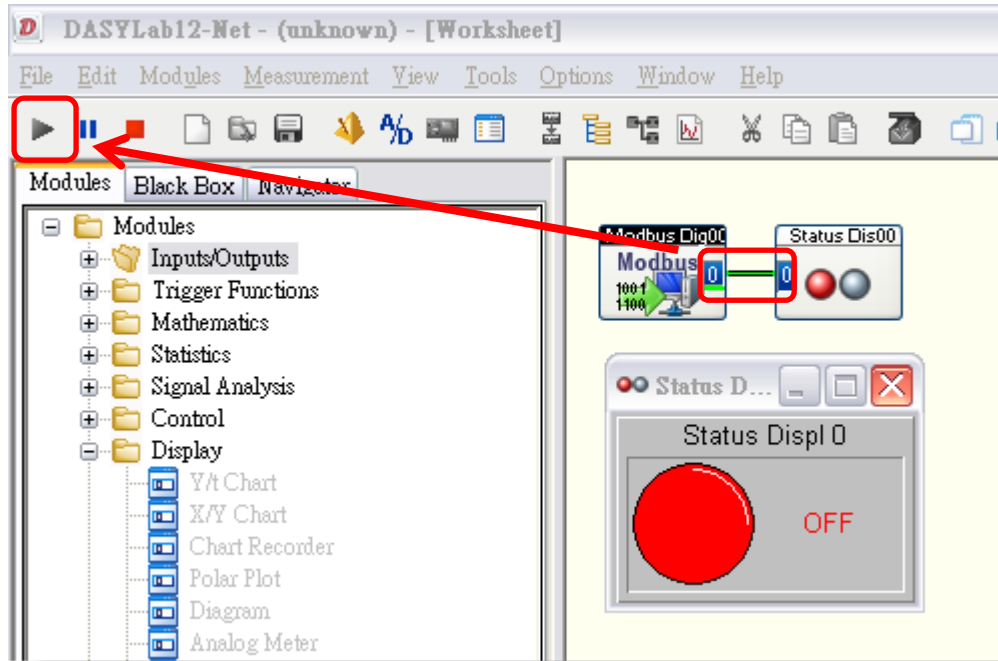
- a. Change Interface to TCP/IP and enter IP address.
- b. Choose the Address: It is the NetID of I-8000-MTCP.
- c. Enter the Start byte: You can find the address mapping on Modbus Utility's list.



Step 4. Drag a Status Display.

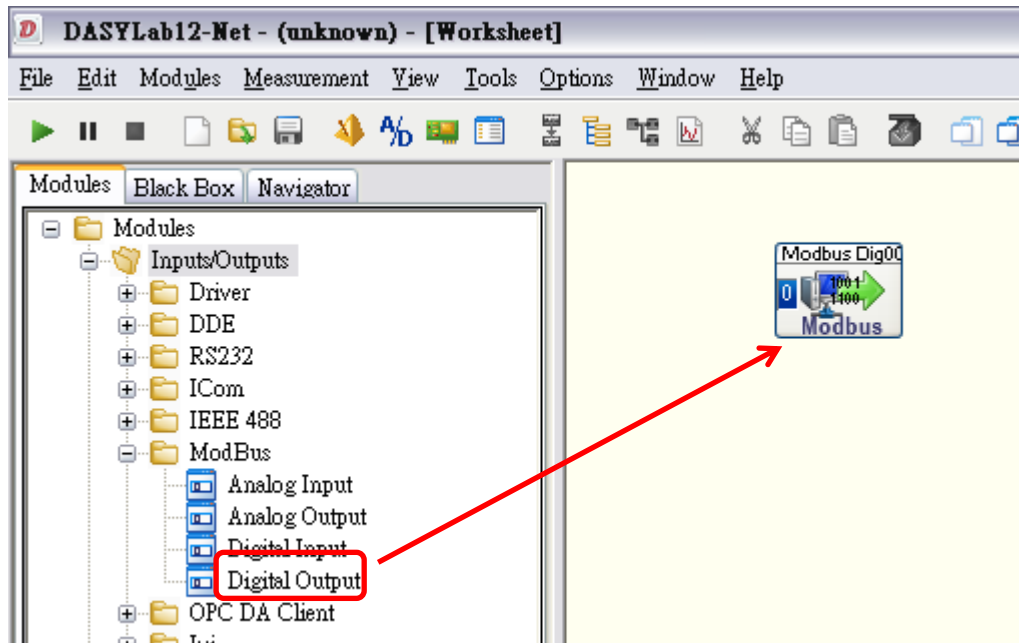


Step 5. Connect Digital Input module to Status Display, and start to run. You can check the input value in Modbus Utility.

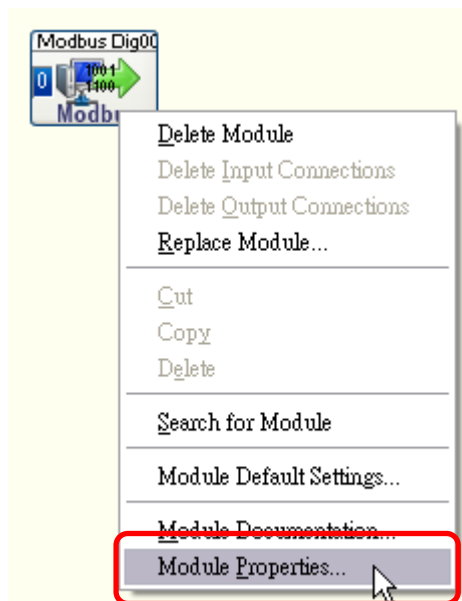


## Add a digital output channel

Step 1. Drag a Digital Output module

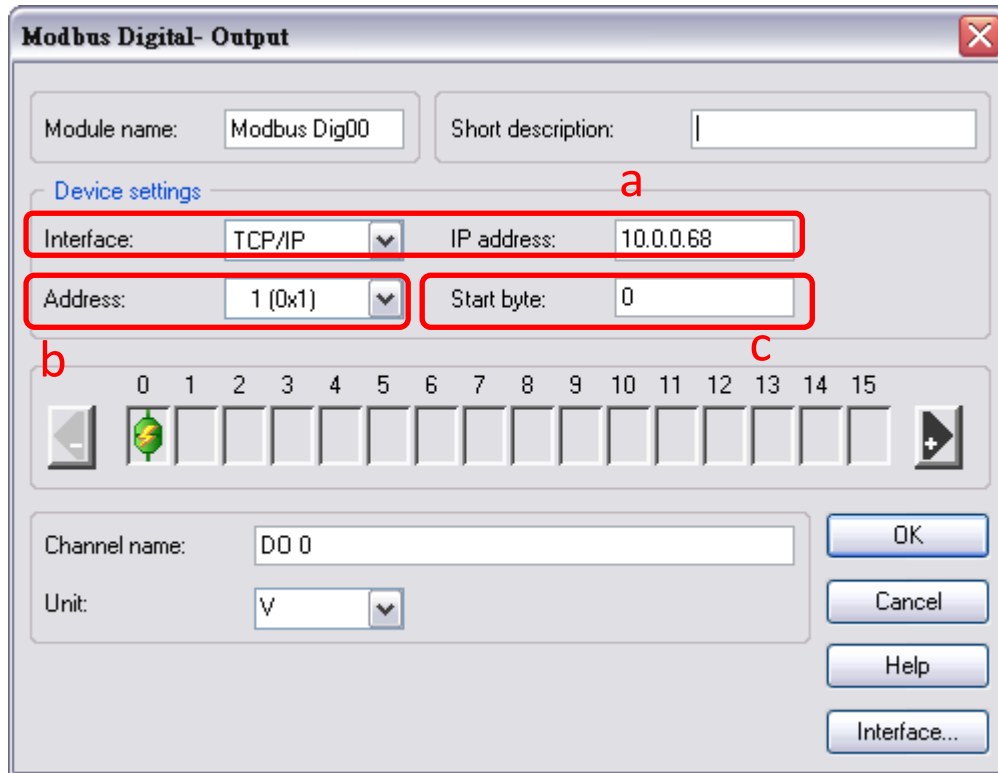


Step 2. Right click the module and choose Module Properties.

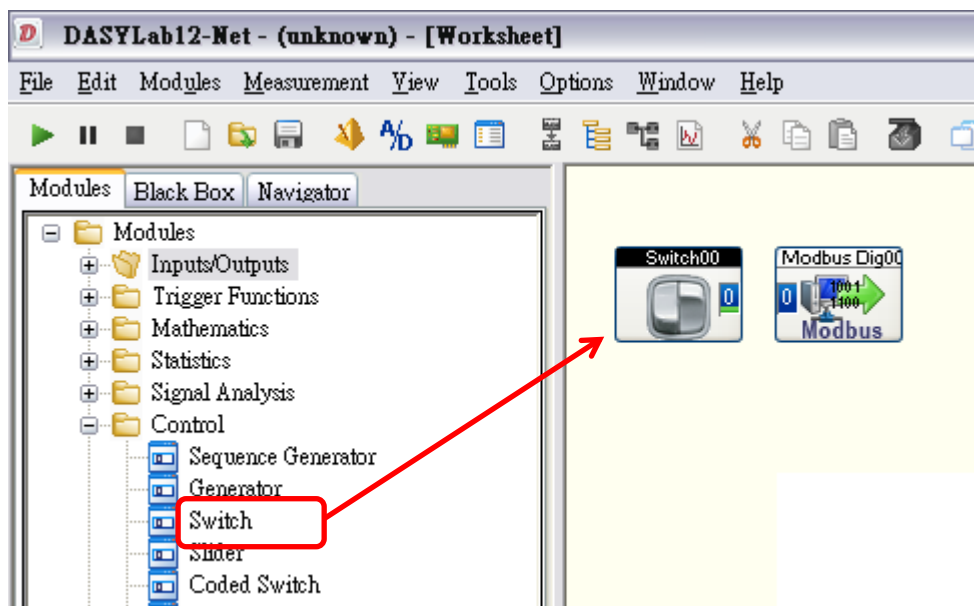


Step 3. Set Modbus Digital Output module properties.

- a. Change Interface to TCP/IP and enter IP address.
- b. Choose the Address: It is the NetID of I-8000-MTCP.
- c. Enter the Start byte: You can find the address mapping on Modbus Utility's list.



Step 4. Drag a Switch Control.





Step 5. Connect Switch Control to Digital Output module, and start to run. You can check the output value in Modbus Utility.

