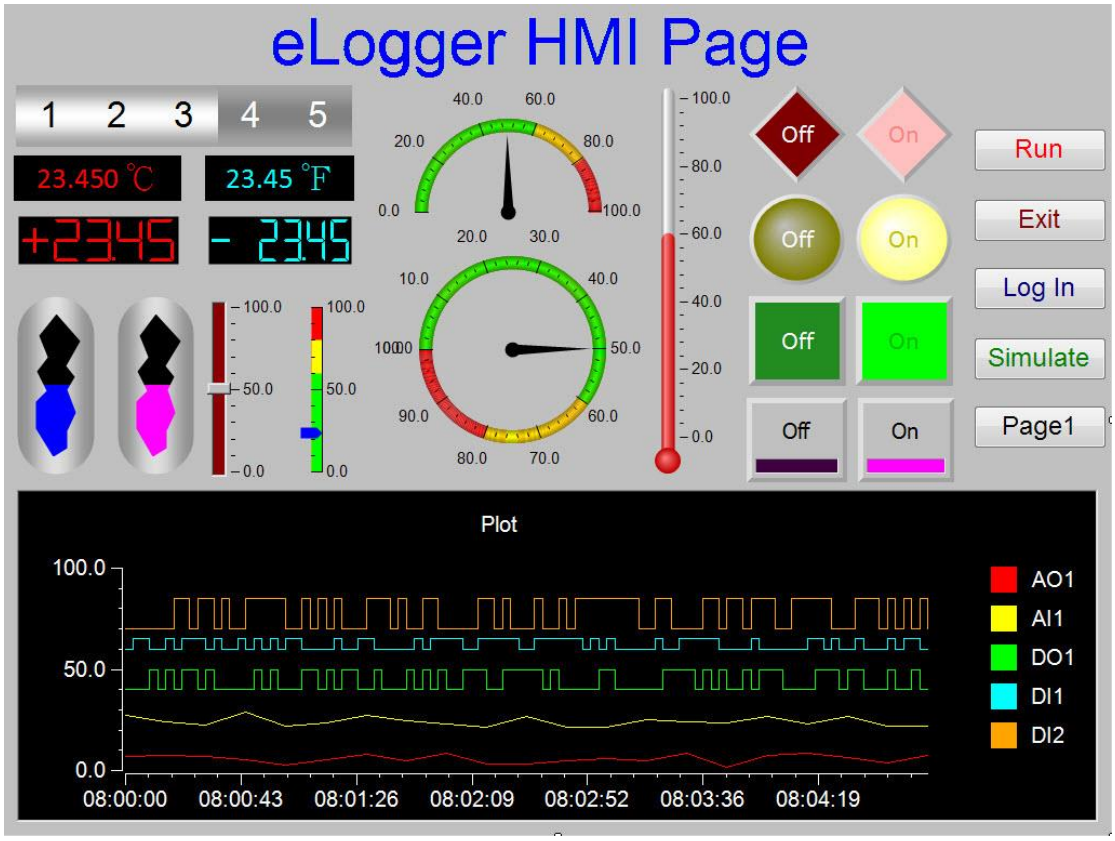
eLogger User Manual

Version 2.0.0, Nov. 2020



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Revision History

Revision	Date	Description
2.0.0	2020/11	**eLogger ver. 2.0.0 supports PC Runtime which is a portable software**

eLogger Developer: Used to edit project, and no tag limited.

eLogger Runtime:

Version	PC Runtime	PAC Runtime
Free charge (Trial version)	**30 tags** and 24 hours trial	-
Free charge (Registration)	-	**50 Tags** (no time-limited)
Paid (License)	-	300/1500/4000 Tags
Paid (USB Key Pro)	300/1500/4000 Tags	-

Ordering information:

PC Runtime	eLogger-**NT**300R,	eLogger-NT1500R,	eLogger-NT4000R
PAC Runtime (WinCE 6/7)	eLogger-**CE**300R,	eLogger-CE1500R,	eLogger-CE4000R
PAC version (WES7)	eLogger-**WES**300R,	eLogger-WES1500R,	eLogger-WES4000R

Table of Contents

Chapter 1 About eLogger

eLogger is an easy-to-use HMI software to implement HMI, web HMI and data logger on ICP DAS PACs for simple I/O monitor and system control. Using eLogger could reduce software development costs and shorten the time to market. In addition, eLogger can cooperate with Visual Studio .NET, Win-GRAF and ISaGRAF programs.

1.1. Features

✧ The Supported Device

Developer	
Windows PC	Windows 10, Windows 7
Runtime Target	
Windows PC	Windows 10, Windows 7
Windows CE 6.0 platform	XP-8000-CE6 Series
Windows CE 7.0 platform	VP-x201-CE7 (7"/8.4"/15", 0 Slot) VP-x231-CE7 (5.7"/10.4"/15", 3 Slots) WP-9000-CE7 (2/4/8 Slots) WP-8000-CE7 (1/4/8 Slots) WP-5000-CE7 (1 I/O Bus) WP-2000-CE7 (1 I/O Bus)
WES7 platform	iPPC-x701-WES7, iPPC-x801-WES7 (10.4"/12.1"/15", 0 Slot), iPPC-x731-WES7, iPPC-x831-WES7 (10.4"/12.1"/15", 3 Slots) XP-8000-WES7, XP-9000-WES7 (1/3/7 Slots)

✧ The Supported Driver

Driver	**Description**
Math Curve	A simple demo for curve, it also provides source code for users to develop a plug-in driver
Module on Slot (For PAC version)	I-8K modules: I-8017HW, I-8024W and I-8K DIO I-87K modules: DI, DO, AI, AO, counter, frequency, DI with latch function
Modbus Serial Master	M-7000 modules Modbus RTU devices/Modbus ASCII devices
Modbus TCP Master	(P)ET-7000 modules Modbus TCP devices
MQTT Client	MQ-7200 modules

✧ HMI

- Objects: Text Box, Linear Gauge, Angular Gauge, Seven Segment, Tank, Thermometer, Slider, LED, Switch, Odometer, Label, Button, Plot, Picture Toggle and Message List.
- Pages: Maximum of 32 pages.

✧ Web HMI

- Web Pages Converter
- Objects:
  Text Box, Seven Segment, Label, Button, Picture Toggle, Chart, Linear Gauge, Radial Gauge and Message List.
- Support administrator login.
- Support browsers: Google Chrome, Internet Explorer, Firefox, Safari, and Opera.

✧ Real Time Data Trend

Maximum of 5 trend line in one plot.

✧ Value Scaling

Set gain and offset can scale analog values from volt or amp unit to another physical unit. For example, rpm for rotation, kg for weight.

✧ Account Management

3 levels operating management: Administrator, Power User, User

✧ Remote Maintenance

You can use eLogger Developer's remote control function to Upload, Run or Stop the project through the Ethernet.

✧ Database

- Local database: Supports csv format file.
- Remote database: Microsoft SQL Server 2005 or later and MySQL Server.

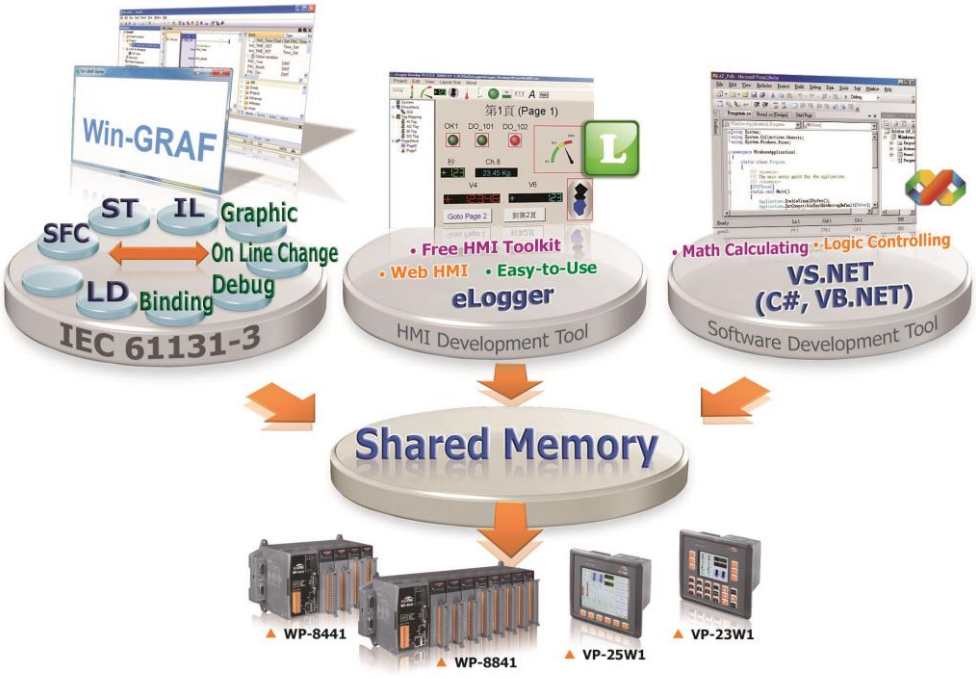
✧ Logic Control Programming

Via the "Shared Memory", you can choose Win-GRAF, ISaGRAF or Visual Studio .Net to develop a logic control program and cooperate with the eLogger. Your programs can access the data of I/O module and exchange other temporary data through the "Shared Memory". You can focus on the logic control programming.

■ **Win-GRAF** or **ISaGRAF** (IEC61131-3 standard PLC languages)
(Refer to Win-GRAF FAQ-018 or ISaGRAF FAQ-115)

Note: **eLogger (for PAC) can be used with Win-GRAF PAC (e.g., VP-4238-CE7) or ISaGRAF PAC (e.g., VP-4237-CE7)**

■ Visual Studio .NET (C#, VB.NET): For Window CE.NET 6/7 (demo for logic control)



✧ Support ISAPI

The user can read/write the shared memory by calling ISAPI URL. It helps users to design a HMI web page with JavaScript.

With "MIT App Inventor" which is the Android App develop site, the user can build an Android app by calling ISAPI quickly, no coding required.

✧ Support Modbus TCP Server

It allows to read/write data via Modbus TCP Protocol.

✧ Support Runtime Executing in Background Mode

eLogger Runtime can run in background without designing HMI layout.

1.2. Supported Module

eLogger supports the following I/O modules.

8K I/O Module	
AI	I-8017HW
AO	I-8024W
DIO	I-8040W, I-8041W, I-8042W, I-8046W, I-8050W, I-8051W, I-8052W, I-8053W, I-8054W, I-8055W, I-8056W, I-8057W, I-8058W, I-8060W, I-8063W, I-8064W, I-8065W, I-8066W, I-8068W, I-8069W, I-8077W
87K I/O Module	
AI	I-87005W, I-87013W, I-87015W, I-87015PW, I-87016W, I-87017W, I-87017RW, I-87017RCW, I-87017DW, I-87017ZW, I-87017A5, I-87018W, I-87018RW, I-87018PW, I-87018ZW, I-87019RW, I-87019PW, I-87019ZW
AO	I-87024W, I-87024CW, I-87024DW, I-87024RW, I-87028CW
DIO	I-87037W, I-87040W, I-87040PW, I-87041W, I-87042W, I-87046W, I-87051W, I-87052W, I-87053W, I-87053PW, I-87053WA2, I-87053WA5, I-87053WAC1, I-87053WE5, I-87054W, I-87055W, I-87057W, I-87057PW, I-87058W, I-87059W, I-87061W, I-87063W, I-87064W, I-87065W, I-87066W, I-87068W, I-87069W, I-87069PW
ET-7000	
ET-7005, ET-7015, ET-7016, ET-7017, ET-7017-10, ET-7018Z, ET-7019, ET-7026, ET-7042, ET-7044, ET-7050, ET-7051, ET-7052, ET-7053, ET-7060, ET-7065, ET-7066, ET-7067	
PET-7000	
PET-7005, PET-7015, PET-7016, PET-7017, PET-7017-10, PET-7018Z, PET-7019, PET-7026, PET-7042, PET-7044, PET-7050, PET-7051, PET-7052, PET-7053, PET-7060, PET-7065, PET-7066, PET-7067	
WISE	
WISE-7105, WISE-7115, WISE-7117, WISE-7118Z, WISE-7119, WISE-7126, WISE-7144, WISE-7151, WISE-7152, WISE-7160, WISE-7167	

M-7000	
AI	M-7005, M-7015, M-7016, M-7016D, M-7017, M-7017C, M-7017R, M-7017RC, M-7018, M-7018R, M-7019R, M-7033, M-7033D
AO	M-7022, M-7024
DIO	M-7041, M-7041D, M-7045, M-7045D, M-7050, M-7050D, M-7051, M-7051D, M-7052, M-7052D, M-7053, M-7053D, M-7055, M-7055D, M-7059D, M-7060, M-7060D, M-7067, M-7067D
MQ-7200	
DO	MQ-7244M, MQ-7252M, MQ-7255M
DI	MQ-7251M, MQ-7253M

1.3. Installation

eLogger provides two kinds of programs:

1. **eLogger Developer:**

   Installed on a PC, using it to design HMI pages and configure graphics objects.

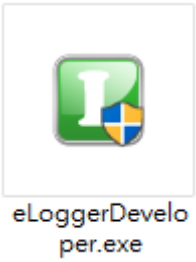
2. **eLogger Runtime:**

   Installed on a PAC, executing it before uploading or running the eLogger project.

1.3.1. Installing eLogger on PC

eLogger V2.0.0 is a portable software. It's recommended to copy the software folder to C:\ICPDAS\. In addition, make sure that .NET Framework 4.0 has been installed on PC.
The download link from Microsoft is Microsoft.com downloads.

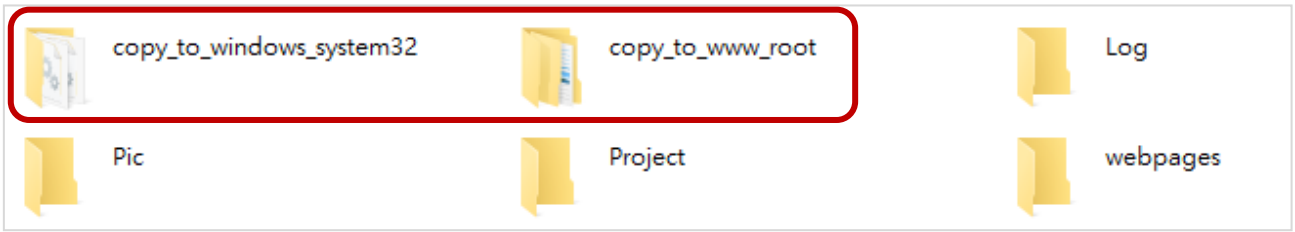
The eLogger folder includes several programs such as Developer, **PC** Runtime, **PAC** Runtime and DB Report. Double-click on \Developer**eLoggerDeveloper.exe** to perform eLogger Developer.



1.3.2. Installing eLogger PC Runtime

In the eLogger folder, copy the 'RuntimePC' folder to the desired PC first. For PC Runtime can work properly, copy **the SharedMemory.dll** and **TestUP.dll** in the 'copy_to_windows_system32' folder to the C:\Windows\System32 (for 32-bit PC) or the C:\Windows\SysWOW64 (for 64-bit PC).

Next, copy both the 'base' and 'WebBase' folders in the 'copy_to_www_root' folder to the C:\inetpub\wwwroot.



1.3.3. Installing eLogger PAC Runtime

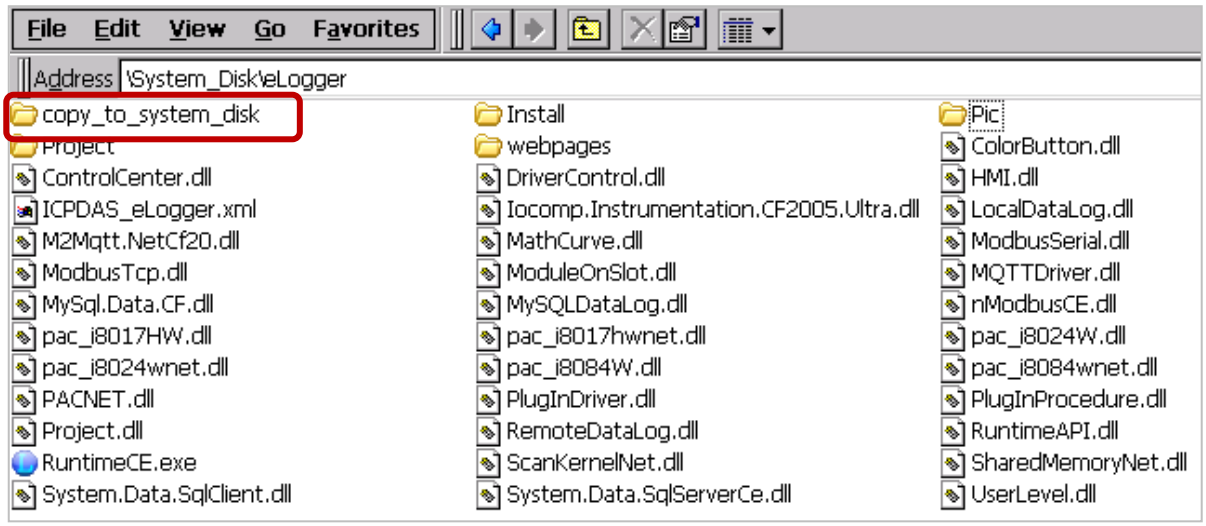
Install eLogger PAC Runtime according to the model of ICPS DAS PAC. Before uploading and executing the project on PC, eLogger Runtime must be installed and executed on PAC.

Follow these steps:

Step 1: Choose the proper version of PAC Runtime in the eLogger folder**.** For example, when using Win-GRAF PAC (VP-4238**-CE7)**, copy all files in the 'RuntimeCE7' folder.

PAC Runtime	Supported ICP DAS PAC
For WinCE7	VP-x201-CE7 (7"/8.4"/15", 0 Slot) VP-x231-CE7 (5.7"/10.4"/15", 3 Slots) WP-9000-CE7 (2/4/8 Slots) WP-8000-CE7 (1/4/8 Slots) WP-5000-CE7 (1 I/O Bus) WP-2000-CE7 (1 I/O Bus)
For WES7	iPPC-x701-WES7, iPPC-x801-WES7 (10.4"/12.1"/15", 0 Slot), iPPC-x731-WES7, iPPC-x831-WES7 (10.4"/12.1"/15", 3 Slots) XP-8000-WES7, XP-9000-WES7 (1/3/7 Slots)

Step 2: Copy all files to the specific folder (e.g., \System_Disk\eLogger\) on PAC via FTP.



Step 3 : Copy the **SharedMemory.dll** file.

1) **For WinCE7**:
   Copy the dll file in the 'copy_to_system_disk' folder to the \System_Disk\Icpdas\System.
2) **For WES7:**
   Copy the dll file in the 'copy_to_windows' folder to the C:\Windows\System32 (32-bit PC) or C\:Windows\SysWOW64 (64-bit PC).

Chapter 2 Introduction of eLogger

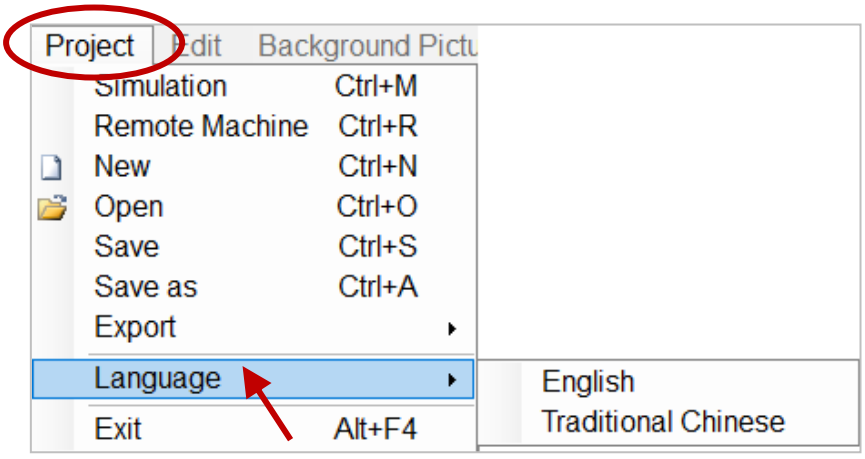
eLogger includes two kinds of programs - **eLogger Developer and eLogger Runtime**. Using eLogger Developer to design the HMI project on PC, and then upload project and webpages via Remote Machine function after running eLogger Runtime on PAC/PC.

2.1. The Project Menu of eLogger Developer

Execute \Developer\eLoggerDeveloper.exe, and click **Project** from the menu bar.

■ **Language**

Used to change the display language. eLogger supports English and Traditional Chinese.



■ **New**

Used to add a project file which will be saved in the '…\ Developer\Project' folder.

■ **Open**

Used to open the existing project.

■ **Save**

Used to save the editing project.

■ **Save as**

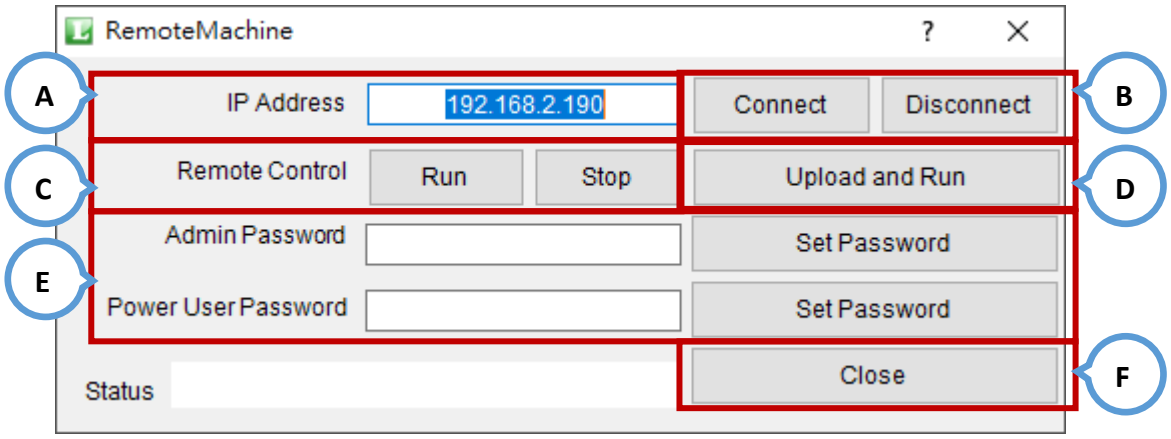
Used to save the current project as a new one.

■ **Simulation**

Used to simulate how values display on HMI page. Press **Alt + F4** can leave simulation page.

■ **Remote Machine**

Used to upload, run or stop the project.



A. Enter the IP address of the PAC/PC.

B. Connect or disconnect to the remote PAC.

C. Run or stop the project.

D. Upload project and webpages to the remote PAC/PC.
Note that click Connect before uploading.

E. Enter the password and click “Set Password”. To cancel a password, only let the textbox remain blank and click “Set Password”.

F. Close Remote Machine.

■ **Export**

Used to export either the tag or the procedure settings as a CSV file.

■ **Exit**

Used to close eLogger Developer application.

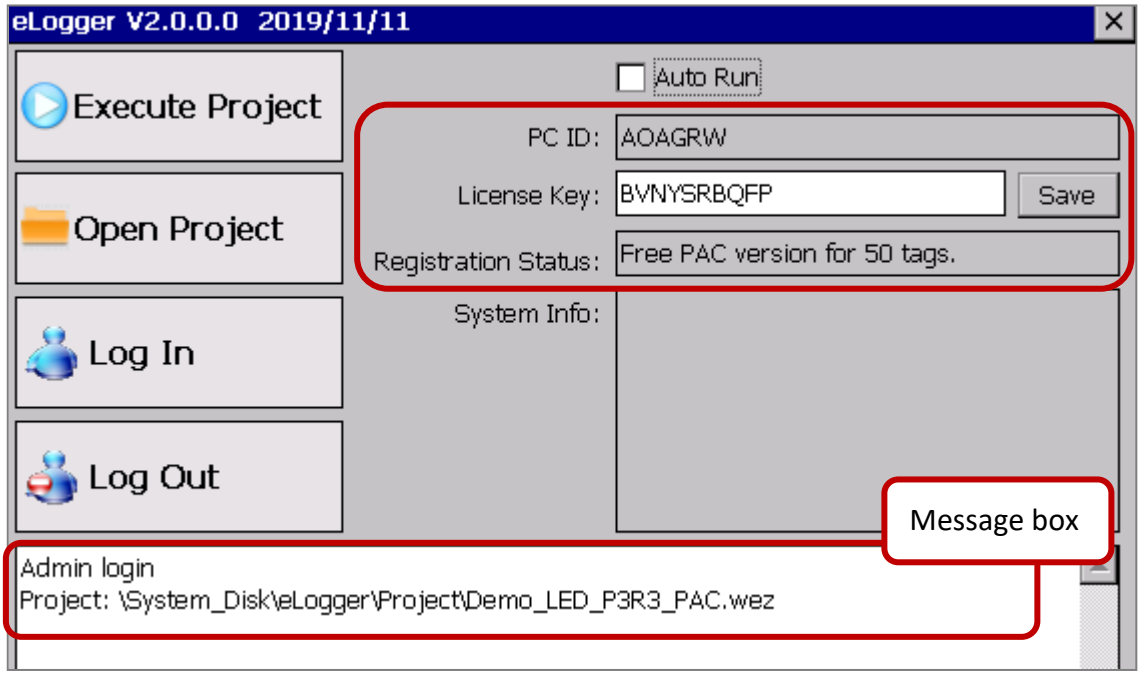
2.2. The Description of eLogger Runtime

eLogger PAC Runtime:

Double-click **RuntimeCE.exe** in the '\System_Disk\eLogger' folder on PAC.

eLogger PC Runtime:

Double-click **RuntimeXP.exe** in the '..\eLogger_Vxxx_yyyymmdd\RuntimePC' folder on PC.



Description	
Execute Project	Start to run the project
Open Project	Click to select a project to run
Log In	Input the password for the access authority
Log Out	Logout
Auto Run	Check the 'Auto Run' box to automatically run the project whenever the eLogger Runtime is activated
Message box	Display the current login permission, the project name, and the file location. Also, the status of file uploads will be displayed

NOTE: Users need to register the license key for the FREE version of eLogger Runtime.

Visit to the eLogger registration page.

http://www.icpdas.com/products/Software/ez_data_logger/elogger_licensekey.html

2.3. Account Management

eLogger provides three levels operating management.

Click **Project** > **Remote Machine** in the menu bar to set the password.

Authority	Levels	Admin	Power User	User
1. Open project		●	○	○
2. Start/Stop project		●	●	○
3. Set AO/DO values		●	●	○
4. Switching group pages		●	●	●

●: Allowed ○: Not Allowed

Note: By default, eLogger Runtime will run the project with the highest level authority (i.e., Admin) that no password set. If the password of Admin and Power User are set, it will run a project with the User authority. Also, logging in to the runtime to get the specific authority.

- **Admin:** Logging in with the 'Admin' password to obtain the authority 1 to 4.
- **Power User:** Logging in with the 'Power User' password to obtain the authority 2 to 4.
- **User:** Only authority 4 is permitted. No password required.

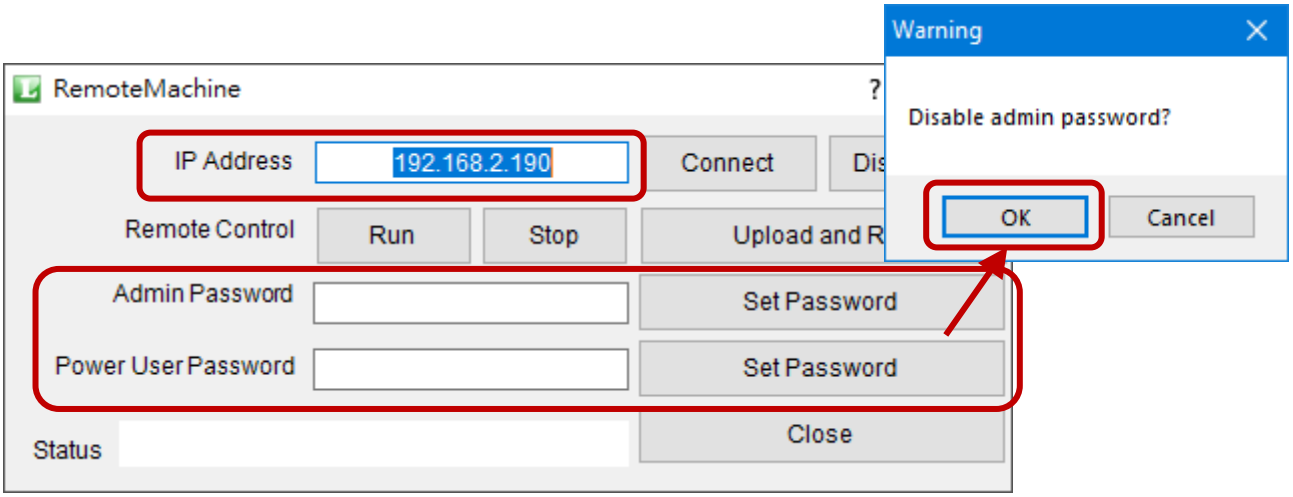
2.3.1. Set or Disable the Password of Admin or Power User

Step1: First at all, execute eLogger Runtime on PAC (or PC).

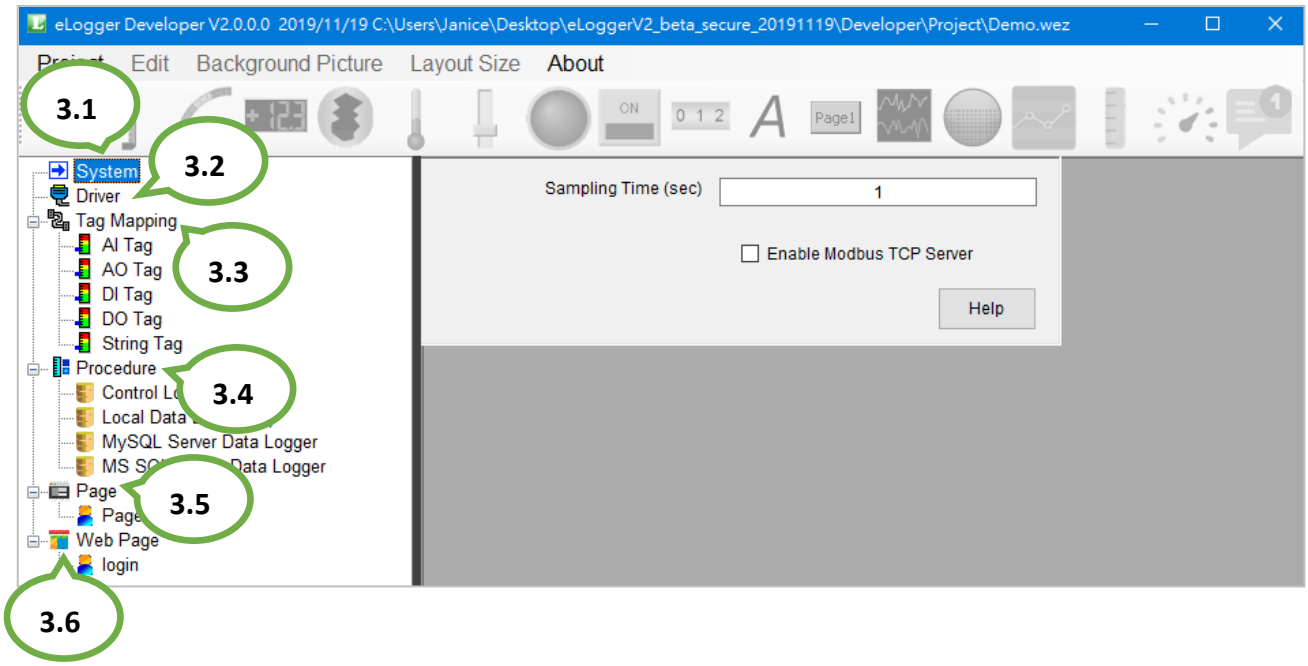
Stpe2: Execute eLogger Developer and click **Remote Machine** from **Project** menu bar.

Step3: Enter the IP address of PAC (or PC) and click **Connect** to check the connection.

Step4: To set the password, enter the password and click **Set Password**.
To disable the password, leave the password field blank and click **Set Password**.
Then, click **OK** in the popup window.



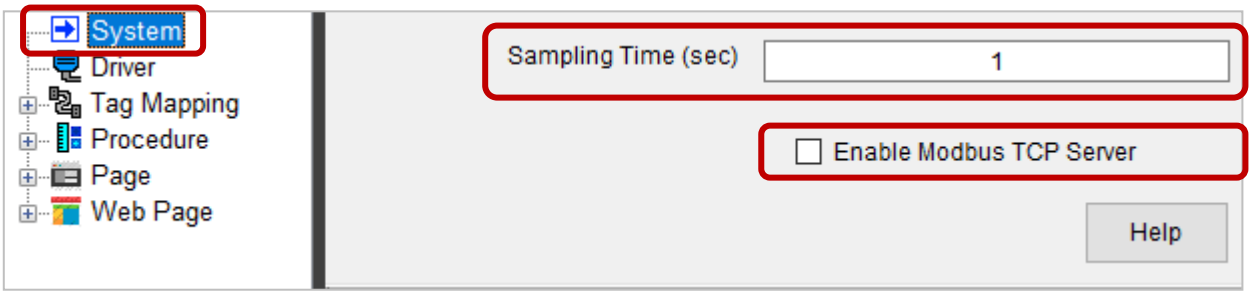
Chapter 3 Using eLogger Developer



- Step 3.1 System Setting
- Step 3.2 Add Drivers and Devices
- Step 3.3 Add Tags
- Step 3.4 Procedure (Data Log Configuration)
- Step 3.5 Edit Pages
- Step 3.6 Edit Webpages

3.1. The System Menu

Click the **System** menu to display the setting page.



Sampling Time (seconds)

Set a refresh interval for data displayed on HMI pages (defaults: 1 second).

Enable Modbus TCP Server

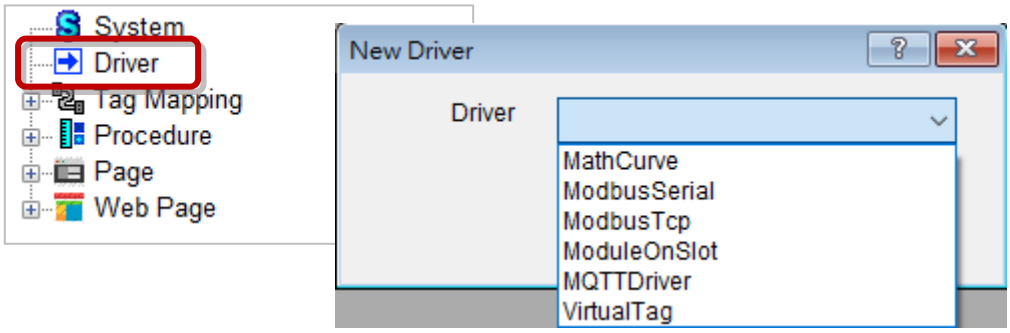
Let eLogger become a Modbus TCP Slave device.

3.2. The Driver Menu

eLogger supports six drivers for communicating with devices, including MathCurve, Modbus Serial, Modbus TCP, Module On Slot, MQTT Driver, and Virtual Tag.

Add Driver

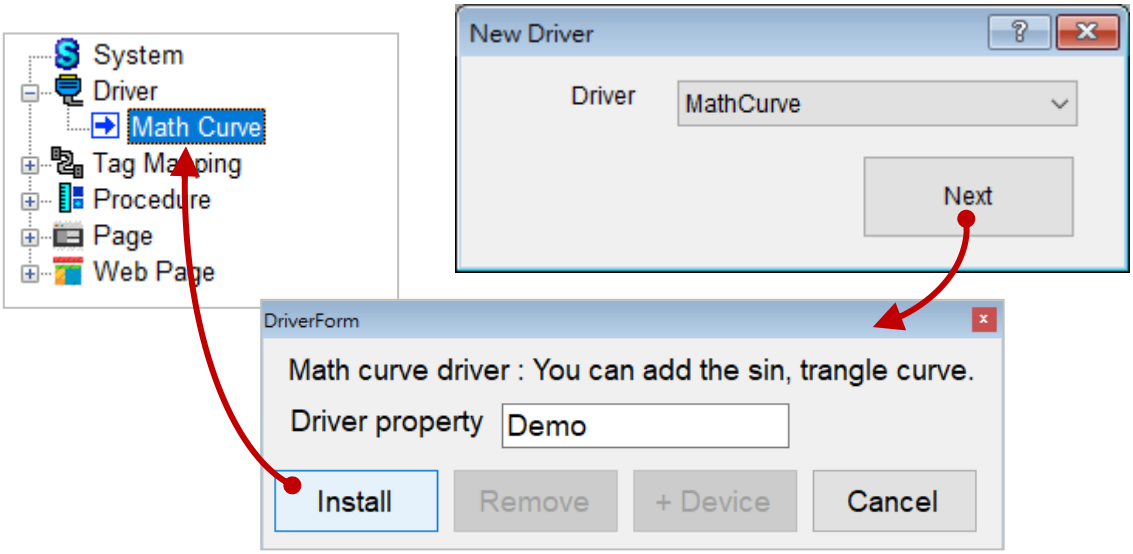
Click **Driver** to display the **New Driver** window. Select the driver to be installed and click **Next**.



3.2.1. Math Curve

Step 1: Install the Driver

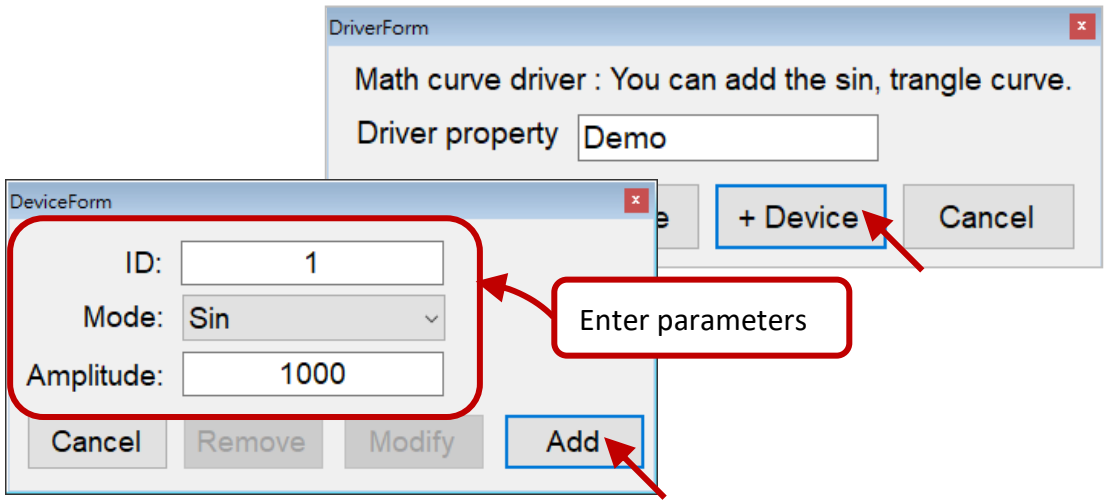
Click "**Install**" to install Math Curve driver. The function is only available for simulating, and do not output value.



Description	
Driver property	Used to add notes for the driver
Install	Used to install the driver. Note: Click the driver's name in the tree menu to allows the Remove and +Device operations.
Remove	Used to remove the driver if there is no added device
+ Device	Used to add a device
Cancel	Close the 'DriverForm' window

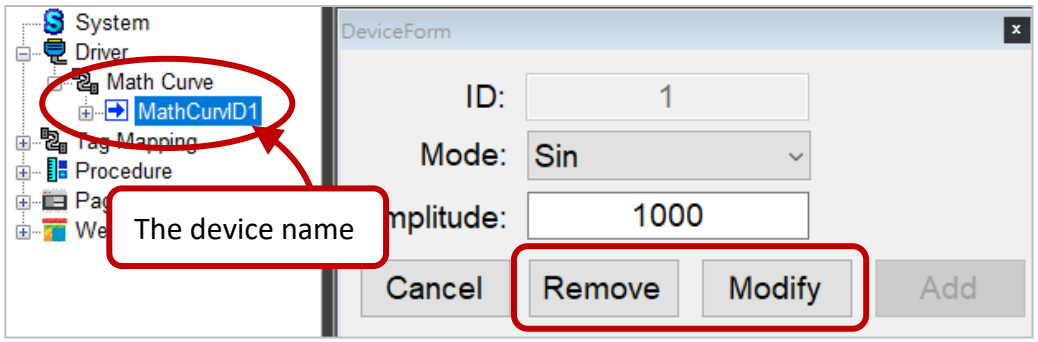
Step 2: Add the Device

1. Click the **+Device** button and enter parameters, and then click the **Add** button.

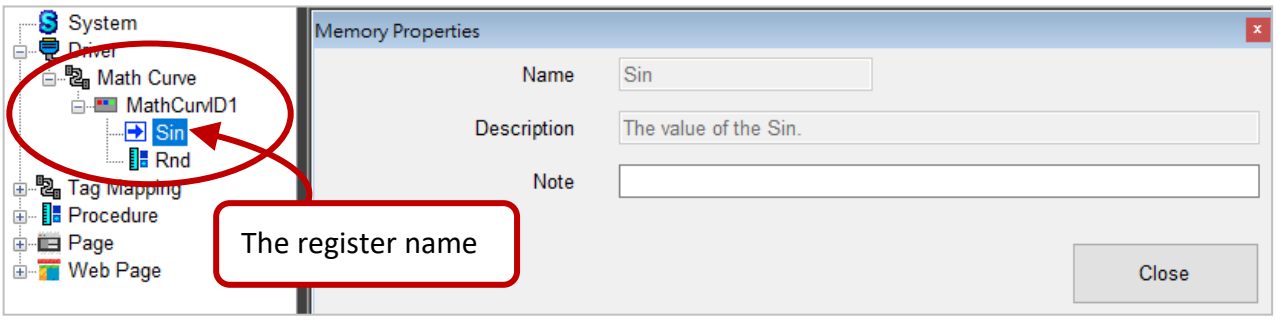


Description	
ID	The unique ID to identify the device
Mode	The type of math curve, it can be Sin or Trangle
Amplitude	Amplitude

2. After selecting the device name, click **Modify** for the changes to take effect or click **Remove** to remove the device.



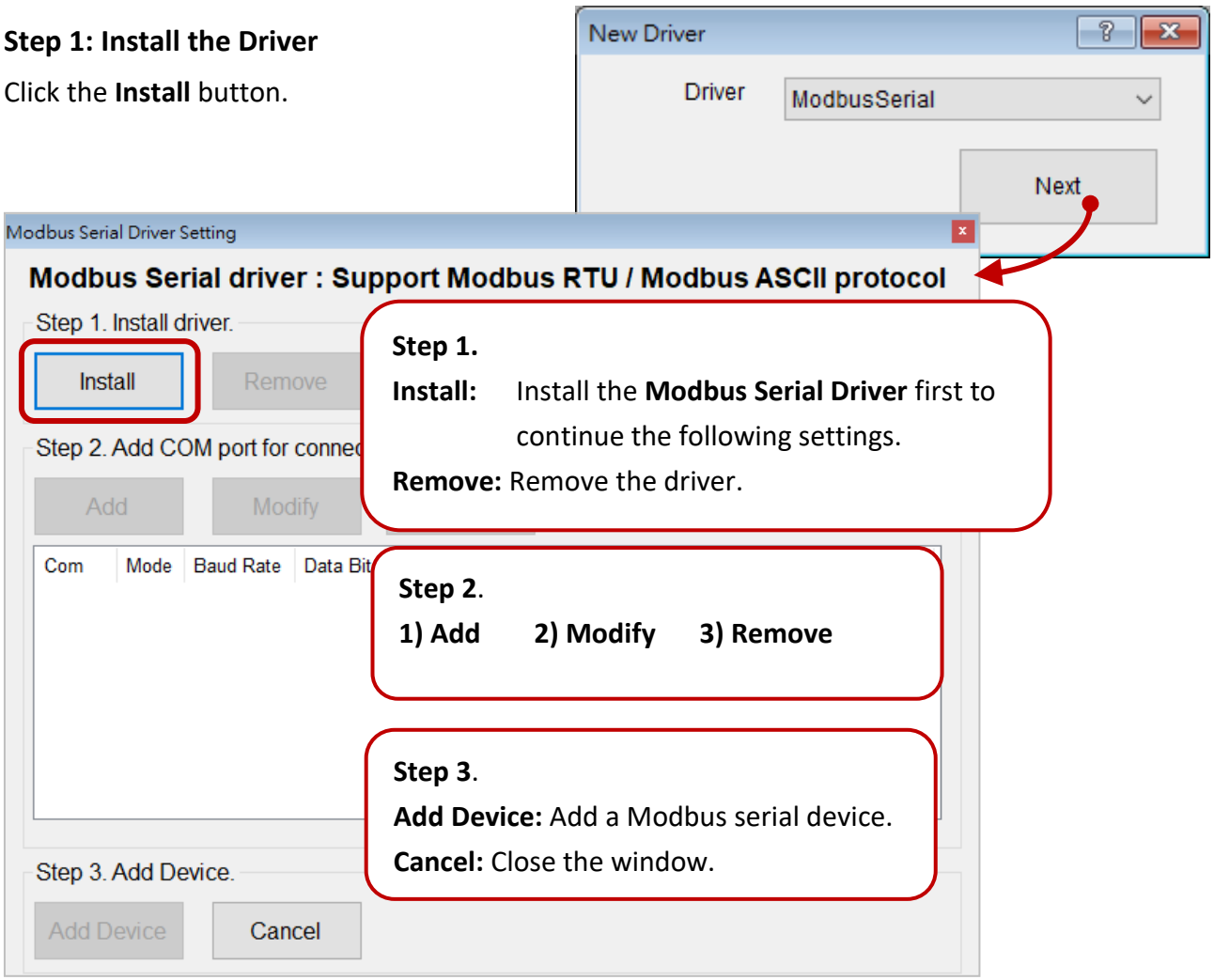
3. Expand the device name to show register names. Click it to view the description of the register.



3.2.2. Modbus Serial

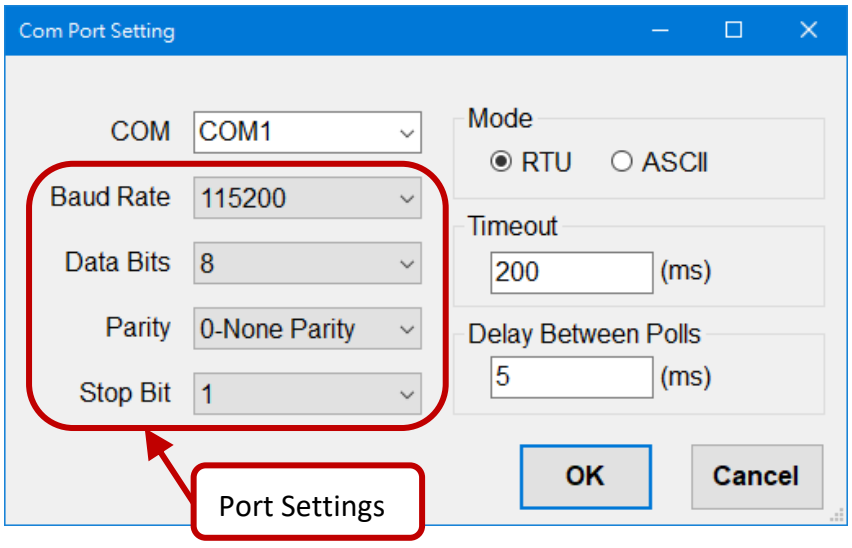
Step 1: Install the Driver

Click the **Install** button.



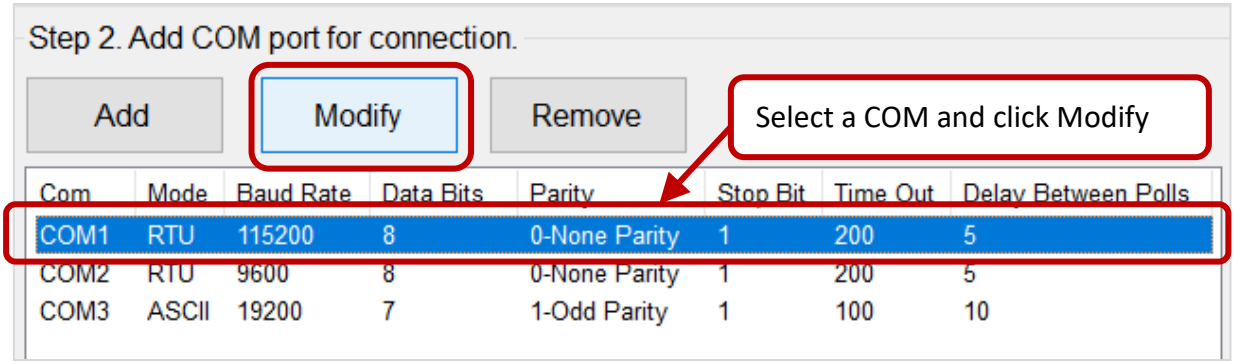
Step2: Set the COM Port

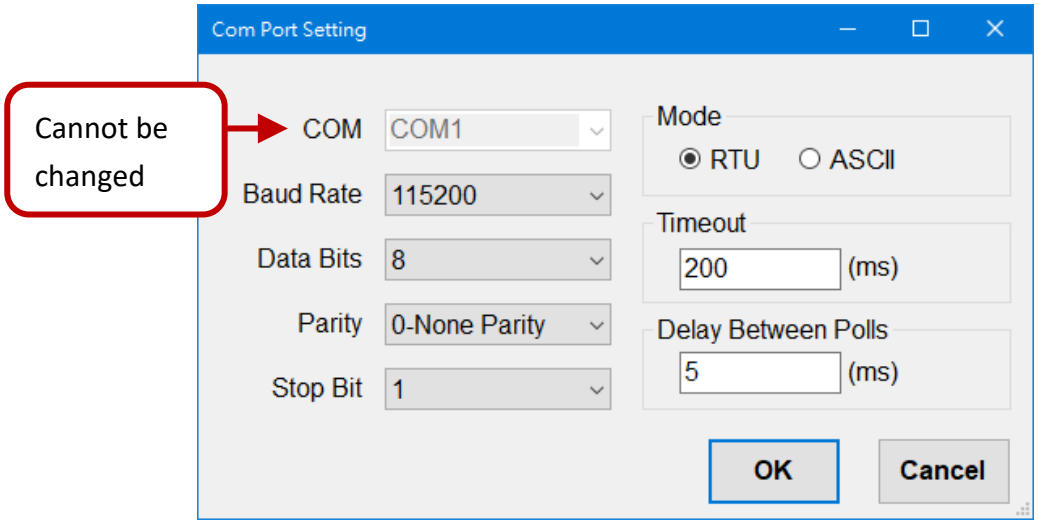
Add: Add a COM port for the connection.



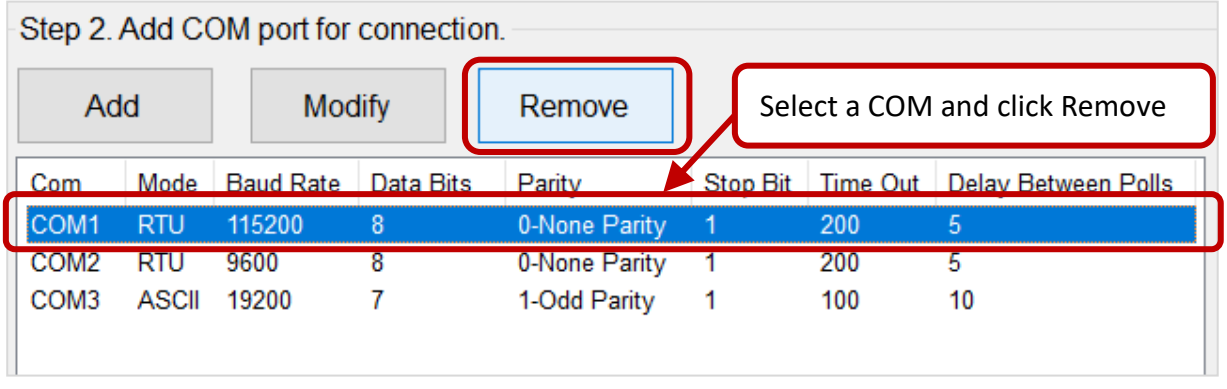
Description	
COM	Choose a COM port number or enter a COM port name.
Mode	Choose RTU or ASCII
Timeout	Set a timeout (Defaults: 200ms)
Delay Between Polls	Set a delay in between commands (Defaults: 5ms)
Port Settings	Set the Baud Rate, Data Bits, Parity, and Stop Bit

Modify: Modify the selected COM port settings.





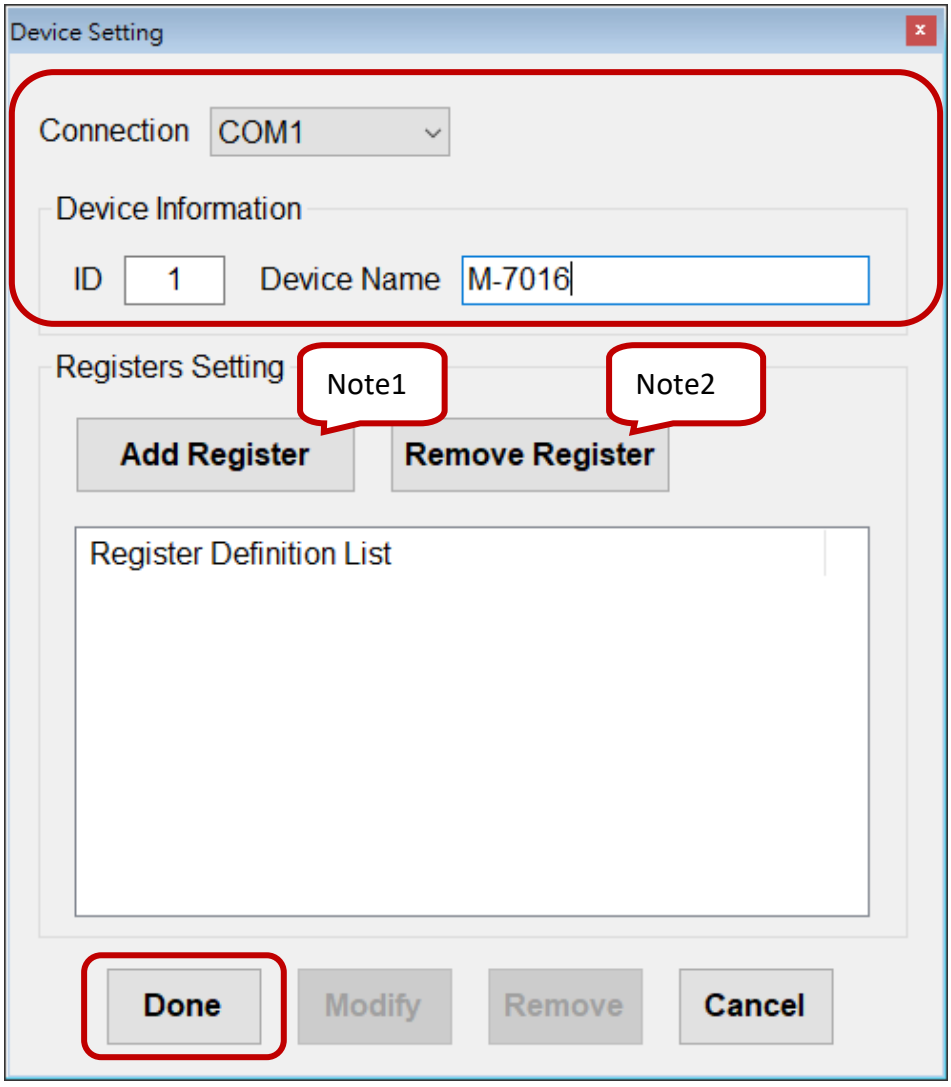
Remove: Remove the selected COM port settings.



Step3: Add the Device

Click the **Add Device** button.

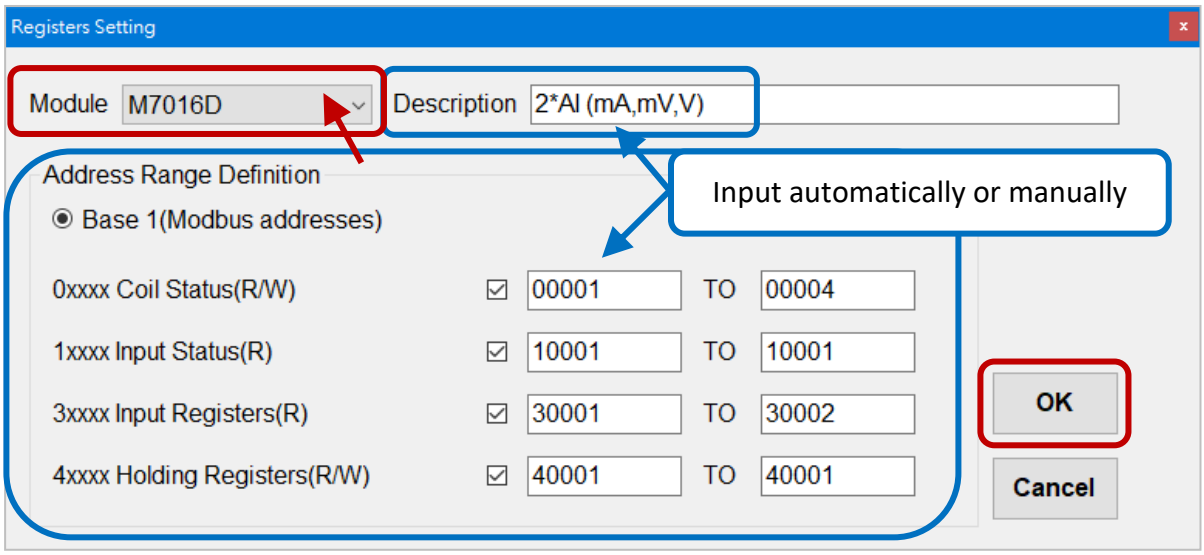
1. Enter parameters of the device and configure registers, and then click the **Done** button.



Description	
Connection	Select a COM port.
ID	Enter the Modbus ID, also called Net-ID
Device Name	Enter a name for easier identification

Note1: The Add Register button

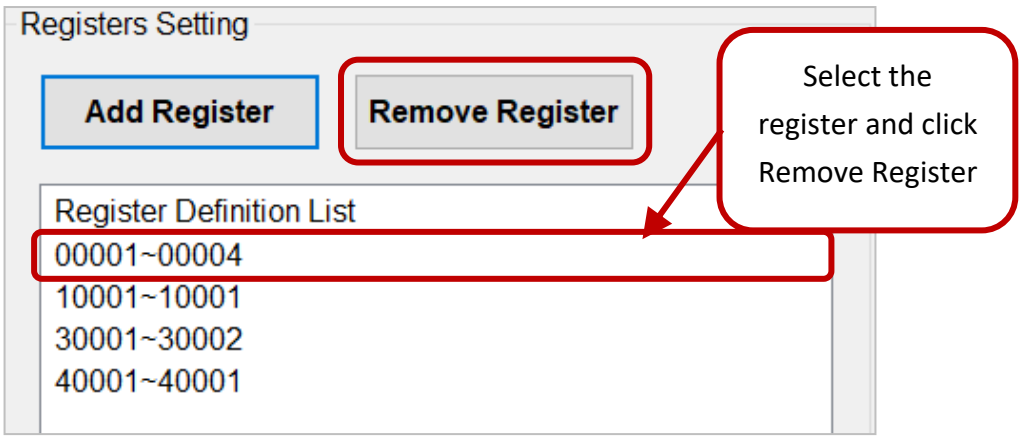
After selecting the module, the **Address Range** and **Description** settings will automatically be set (also can be set manually), click **OK** to finish.



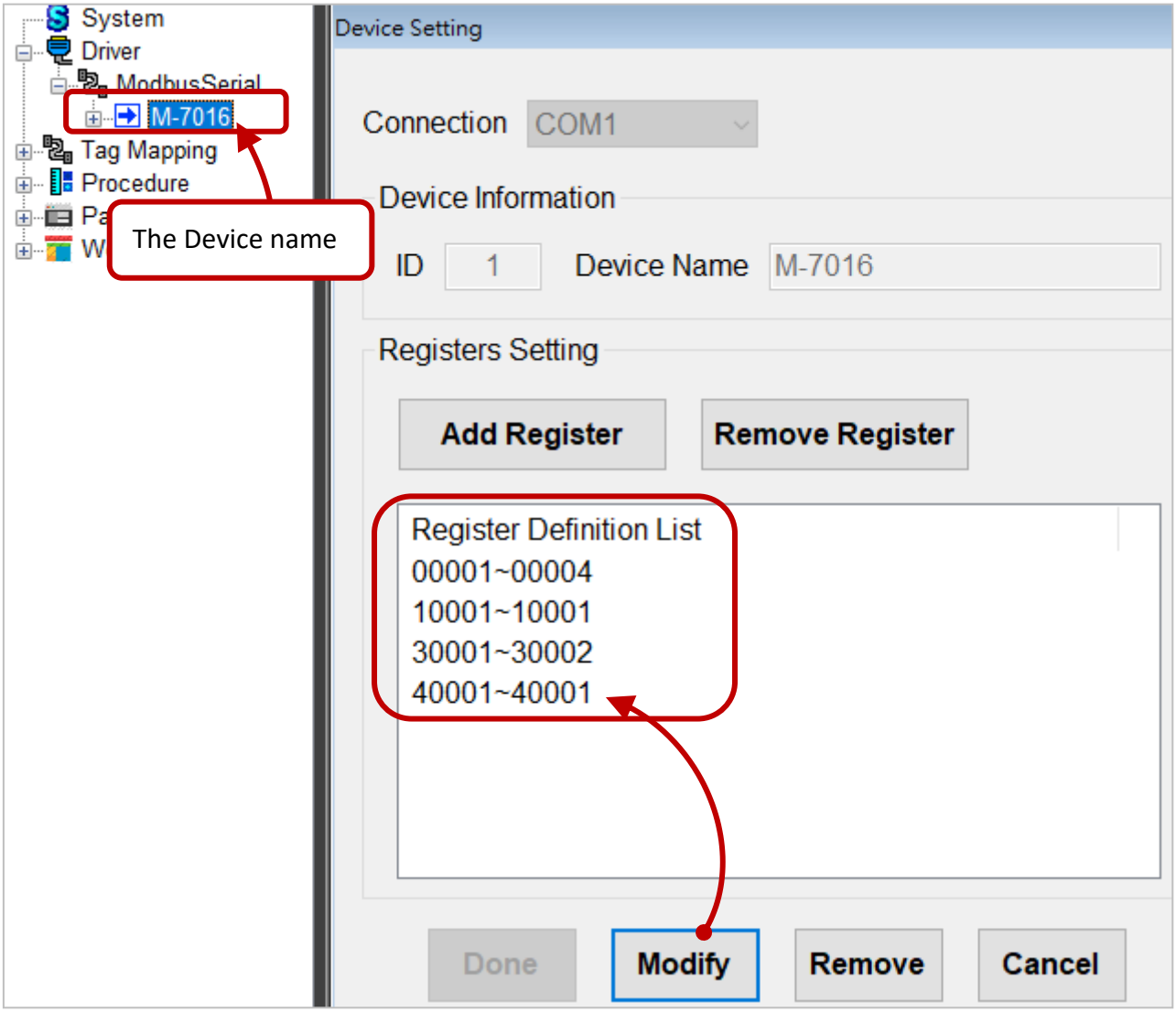
Description	
Module	Support M-7000 and tM DIO series modules. Once selected, relative settings will be filled automatically.
Description	The description of the module.
Base Address	Base 1 (Modbus address)
0xxxx Coil Status(R/W)	From start address to end address.
1xxxx Input Status(R)	From start address to end address. **Note:** The start address of tM modules (DI) is 10033
3xxxx Input Registers(R)	From start address to end address.
4xxxx Holding Registers(R/W)	From start address to end address.

Note2: The Remove Register button

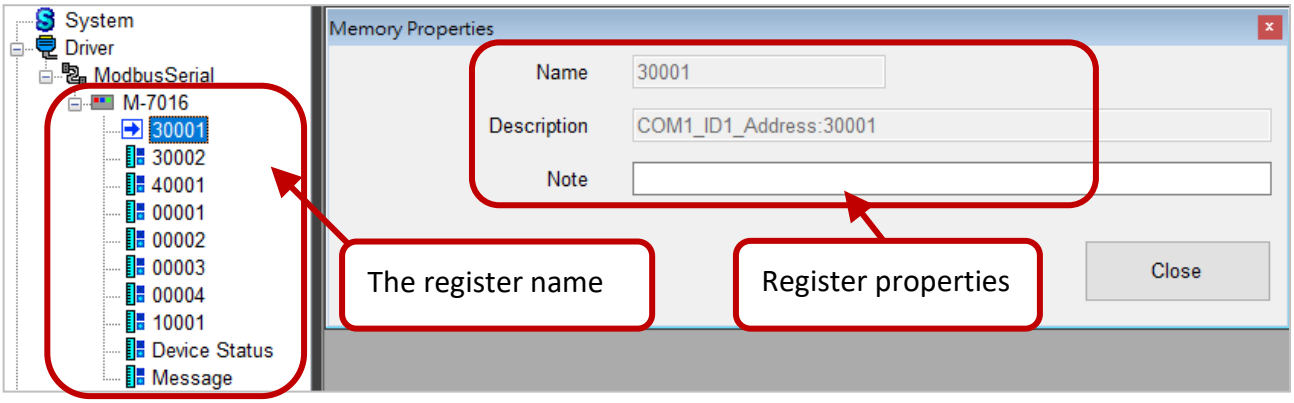
Select the register to be removed in the list, and click the **Remove Register** button.



2. Click the device name to display the **Device Setting** window. Click **Modify** for the changes of Registers to take effect. Click **Remove** to remove the device.



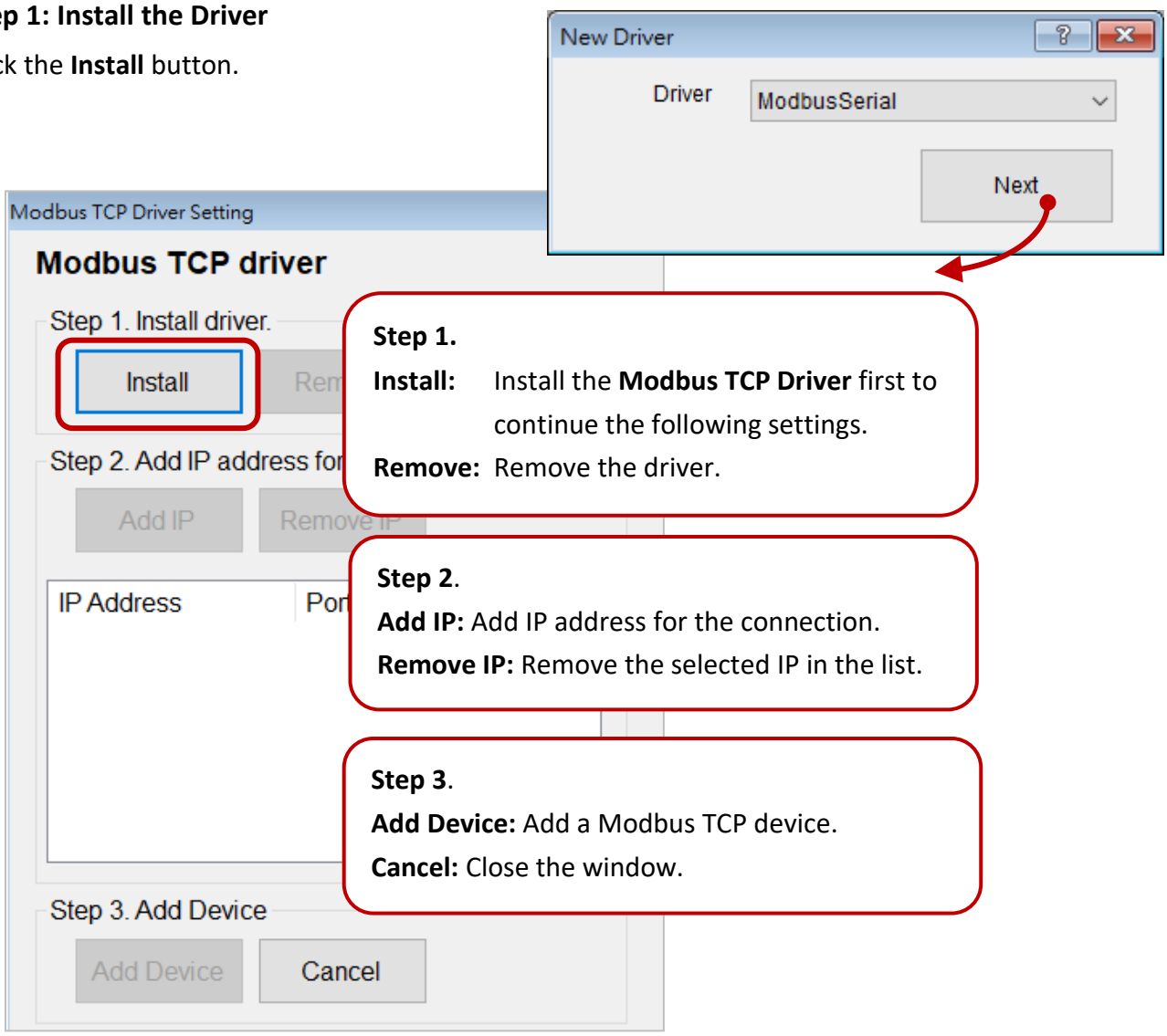
3. Expand the device name (M-7016) to view all register name, and click the name to view the properties.



3.2.3. Modbus TCP

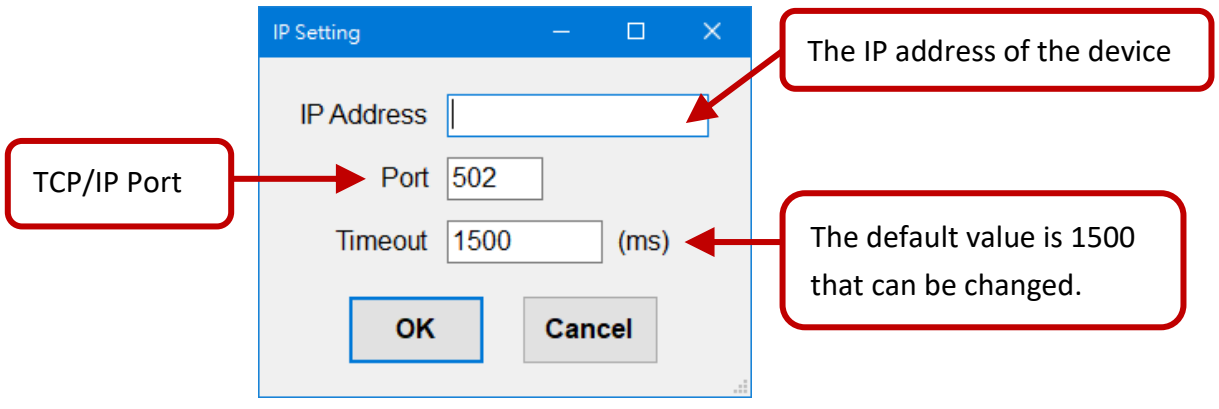
Step 1: Install the Driver

Click the **Install** button.

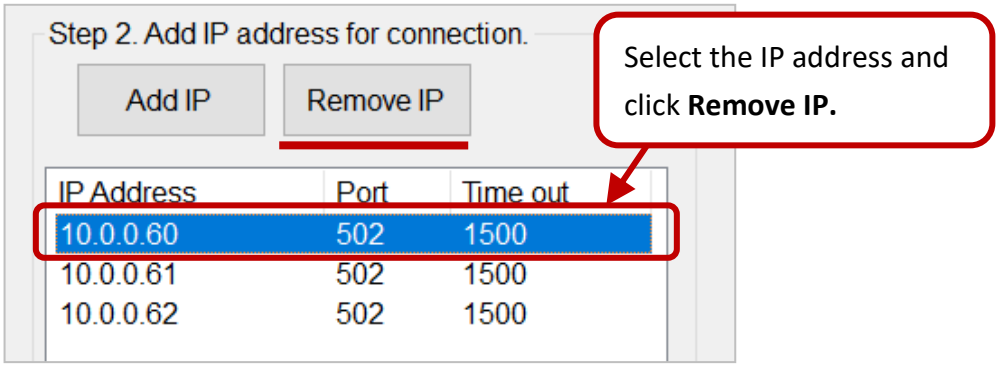


Step2: Set the IP address

Add IP: Click the **Add IP** button and enter parameters in the **IP Setting** window.

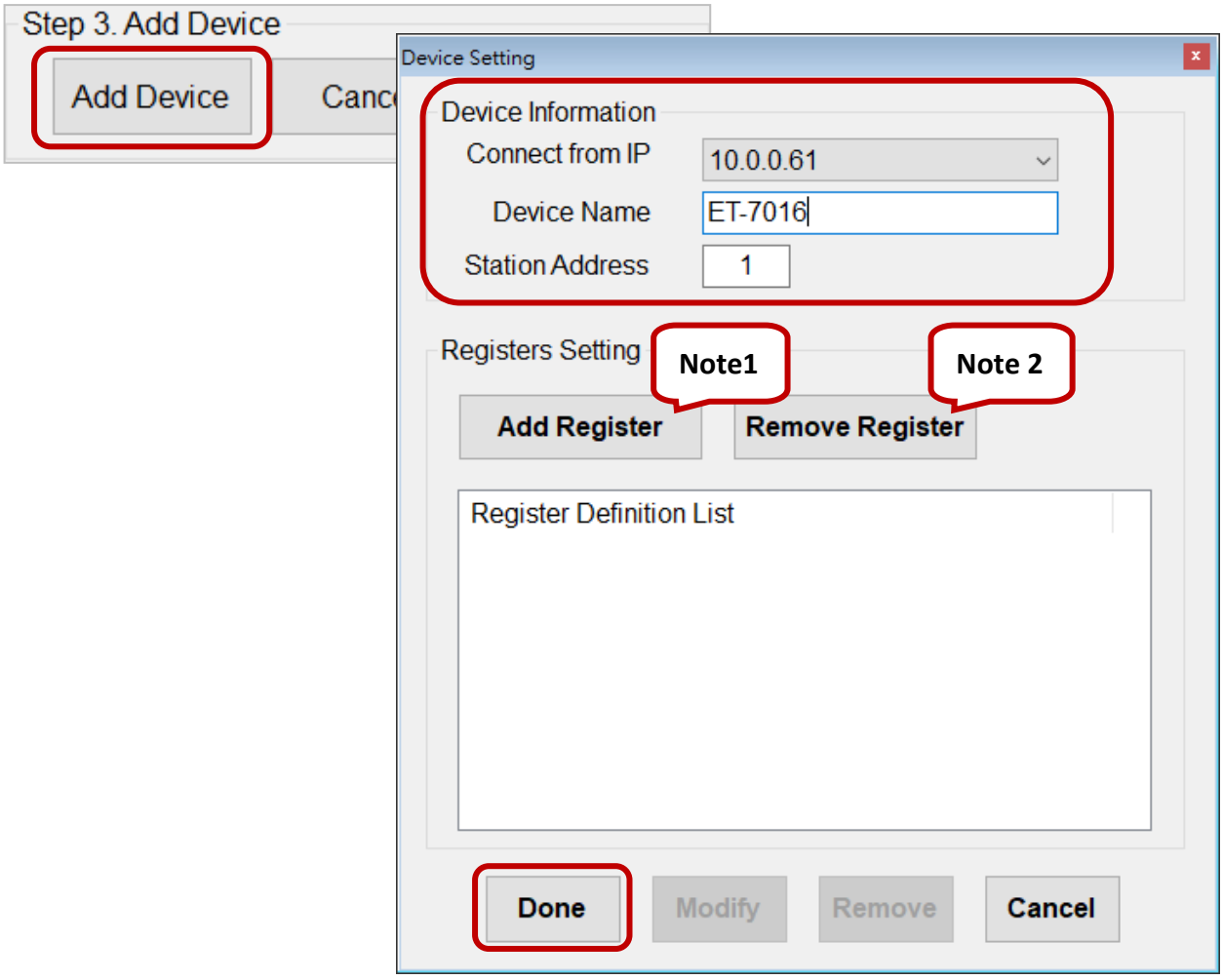


Remove IP: Select the IP address you want to remove and click the **Remove IP** button.



Step3: Add the Device

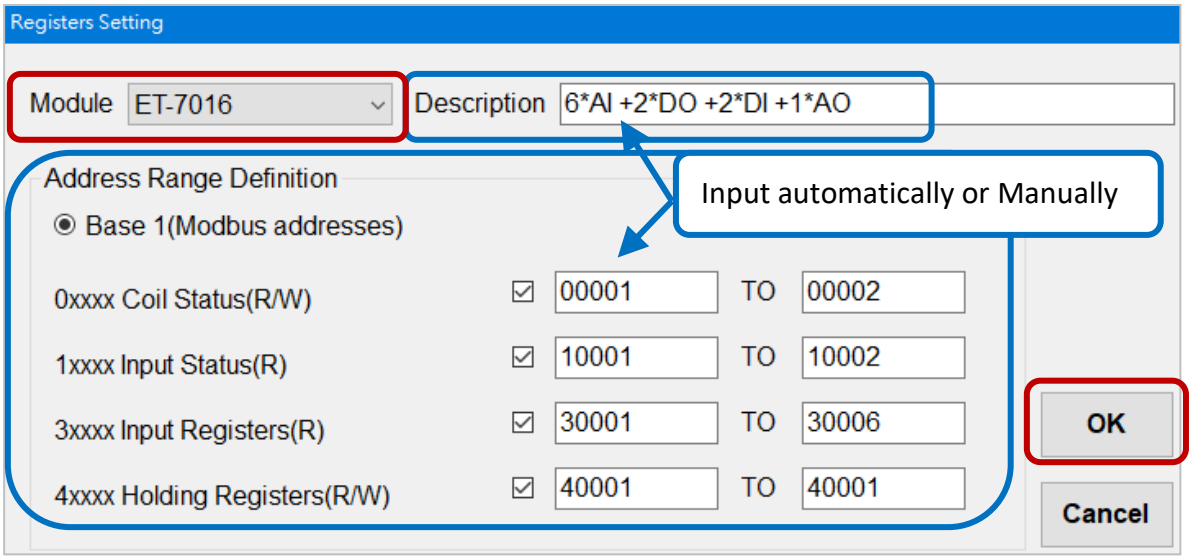
1. Enter parameters of the device and configure registers, and then click the **Done** button.



Description	
Connect from IP	Select the IP address of the Modbus TCP Slave device to connect
Device Name	Enter a name for easier identification
Station Address	Enter the Modbus ID (i.e., Net-ID)

Note1: The Add Register button

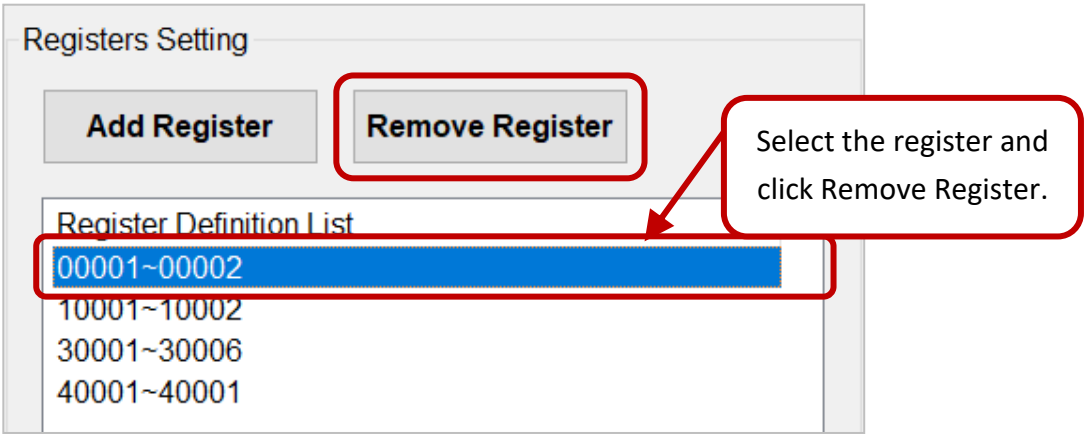
After selecting the module, the Address Range and Description settings will automatically be filled (also can be set manually), click OK to finish.



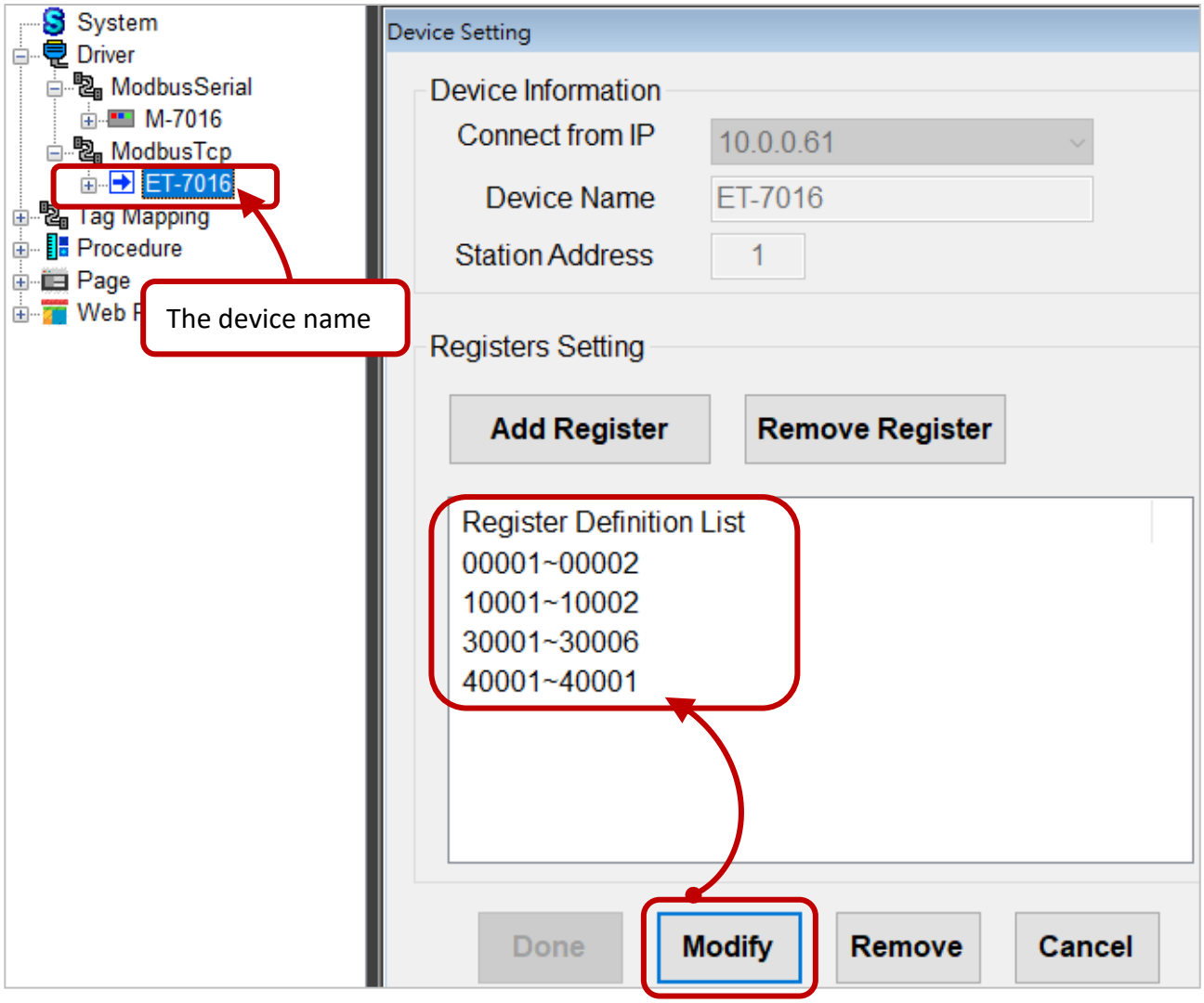
Description	
Module	Support ET7000, PET7000, WISE modules, etc. Once selected, relative settings will be filled automatically.
Description	Description of the module.
Base Address	Base 1 (Modbus address)
0xxxx Coil Status(R/W)	From start address to end address.
1xxxx Input Status(R)	From start address to end address.
3xxxx Input Registers(R)	From start address to end address.
4xxxx Holding Registers(R/W)	From start address to end address.

Note2: The Remove Register button

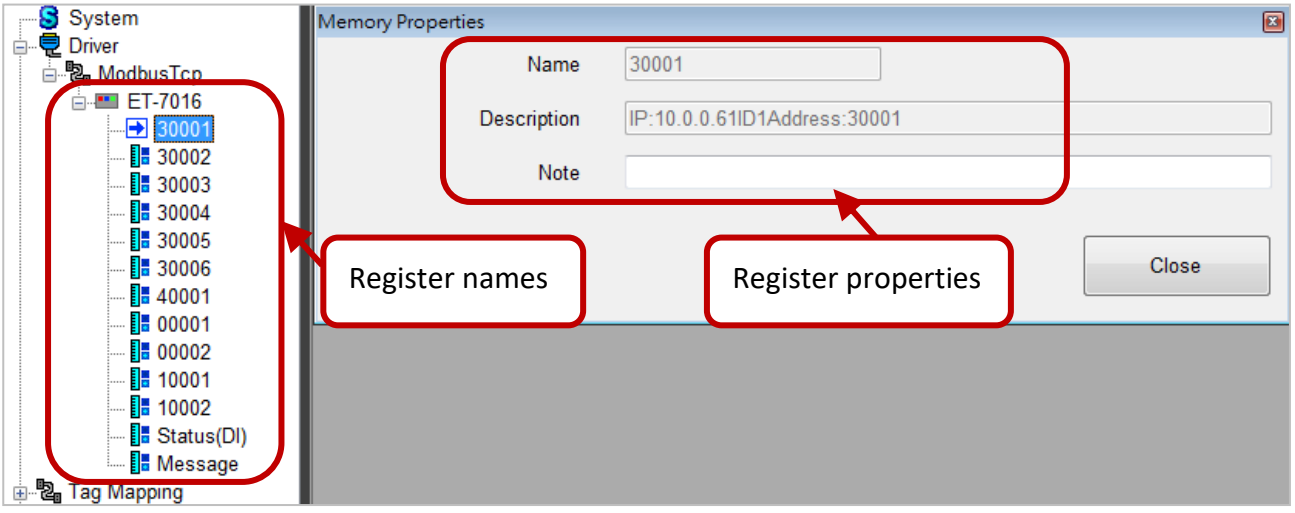
Select the register you want to remove in the list, and click the **Remove Register** button.



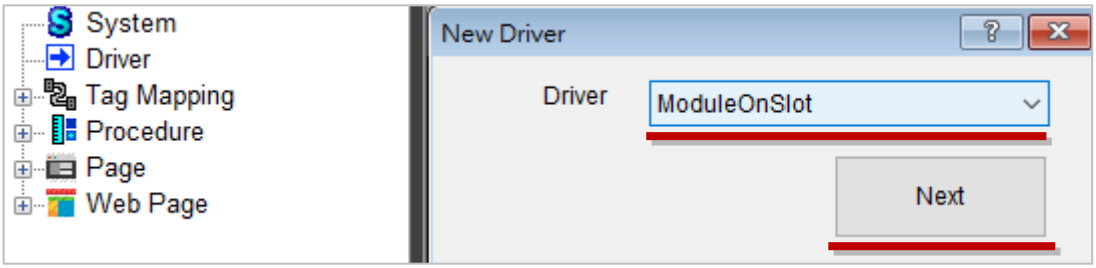
2. Click the device name to display Device Setting window. Click **Modify** for the changes of Registers to take effect. Click **Remove** to remove the device.



3. Expand the device name (ET-7016) to view all register name, and click the name to view the properties.

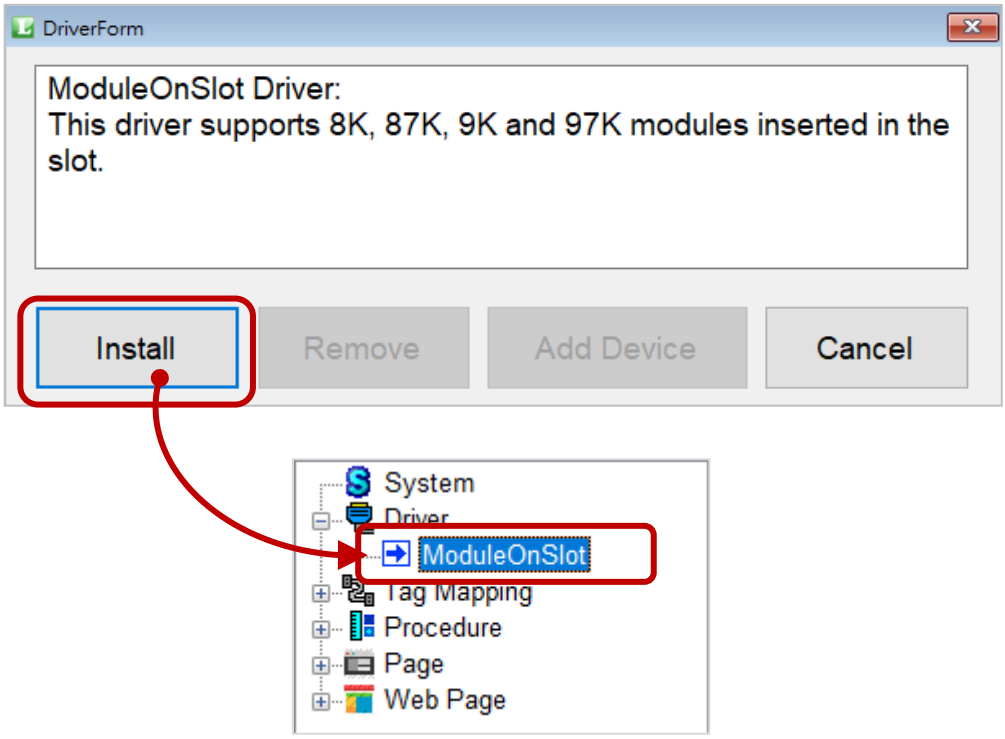


3.2.4. Module On Slot (For PAC version)



Step1: Install the Driver

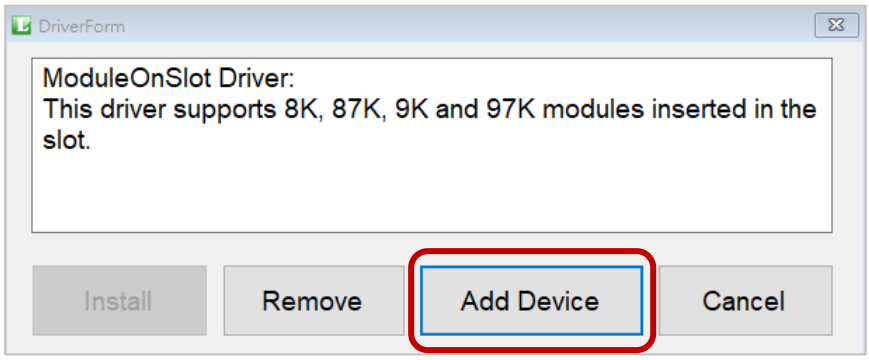
Click the **Install** button.



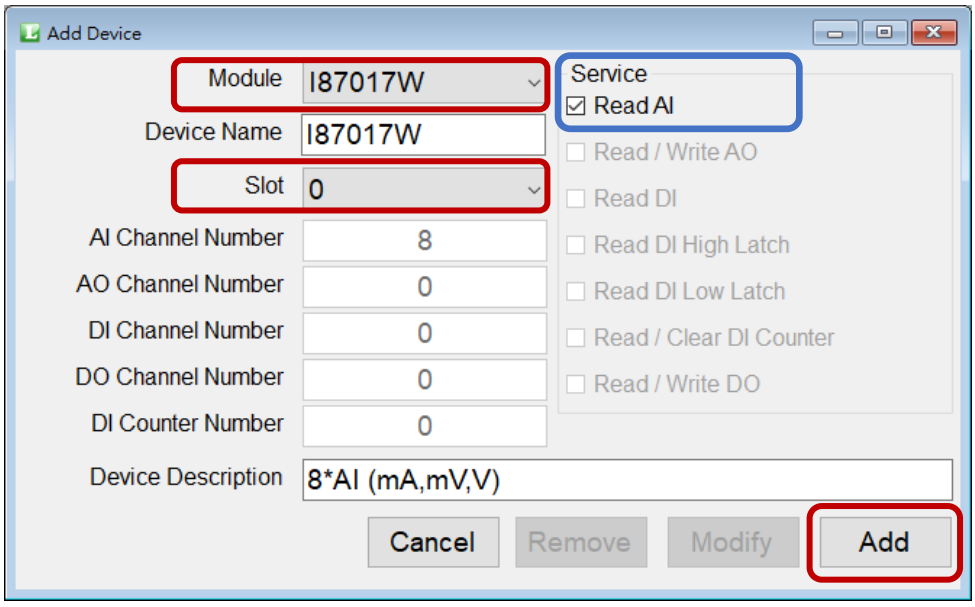
Description	
Install	Used to install the driver. Note: Click the driver's name in the tree menu to allows the Remove and Add Device operations.
Remove	Used to remove the driver if there is no added device
Add Device	Used to add a device such as I-8K/87K or I-9K/97K series modules.
Cancel	Close the DriverForm window

Step2: Add the Device

Click the **Add Device** button.



1. Select the module name and choose a slot number which the module is plugged in, and then click **Add** to add the device.

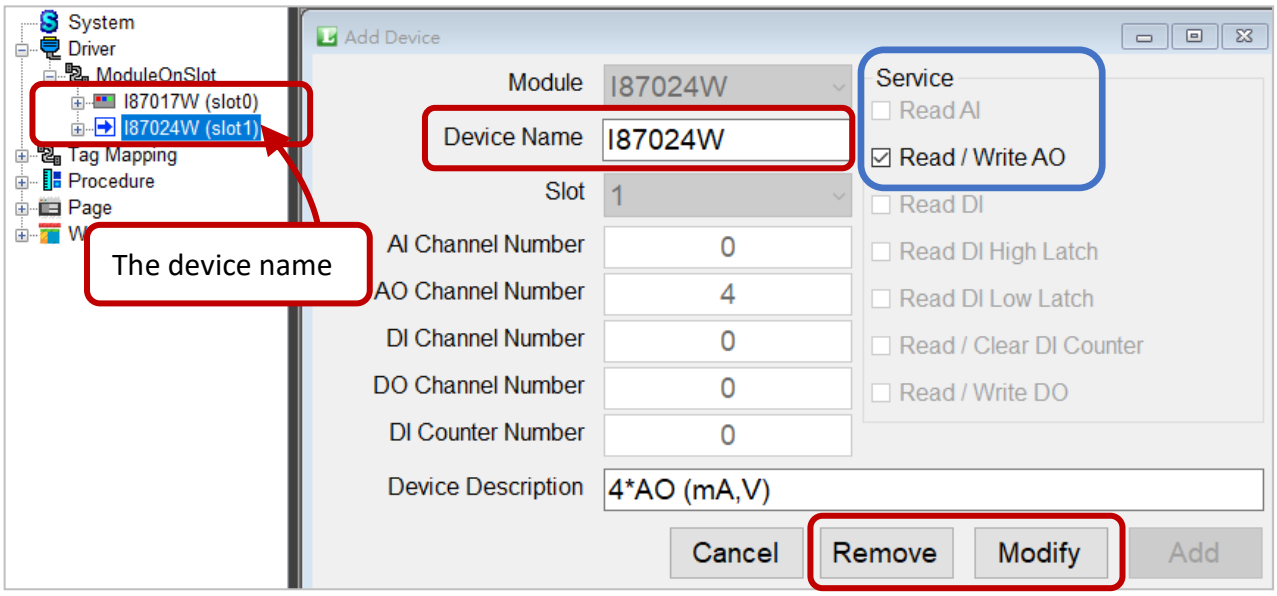


Description	
Module	After selecting the module (e.g., I-8K/87K/9K/97K series), the relative parameters will be set automatically.
Device Name	Enter a name for easier identification
Slot	Enter the slot number where the module is plugged in
AI Channel Number	The number of analog input channels
AO Channel Number	The number of analog output channels
DI Channel Number	The number of digital input channels
DO Channel Number	The number of digital output channels
DI Counter Number	The number of DI counter channels
Device Description	Enter notes for the module

Service: Arrange register to correspond channels by service type. Uncheck any Service box to disable the service.

Services	The needed amount of the Memory
Read AI	Input Register x 1
Read / Write AO	Holding Register x 1
Read DI	Input Status x 1
Read / Clear DI Counter	Input Register x 2 , Coil Status x 1
Read DI High Latch	Coil Status x 1
Read DI Low Latch	Coil Status x 1
Read / Write DO	Coil Status x 1

2. Click the device name to display the **Add Device** window. Click **Modify** for the changes to take effect or click **Remove** to remove the device.

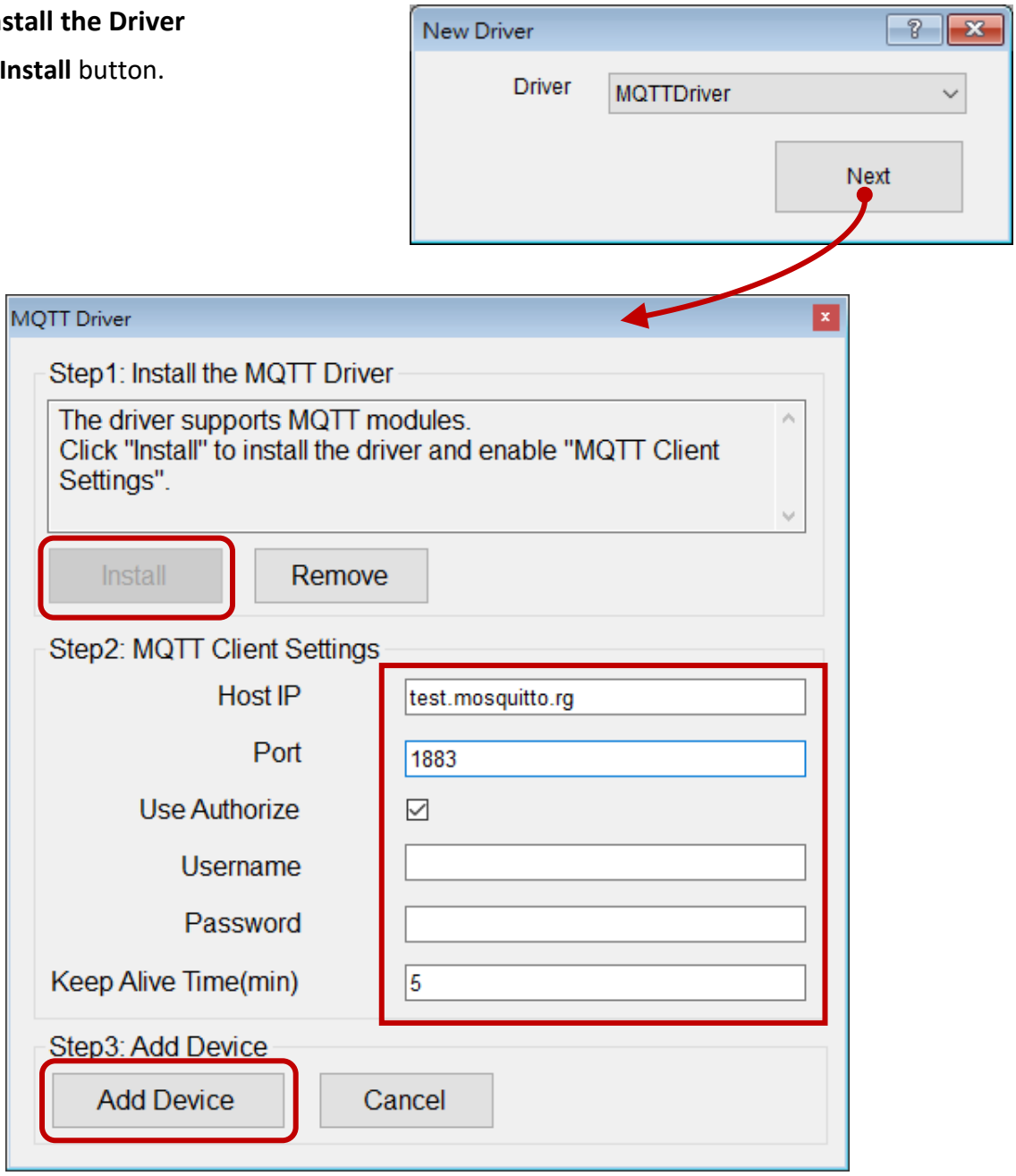


3. Expand the device name (I-87K) to view all register name, and click the name to view the properties.

3.2.5. MQTT Client

Step1: Install the Driver

Click the **Install** button.



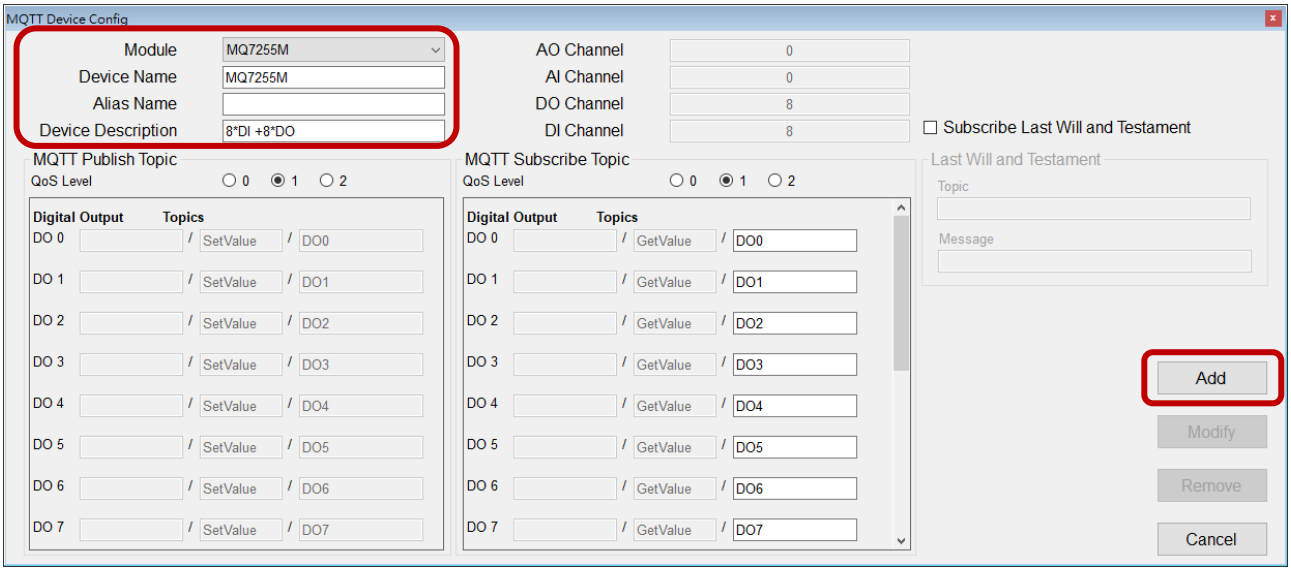
Step2: Configure MQTT Settings

Enter the parameters of MQTT Client

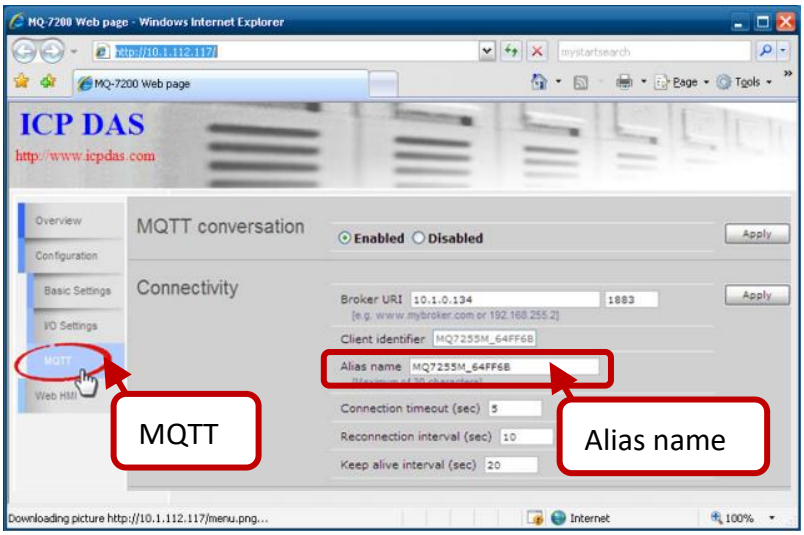
Step3: Add the Device

1. Click the **Add Device** button.

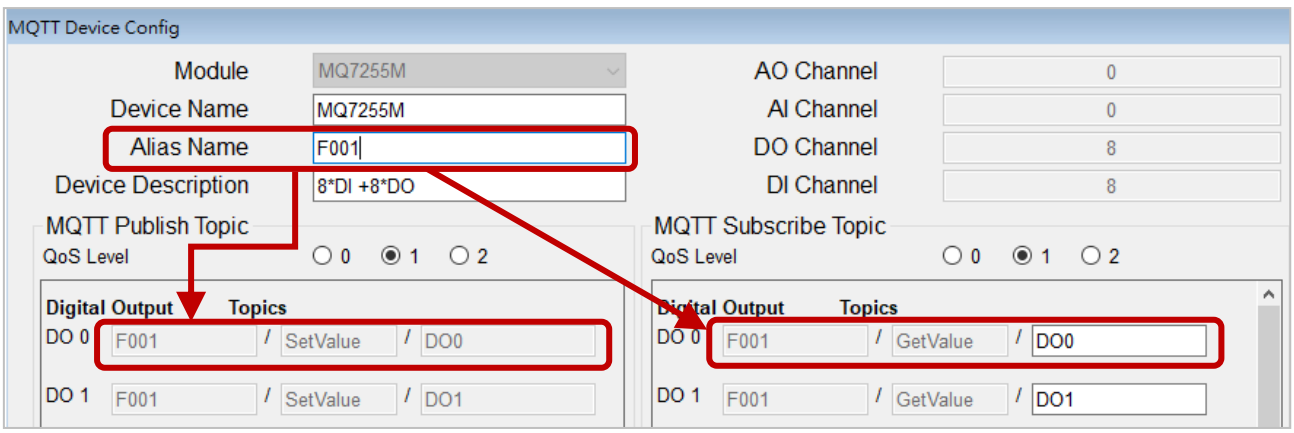
Step2: Select the module and enter parameters, and then click **Add** to add the device.



Refer to MQ-7200M series user manual to check the Alias Name on MQ-7200M web interface.



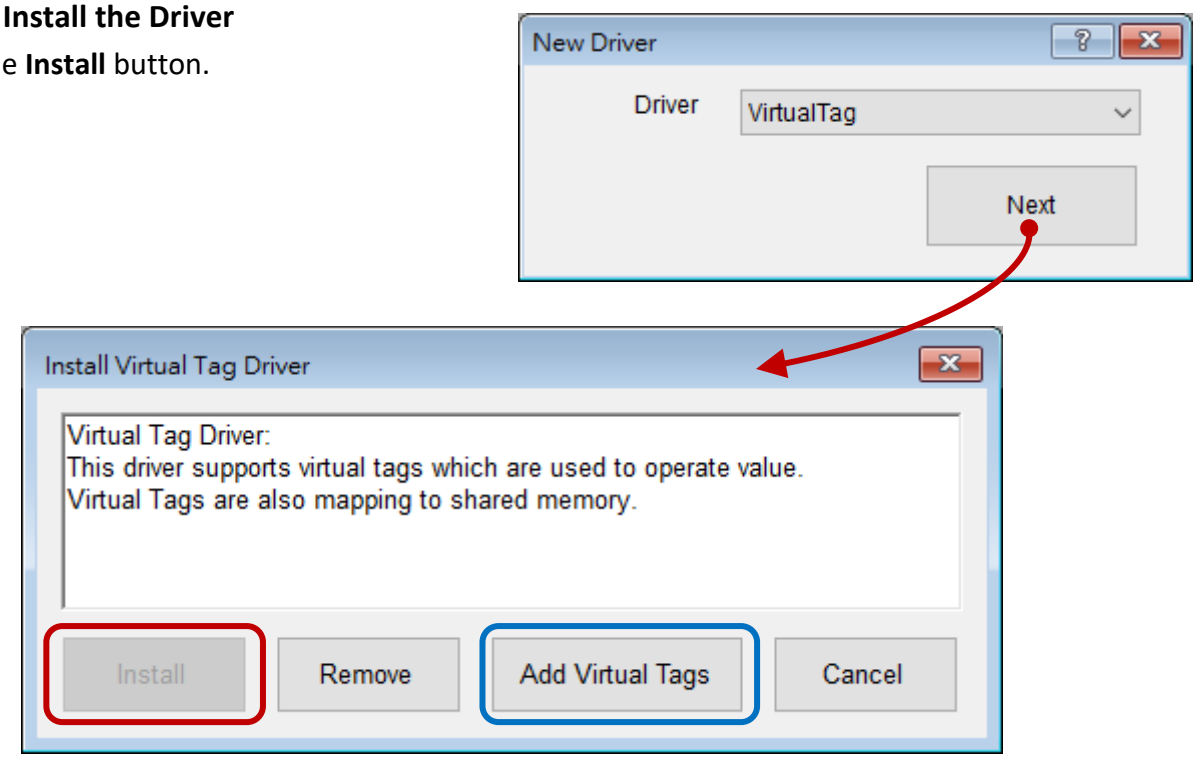
After entering the Alias Name, the text will automatically be added into the **Topics** field.



3.2.6. Virtual Tag

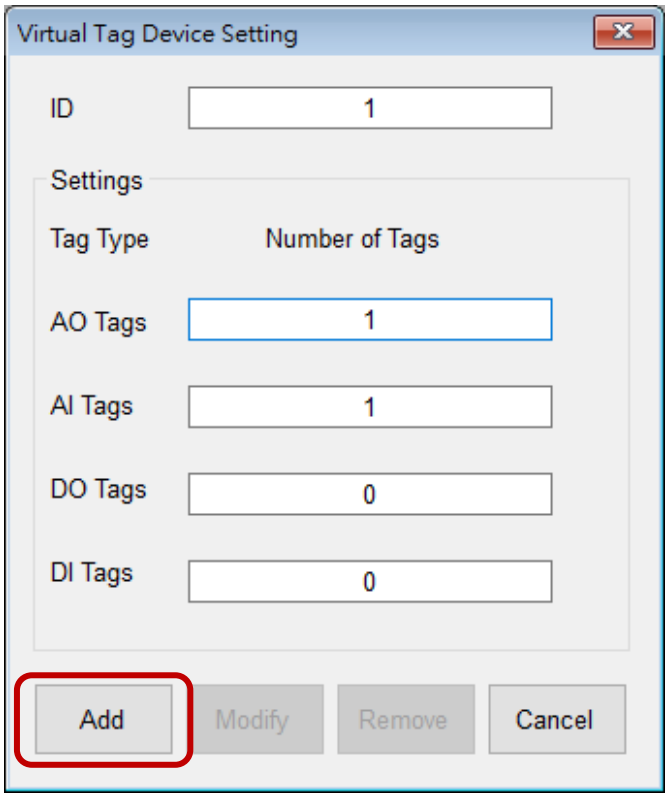
Step1: Install the Driver

Click the **Install** button.



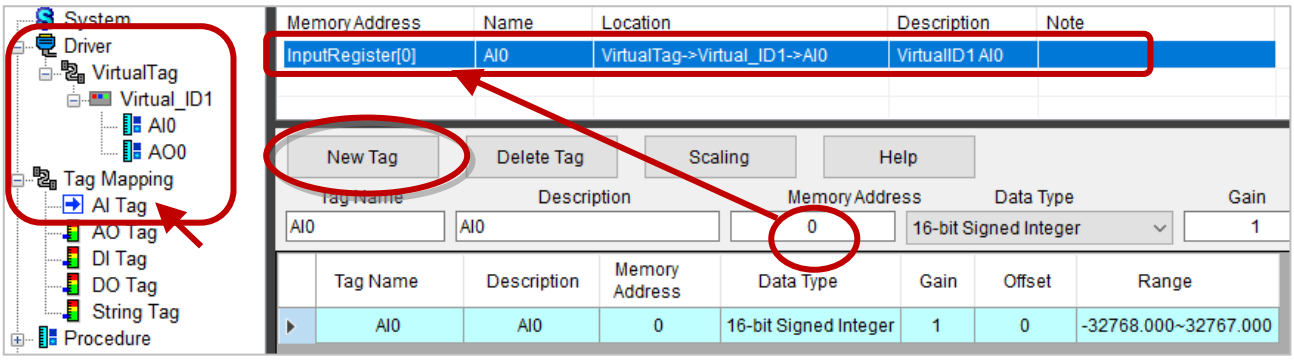
Step2: Add the Virtual Tag

Click the **Add Virtual Tags** button, enter a unique ID and the number of tag(s), and click **Add**.

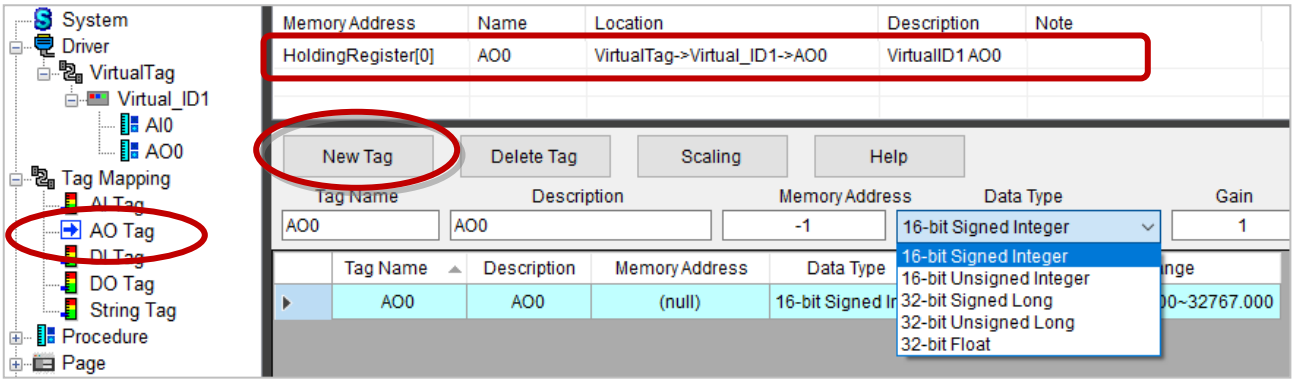


Users can check the added Virtual Tag Device in the **Driver** menu. In the **Tag Mapping** menu, the memory address for the added virtual tags has automatically been allocated. Click **New Tag** to add a tag and set the memory address and data type.

AI Tag:



AO Tag:



3.3. The Tag Mapping Menu

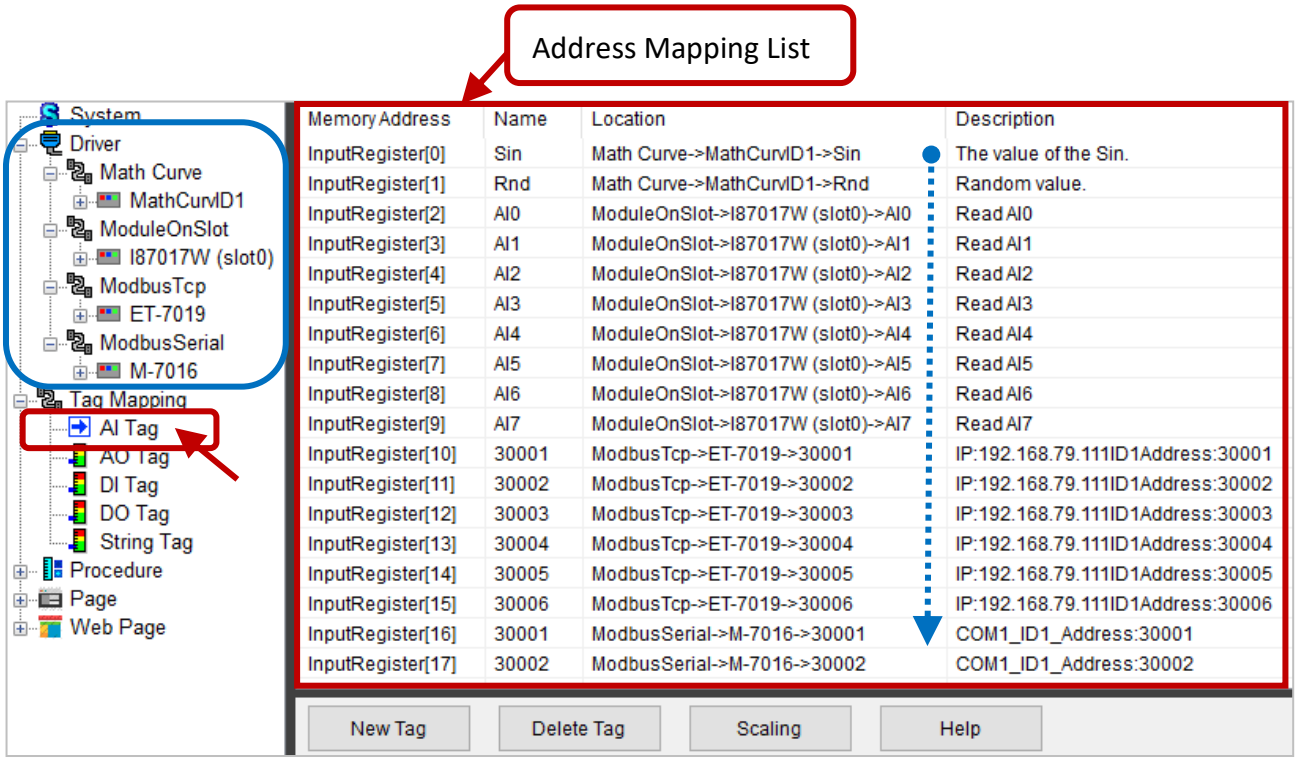
After installing the driver and adding the device, the memory address for tags will automatically be allocated and be arrayed sequentially on the address mapping list in the **Tag Mapping** menu via shared memory.

Users can add tags and set the corresponding address according to application needs.

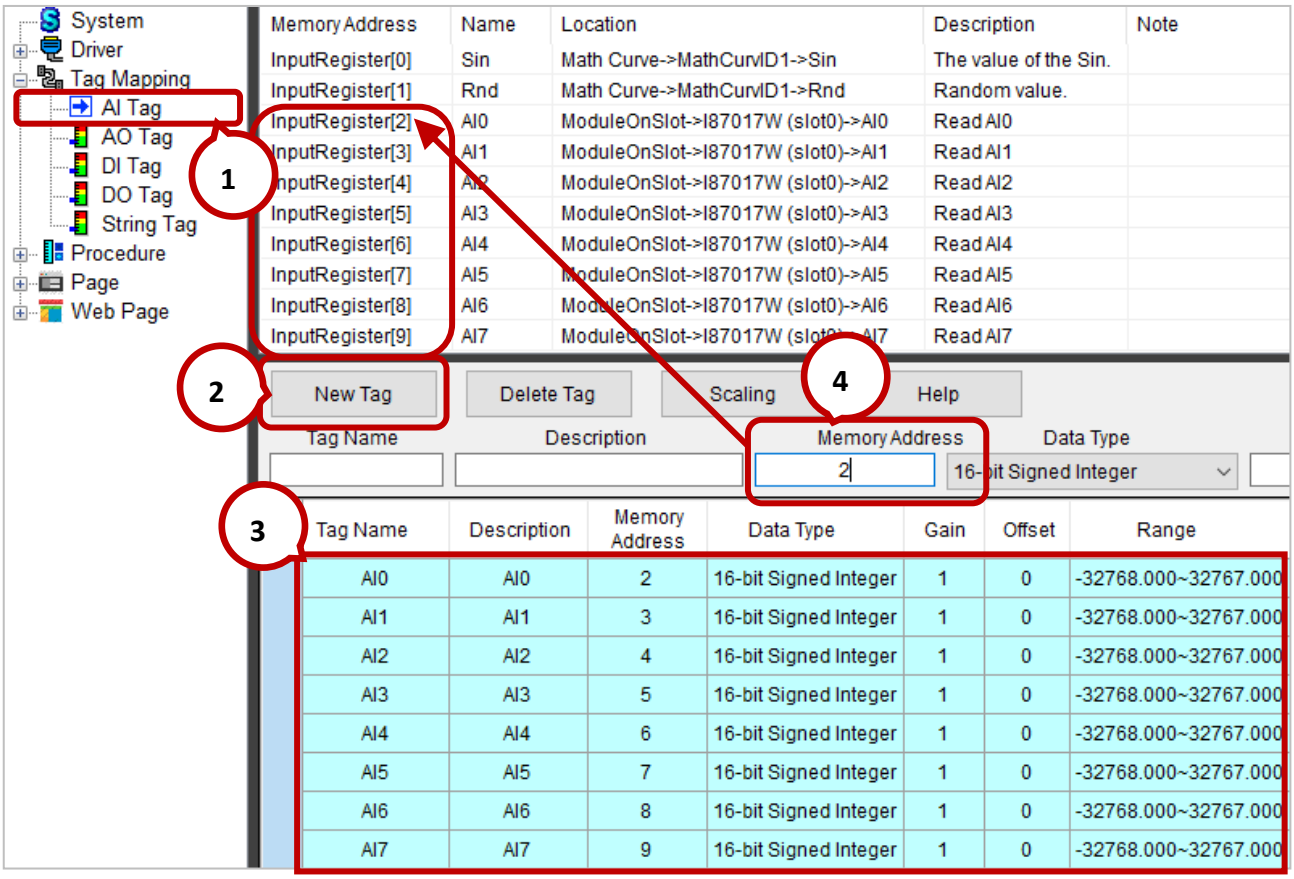
The following description will show you how to set Tags.

3.3.1. The Address Mapping List

Shared Memory address starts from “0”. The addresses are arrayed in the order of the driver, device, and channel.

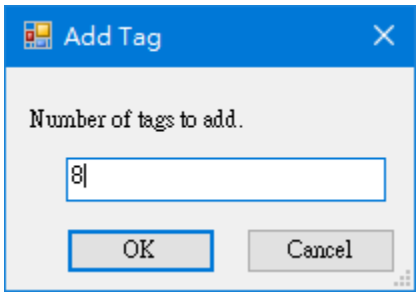


3.3.2. Add Tags



Step1: Select the Tag type (e.g., AI Tag).

Step2: Click the **New Tag** button and input the number of tags to be added, and then click **OK**.



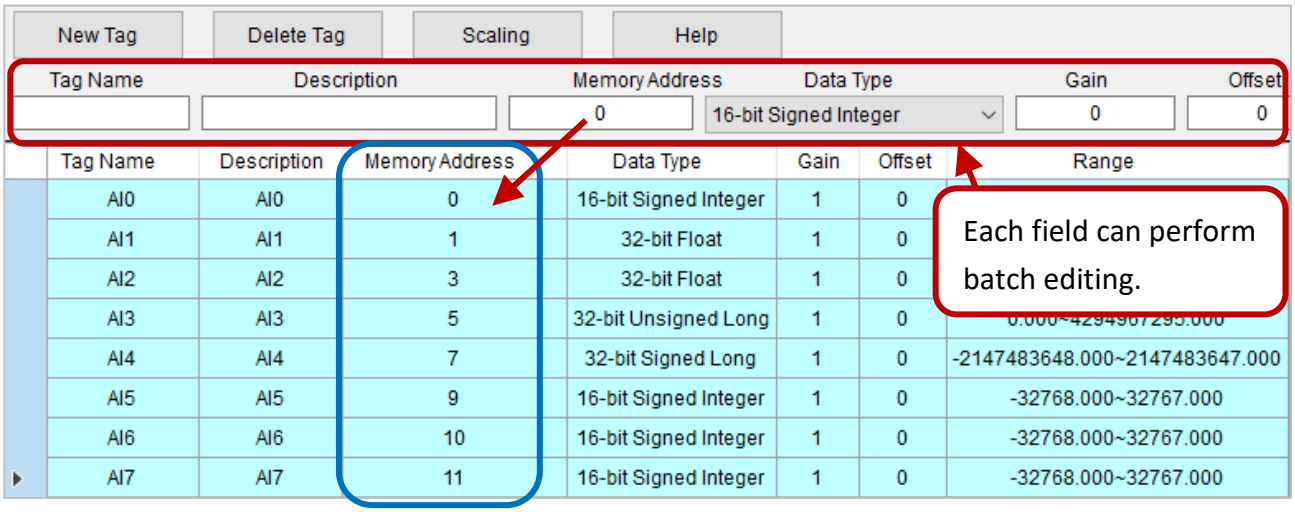
Step3: Select the added Tag. Also, holding down the mouse button and dragging the cursor to select multiple tags.

Step4: Enter parameters for tags (e.g., Tag Name, Memory Address, Data Type, etc.).

3.3.3. Batch Editing for Tags

Step 1: Select multiple tags you want to edit.

Step 2: Enter the start address (e.g., 0) in the **Memory Address** field, the rest of address will automatically be filled.



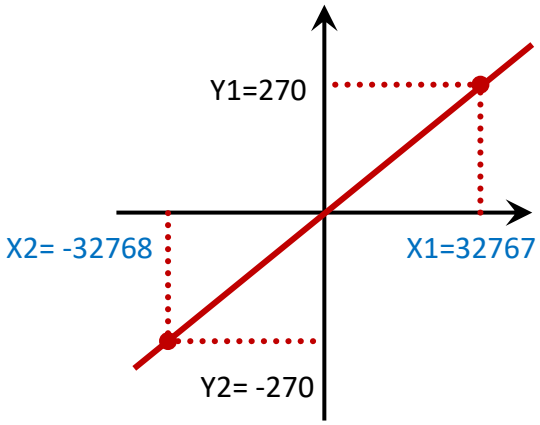
Description	
Tag Name	Enter a name for easier identification
Description	Enter the description of tag
Data Type	Select the data type for input/output channel. **Note:** when using a 32-bit data type, it needs two memory addresses.
Gain	Enter the Gain value for scaling (Note 1)
Offset	Enter the Offset value for scaling (Note 1)
Range	The range of data

Note 1: Calculating the Gain and Offset values

To convert data to the desired units type by calculating the Gain and Offset values or using the "Scaling" function. In this example, we calculate the Gain and Offset values for converting data ranges from -32768 to 32767 to a temperature value ranges from -270 to 270.

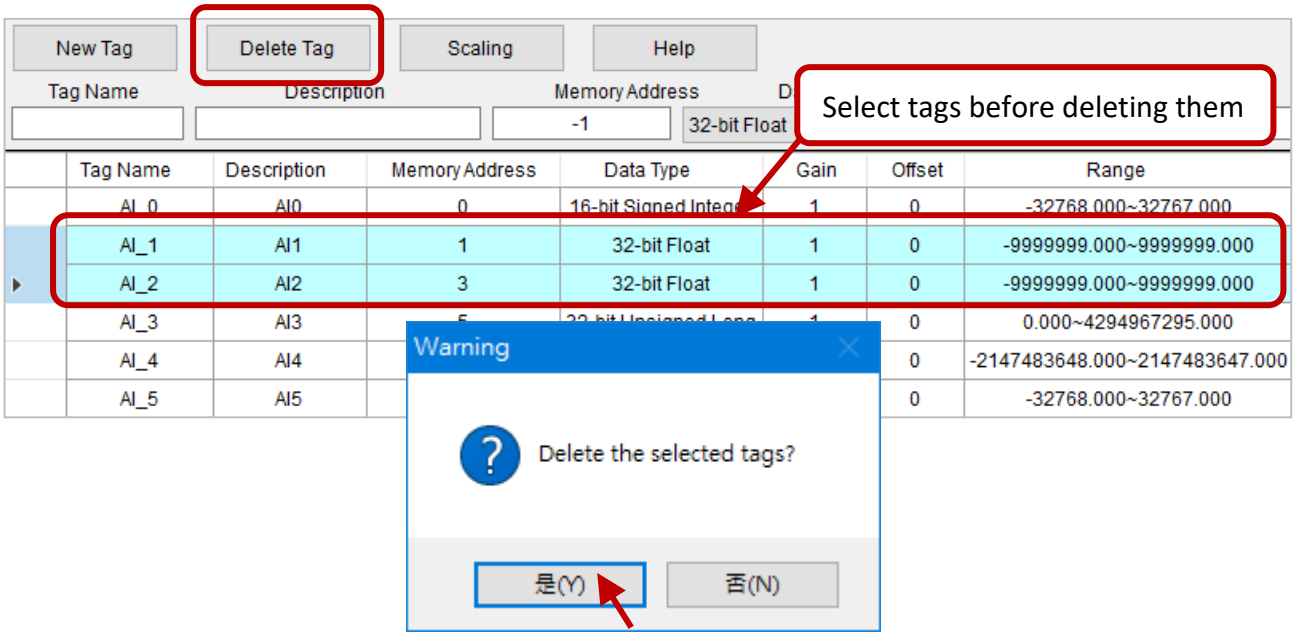
$$\text{Gain} = \frac{Y2-Y1}{X1-X1} = \frac{540}{65535} = 0.00823987$$

$$\text{Offset} = Y1 - \text{Gain} * X1$$
$$= 270 - 269.99 \fallingdotseq 0$$



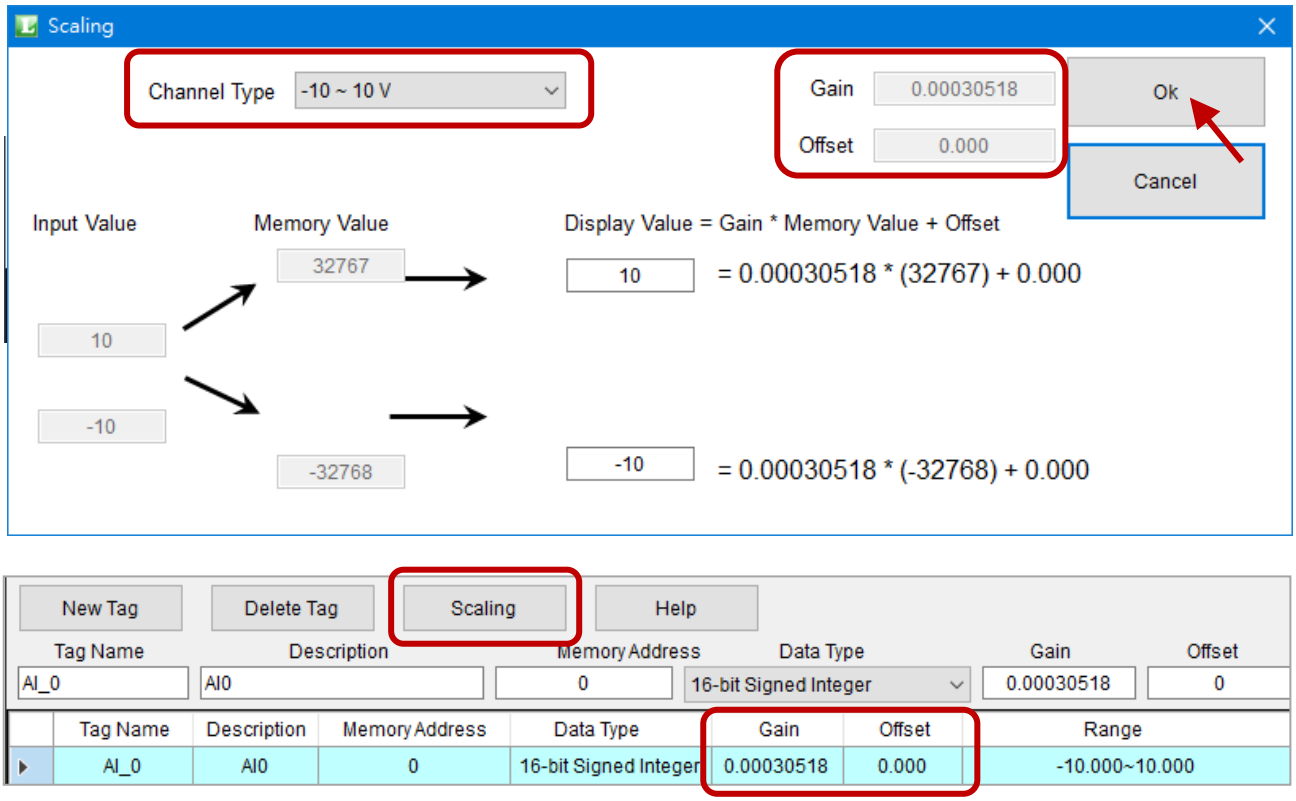
3.3.4. Delete Tag

Click the **Delete Tag** button to delete one or multiple selected tags.



3.3.5. The Scaling Function

To calculate the Gain and Offset values automatically, click the **Scaling** button and select the **Channel Type**, and then click the **OK** button to automatically fill values to correspond fields.



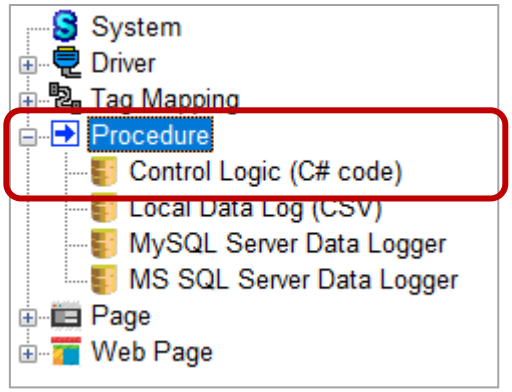
3.4. The Procedure Menu

The **Procedure** tree-menu provides Control Logic, Local Data Logger, and Remote Data Logger (using MySQL or MS SQL) functions.

3.4.1. Control Logic (C# code)

Using C# to edit a simple logic control program.

Step1: Expand the **Procedure** menu and click **Control Logic (C# code)** to display the setting window.

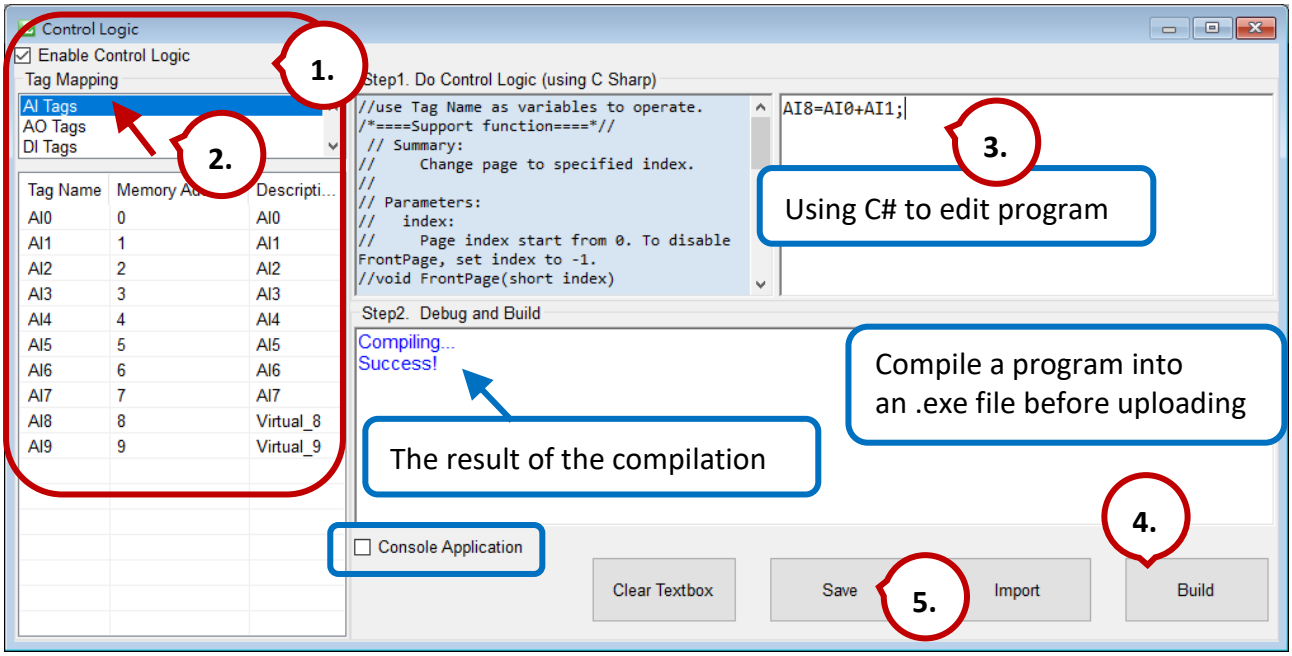


Step2: In the **Control Logic** window, click **Enable Control Logic** to enable the function.

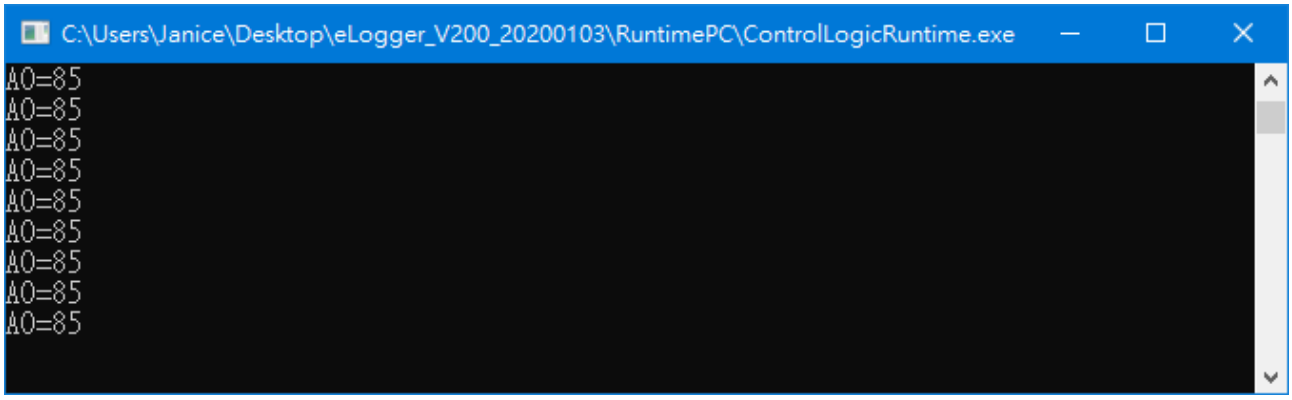
Step3: In the **Tag Mapping** section, click any tag type to view available tags.

Step4: Using C# to edit program in the textbox, and click **Build** to compile the program.

Step5: After a successful compilation, click **Save** to save the program.



Note: After the compilation, a **ControlLogicRuntime.exe** file will be generated in the installation folder of eLogger Developer. As the figure above, if the 'Console Application' is checked, a DOS window that used for debugging will be displayed after downloading and running the project. For example, enter the code **Console.WriteLine("AO="+AO0.ToString());** and the window will be displayed as follows.



Related demo program:
http://ftp.icpdas.com/pub/cd/winpac/napdos/elogger/Logic_Control_Demo/

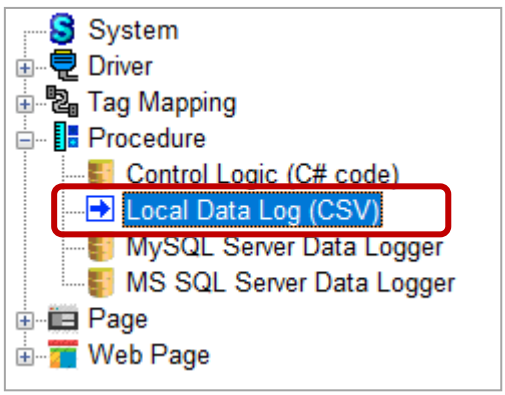
3.4.2. Local Data Logging (.CSV)

The **"Local Data Log (CSV)"** function is used to record I/O data in the storage device of PAC such as SD memory card. The user can set the scan interval, the record time, and the log path.

There are three folders (i.e., Log, YYYY, and MM) that will be created in the custom log path. 'YYYY' and 'MM' stands for the year and month of system time. Log files are stored in the 'MM' folder and are named "the custom name_YYYYMMDD_HH.csv". When the disk space is less than 10 MB, the oldest file will be deleted by eLogger Runtime. If the file needs to be deleted are created same-day, it will stop logging data.

Once the data logging is completed, the log files can be copied from PAC to PC by using FTP. These CSV files can be opened in Excel or Access for further analysis.

Step1: Expand the **Procedure** menu and click **Local Data Log (CSV)** to display the setting window.



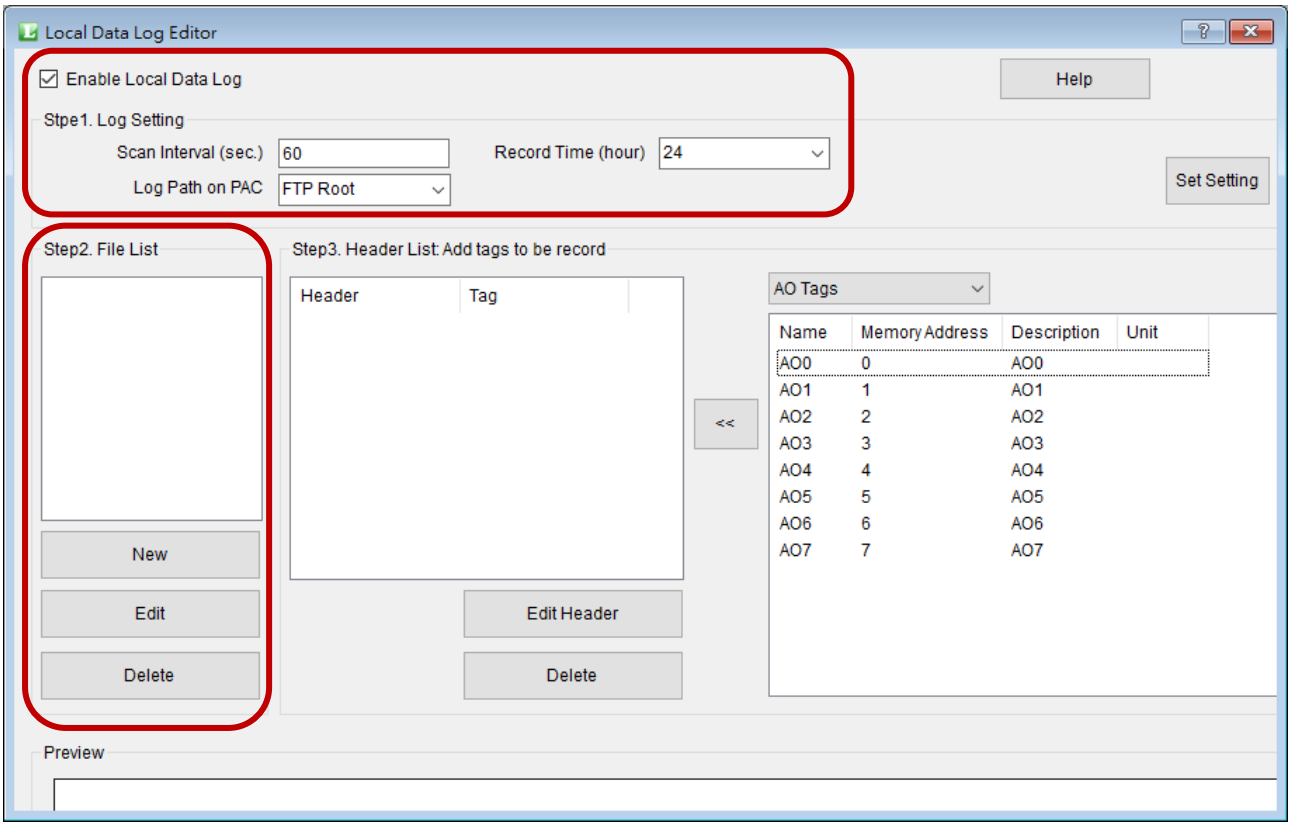
Step2: In the **Local Data Log Editor** window, check the **Enable Local Data Log** box to enable the function.

Step3: Configure the following settings in the **Log Setting** section,

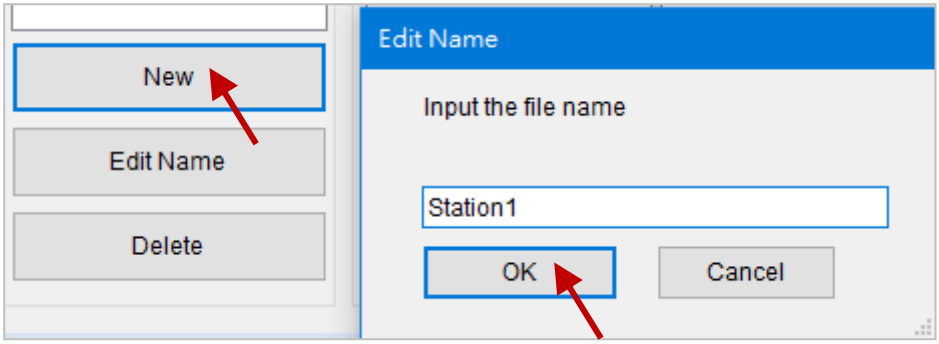
Scan Interval: By default, records data every 60 seconds.

Record Time: By default, creates a new file every 24 hours.

Log path on PAC: The file path can be set to 'FTP Root', 'Runtime Root', or 'Input manually'.

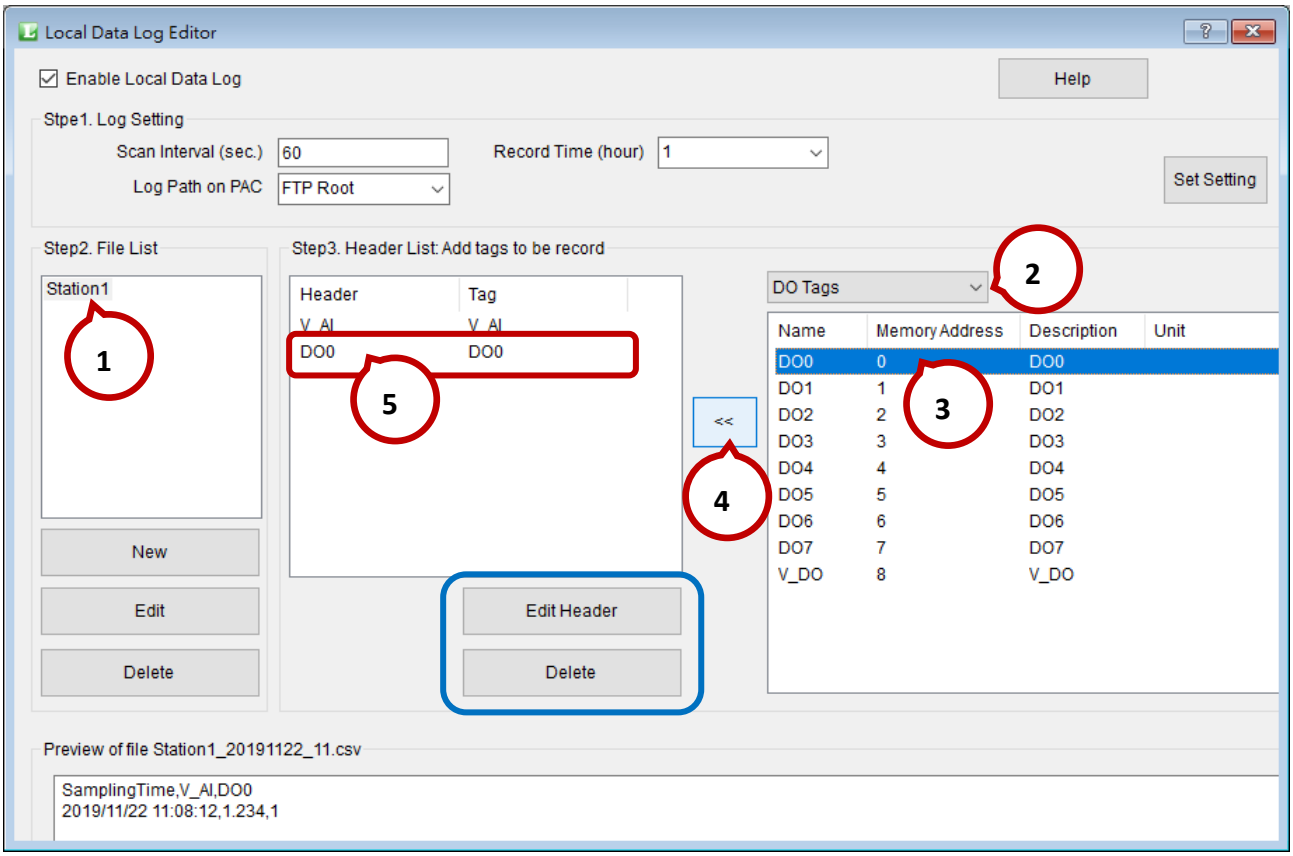


Step4: Click the **New** button under **File List**, and enter a file name in the **Edit Name** window, and then click the **OK** button.



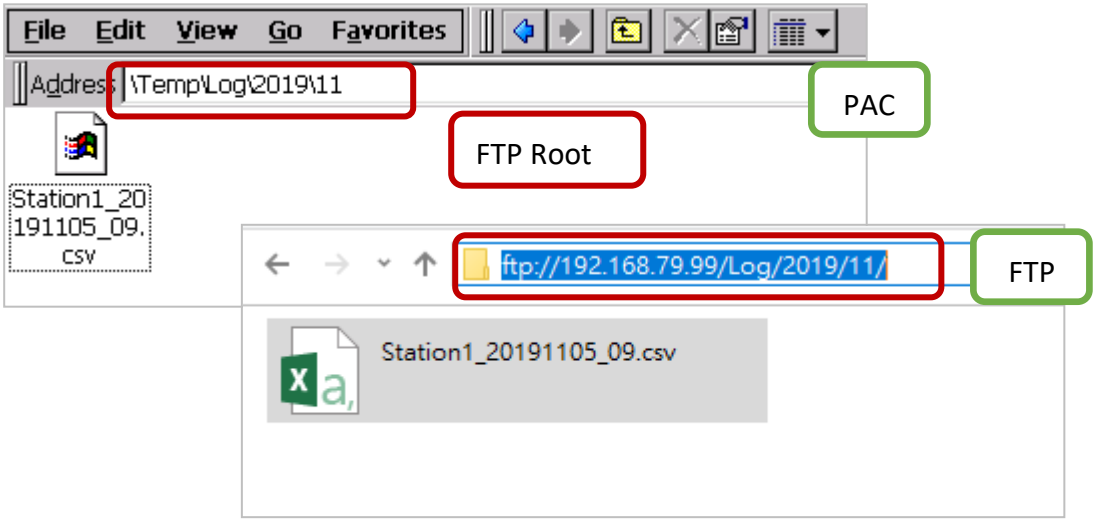
Note: The format of file name is "**the custom name**_YYYYMMDD_HH.csv".

Step5: Click the file name and select the tag type, and then add the selected tag into the **Header List** one-by-one.



Note: Under the **Header List**, click the **Edit Header** button to edit the selected tag name, or click the **Delete** button to delete the selected tag. Also, view the style of data table in the **Preview** window.

Step6: After completing the data logger, the log files can be copied from PAC to PC by using FTP. The file path is “the custom path/Log/YYYY/MM”.

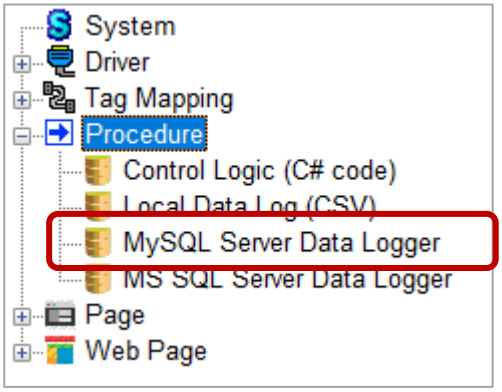


3.4.3. MySQL Server Data Logger (Remote Database)

Remote data logging allows sending data to MySQL Server via Ethernet. To access a MySQL Server, the user needs to get the user account with the access permission.

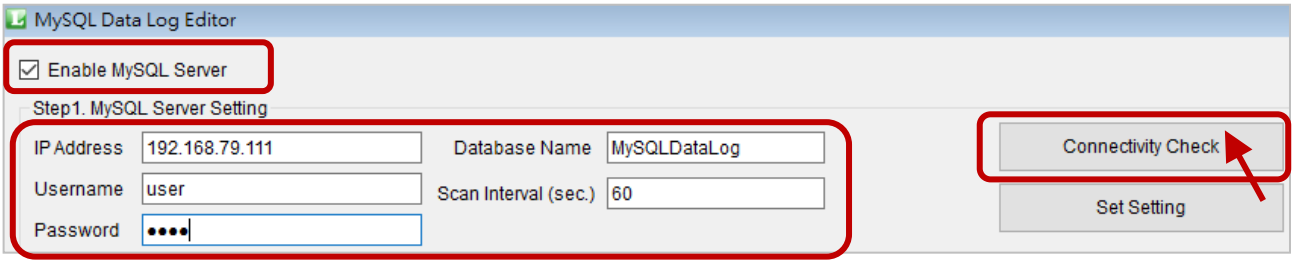
While a successful connection, the data table will automatically be created in MySQL Server by the specified names in eLogger. And then, writing data to MySQL Server at the specified time Interval.

Step1: Expand the **Procedure** menu and click **MySQL Server Data Logger** to display the setting window.

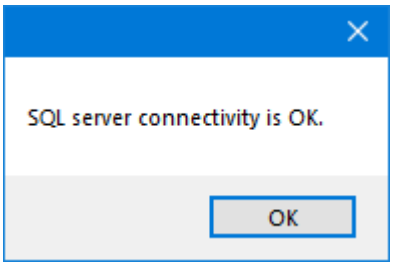


Step2: In the **MySQL Data Log Editor** window, check **Enable MySQL Server** to enable the function. Enter the following parameters, and click the **Connectivity Check** button to test the connection and access authority.

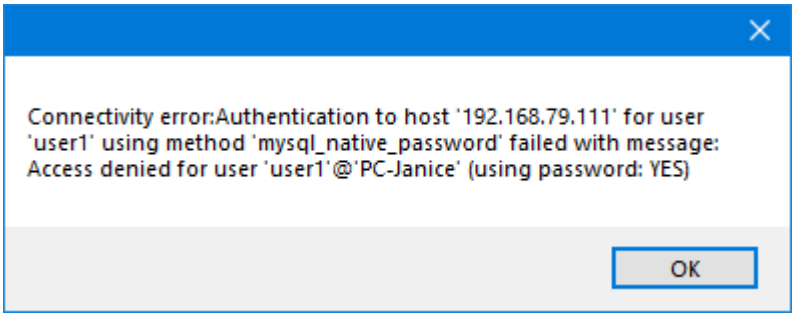
1) **IP Address:**
   Enter the IP address of the MySQL Server (e.g., 192.168.79.111).
   Note: The TCP port of MySQL is "3306".
2) **User Name and User Password:**
   Enter the username and password that have been created in MySQL Server.
3) **Database Name:**
   Enter the database name that will have been created in the MySQL Server.
4) **Scan Interval:** Enter a scan rate. By default, records data every 60 seconds.



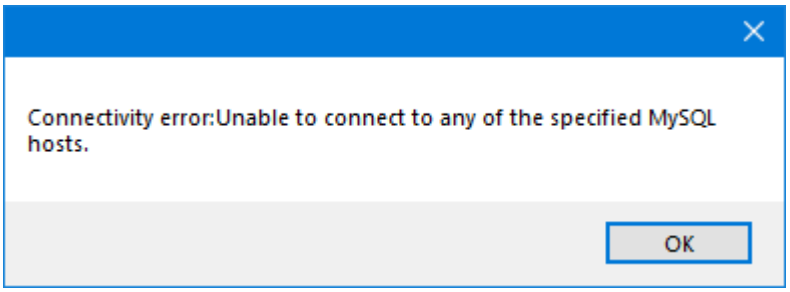
- **The SQL connection is valid**



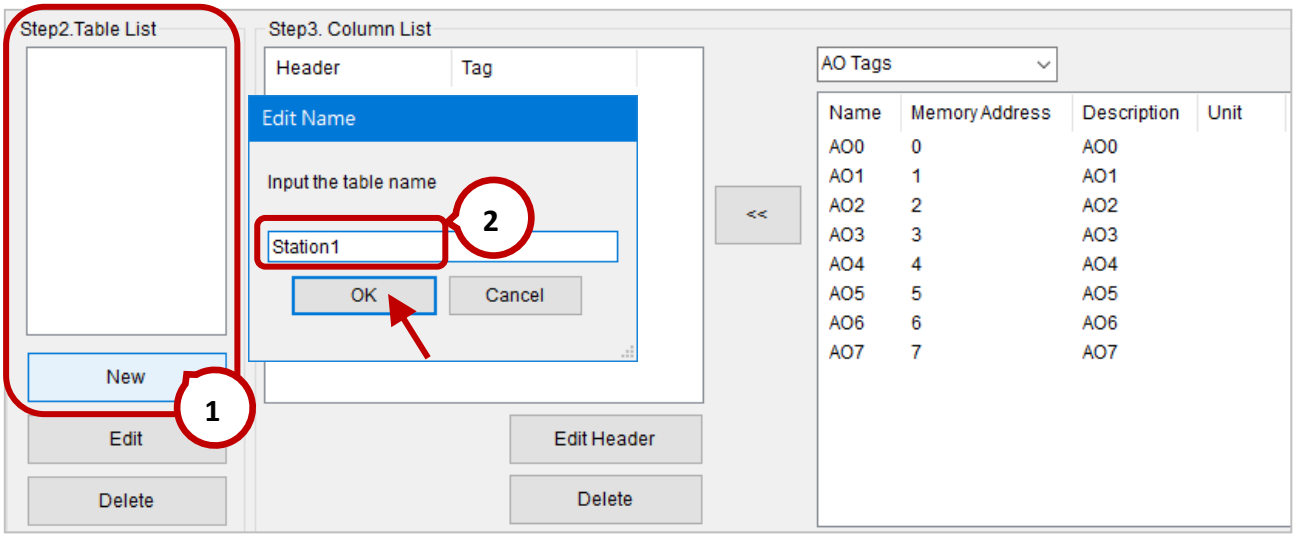
- **The username or password is incorrect**



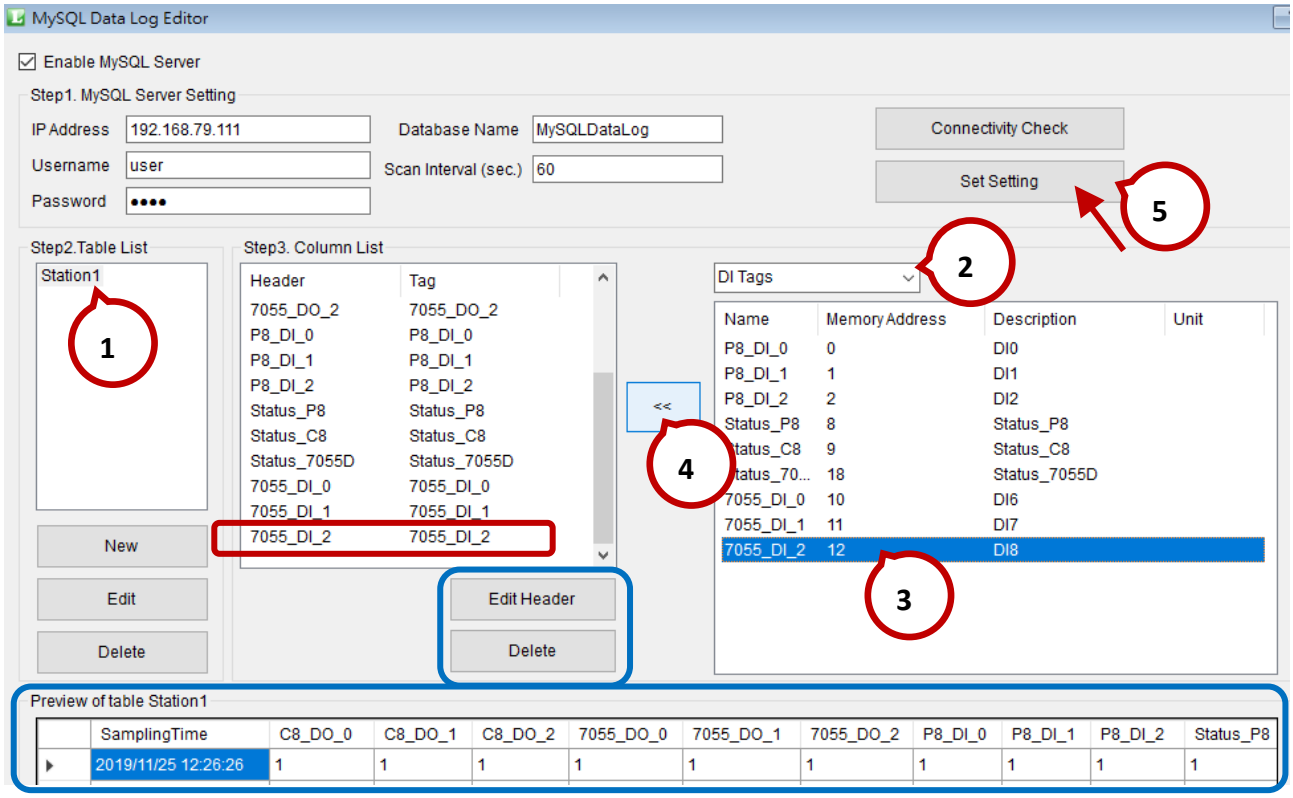
- **MySQL is not started**



Step3: Click the **New** button under **Table List**, and set the table name in the **Edit Name** window, and then click the **OK** button.



Step4: Click the table name and select the tag type, and then add the selected tag into the **Column List** one-by-one. Finally, click the **Set Setting** button to completing the setting.



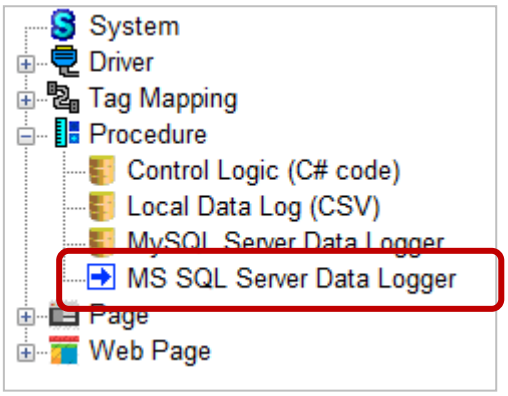
Note: Under the **Column List**, click the **Edit Header** button to edit the name of selected tag, or click the **Delete** button to delete a tag. Also, view the style of data table in the **Preview** window.

3.4.4. MS SQL Server Data Logger (Remote Database)

Remote data logging allows sending data to Microsoft SQL Server via Ethernet. To access a SQL Server, the user needs to get the database name and the user account with the access permission.

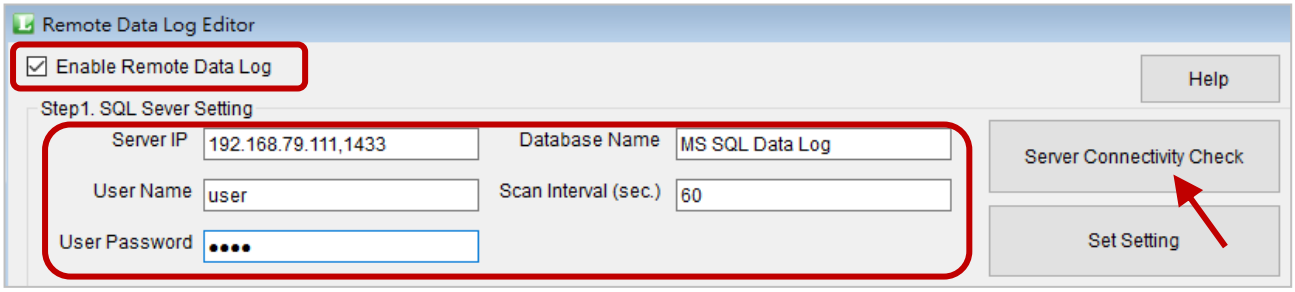
While a successful connection, the data table will automatically be created in SQL Server by the specified name in eLogger. And then, writing data to SQL Server at the specified.

Step1: Expand the **Procedure** menu and click **MS SQL Server Data Logger** to display the setting window.

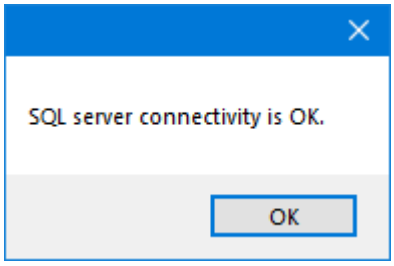


Step2: In the **Remote Data Log Editor** window, check **Enable Remote Data Log** to enable the function. Enter the following parameters, and click the **Server Connectivity Check** button to test the connection and access authority.

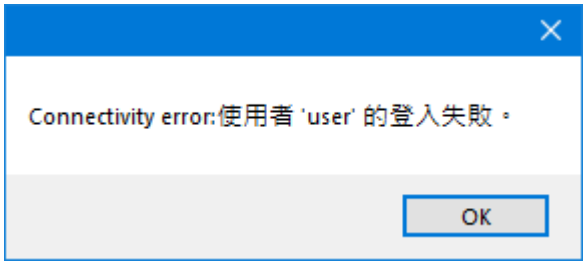
1) **Server IP:**
   Enter the IP address of the SQL Server (e.g., 192.168.79.111).
   Note: The TCP port of SQL Server is "1433".
2) **User Name and User Password:**
   Enter the username and password that have been created in SQL Server.
3) **Database Name:**
   Enter the database name that have been created in SQL Server.
4) **Scan Interval:** Enter a scan rate. By default, records data every 60 seconds.



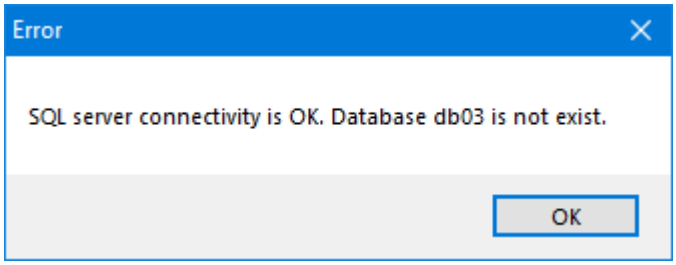
- **The SQL connection is valid**



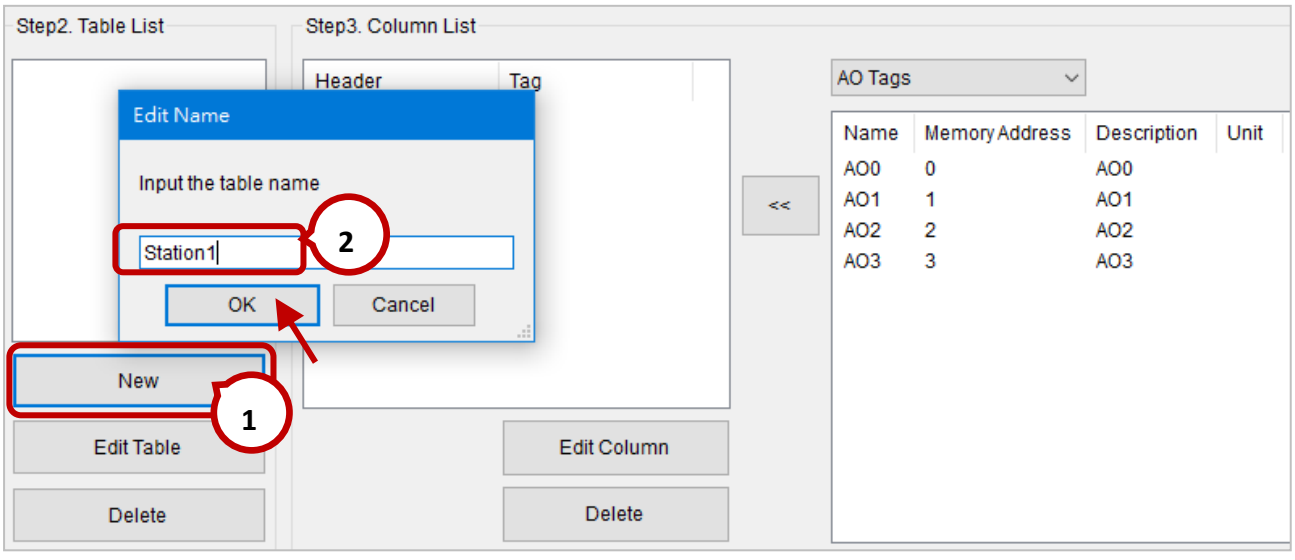
- **The username or password is incorrect**



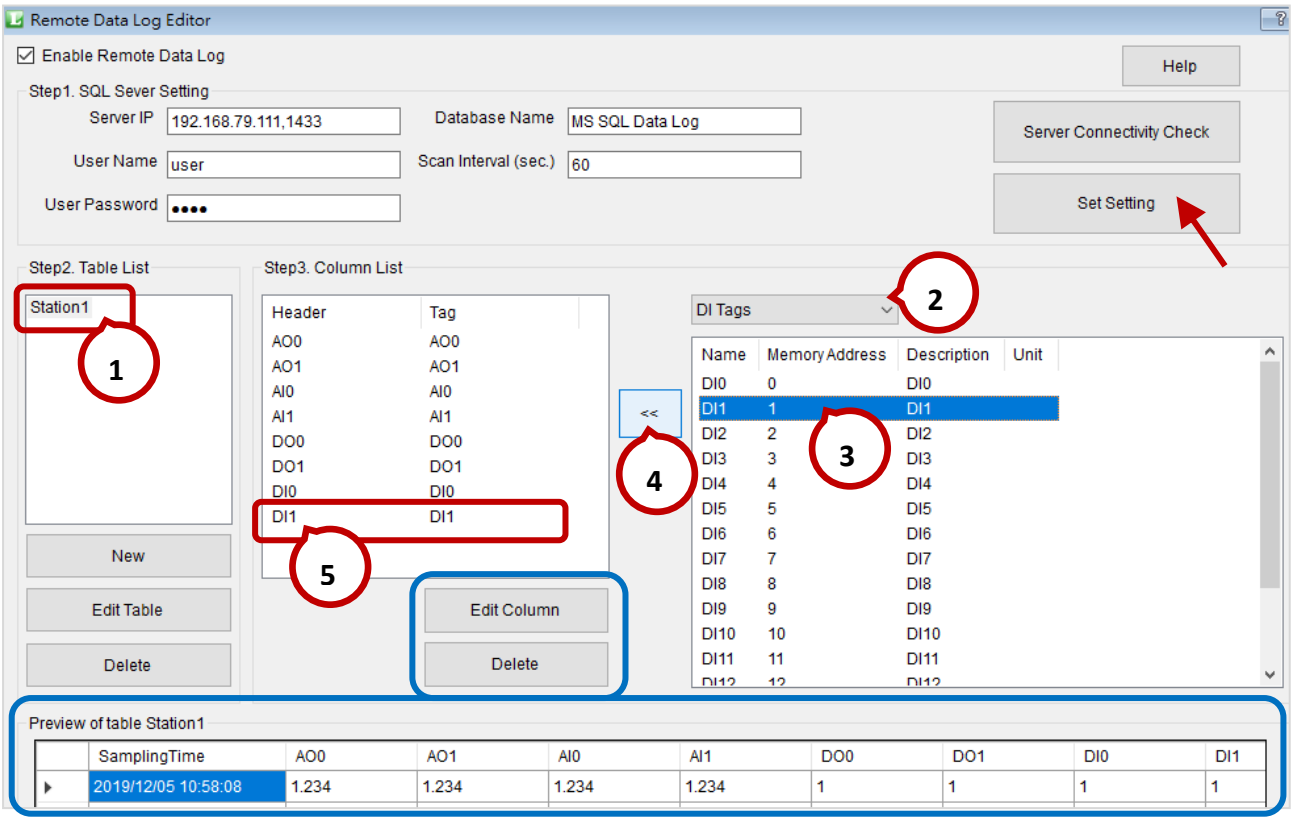
- **The SQL account is correct, but the specified database name does not exist. Enter an existing DB name again.**



Step3: Click the **New** button under **Table List**, and set the table name in the **Edit Name** window, and then click the **OK** button.



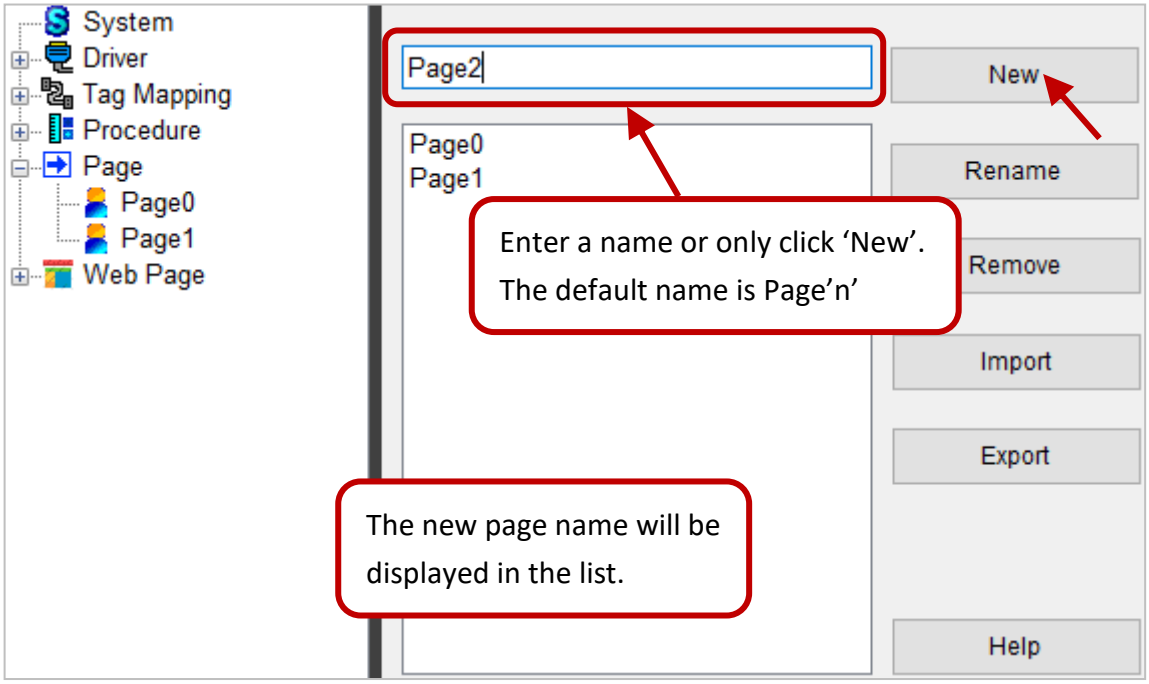
Step4: Click the table name and select the tag type, and then add the tag into the **Column List** one-by-one. Finally, click the **Set Setting** button to completing the setting.

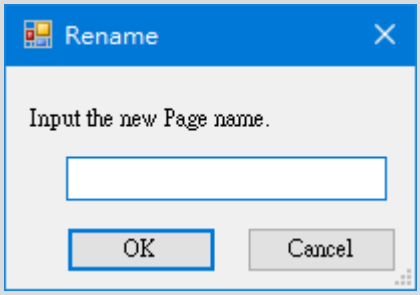


Note: Under the **Column List**, click the **Edit Column** button to edit the name of selected tag, or click the **Delete** button to delete a tag. Also, view the style of data table in the **Preview** window.

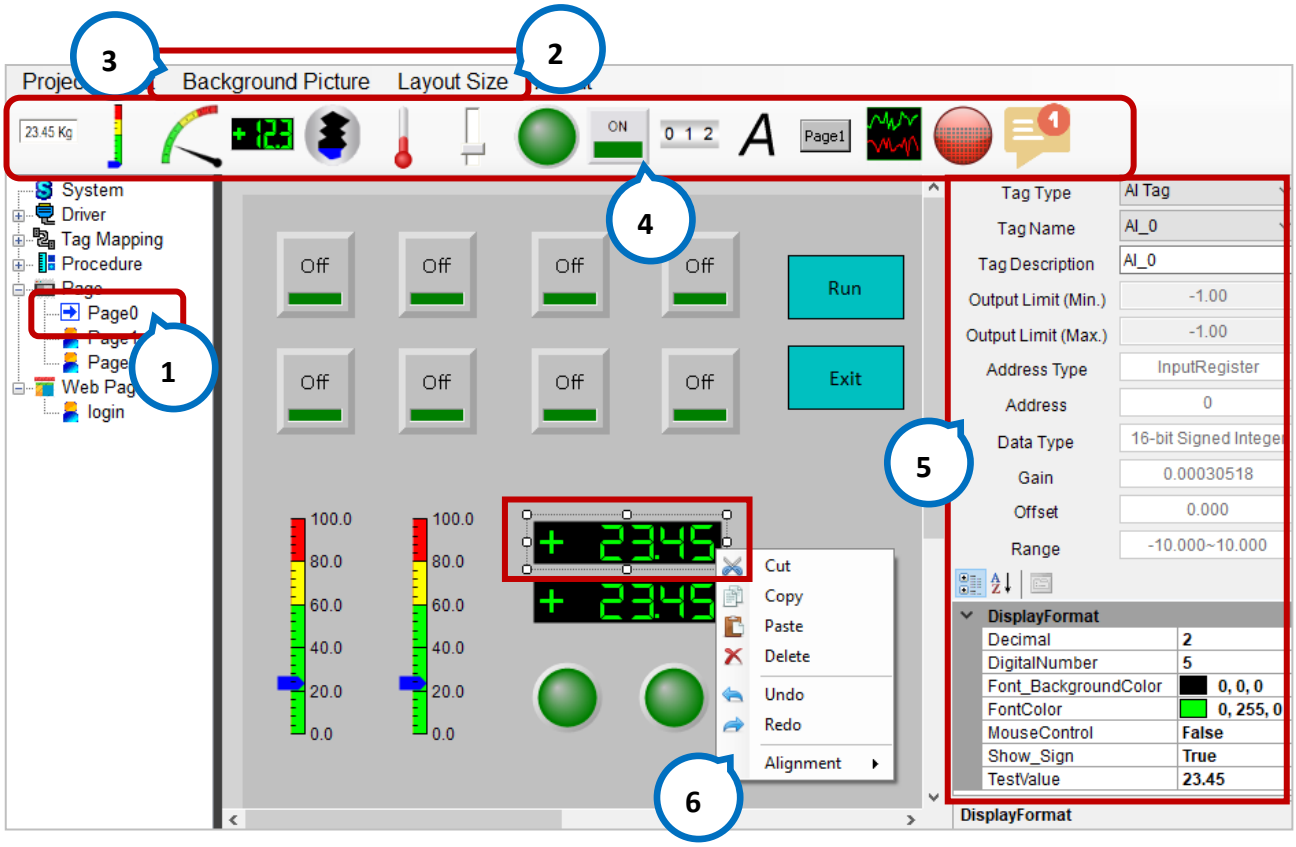
3.5. The Page Menu

The **Page** menu can be used to add, edit, remove, import, or export the HMI page.



Description	
New	Used to add the HMI page. By default, there is a blank page called "Page0". Enter a page name or keep it blank, and click the New button. It will automatically be named with the number (e.g., Page**1**, Page**2**, Page**3**….Page**'n'.**)
Rename	Used to change the name of the selected page 
Remove	Used to remove the selected page
Import	Import an existing page file from '..\Developer\Page'
Export	Export the specific page as a file, and can be used for multiple projects afterward

3.5.1. Design an HMI Page



Step1: Choose a page for editing.

Step2: In the menu bar, click **Layout Size** to change the page size. (Defaults: 640x480)

Step3: Click **Background Picture** to specify a background image that will automatically be stored in the '…\Developer\Pic' folder.

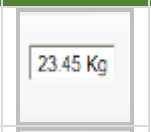
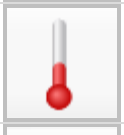
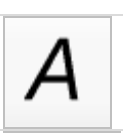
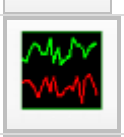
Step4: Click an object in the toolbar, and add it into the page with mouse click-drag-release.

Step5: Select an object to display the property pane and then set parameters.

Property	
Tag Type	Display available tag type depends on the selected object
Tag Name	Display available tags that be set in **Tag Mapping**
Tag Description	Display the description of the tag that be set in **Tag Mapping**
Output Limit	There is no output value if the AO value exceeds the range of limits
Tag Information	Including Address Type, Address, Data Type, Gain, Offset, and Range
DisplayFormat	Display properties of the selected HMI object (see Section 3.5.1.2)

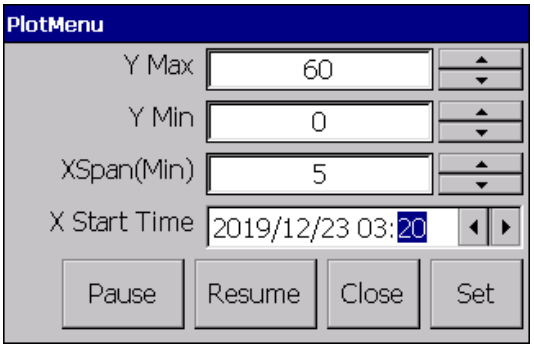
Note: Right-click the object can perform Cut, Paste, Delete, Undo, Redo, or Alignment operations.

3.5.1.1. The Description of HMI Objects

NO.	Object	Icon	Description
1.	**Text Box**		Display the read or output AI/AO value
2.	**Linear Gauge**		
3.	**Angular Gauge**		
4.	**Seven Segment**		
5.	**Tank**		
6.	**Thermometer**		
7.	**Slider**		
8.	**Odometer**		
9.	**LED**		Display the read or output DI/DO status
10.	**Switch**		
11.	**Picture Toggle**		Display the DI/ DO status with a specified image. * Image folder: …\Developer\WebPic * Image format: bmp, jpg, jpeg, gif, png, and ico
12.	**Label**		Display the text
13.	**Plot**		Display the DIO or AIO curves (Max. 5 curves)
14.	**Message List**		Display the latest or historical message

NO.	Icon	Description	Object
15.	**Button**		There are five types of buttons: **Run:** Run or stop the project and update the value. Click the button to display 'Run' or 'Stop'. **SwitchPage:** Used to go to the specified page. **Simulation:** Used to simulate the HMI page. **Exit:** Used to close the HMI page to display the eLogger Runtime. **LogIn:** Enter the password to log in with the Admin or Power User authority.

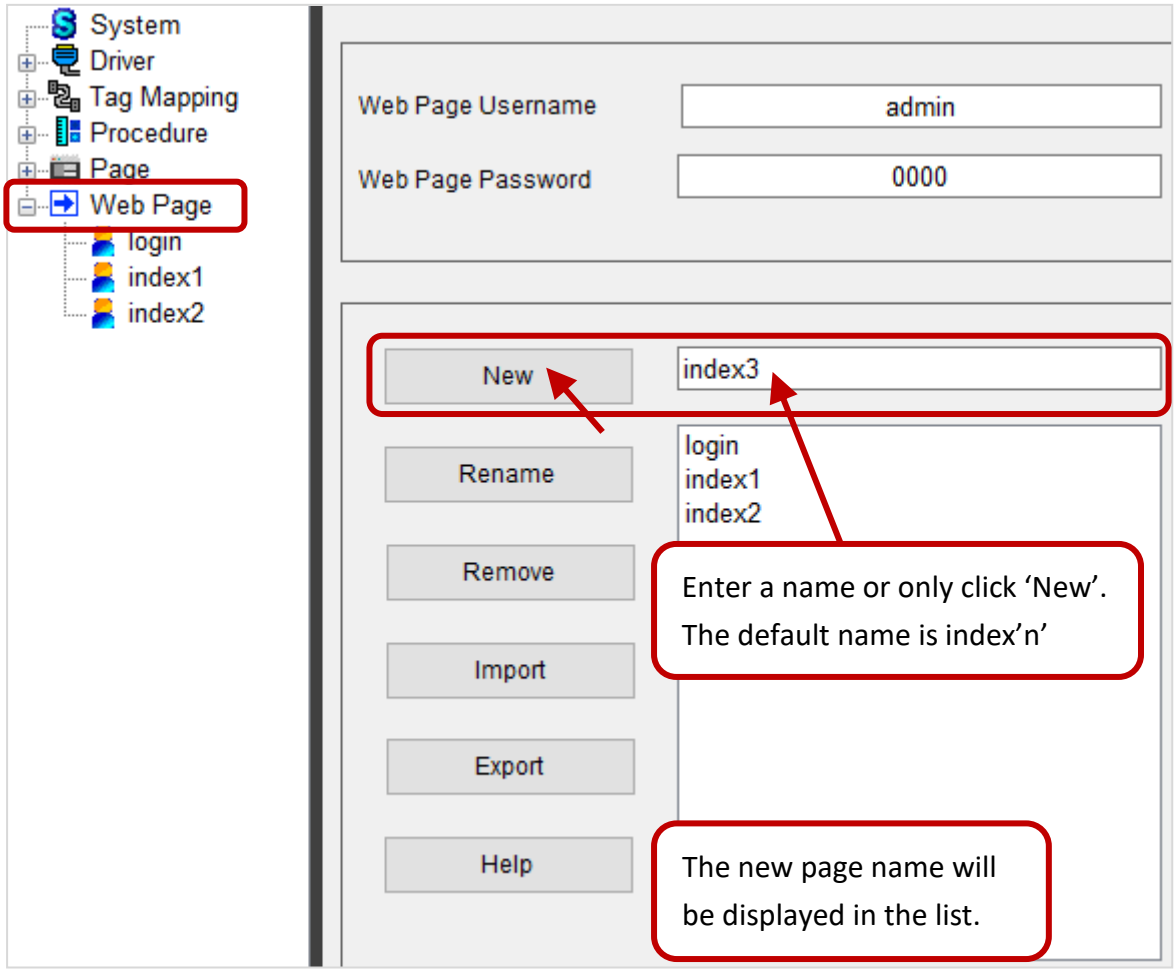
3.5.1.2. The Properties of HMI Objects

Properties	Description	Objects NO.
BackgroundColor	The background color.	1, 10, 12 ~ 15
BodyColor	The outer color of the tank.	5
BufferSize (Minutes)	How long to retain data before the start time	13
	Note: Double click on Plot to set the time in the PlotMenu window for viewing records. 	
ColorSection	The range and color for each sections of the Gauge. ***Start***: Start value ; ***Stop***: Stop value	2, 3
ConformWindow	Display the confirmation window before outputting the DO value.	
	True: Display the confirmation window ***False***: Output value directly	9, 10
Decimal	The number of decimal places	1, 4, 8
DigitalNumber	The number of digits	4, 8
DisplayText	The display text	1, 2, 12, 15
Font_BackgroundColor	The background color	4
FontColor	The font color	1 ~ 3, 6, 7, 12 ~ 15
FontStyle	The font style	1, 9, 10, 12 ~ 15

Properties	Description	Objects NO.
GaugeAngle	The start and end angles for gauge	3
GridColor	The color of the gridlines	13
Header1	The first column name in the message list	14
Header2	The second column name in the message list	14
LedStyle	The shape of the LED object	9
MaxLine	The number of lines to display in the message list	14
MouseControl	Set to TRUE to allow set data with a mouse	1 ~ 11
OffColor, OnColor	The display color when the DI/DO status is False or True	9, 10
OffDisplatText, OnDisplatText	The display text when the DI/DO status is False or True	9, 10
OffPicture, OnPicture	The display image when the DI/DO status is False or True	11
OffTextColor, OnTextColor	The display font color when the DI/DO status is False or True	9
PointerBackgroundColor	The background color for a value range	5 ~ 7
PointerColor	The pointer color for the current value	7
PointerForegroundColor	The marking color for the current value	5, 6
Scale	The maximum and minimum scale values	2, 3, 5, 6
ShowLineDescription	Set to TRUE to display the curve name and color on Plot	13
Show_Sign	Set to TRUE to display plus and minus signs	4
TestValue	Set a value to get result view of the object	1 ~ 8
ValueTest		9 ~ 11, 15
TextColor	The font color of the Switch object	10
Title	The title of the Plot object	13
Unit	Enter the text that will be added after the value	1 ~ 3
X_Span (minutes)	The visible range of time on X-axis in a Plot	13
Y_Max, Y_Min	The range of value on Y-axis in a Plot	13

3.6. The “Web Page” menu

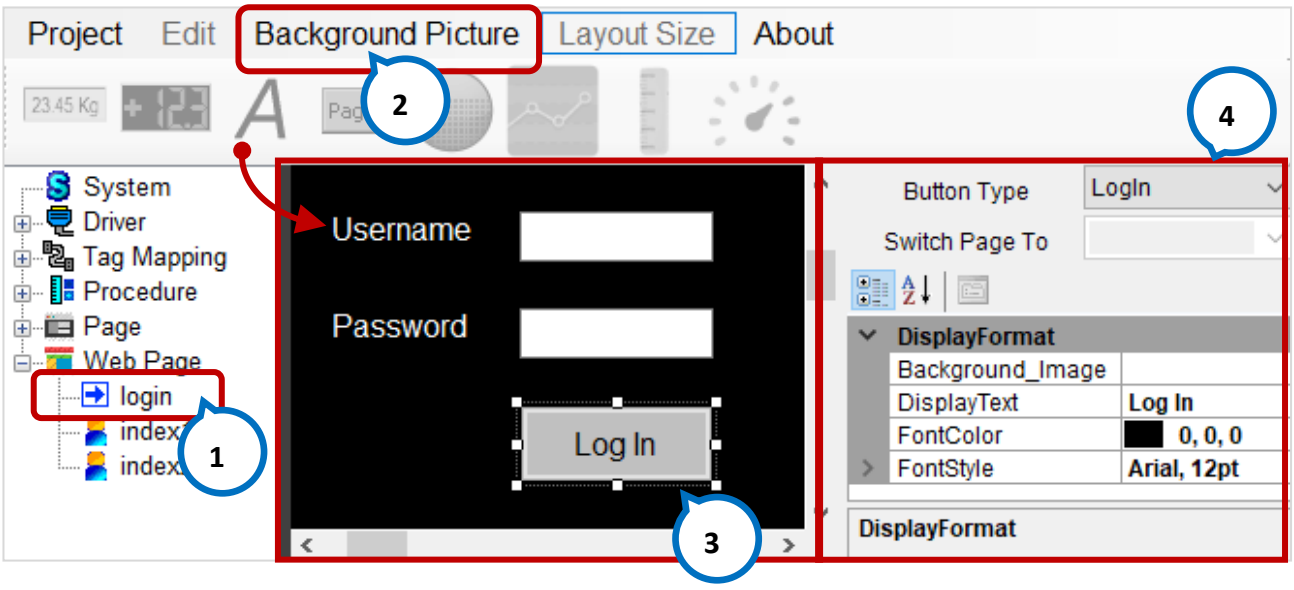
The **Web Page** menu can be used to add, edit, remove, import, and export the web HMI page.



Description	
Web Page Username	The usename to Log in to the web HMI, the defaults is ‘admin’
Web Page Password	The password to Log in to the web HMI, the defaults is ‘0000’
New	Used to add a web page. By default, there is a “login” page. Enter a name in the text box or only click ‘New’ to add a web page. The default name is **index’n’** (e.g., index1, index2, index3, etc.)
Rename	Used to change the name of the selected web page
Remove	Used to remove the selected web page
Import	Used to import an existing page file from ‘\Developer\MyWebPage’
Export	Used to export the specific web page as a file and can be used for multiple projects afterward.

3.6.1. Design the Login Page

Notice: **Do not** add, delete, copy and paste any objects on this page. The user can only modify the properties of objects.



Step1: Click the **login** page for editing.

Step2: Click **Background Picture** in the menu bar to specify a background image that will automatically be stored in the '…\Developer\WebBackPic' folder. Also, click on the form to set the background color.

Step3: Click on object to set the parameters in the property pane.

3.6.1.1. The Description of HMI Objects

Notice: On the Login page, only the properties of objects can be modified.

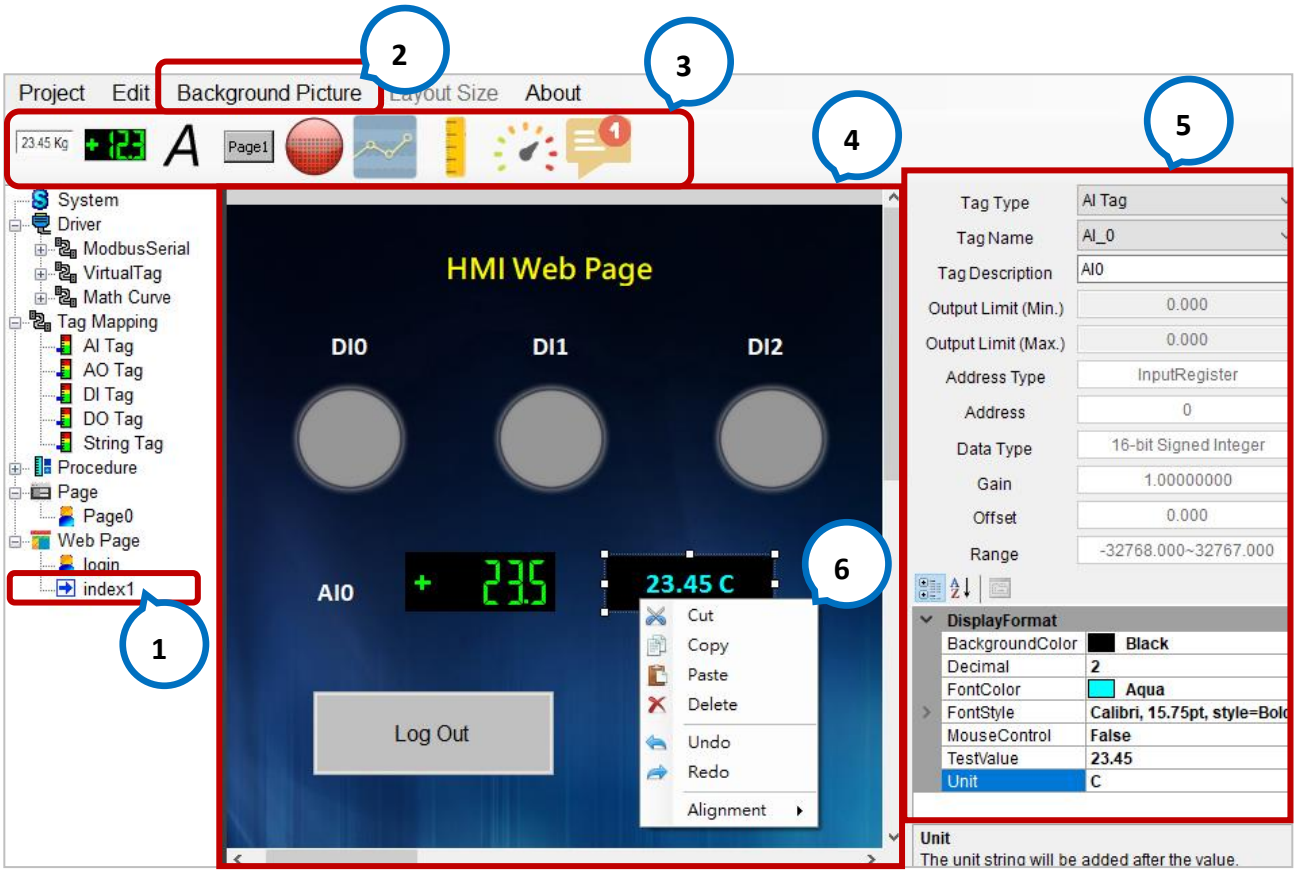
Object Name	Icon	Description
Label	Username	Used to display text
Text Box		Used to input text (e.g., username or password)
Button	Log In	Used to log in to the web page Button type: **LogIn** (Only used for the login page)

3.6.1.2. The Properties of HMI Objects

Properties	Description
Back Color	Set the background color of the web page
Background_Image	Set the background color of the 'Log in' button
DisplayText	Set the text to be displayed on the object
DisplayTextTest	Enter a text in the text box to get the result view
FontColor	Set the font color
FontStyle	Set the font style
Password	Set to True to hide the password, the inputs will be displayed as a series of '●●●●' (Only used for the Login page)

3.6.2. Design Web HMI Page

Before editing the web HMI page, refer appendix A.3 to configure IIS and ISAPI.



Step1: Choose a web page for editing.

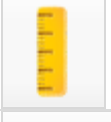
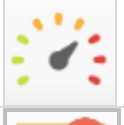
Step2: Click **Background Picture** in the menu bar to specify a background image that will automatically be stored in the '…\Developer\WebBackPic' folder. Also, click on the form to set the background color.

Step3: Click an object in the toolbar, and add it to the page with mouse click-drag-release.

Step4: Click an object to display the property pane and then set parameters.

Note: Right-click the object can perform **Cut, Paste, Delete, Undo, Redo, or Alignment** operations.

3.6.2.1. The Description of HMI Objects

NO.	Object Name	Icon	Description
1.	**Text Box**		Display the read or output AI/AO value
2.	**Seven Segment**		
3.	**Label**		Display the text
4.	**Button**		There are two types of buttons: **SwitchPage:** Used to go to the specified page. **LogOut:** Enter the password to log in with the Admin or Power User authority.
5.	**Picture Toggle**		Display the DI/ DO status with a specified image. * Image folder: …\Developer\WebPic * Image format: bmp, jpg, jpeg, gif, png, and ico
6.	**Chart**		Display the DIO or AIO curves (Max. 5 curves)
7.	**Ultra Linear Gauge**		Display the read or output AI/AO value
8.	**Ultra Radial Gauge**		Display the read or output AI/AO value
9.	**Message List**		Display the latest or historical message

3.6.2.2. The Properties of HMI Objects

General Property	
Properties	**Description**
Tag Type	The type of tag which displays depends on the selected object
Tag Name	The name of the tag
Tag Description	The description of the tag
Output Limit	If the set AO value exceeds the limitation of output value, do not output value.
Memory Tag Property	Address Type, Address, Data Type, Gain, Offset and Range
Note: see Section 3.3.3 to modify the setting of tags, if necessary.	

Objects 1 to 5 

HMI Object Property		
Properties	**Description**	**NO.**
BackgroundColor	The background color of text box	1
Background_Image	The background image of button	3
Decimal	The number of decimal places	1, 2
DigitalNumber	The number of digits	2
DisplayText	The display text	3, 4
Font_BackgroundColor	The color of background digits	2
Font_Color	The text color	1 ~ 4
FontStyle	The font size and style	1, 3, 4
MouseControl	Set to TRUE to allow set data with a mouse	1, 2, 5
OffPicture	The display image when the status is OFF (Note1)	5
OnPicture	The display image when the status is ON (Note1)	5
Show_Sign	Set to TRUE to display plus and minus signs	2
TestValue	Set a value to get result view of the object	1, 2
Unit	Add the units to display	1
ValueTest	Display the On/Off image by the setting	5
Note1: The specified image will automatically be stored in the '\Developer\WebPic' folder.		

3.6.2.3. The Properties of Chart 

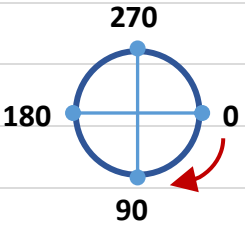
Properties	Description
AxisColor_X, AxisColor_Y	The color of X-axis or Y-axis
AxisFormat_X	The time format on X-axis, it can be Time/Date Time/Date
Extent_X, Extent_Y	The position of X-axis or Y-axis. The default value is 50, the larger the value, the axis shift up or shift right
FontColor_X, FontColor_Y	The color of font next to X-axis or Y-axis
FontStyle_X, FontStyle_Y	The style of font next to X-axis or Y-axis
Interval_X, Interval_Y	The time interval in X-axis (Defaults, 1minute or 1 day) The value interval in Y-axis (Defaults, 10)
LegendBackground	The background color of the chart legend
LegendBorderColor	The border color of the legend
LegendBorderCornerRadius	The corner radius of the legend
LegendBorderStyle	The border style of the legend, it can be Solid, Dash, DashDot, DashDotDot, and Dot
LegendBorderThickness	The border width of the legend
LegendFont	The font style of the legend text
LegendFontColor	The font color of the legend text
LegendLocation	The position of the legend By default, Left and it can be Left, Right, and Hidden.
LegendGridColor_X	The color of vertical gridlines in the Chart
LegendGridColor_Y	The color of horizontal gridlines in the Chart
PlotBackground	The background color of the Chart
RangeMax_Y, RangeMin_Y	The maximum or minimum value displayed on Y-axis
Rotation_X	To rotate a text box to the specified degree on X-axis
Span_X	The periods of date/time on X-axis
TitleColor	The font color of the title in the Chart
TitleExtent	The position of the title (shift up or down)
TitleFont	The font style of the title
TitleText	The text of the title

3.6.2.4. The Properties of Linear Gauge 

Properties	Description
BackgroundColor	The background color of the Linear Gauge
LabelColor	The font color of labels
LabelExtent **MajorExtent** **MarkerExtent** **MinorExtent** **SectionExtent**	The position of gauge labels. (By default, 10. The larger the value, labels shift right) The position of major tick marks (By default, 20) The position of the data pointers (By default, 55) The position of minor tick marks (By default, 30) The position of color zones in gauge (By default, 20)
LabelFont	The font style of labels
LabelFrequency **MajorFrequency** **MinorFrequency**	The interval of labels (e.g., 0, 30, 60, 90) The interval of major tick marks (By default, 20) The count of tick marks between two major tick marks (By default, 9)
MajorLength **MinorLength**	The length of major tick marks (By default, 35) The length of minor tick marks (By default, 25)
MajorTickColor **MinorTickColor**	The color of major tick marks The color of minor tick marks
MajorWidth **MarkerWidth** **MinorWidth** **SectionWidth**	The width of major tick marks (By default, 3) The width of the data pointers (By default, 10) The width of minor tick marks (By default, 2) The width of color zones (By default, 35)
MouseControl	Set to TRUE to allow set value with a mouse
ScaleMax, ScaleMin	The minimum or maximum limits (By default, 0 to 100)
Section1Color **Section2Color** **Section3Color**	The color of sections in gauge
Section2Start **Section3Start**	The start value of the section (By default, 60/80)
TestValue	Display the position of the data pointers (By default, 55)

3.6.2.5. The Properties of Ultra Radial Gauge

Properties	Description
BackgroundColor	The background color of the Ultra Radial Gauge
GaugeEndAngle	The end angle of the Gauge (By default, 405)
GaugeStartAngle	The start angle of the Gauge (By default, 135)
LabelColor	The font color of labels
LabelExtent **MajorExtent** **MinorExtent** **SectionExtent**	The position of gauge labels. (By default, 85. The larger the value, labels shift outwards) The position of major tick marks (By default, 55) The position of minor tick marks (By default, 55) The position of color zones in gauge (By default, 55)
LabelFont	The font style of labels
LabelFrequency **MajorFrequency** **MinorFrequency**	The interval of labels (By default, 10. E.g., 0, 10, 20, etc.) The interval of major tick marks (By default, 10) The count of tick marks between two major tick marks (By default, 4)
MajorTickLength **MinorTickLength**	The length of major tick marks (By default, 20) The length of minor tick marks (By default, 10)
MajorTickColor **MinorTickColor**	The color of major tick marks The color of minor tick marks
SectionWidth	The width of color zones (By default, 20)
MouseControl	Set to TRUE to allow set value with a mouse
ScaleMax, ScaleMin	The minimum or maximum limits (By default, 0 to 100)
Section1Color **Section2Color** **Section3Color**	The color of sections in gauge
Section2Start **Section3Start**	The start value of the section (By default, 60/80)
TestValue	Display the position of the data pointers (By default, 23.5)

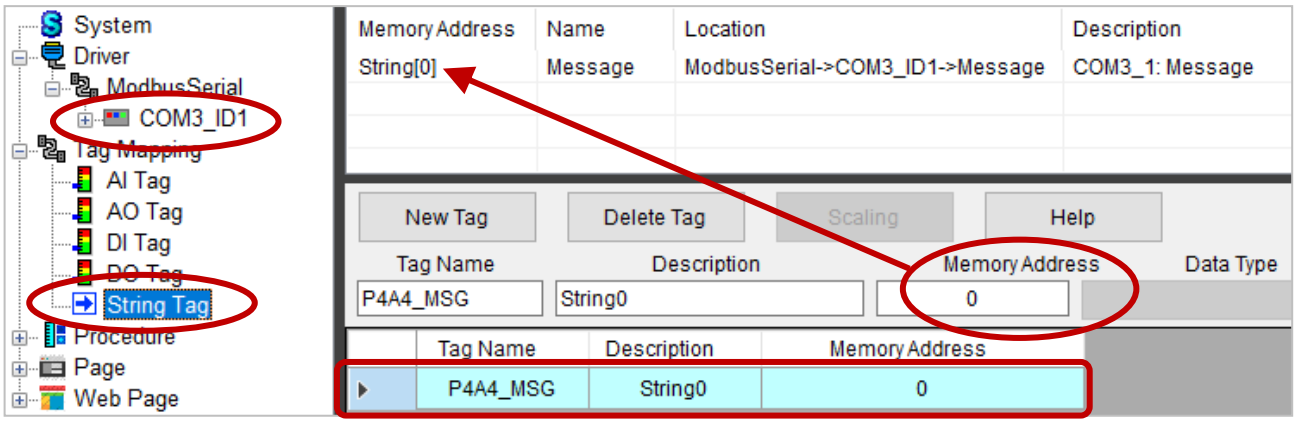


3.6.2.6. The Properties of Message List

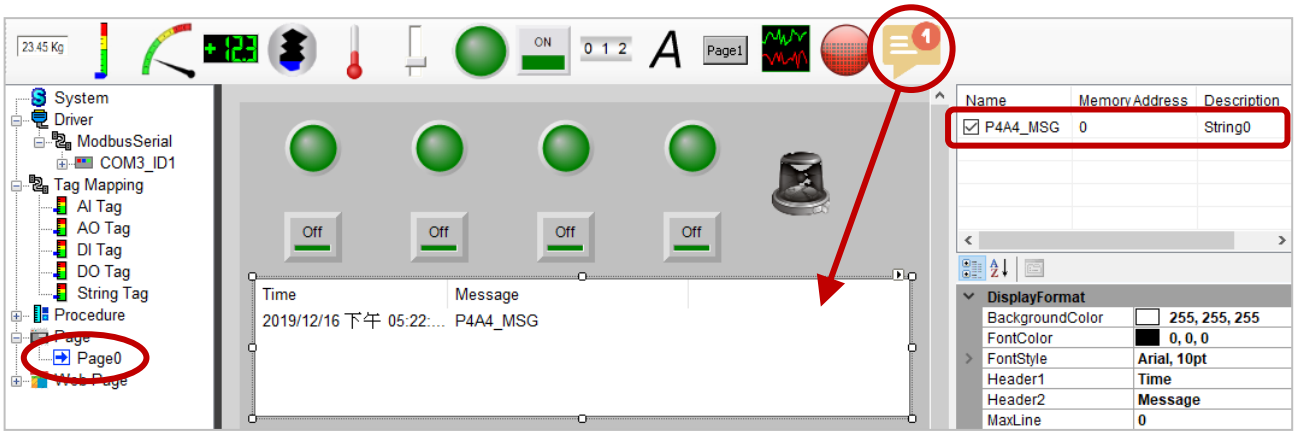
Properties	Description
BackgroundColor	The background color of data rows
FontColor	The font color of the message
FontStyle	The font style of the message
Header1	The first column title in the message list
Header2	The second column title in the message list
MaxLine	The limit number of rows displayed in the message list

How to use:

Step1: After adding a Modbus Serial or Modbus TCP device, a memory address for the string tag will automatically be allocated via 'Shared Memory'. Add a string tag and set the memory address.

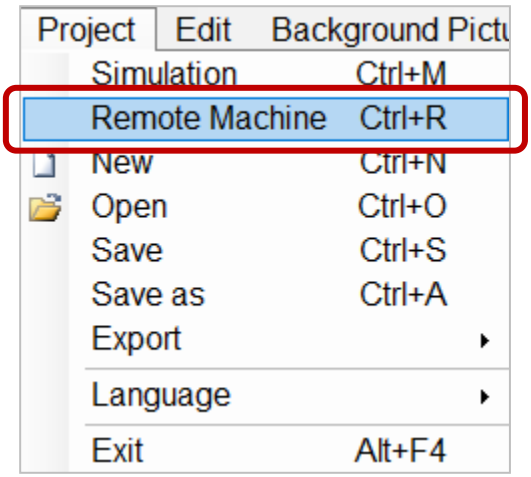


Step2: Add the **Message List** object into the page and check the name of the string tag.



3.6.3. Upload the Project and Web Pages

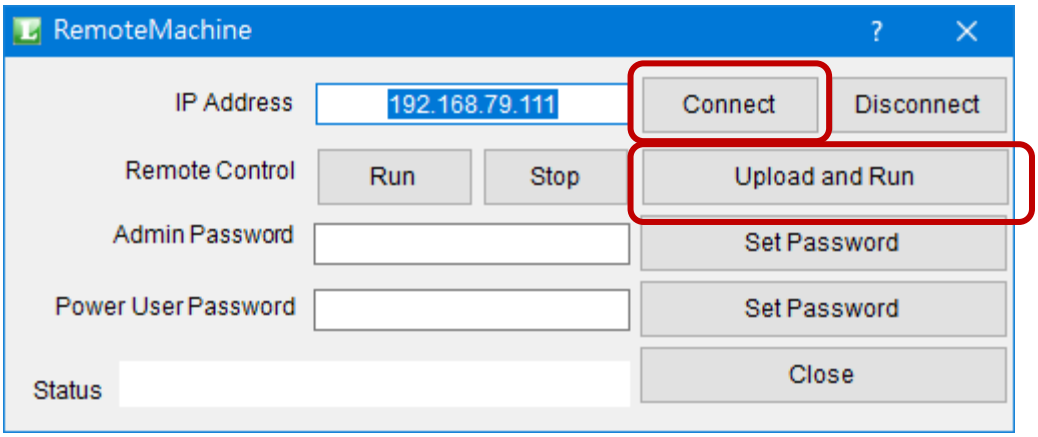
Step1: Click **Remote Machine** from the **Project** menu bar.



Note: Before uploading the project, make sure that eLogger Runtime is running

Step2: Enter the IP address of the PAC (or PC) and click the **Connect** button. After a successful connection, click **Upload and Run** to upload the project and web pages.

The web path of PAC: \System_Disk\eLogger\Webpages
The web path of PC: C:\inetpub\wwwroot



Chapter 4 Demo for PAC Runtime

Follow the steps to develop a HMI project for ViewPAC by using eLogger v2.0.0.

Step1: Create a New Project

Step2: Design a project

Step3: Prepare a ViewPAC

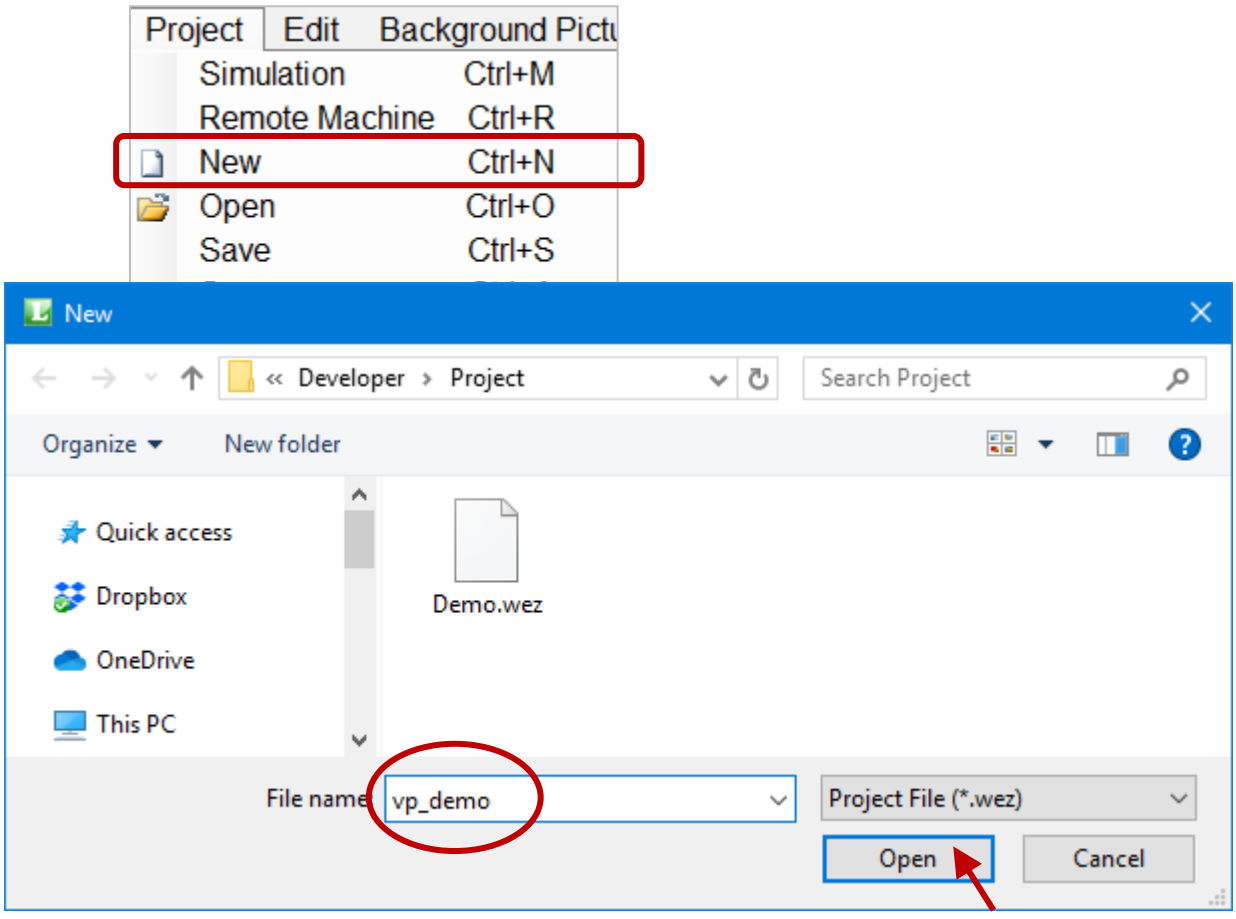
Step4: Execute the Project

PAC and module to demonstrate: **VP-4238-CE7 and I-8057W (slot 0).**

4.1. Create a New Project

Step1: Execute eLoggerDeveloper.exe

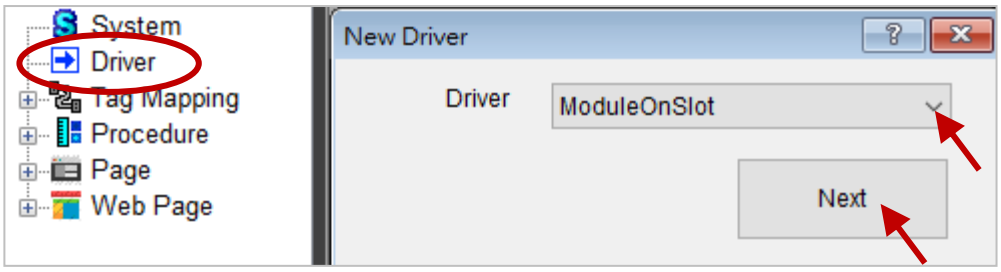
Step2: Add a new project which is named “vp_demo”.



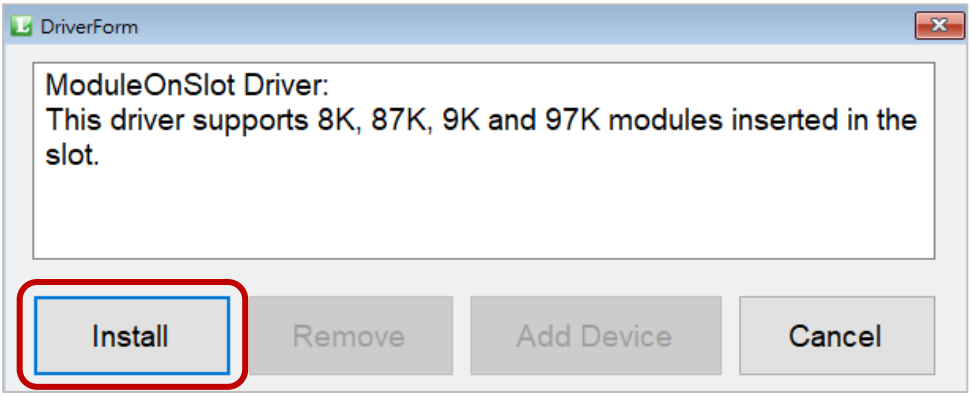
4.2. Design a Project

4.2.1. Configure the Driver and Tags

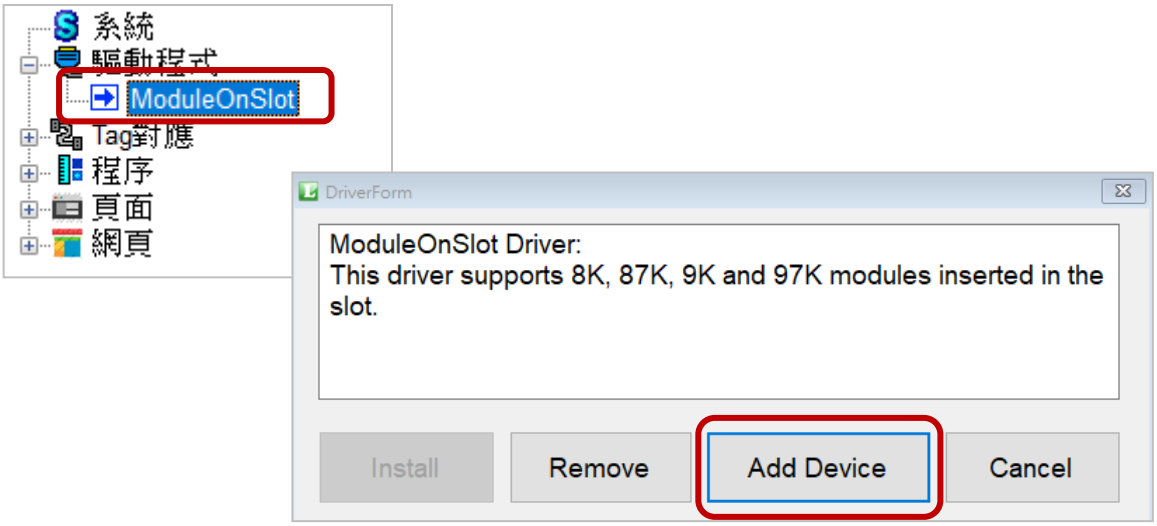
Step1: Click the **Driver** menu and select **ModuleOnSlot** from the **Driver** drop-down menu, and then click **Next**.



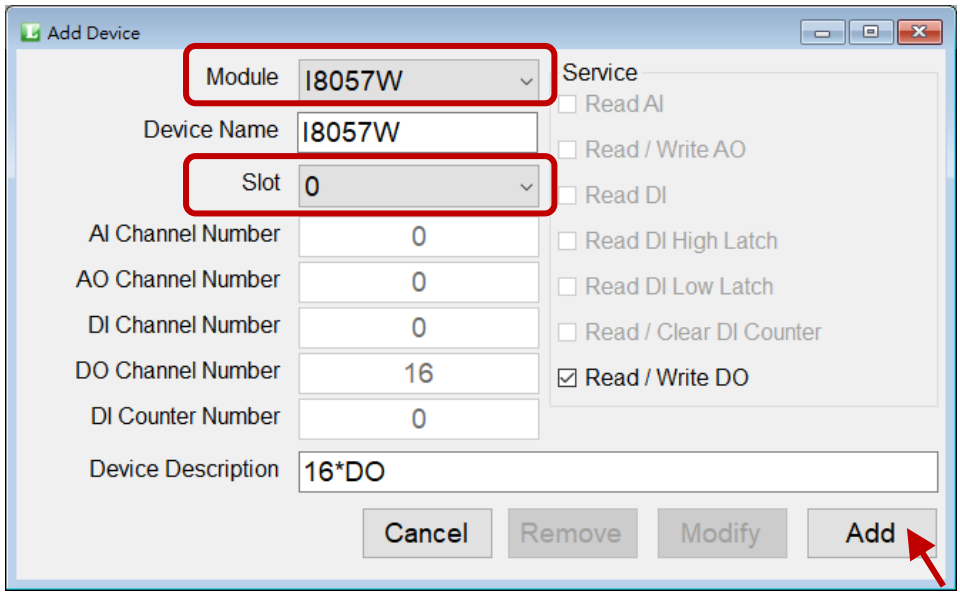
Step2: Click the **Install** button to install the driver.



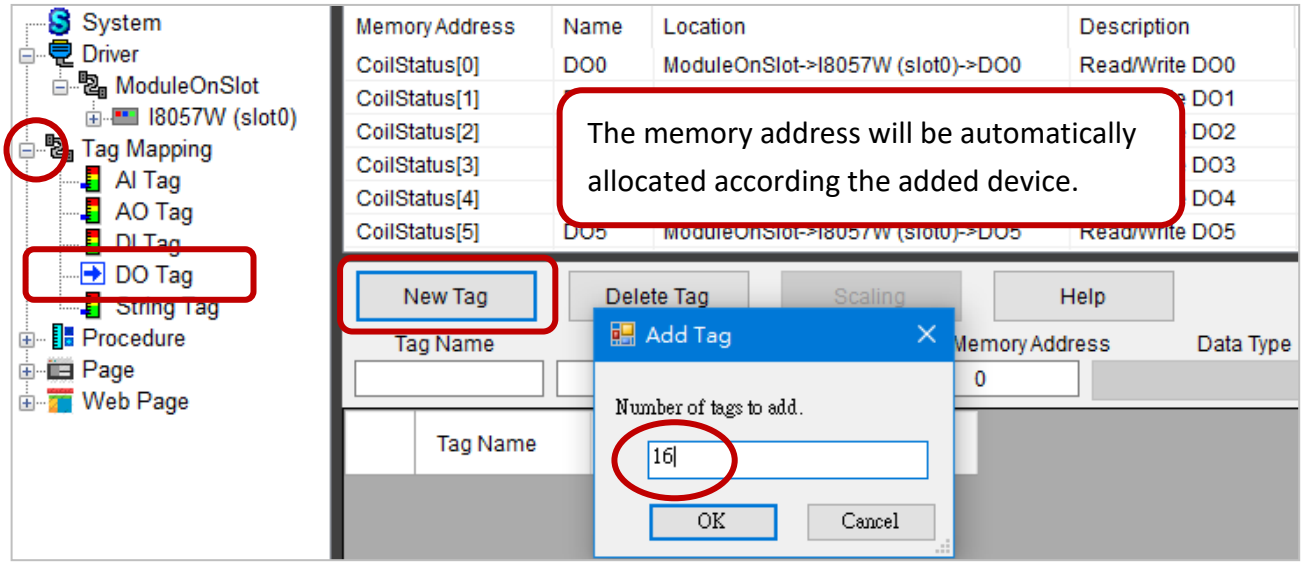
Step3: Click the added **Module On Slot** driver in the tree menu to display the **DriverForm** window and click the **Add Device** button.



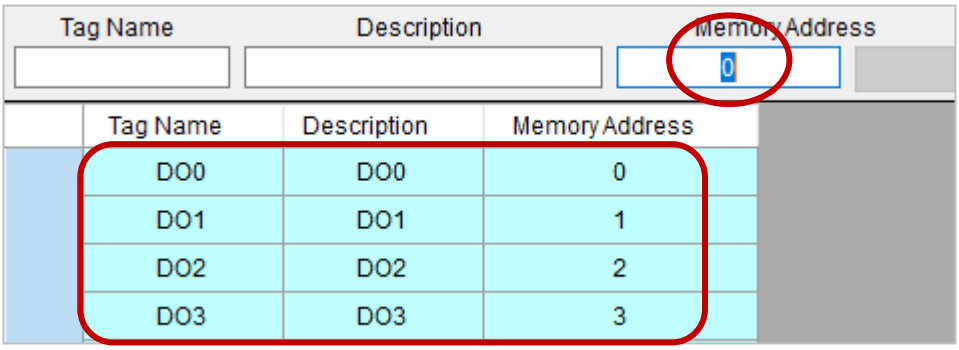
Step4: Select **I-8057W** from the **Module** drop-down menu, and select the slot number 0, and then click the **Add** button to add the device.



Step5: Expand the **Tag Mapping** menu and click **DO Tag** to display the setting window. Next, click **Add Tag** to add 16 tags and click **OK**.

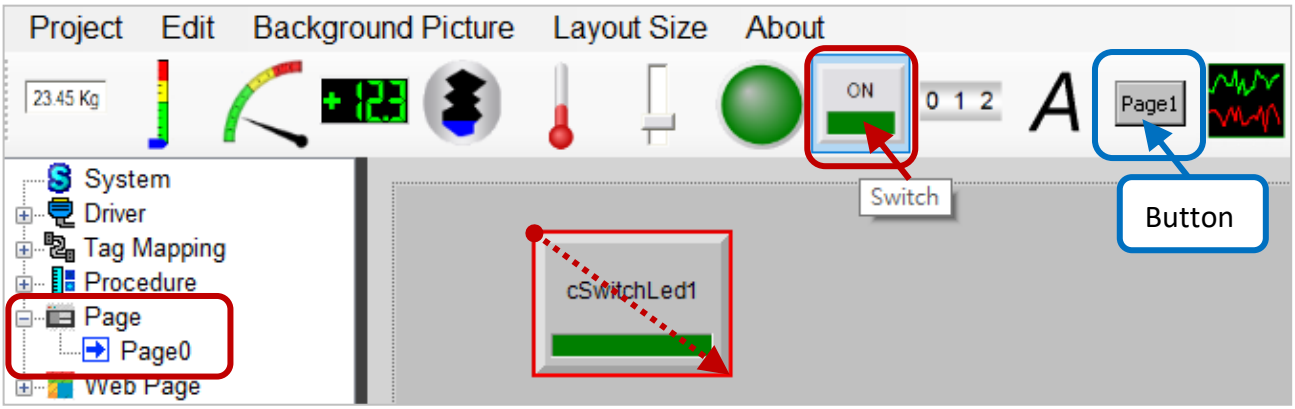


Step6: To do patch settings, Select 16 tags with mouse click-and-drag and set the start memory address as **0**

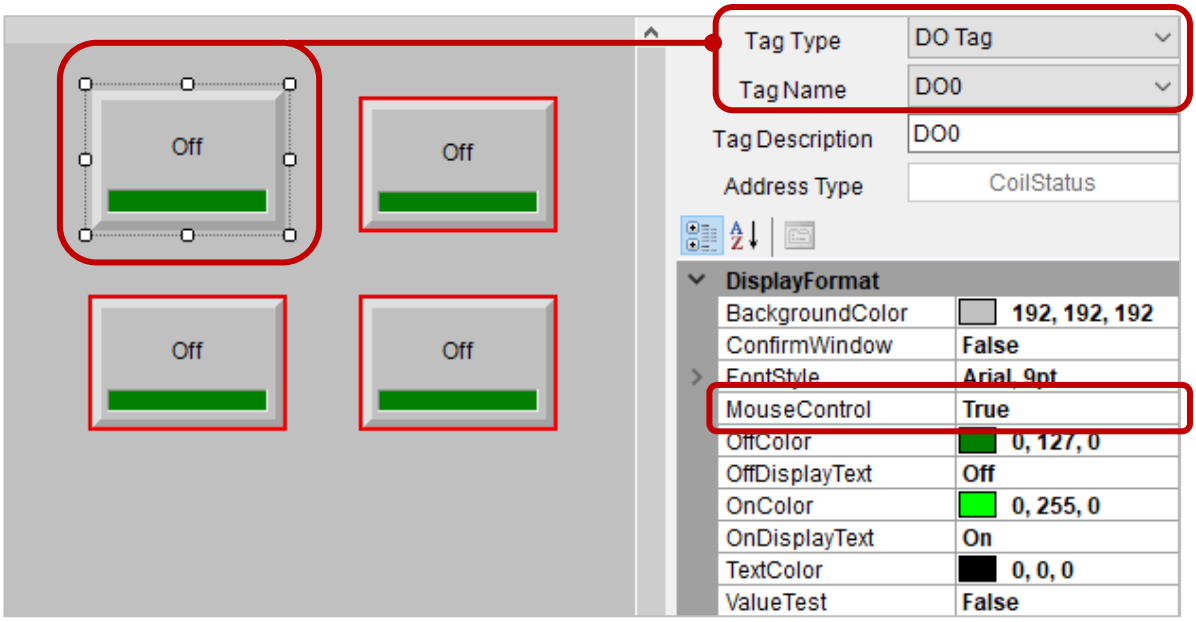


4.2.2. Edit Pages

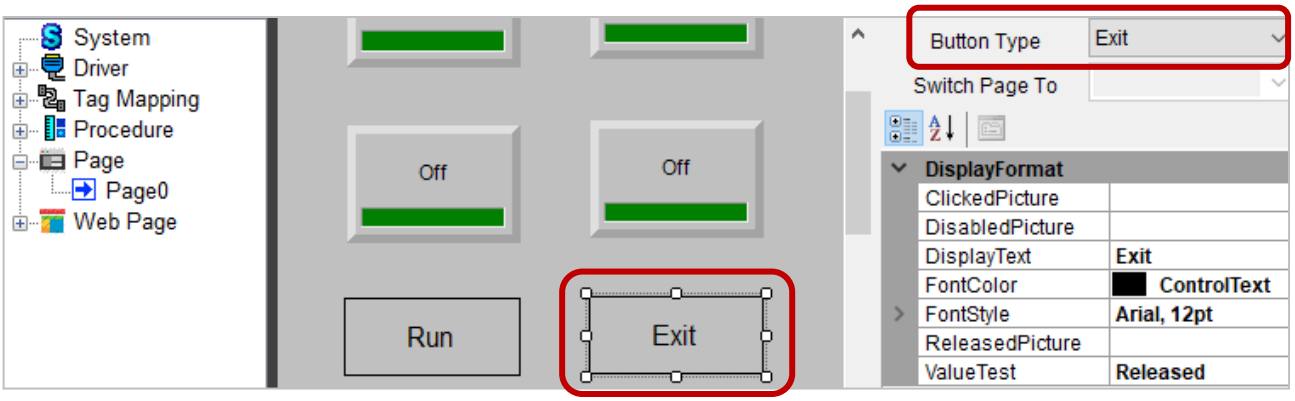
Step1: Expand the **Page** menu and click **Page0** to open the page. Select the **Switch** object on the toolbar and add 4 objects to the page with mouse drag-and-drop.



Step2: Click the object to display its property pane. Select **DO Tag** from **Tag Type**, select **DO0** from Tag Name, and set **MouseControl** to **True** to allow set outputs with a mouse.

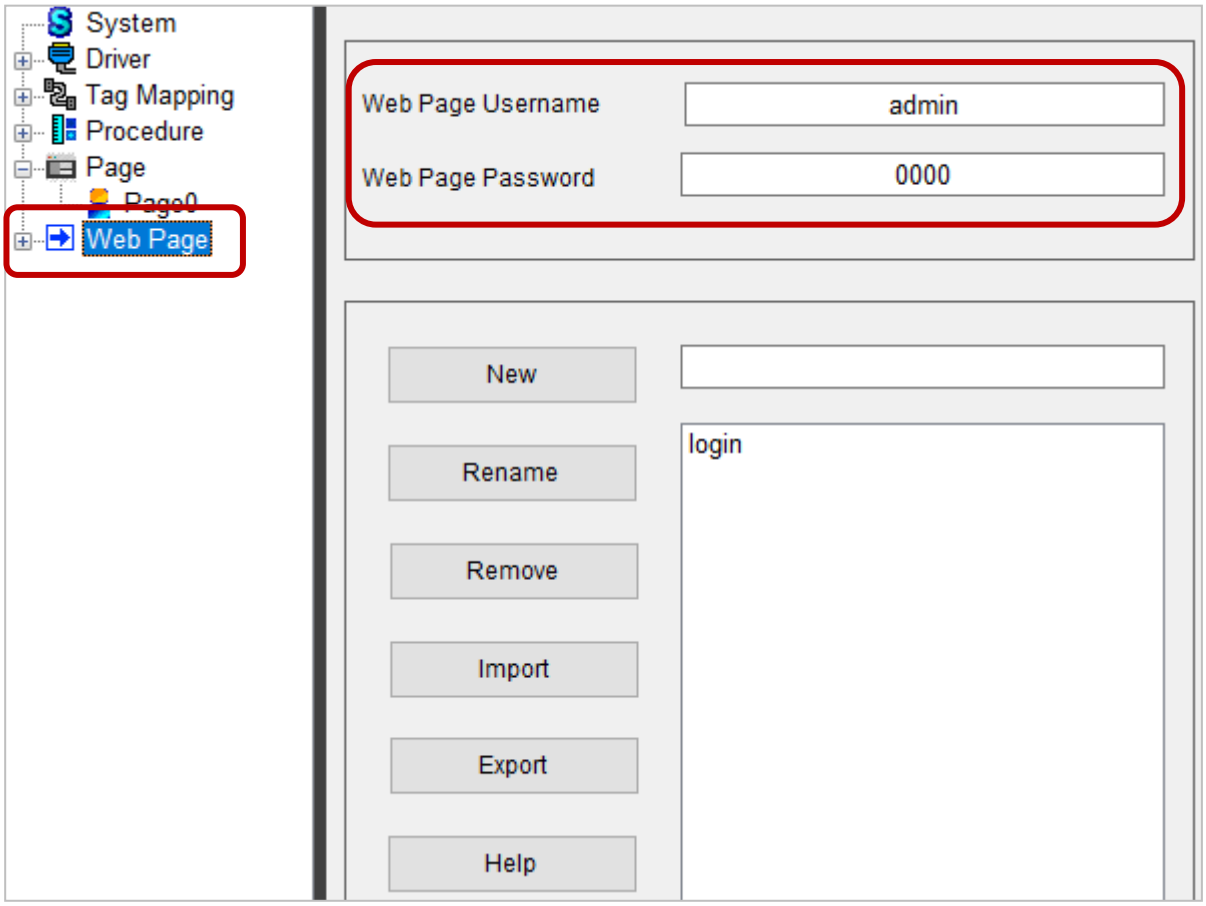


Step3: Add two **Button** objects to the page and set the **Button Type** to **Run** and **Exit**.

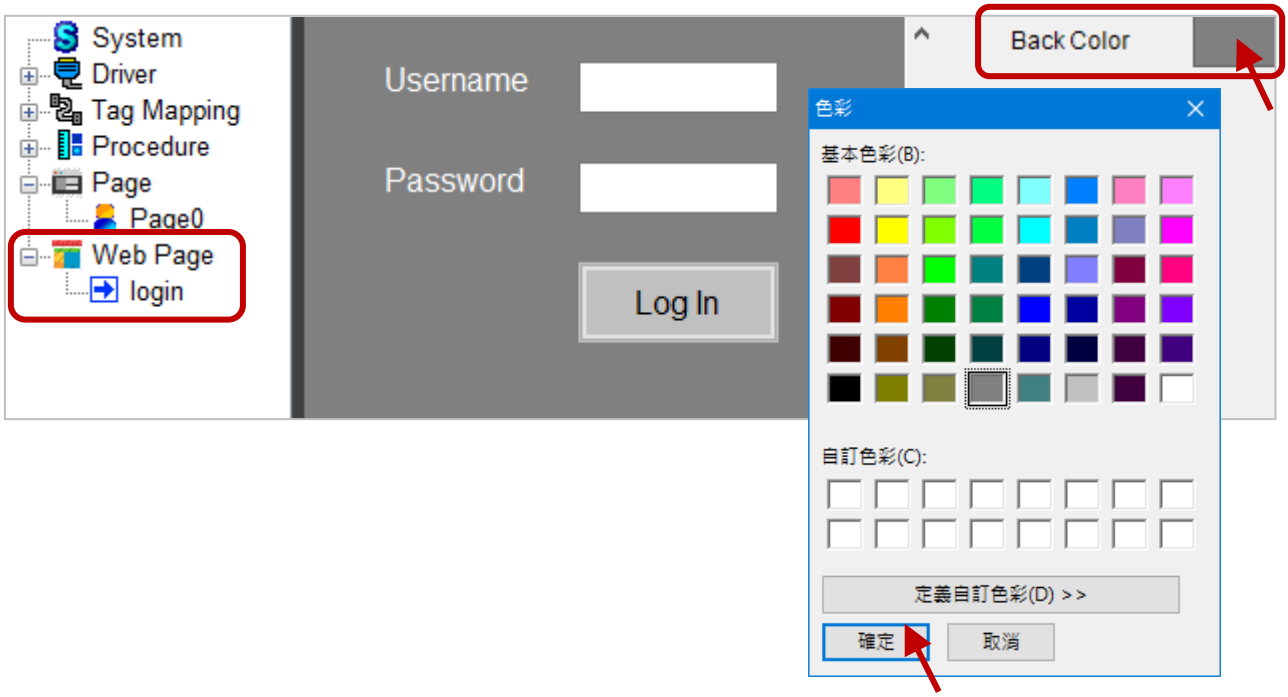


4.2.3. Edit Webpages

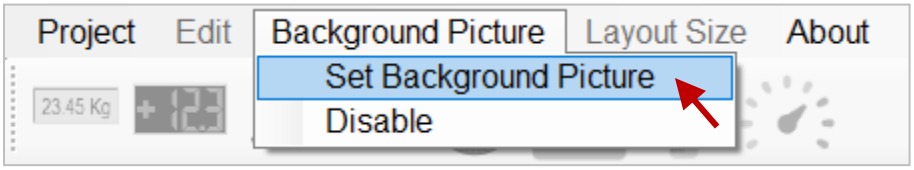
Step1: Click the **Web Page** menu to display its setting window. Enter the username and password in the Web Page Username and Web Page Password fields. (Defaults, admin/0000)

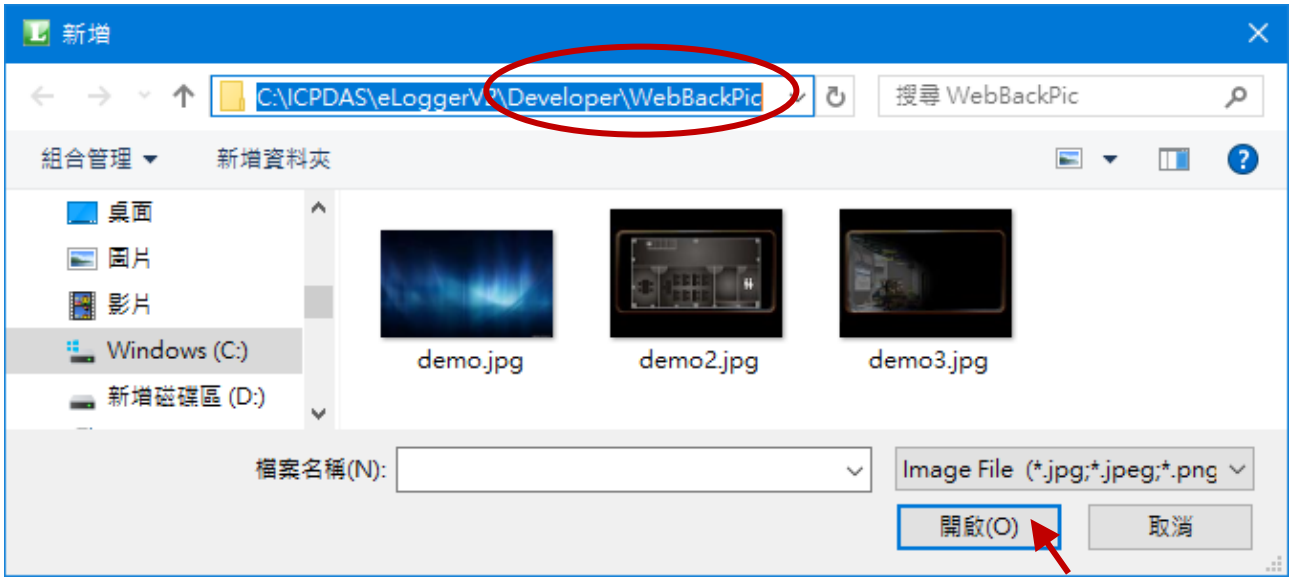


Step2: Expand the **Web Page** menu and click **login** to display the page. Click the **Back Color** property can change the background color.

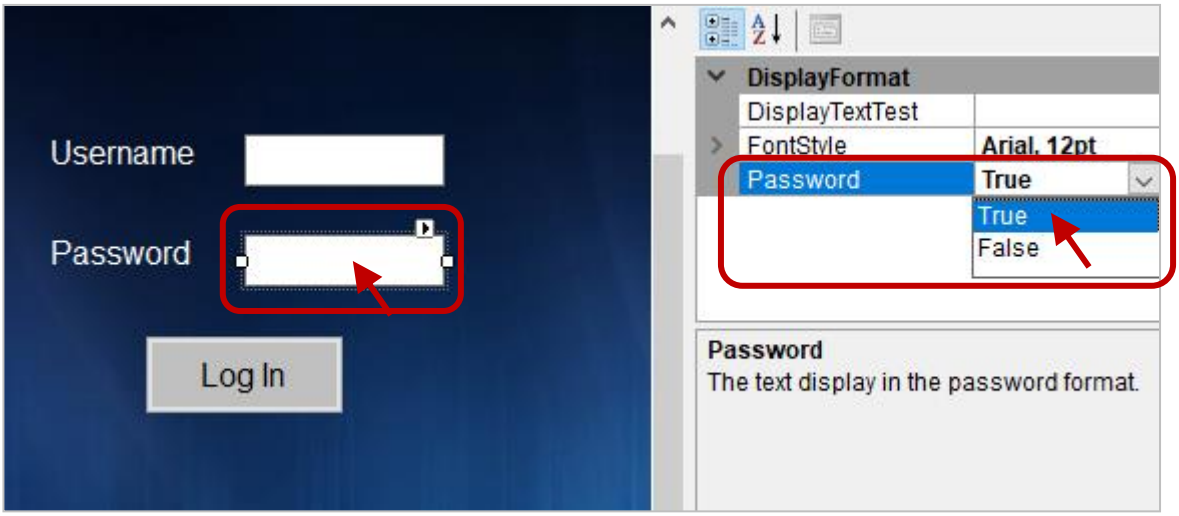


Step3: Click **Set Background Picture** from the **Background Picture** menu, and choose an image in the **WebBackPic** folder.

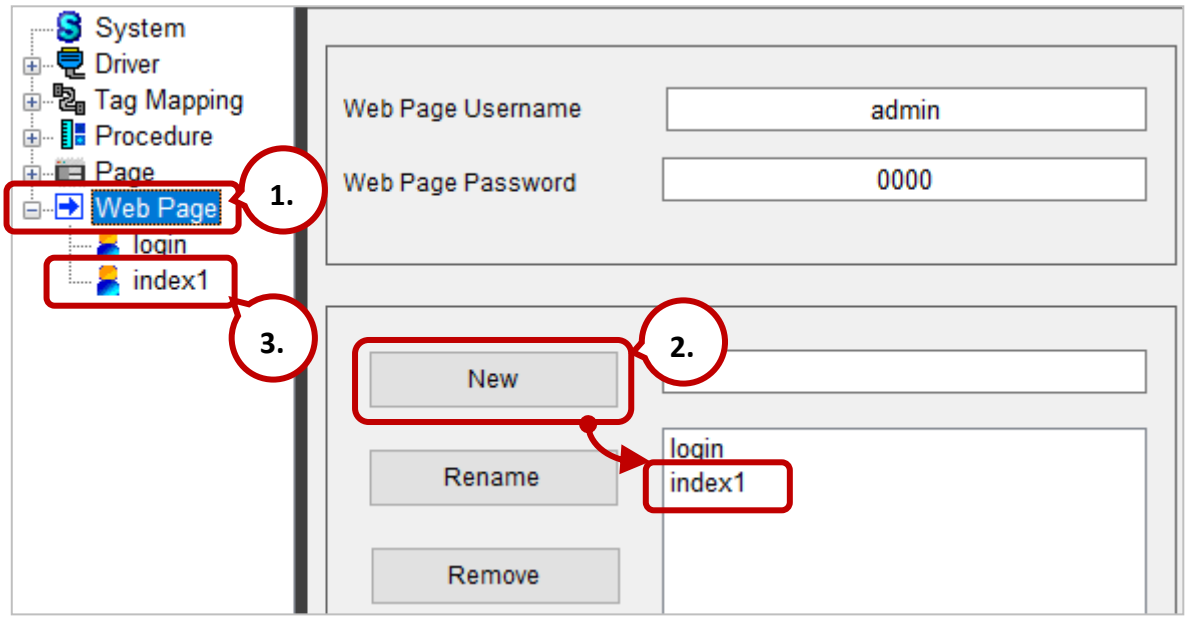




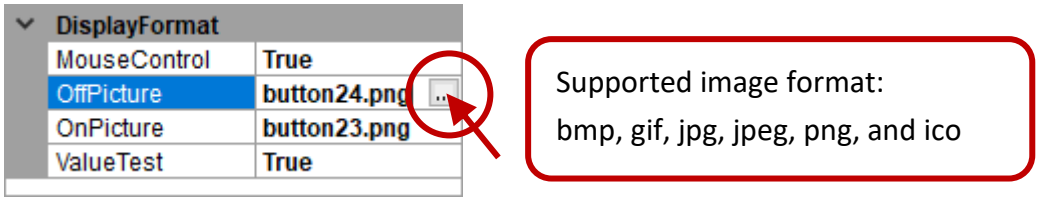
Step4: Click the **Password** input box on the page, and set the **Password** property to **True** to hide the password input on the web page.

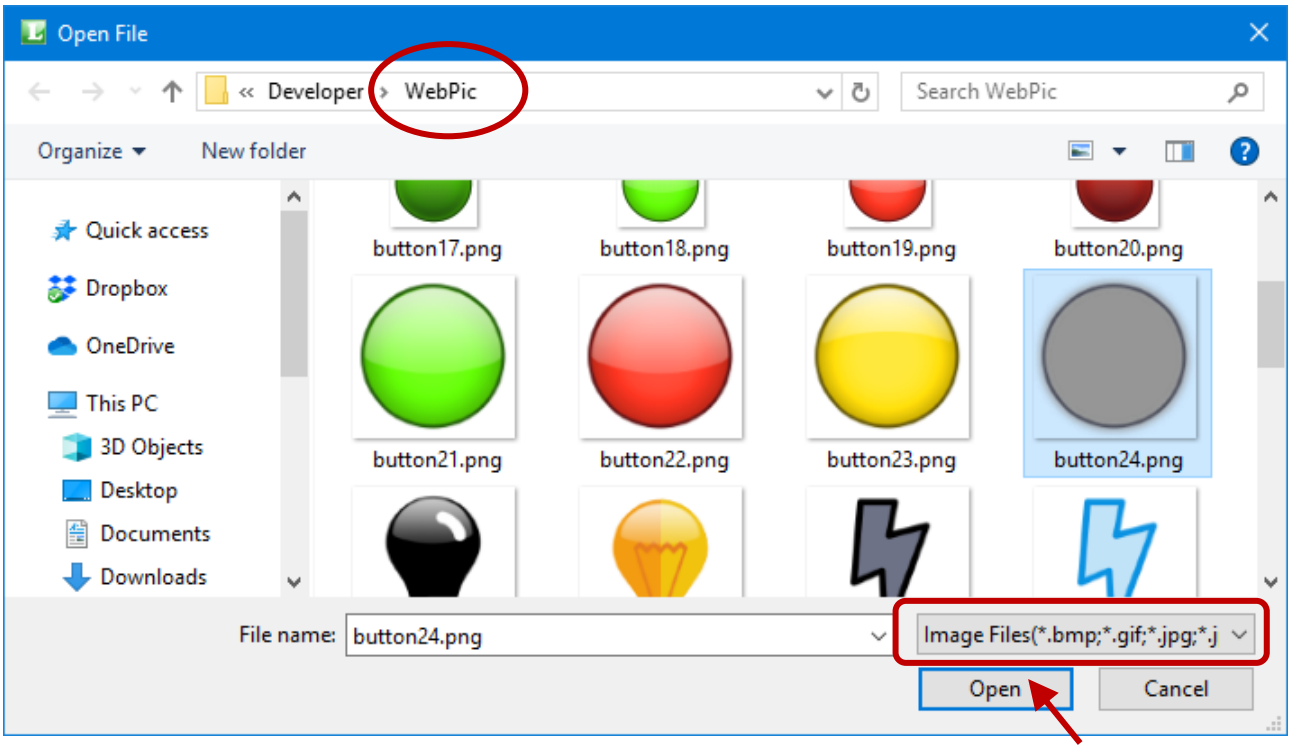


Step5: Click the **Web Page** menu to display its setting window. Click the **New** button to add a web page named index**1**. Click **index1** in the menu to display the page.



Step6: Click the **Picture Toggle** object on the tool bar and add six objects to the **index1** page. Select **DO Tag** from **Tag Type**, select a tag name from **Tag Name** (e.g., DO0 to DO5), and set **MouseControl** to **True** to allows set outputs with a mouse. In the **Off Picture/On Picture** field, specify the OFF/ON image from the **WebPic** folder. Also, go to Step3 to set a background picture.



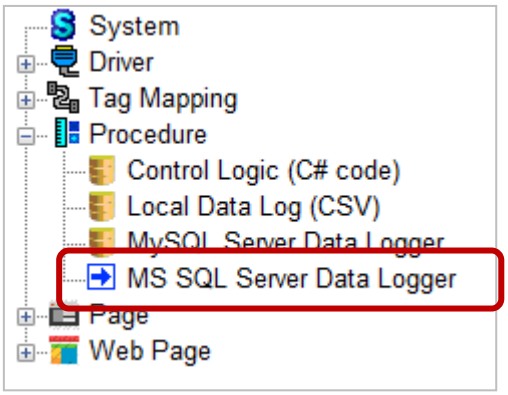


Step7: Click the **Button** object to add a button and set the button type as **LogOut.** The button can be used to log out the web page.

4.2.4. Configure the Procedure

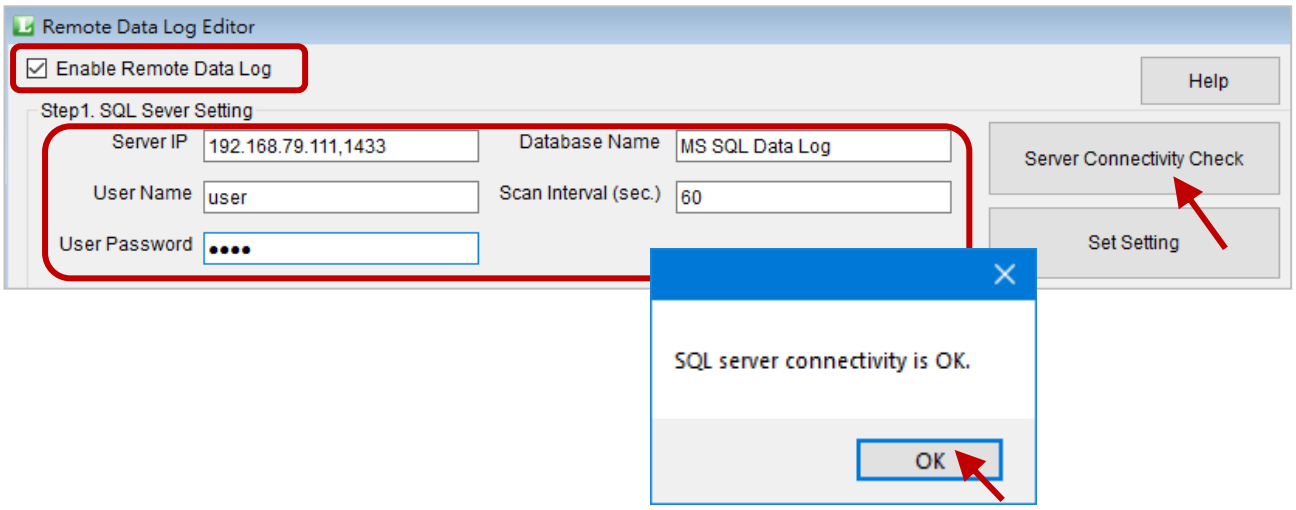
4.2.4.1. Remote Data Logging Configuration (MS SQL Server)

Step1: Expand **Procedure** and select **MS SQL Server Data Logger** to display the setting window.

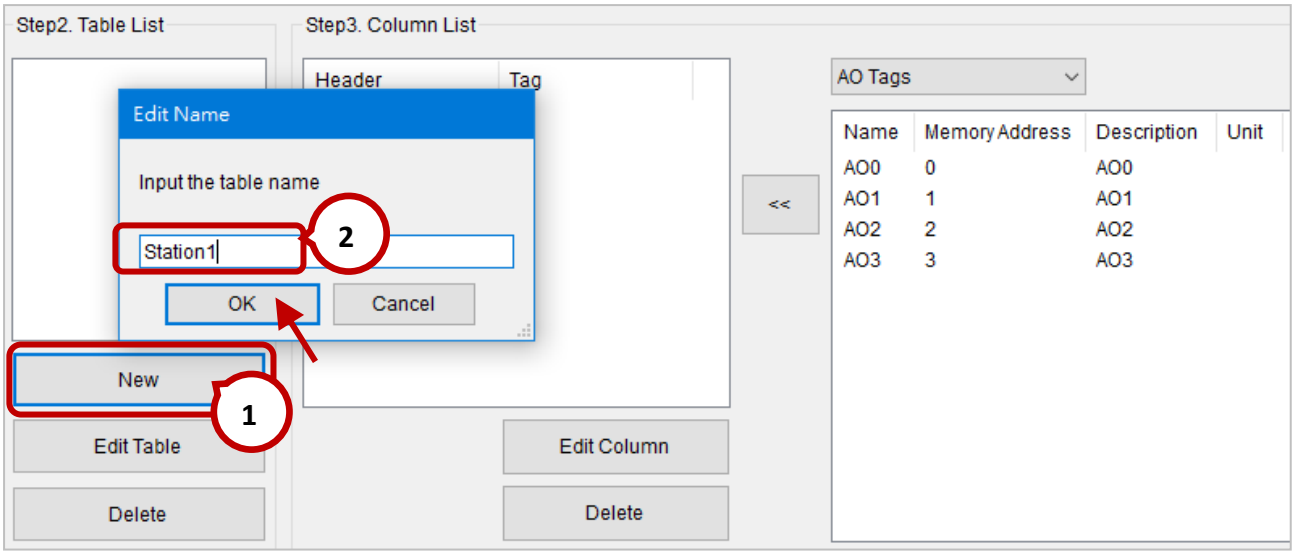


Step2: In the **Remote Data Log Editor** window, check **Enable Remote Data Log** to enable the function. Enter the following parameters, and click the **Server Connectivity Check** button to test the connection and access authority.

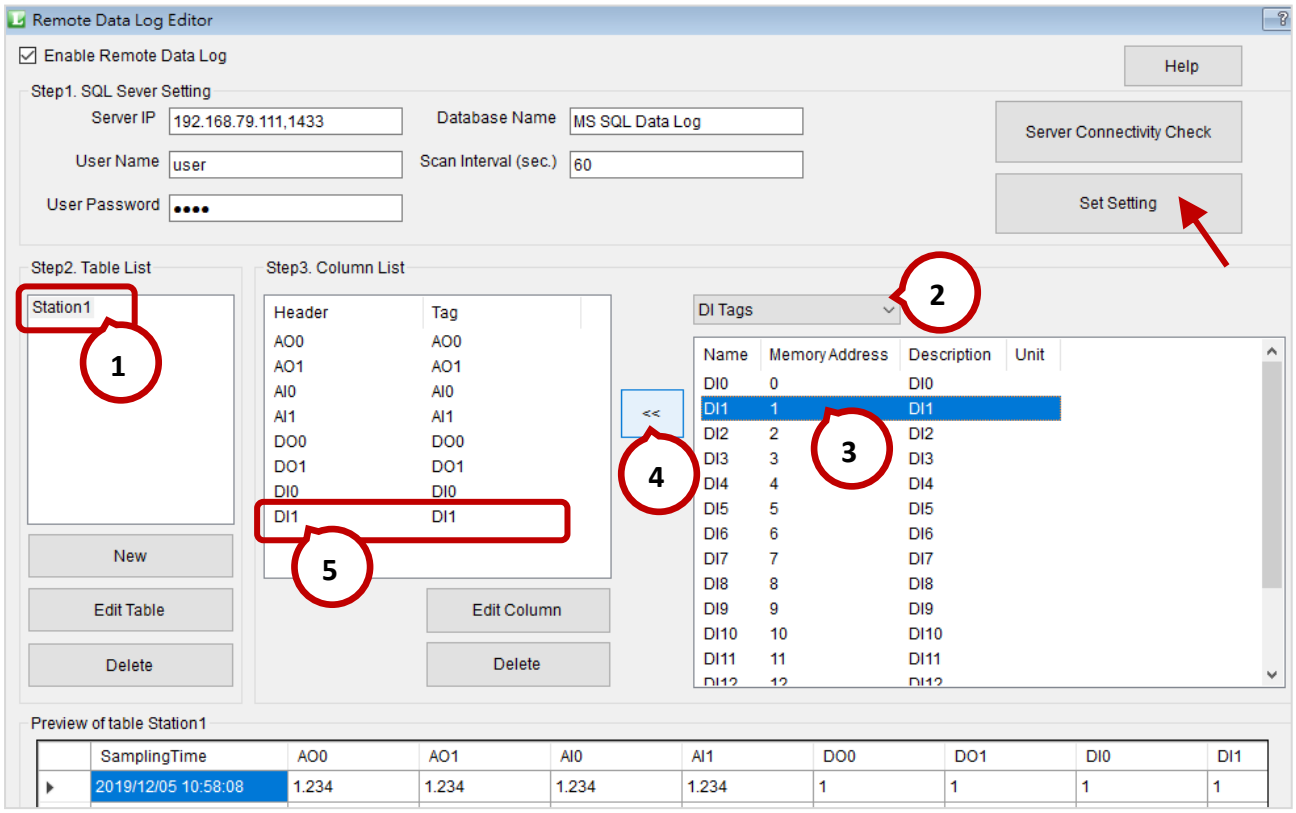
1) **Server IP:**
   Enter the IP address of the SQL Server (e.g., 192.168.79.111).
   Note: The TCP port of SQL Server is "1433".
2) **User Name and User Password:**
   Enter the username and password that have been created in SQL Server.
3) **Database Name:**
   Enter the database name that have been created in SQL Server.
4) **Scan Interval:** Enter a scan rate. By default, records data every 60 seconds.



Step3: Click the **New** button under **Table List**, and set the table name in the **Edit Name** window, and then click the **OK** button.

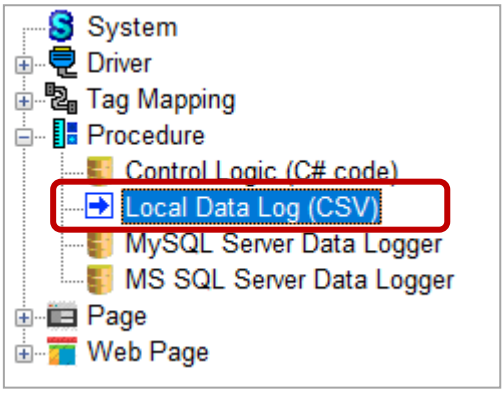


Step4: Click the table name and select **DO Tags** from the drop-down menu, and then add DO0 to DO5 tags into the **Column List** one-by-one. Finally, click the **Set Setting** button to save the settings.



4.2.4.2. Local Data Logging Configuration

Step1: Expand the **Procedure** menu and click **Local Data Log (CSV)** to display the setting window.



Step2: In the **Local Data Log Editor** window, check the **Enable Local Data Log** box to enable the function.

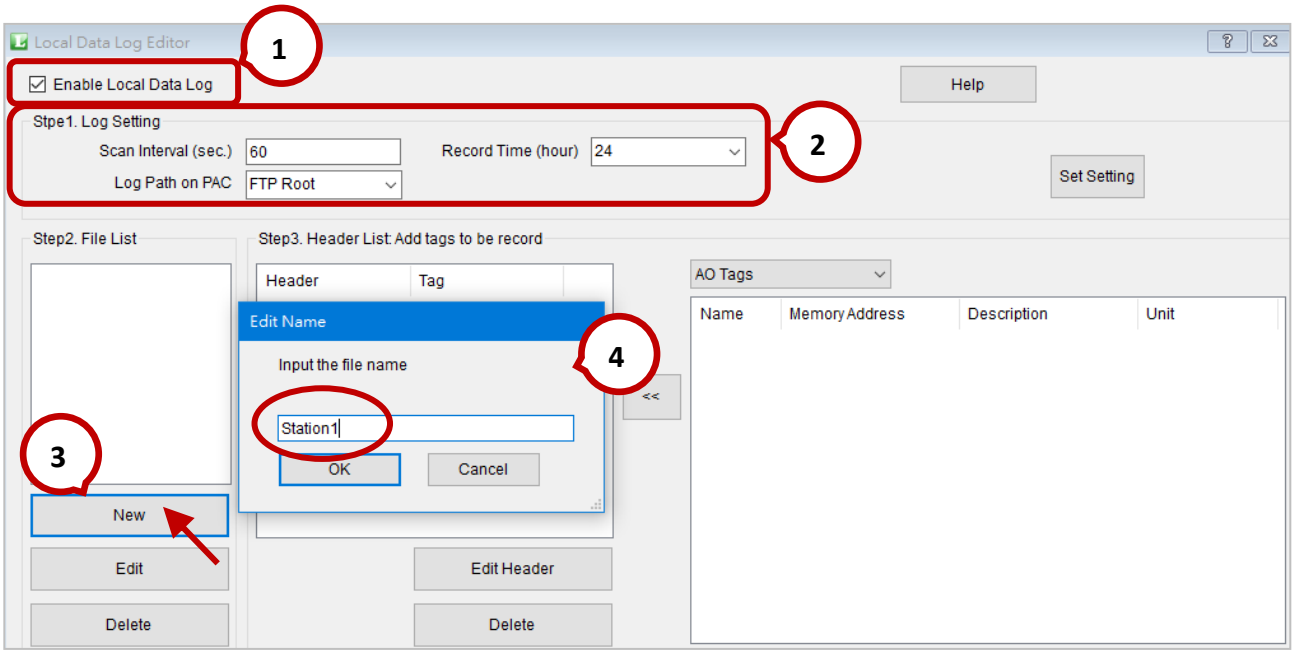
Step3: Configure the following settings in the **Log Setting**,

Scan Interval: By default, records data every 60 seconds.

Record Time: By default, creates a new file every 24 hours.

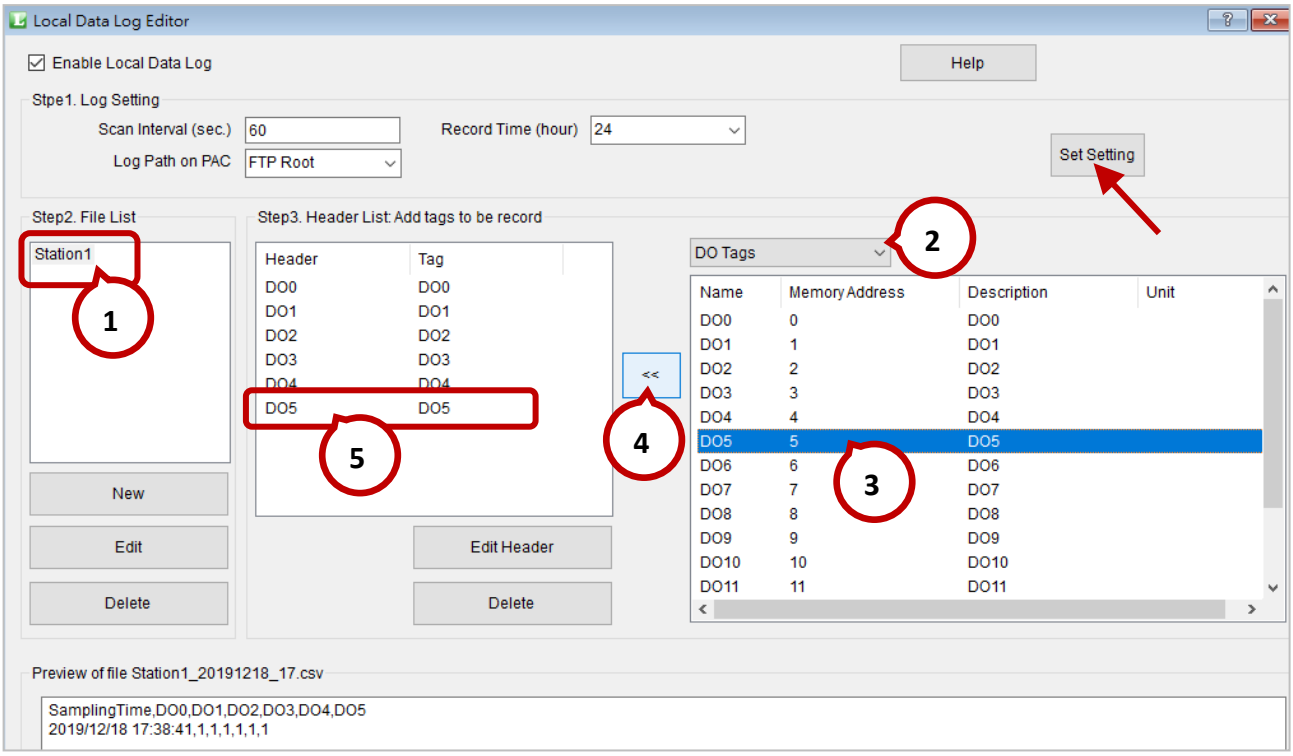
Log path on PAC: Set the file path to FTP Root, Runtime Root, or fill the path manually.

Step4: Click the **New** button under **File List**, and enter a file name in the **Edit Name** window, and then click the **OK** button.



Note: The format of file name is "**the custom name**_yyyyMMdd_HH.csv".

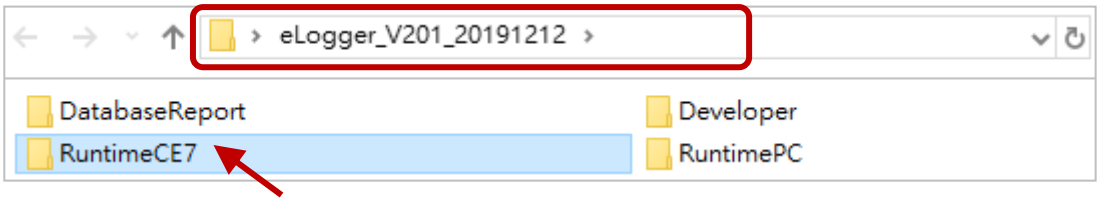
Step5: Click the file name and select the **DO Tags** from the drop-down menu, and then add DO0 to DO5 tags into the **Header List** one-by-one. Finally, click the **Set Setting** button to save the settings.

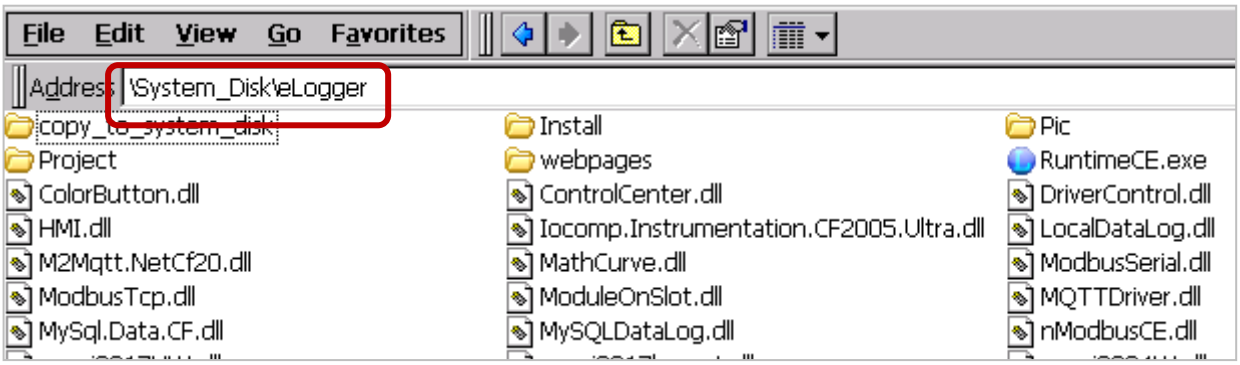


4.3. Prepare a ViewPAC

Step1: Prepare a **VP-4238-CE7** and make sure the PAC connects to Ethernet. Insert **I-8057W** module on slot 0.

Step2: On PC, copy all files in the PAC Runtime folder (e.g., eLogger_V201…\RuntimeCE7) and paste to **VP-4238-CE7** by using FTP or an USB drive.

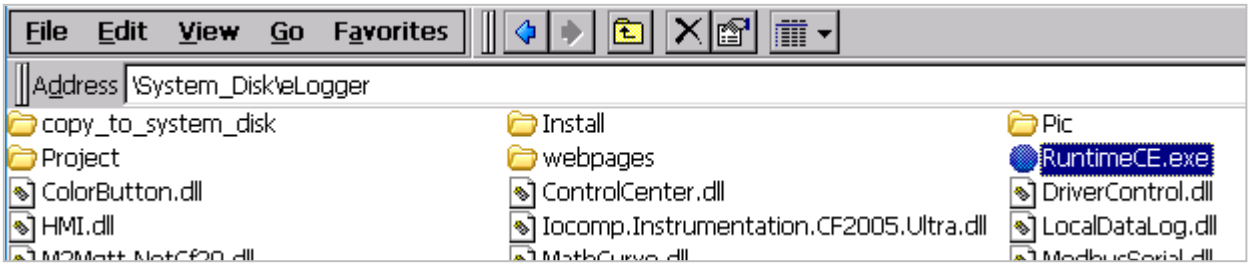




Step3: On PAC, copy dll files in the '\System_Disk\eLogger\copy_to_system_disk' folder and paste to the '\System_Disk\icpdas\system' folder.

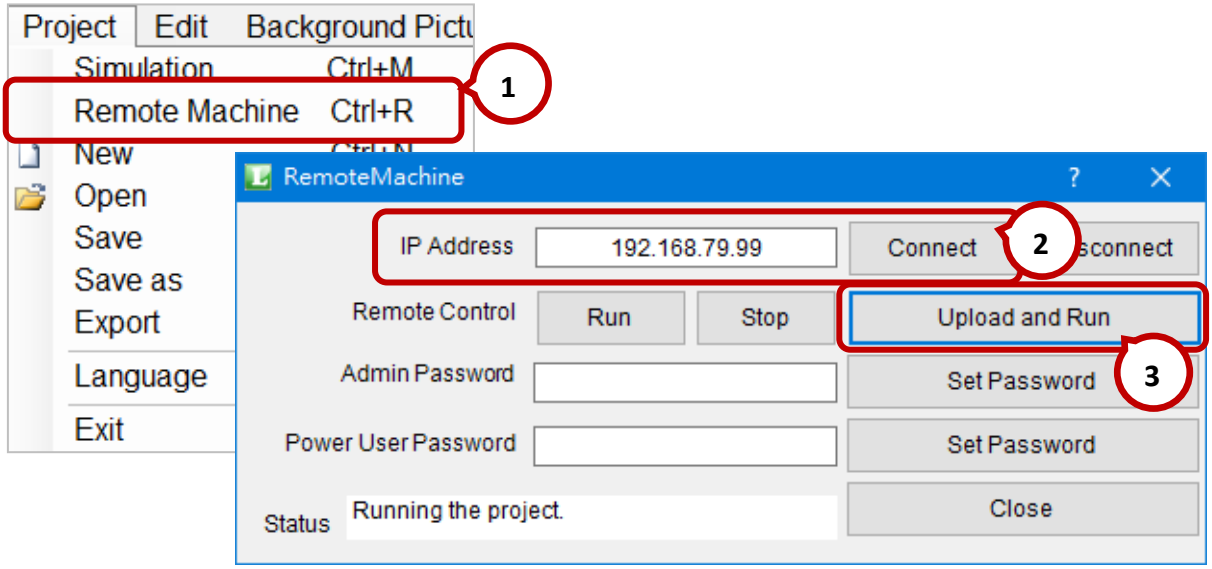
4.4. Execute a Project

Step1: On PAC, execute **RuntimeCE.exe** in the '\System_Disk\eLogger' folder.

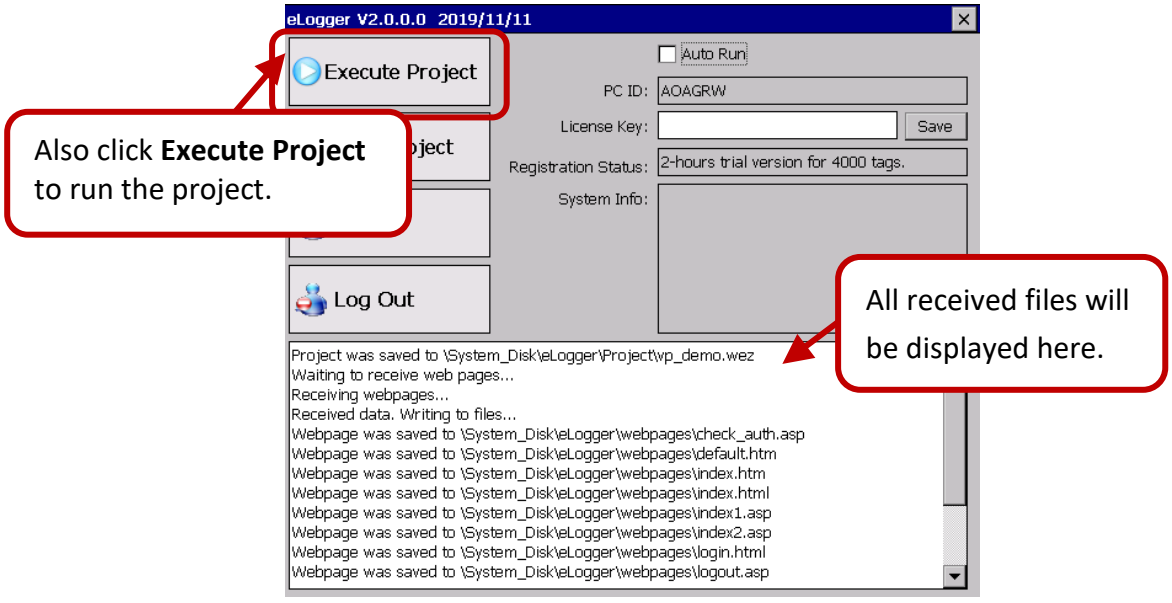


Step2: On PC, Click **Project** and **Remote Machine** from the menu bar in the eLogger Developer.

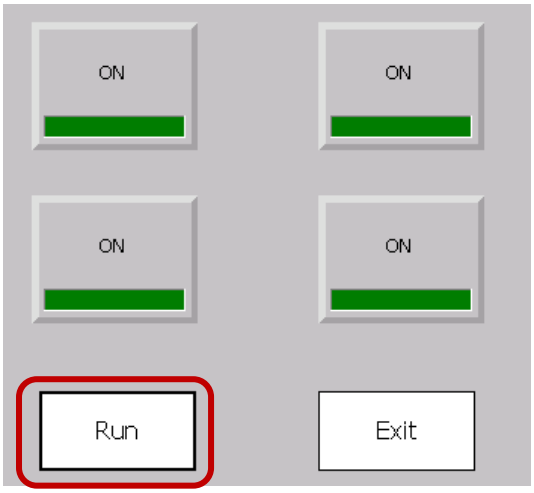
Step3: Enter the IP address of the PAC and click the **Connect** button. After a successful connection, click the **Upload and Run** button to upload the project.

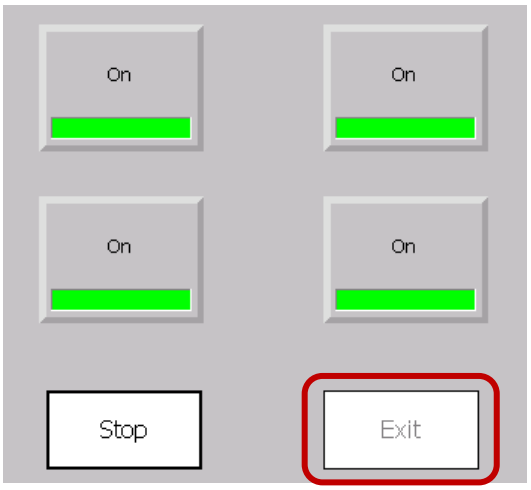


Step4: After the upload completes, the project will be automatically running.

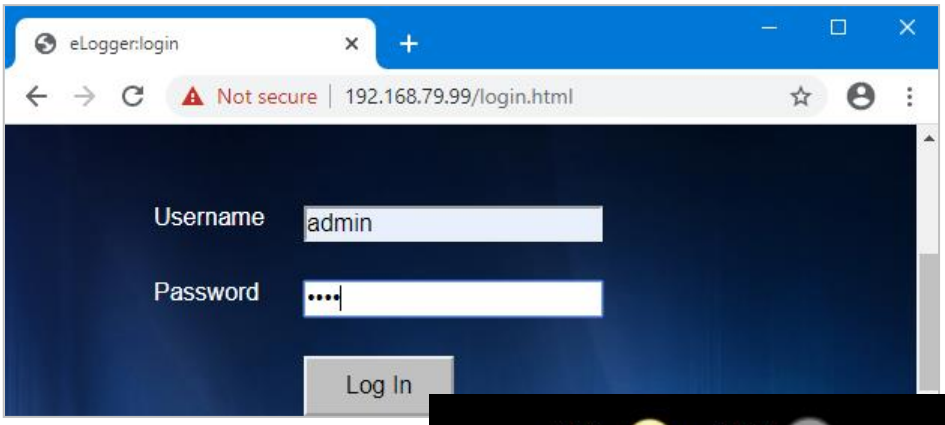


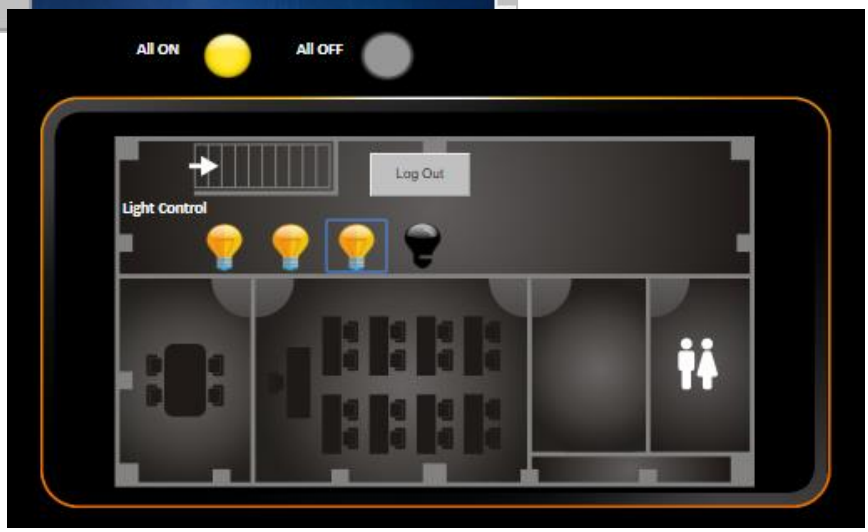
Step5: Click the **Run (or Stop)** button to start (or stop) running the project. Click the Switch button to control the DO status of I-8057W module. Click the **Exit** button to exit the HMI page and display the eLogger runtime window.



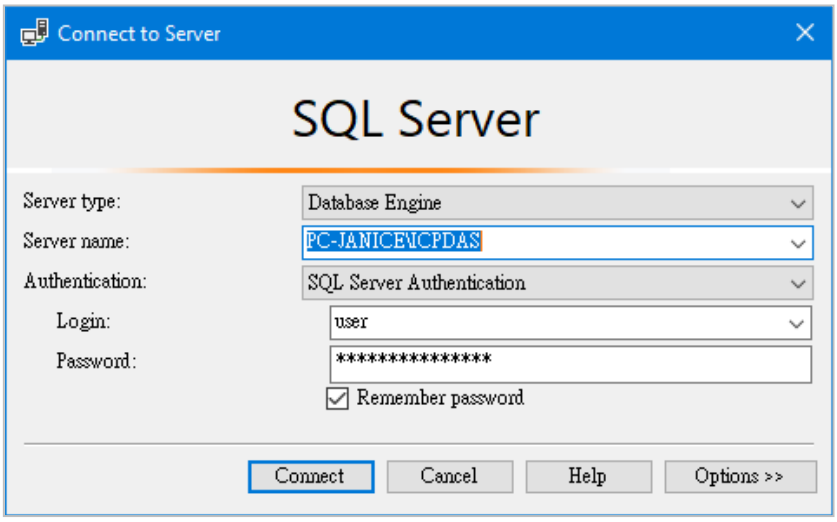


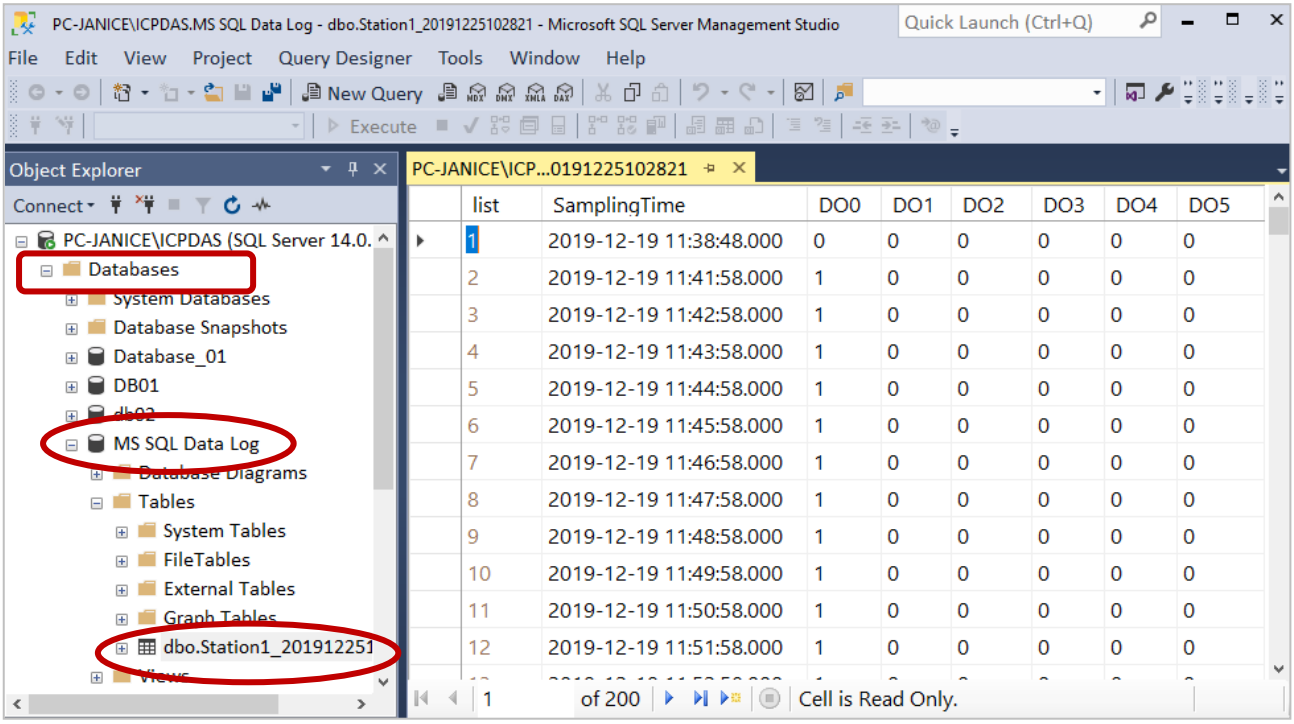
Step6: On PC (or smart phone, tablet), open the web browser and enter the IP address of the PAC, for example, http://192.168.79.99/, and then enter the username/password (defaults: admin/0000) to log into the web page. And then, you can remotely control the DO status of the module.



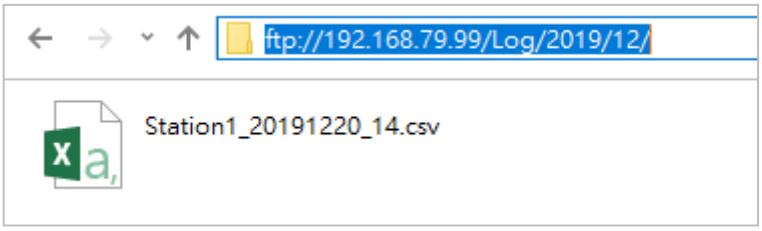


Step7: In this case, **Remote Data Logging** is enabled (see Section 4.2.4). Users can log in to SQL Server and check the data table.





Step7: In this case, **Local Data Logging** is enabled (see Section 4.2.4). Users can copy the data file from PAC (ftp://PAC IP/Log/YYYY/MM) to PC by FTP.

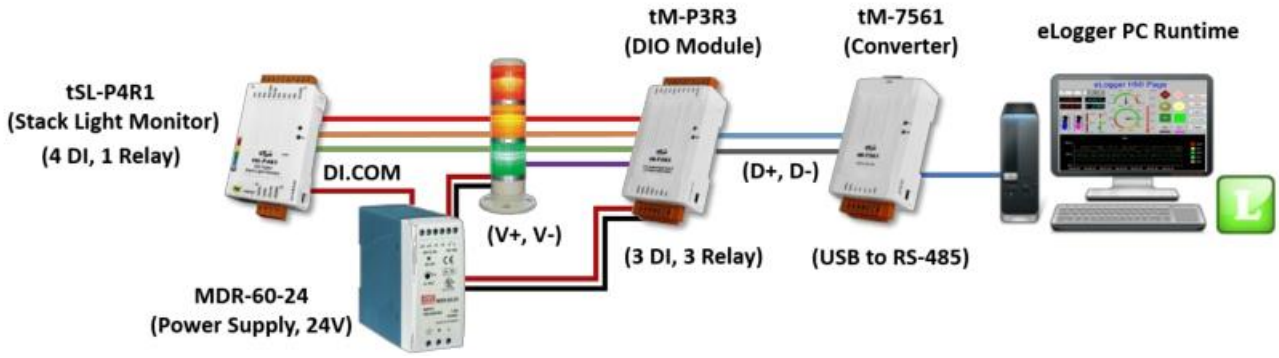


Chapter 5 Demo for PC Runtime

In the example, using an eLogger PC Runtime to connect tM-P3R3 (DIO module) and tSL-P4R1 (stack light monitoring module), and simulating the operating status of equipment.

ICP DAS Stack Light Monitoring Modules (Modbus RTU: tSL-P4R1/tSL-PA4R1, Modbus TCP: SL-P6R6-WF/ SL-PA6R6-WF) support for network-based operating interface and can be used to detect the status of each color segment of the stack light as being either OFF, ON, or flashing. In addition, allows users to define the status of the combination of multiple color segments to quickly identify the situation of equipment. It is easy for troubleshooting and to improve machine utilization and throughput.

Hardware Wiring:



Description:

Stack Light	tSL-P4R1 (DC)	tM-P3R3
Red wire	DI0	NO0
Orange wire	DI1	NO1
Green wire	DI2	NO2
Purple wire (Continuous COM)	-	COM0, COM1, COM2
24V to **MDR-60-24** (V+, V-)	DI.COM to V+	+Vs to V+ and GND to V-
-	-	Data+ to **tM-7561** (Data+) Data- to tM-7561 (Data-)
	Slave ID = 1 Baud rate = 9600	Slave ID = 3 Baud rate = 9600
	ON Voltage Level: +10 ~ 50 VDC	ON Voltage Level: +3.5 ~ 50 VDC

Visit ICP DAS website to found the webpage, data sheet, and manual by searching the model.

5.1. Configure I/O Modules

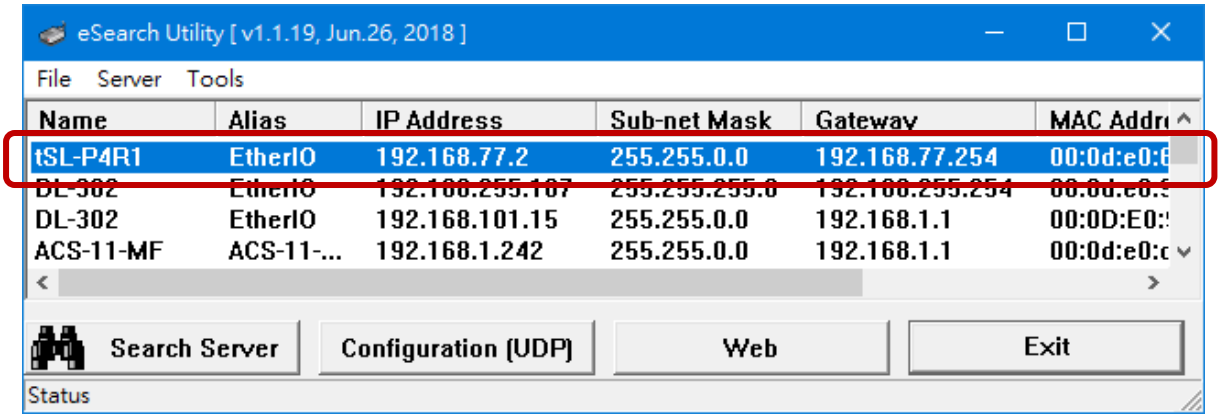
5.1.1. Configure the Stack Light Monitoring Module (tSL-P4R1)

The factory default IP settings of tSL series module are: IP Address: 192.168.255.1; Subnet Mask: 255.255.0.0; Gateway: 192.168.0.1. Before connecting the module to the network, contact your network administrator to get the valid IP/Subnet Mask/Gateway address and set the module.

Step 1: Download and install eSearchUtility.

eSearchUtility can be used to search and configure Ethernet settings of tSL series module.

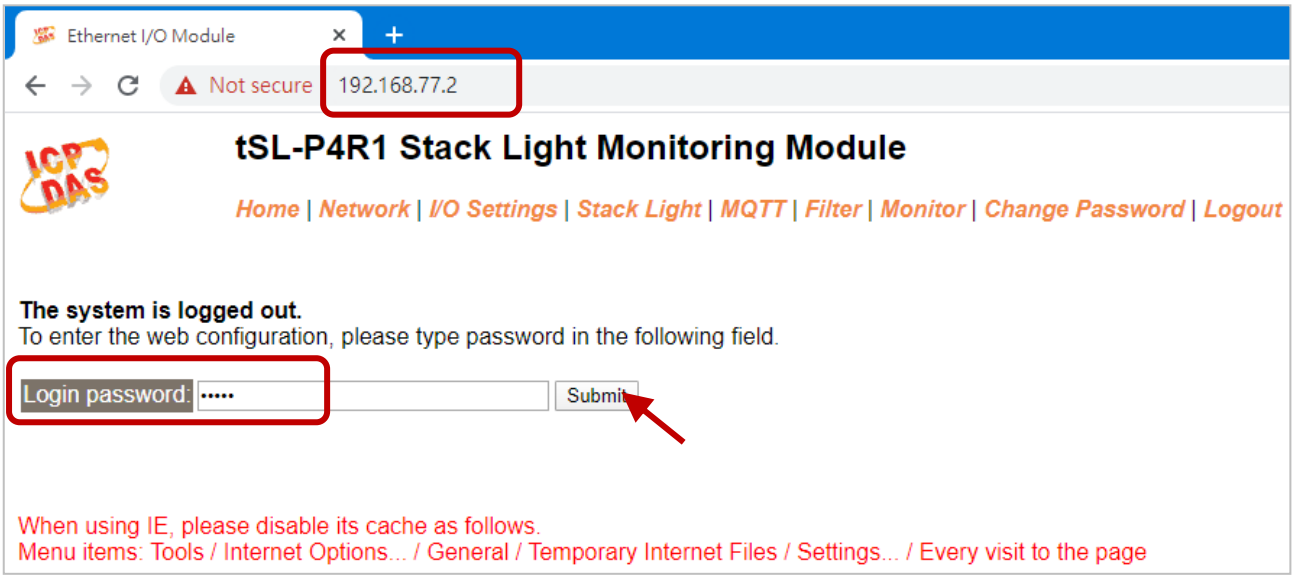
Download link: http://ftp.icpdas.com/pub/cd/tinymodules/napdos/software/esearch/



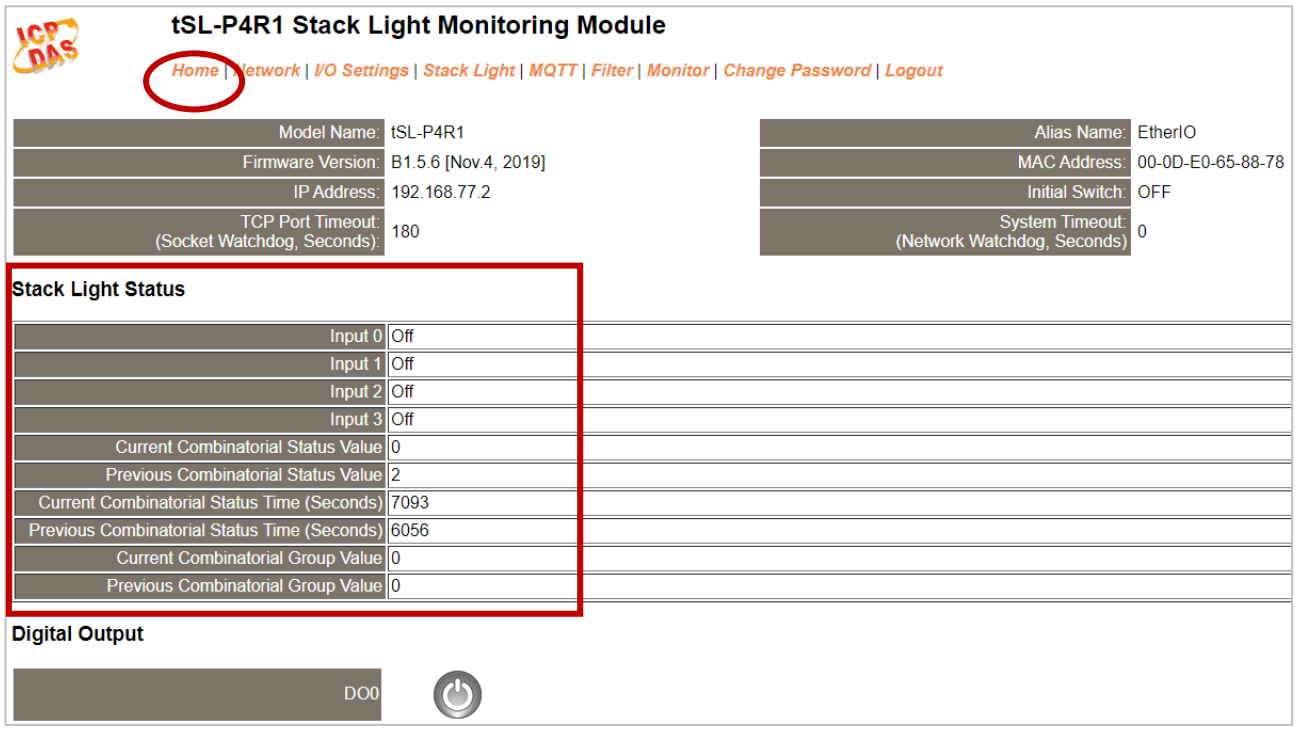
Step 2: Log in to the tSL-P4R1 web server

tSL series module built-in web-based configuration interface that allows users to log in to the module through a web browser on PC to set the parameters and to monitor the I/O status.

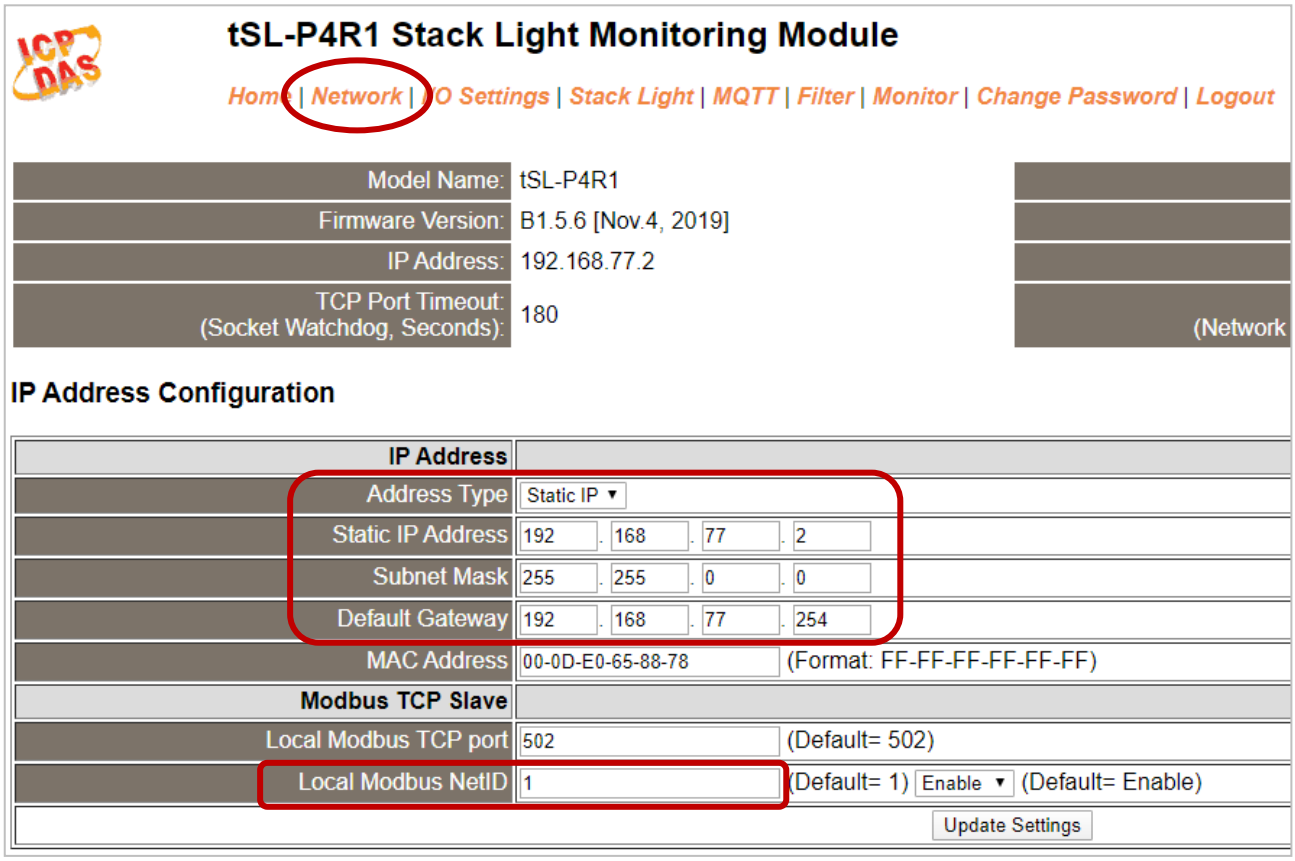
The factory default password is "**Admin**" (case-insensitive).



In the "**Stack Light Status**" section of the **Home** page, displays the status of each color segment, and the number, the duration and the group number of the current (or the previous) combinatorial status.

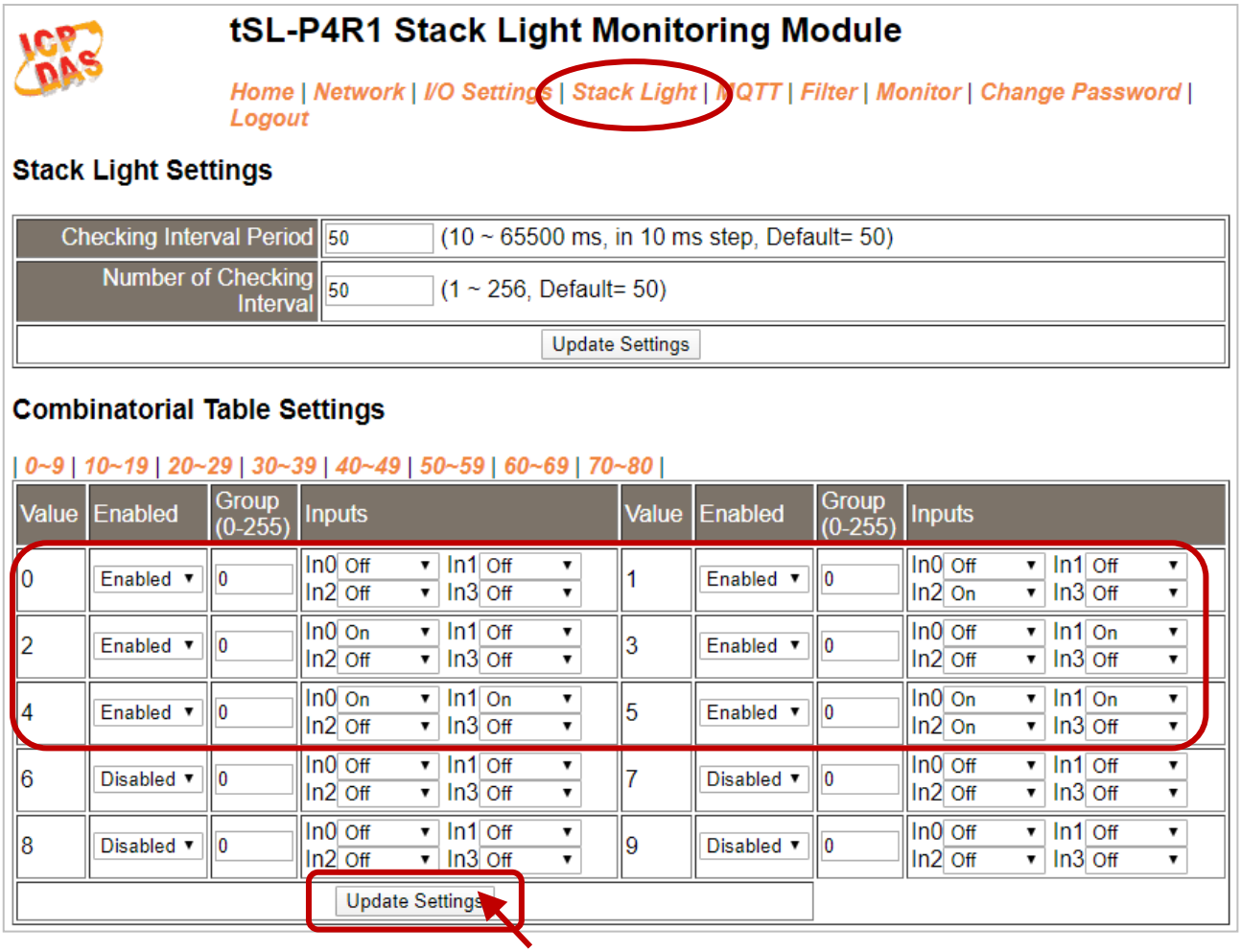


Note: When using Modbus TCP, users can configure the IP settings and Net-ID in the "**IP Address Configuration**" section of the **Network** page.



Step 3: Set the combinatorial status of stack lights for tSL-P4R1

The tSL module can be used to connect up to four color segments of the stack lights and detect the status of each color segment as being either OFF, ON, or flashing. The user can assign various the combinatorial statuses to express the different operating situation for the equipment.

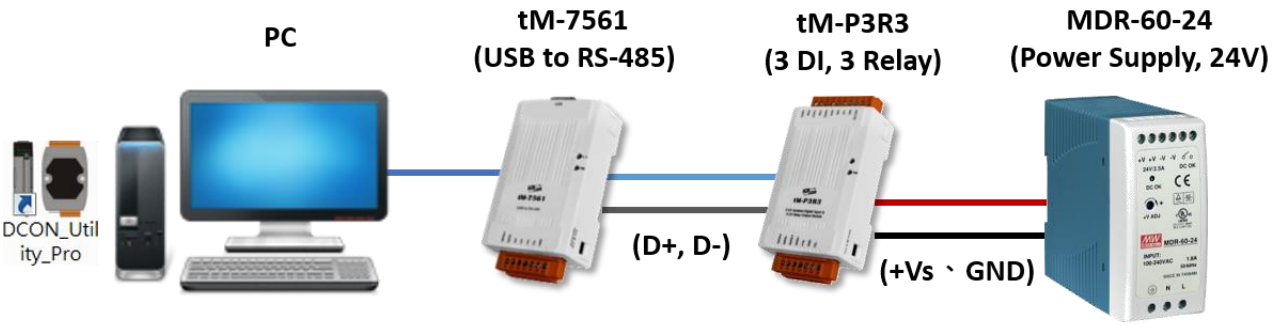


In the "**Combinatorial Table Settings**" section of the **Stack Light** page, in this case, we use three color segments to define the machine status. After complete the settings, click the **Update Settings** button.

Combinatorial Status	In0 (Red)	In1 (Orange)	In2 (Green)
0: Machine off	Off	Off	Off
1: Machine running	Off	Off	**On**
2: Machine done	**On**	Off	Off
3: Out of material	Off	**On**	Off
4: Test-in-process	**On**	**On**	Off
5: Waiting for service call	**On**	**On**	**On**

5.1.2. Configure the DIO Module (tM-P3R3)

DCON Utility Pro can be used to search and set communication parameters and I/O settings for modules. Download link:
http://www.icpdas.com/root/product/solutions/software/utilities/dcon_utiltiy_pro.html



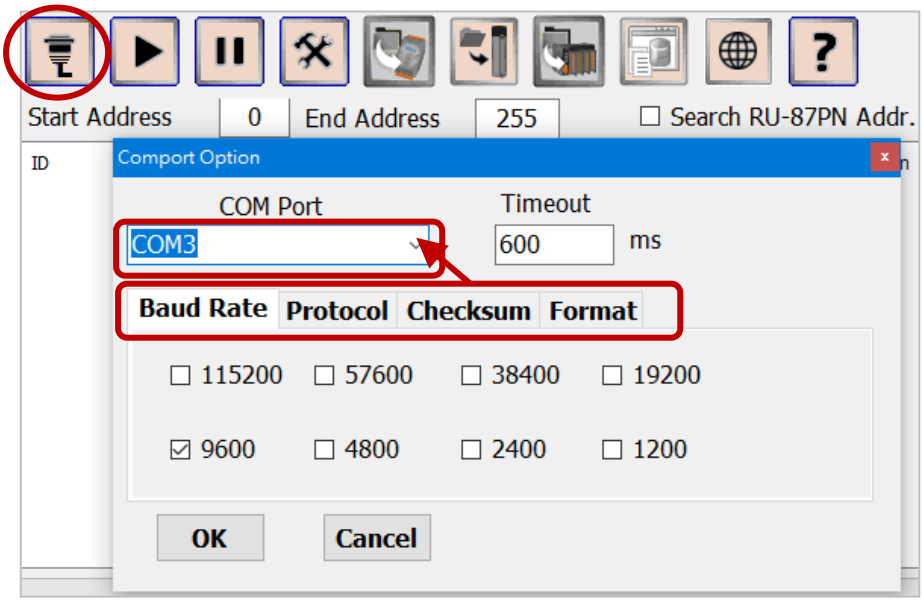
Default settings:

Communication parameters	Factory Defaults (RUN mode)	Fixed Settings (INIT mode)
Protocol	Modbus RTU	DCON
Address	1	0
Baud Rate	9600 bps	
Parity	n,8,1-no parity	
Checksum	Disable	

If communication parameters of the module are unknown, using the Search function to find the I/O module on the RS-485 network. To quickly find the tM module, searching it under INIT mode, i.e., adjusting the DIP switch to '**Init**' before powering on.

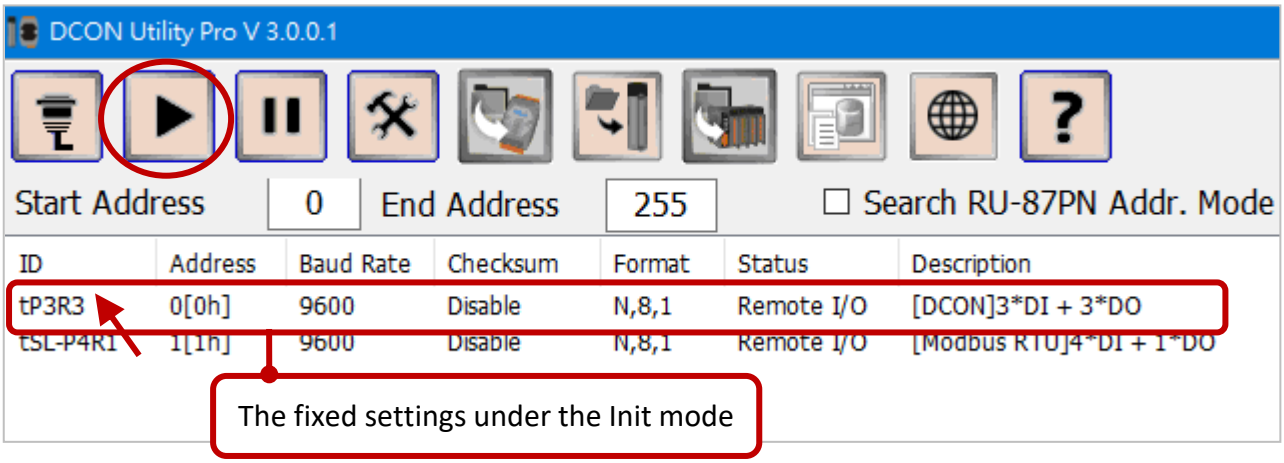
Step 1: Run DCON Utility Pro and choose the COM Port and conditions for searching.

It allows to check several options.



Step 2: Search the module.

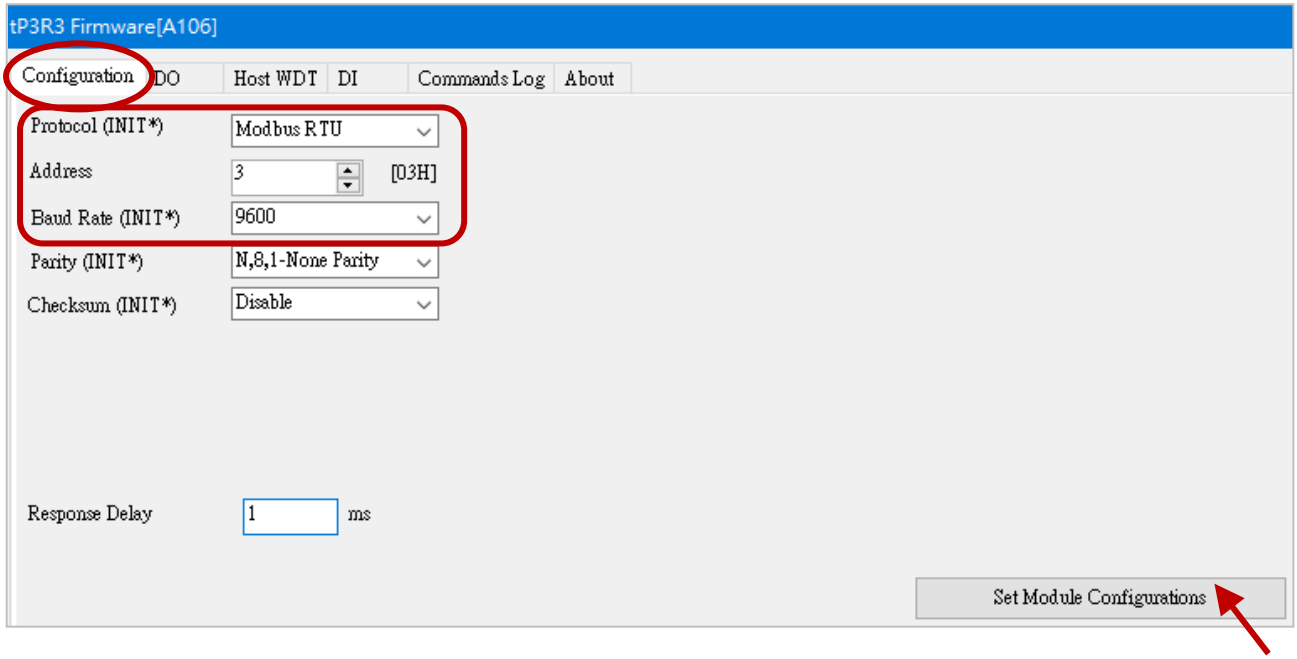
Click **Start Search** to find I/O modules on the RS-485 network.



Step 3: Configure the module.

Double-click the module name to open the setting window. In this example, follow these settings - Protocol = Modbus RTU, Address = 3, and Baud Rate = 9600, and then click the **Set Module Configuration** button. Next, adjusting the DIP switch to '**Run**' and rebooting the module for the setting to take effect.

Note: The item marked with (INIT*) must be set under Init mode, the rest of the items can be set in Run mode.



After rebooting, also search the module again and check the settings.

5.2. Configure an eLogger Project

Description of Demo:

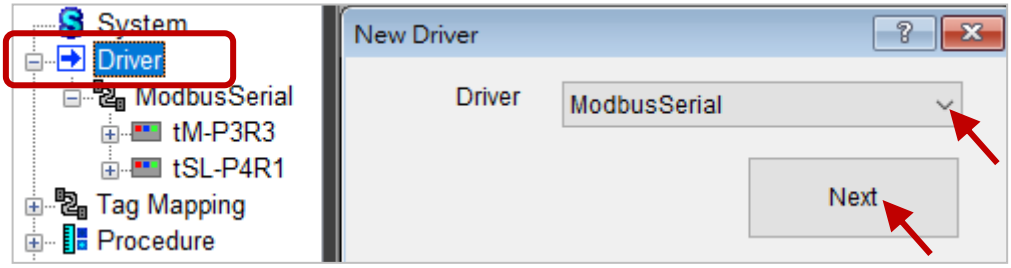
In the example, using an eLogger PC Runtime to connect both tM-P3R3 and tSL-P4R1 modules via Modbus RTU (COM3, Baud rate = 9600). tM-P3R3 can be used to control three color segments of the stack lights to simulate the running status of the machine. tSL-P4R1 can be used to detect the ON/OFF status of each color segments to display the user-defined number and the duration of the combinatorial status.

5.2.1. Add the Driver & Device

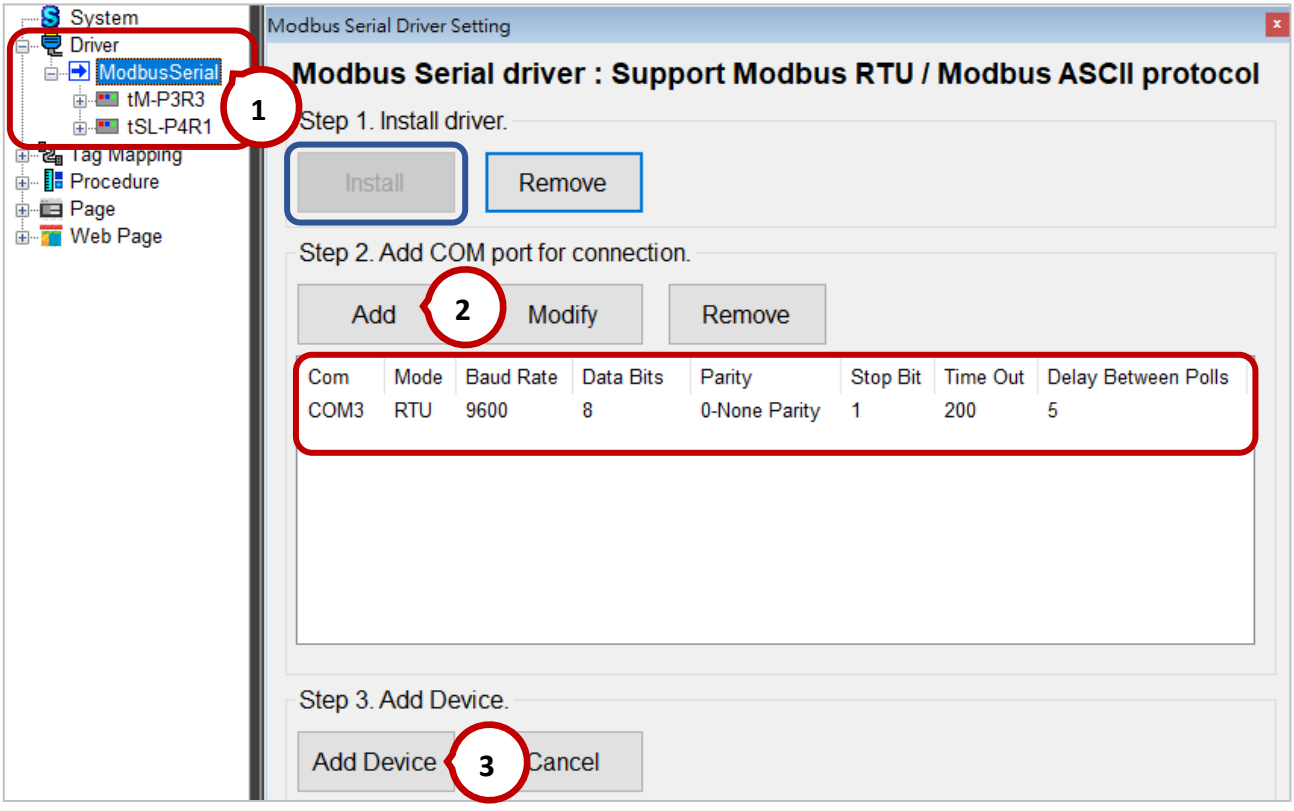
Step1: Add a driver (Modbus Serial) and add two devices (tM-P3R3 and tSL-P4R1).

Click the **Driver** menu, select the **Modbus Serial**, and click the **Next** button.

Next, click the **Install** button.



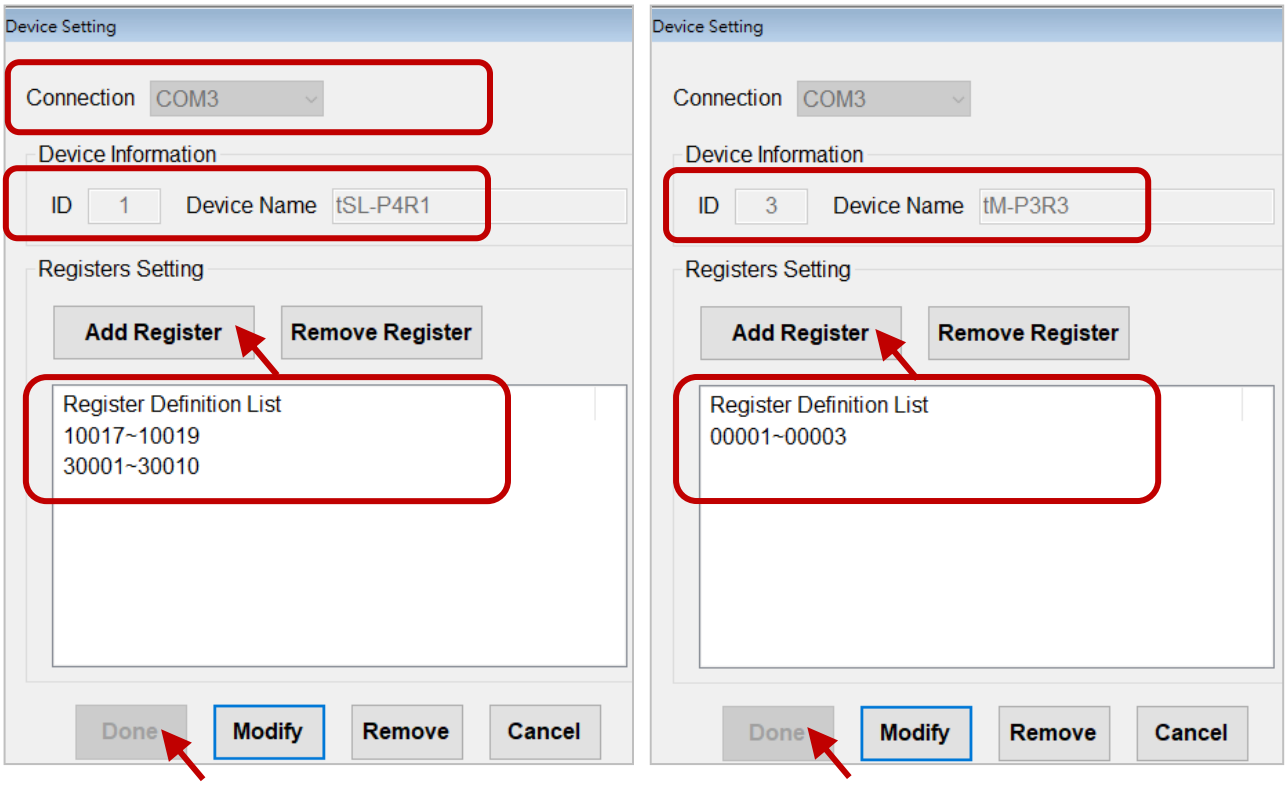
Click on **Modbus Serial** and click **Add** to add a COM Port setting (COM3), and then click the **Add Device** button.



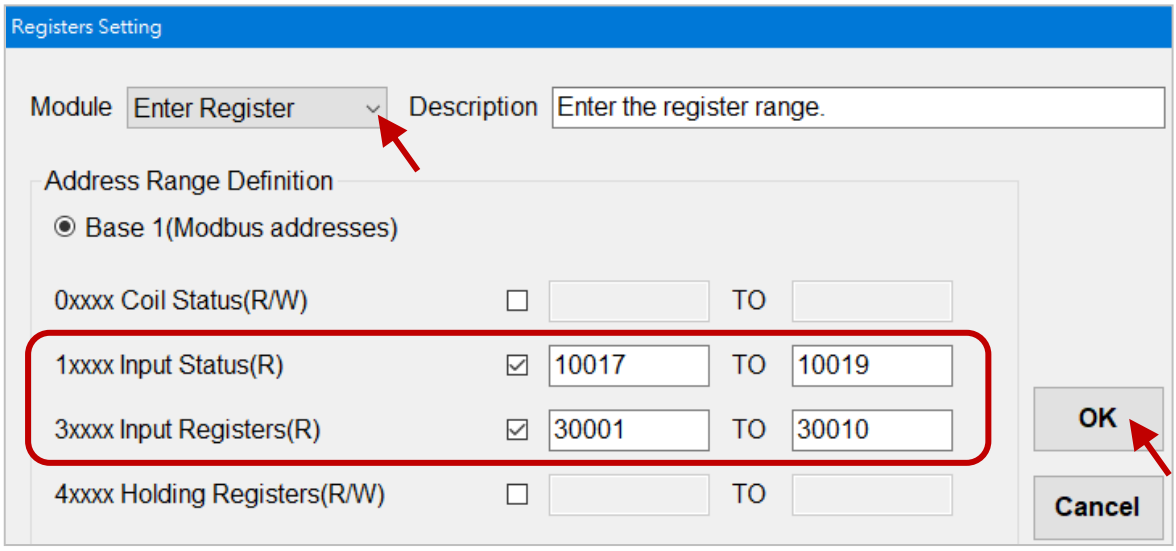
In this example, set the parameters of modules as follows.

	tSL-P4R1	tM-P3R3
Connection	COM3	
Slave ID	1	3
Register (Base 1)	Input Status: 10017 to 10019 Input Register: 30001 to 30010	Coil Status: 0001 to 0003

Click the **Add Register** button to add the Modbus address to be used and click the **Done** button.



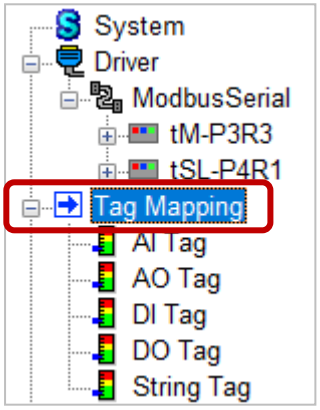
Note: If there is no available module name, simply select "**Enter Register**" to enter the address manually, and click **OK**.



Module Name	tSL-P4R1	tM-P3R3
Register (Base 1)	Input Status: 10017 to 10019 Used to read the status of digital input channels	Coil Status: 0001 to 0003 Used to read/write the status of digital output channels
	Input Register: **30001 to 30010**	-
	tSL-P4R1: **1 ~ 3**: Read the status of the stack lights (0 = off, 1 = on, 2 = flashing) **5:** Read the current combinatorial status of the stack lights **6:** Read the previous combinatorial status of the stack lights **7:** Read the duration of the current combinatorial status in seconds (Low word of the time) **8:** Read the duration of the current combinatorial status in seconds (High word of the time) **9:** Read the duration of the previous combinatorial status in seconds (Low word of the time) **10:** Read the duration of the previous combinatorial status in seconds (High word of the time)	

5.2.2. Add Tags

Expand the **Tag Mapping** menu, and configure the AI, DI and DO tags as follows.

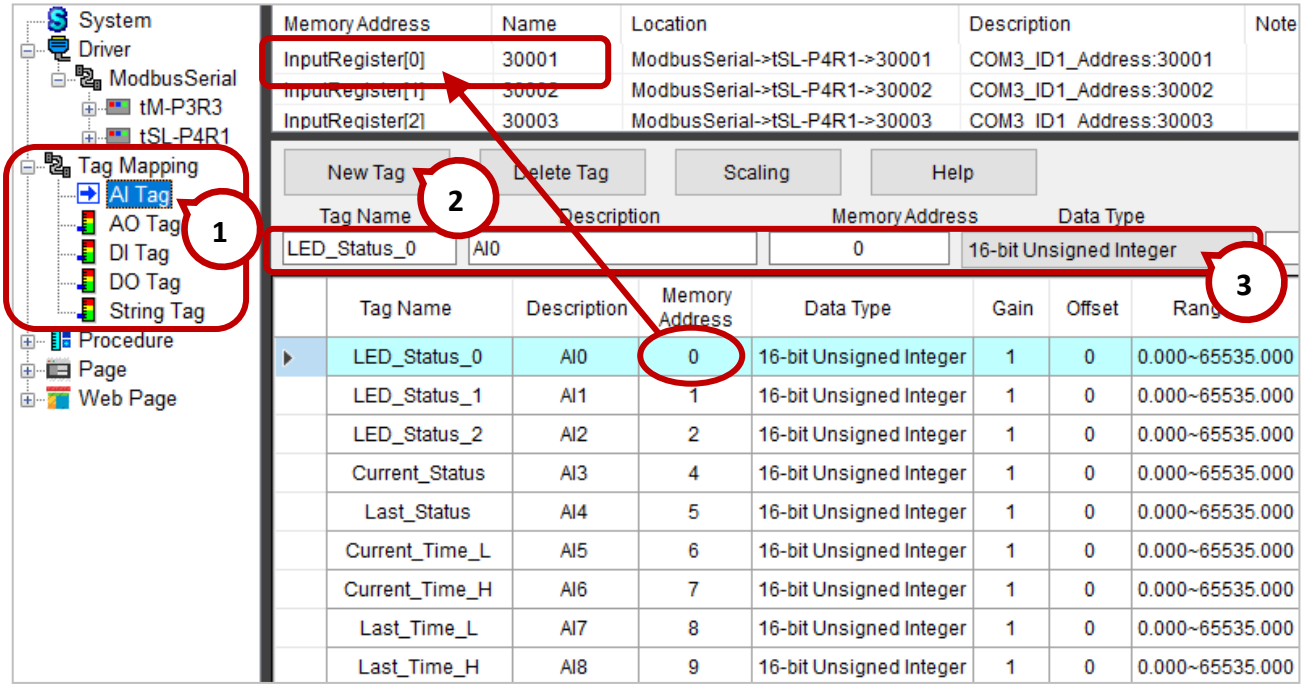


AI Tag:

Read the status (0/1), combinatorial status, and its duration for the stack light in seconds.

Tag Name	Memory Address	Modbus Address
LED_Status_0 ~ LED_Status_2	0 ~ 2	30001 ~ 30003
Current_Status	4	30005
Last_Status	5	30006
Current_Time_L	6	30007
Current_Time_H	7	30008
Last_Time_L	8	30009
Last_Time_H	9	30010

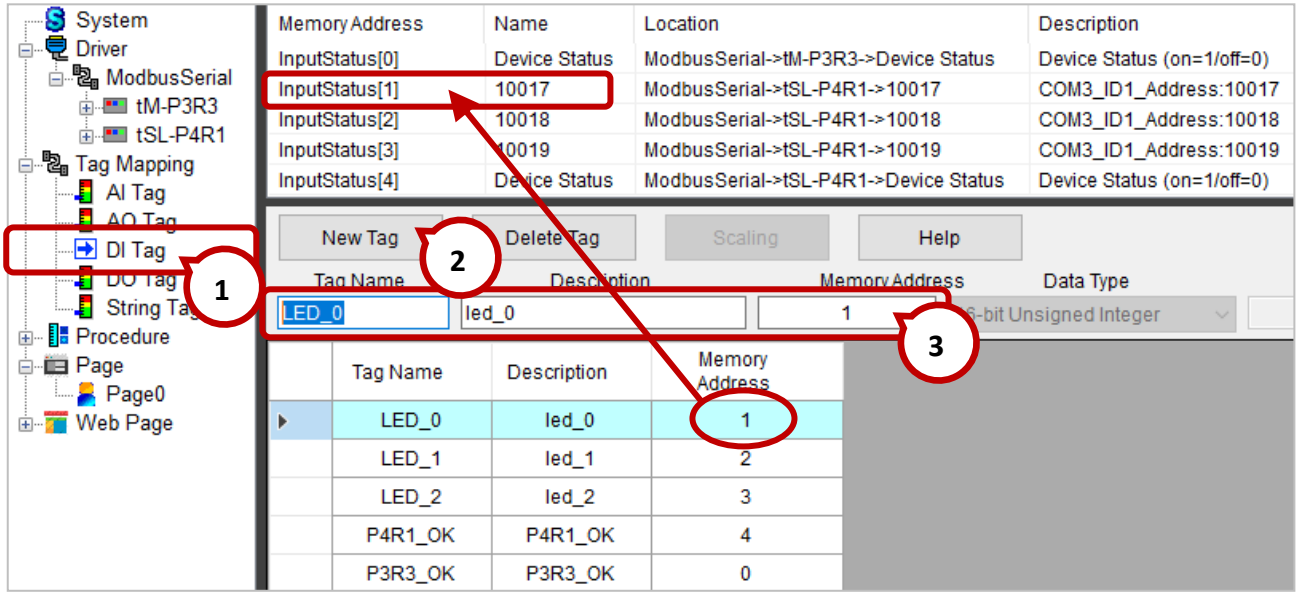
Step1: Click on **AI Tag** and click the **New Tag** button to add 9 tags.



Step2: Click on **DI Tag** and click the **New Tag** button to add 5 tags.

DI Tag: Read the status of three color segments of the stack light, and the communication status of devices.

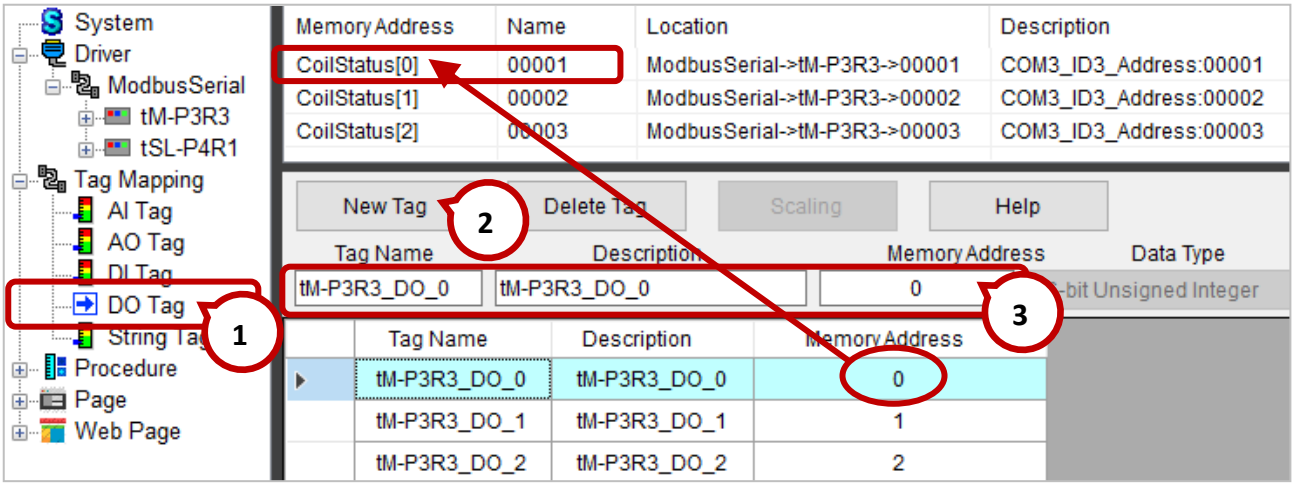
Tag Name	Memory Address	Modbus Address
P3R3_OK	0	-
LED_0	1	10017
LED_1	2	10018
LED_2	3	10019
P4R1_OK	4	-



Step3: Click on **DO Tag** and click the **New Tag** button to add 3 tags.

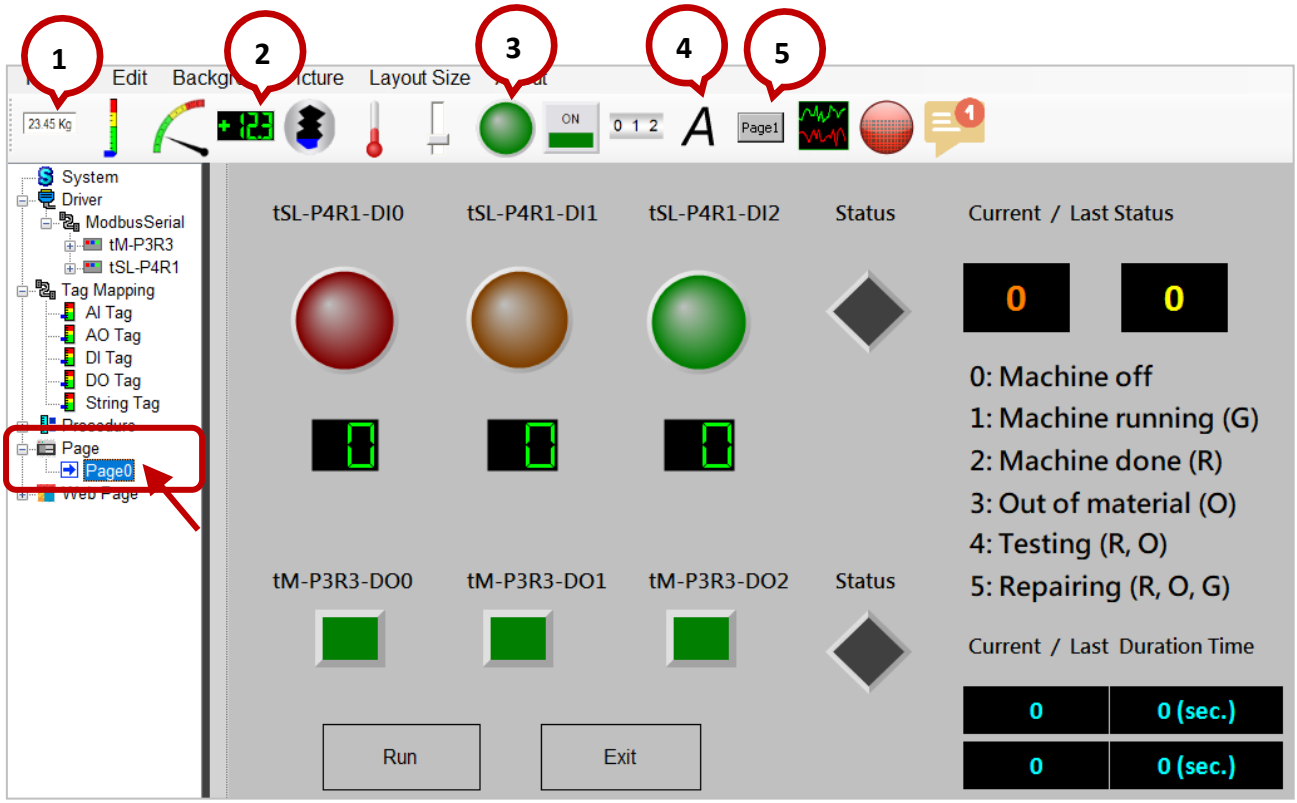
DO Tag: Read/write the status of three relay output channels of the tM-P3R3 module.

Tag Name	Memory Address	Modbus Address
tM-P3R3_DO_0	0	00001
tM-P3R3_DO_1	1	00002
tM-P3R3_DO_2	2	00003



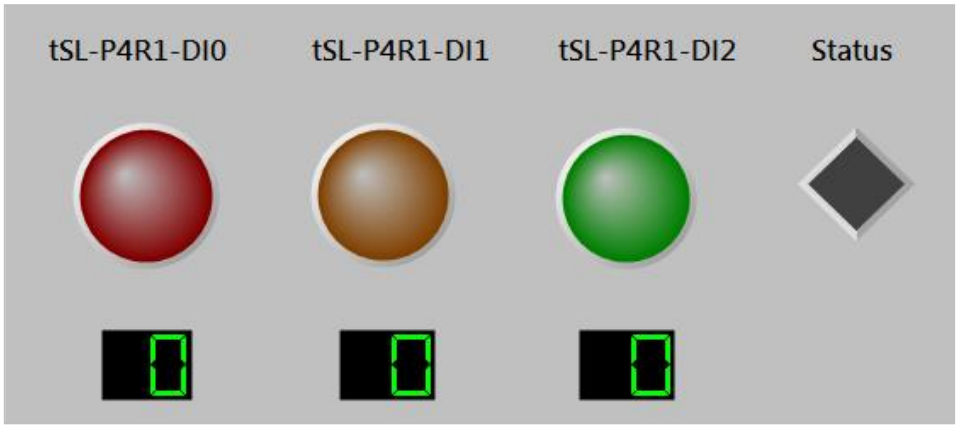
5.2.3. Configure the HMI Page

Click **Page0** in the **Page** menu to configure the HMI page. There are five objects to be used in the example.



Step1: Configure the display status of the tSL-P4R1 module.

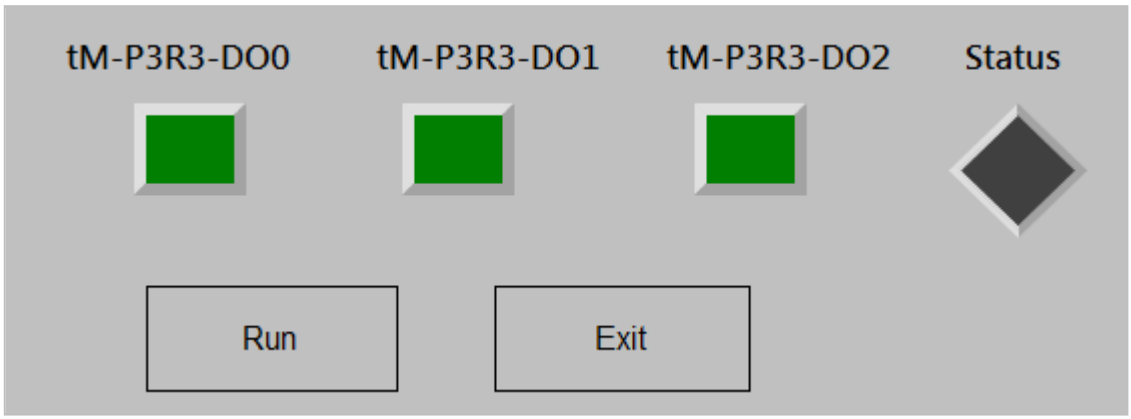
Refer to the settings listed in the table below. Click the icon on the toolbar to add the HMI object and set the properties.



<table>
<tr><th>HMI Objects</th><th>Description</th></tr>
<tr><td>Label
  </td><td>Display the text.
<table><tr><th>Properties</th></tr><tr><td>DisplayText:
tSL-P4R1-DIO, tSL-P4R1-DI1, tSL-P4R1-DI2, Status</td></tr></table></td></tr>
<tr><td>LED
  </td><td>Display the status of the stack lights and the communication status of the tSL-P4R1 module.
<table><tr><th>Tag Type</th><th>Tag Name</th><th>Properties</th></tr><tr><td rowspan="4">DI Tag</td><td>LED_0 (Red)</td><td rowspan="3">LedStyle: Ellipse</td></tr><tr><td>LED_1 (Orange)</td></tr><tr><td>LED_2 (Green)</td></tr><tr><td>P4R1_OK</td><td>LedStyle: Diamond</td></tr></table></td></tr>
<tr><td>Seven Segment
  </td><td>Display the status value of the stack light.
<table><tr><th>Tag Type</th><th>Tag Name</th><th>Properties</th></tr><tr><td rowspan="3">AI Tag</td><td>LED_Status_0</td><td rowspan="3">LedStyle: Ellipse</td></tr><tr><td>LED_Status_1</td></tr><tr><td>LED_Status_2</td></tr></table></td></tr>
</table>

Step2: Configure DO buttons of tM-P3R3 and add Run and Exit buttons.

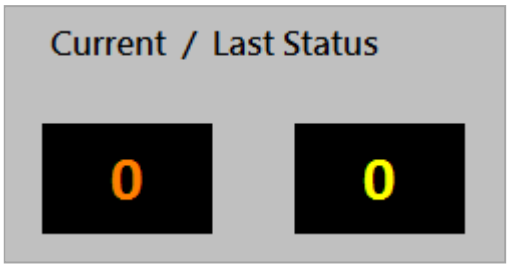
Refer to the settings listed in the table below. Click the icon on the toolbar to add the HMI object and set the properties.

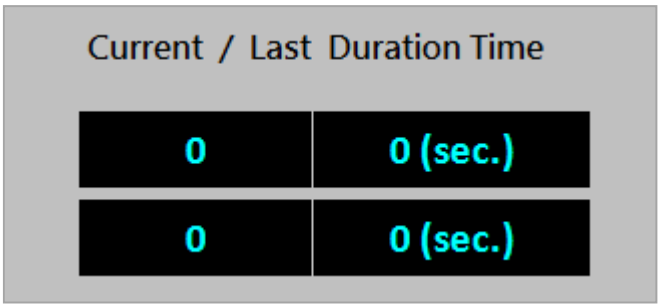


<table>
<tr><th>HMI Objects</th><th>Description</th></tr>
<tr><td>Label
  </td><td>Display the text.
<table><tr><th>Properties</th></tr><tr><td>DisplayText:
tM-P3R3-DO0, tM-P3R3-DO1, tM-P3R3-DO2, Status</td></tr></table></td></tr>
<tr><td>LED
  </td><td>Output DO status of tM-P3R3 and display the communication status.
<table><tr><th>Tag Type</th><th>Tag Name</th><th>Properties</th></tr><tr><td rowspan="4">DO Tag</td><td>tM-P3R3_DO_0</td><td rowspan="3">LedStyle: Rectangle
MouseControl: True</td></tr><tr><td>tM-P3R3_DO_1</td></tr><tr><td>tM-P3R3_DO_2</td></tr><tr><td>P3R3_OK</td><td>LedStyle: Diamond</td></tr></table></td></tr>
<tr><td>Button
  </td><td>Run/Stop the project and close the HMI page.
<table><tr><th>Button Type</th><th>Properties</th></tr><tr><td>Run</td><td>DisplayText: Run</td></tr><tr><td>Exit</td><td>DisplayText: Exit</td></tr></table></td></tr>
</table>

Step3: Configure the current (or previous) combinatorial status and the duration.

Refer to the settings listed in the table below. Click the icon on the toolbar to add the HMI object and set the properties.





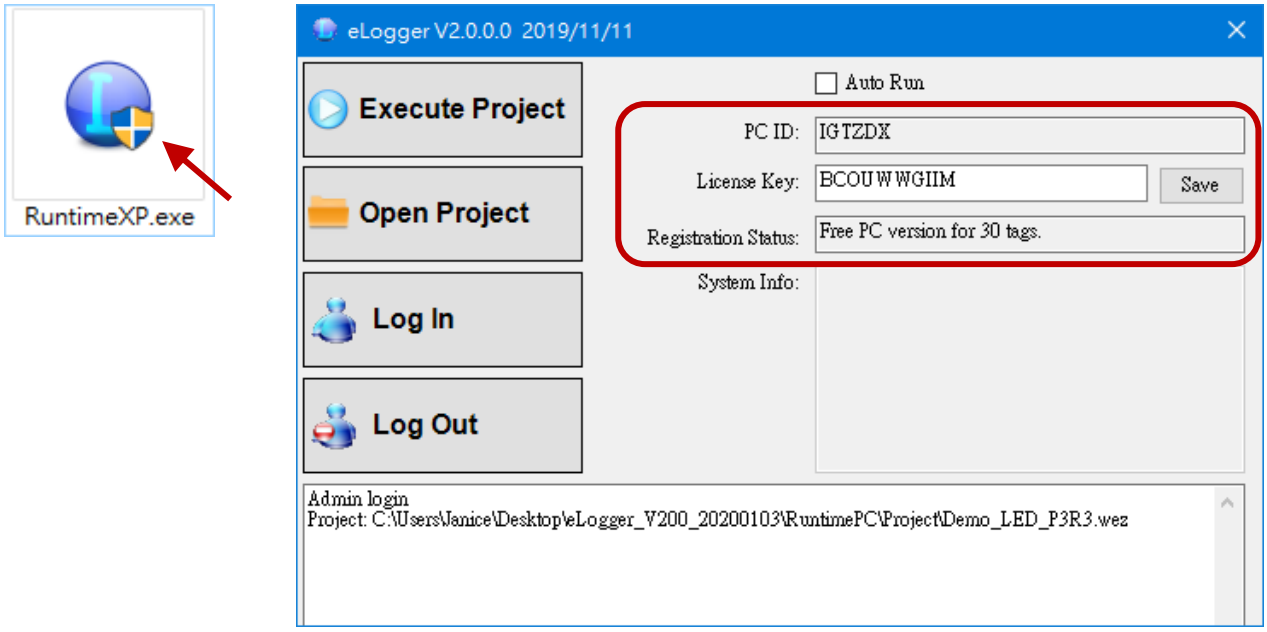
<table>
<tr><th>HMI Objects</th><th>Description</th></tr>
<tr><td>Label
  </td><td>Display the text.
<table><tr><th>Properties</th></tr><tr><td>DisplayText:
Current / Last Status, Current / Last Duration Time</td></tr></table></td></tr>
<tr><td>Text Box
  </td><td>Display the current (or previous) combinatorial status and the duration of value.
<table><tr><th>Tag Type</th><th>Tag Name</th><th colspan="2">Properties</th></tr><tr><td rowspan="6">AI Tag</td><td>Current_Status</td><td rowspan="6">Decimal: 0</td><td rowspan="2">-</td></tr><tr><td>Last_Status</td></tr><tr><td>Current_Time_H</td><td rowspan="2">-</td></tr><tr><td>Current_Time_L</td><td>Unit: (Sec.)</td></tr><tr><td>Last_Time_H</td><td rowspan="2">-</td></tr><tr><td>Last_Time_L</td><td>Unit: (Sec.)</td></tr></table></td></tr>
</table>

5.2.4. Test the HMI Page

Before testing the HMI page, uploading the project to an eLogger PC.

Step 1: Run eLogger PC Runtime.

Perform RuntimeXP.exe in the installation folder of eLogger PC Runtime (e.g., …\eLogger_V200_20200103\RuntimePC).



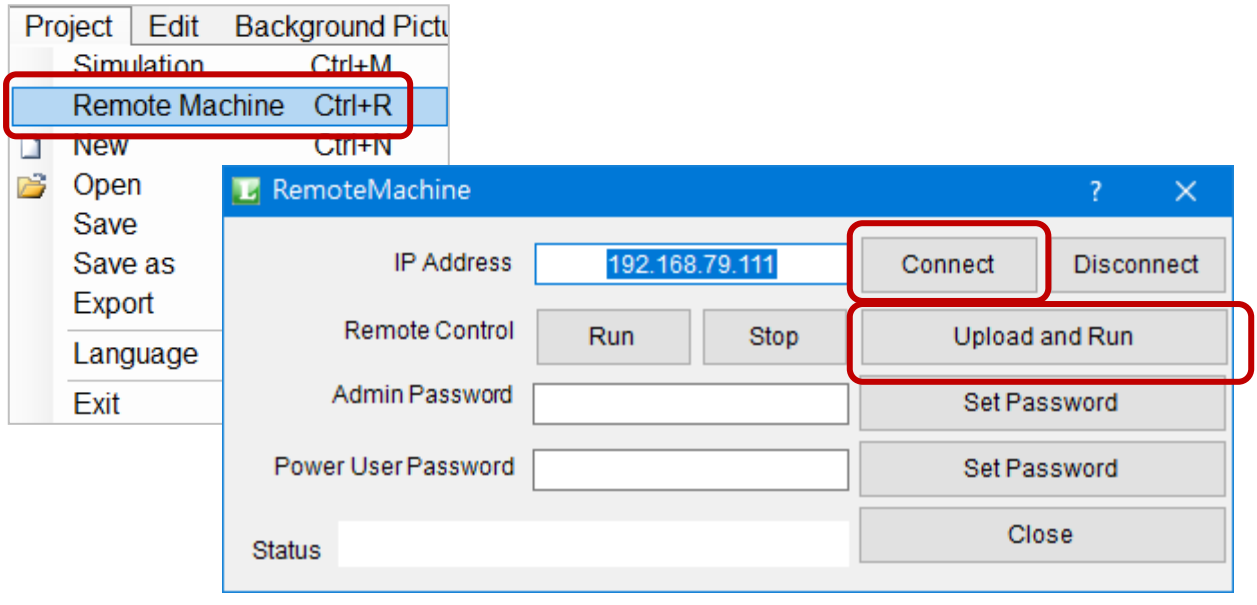
NOTE: Users need to register the license key for the FREE version of eLogger PC Runtime.

Visit to the eLogger registration page.

www.icpdas.com/products/Software/ez_data_logger/elogger_pc_license_request_free.htm

Step 2: Upload the eLogger project.

Perform **Remote Machine** and click **Connect** to check the connection, and then click **Upload and Run** to upload the project.



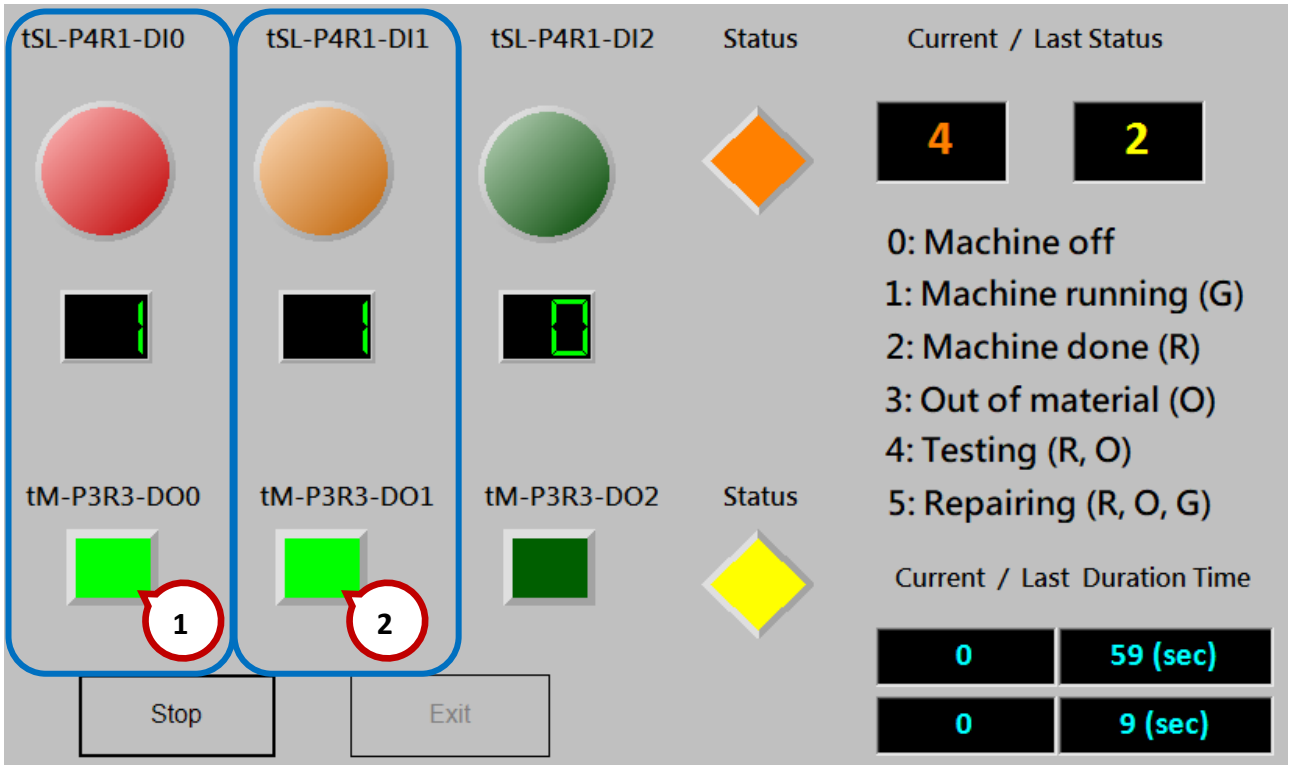
Step 3: Test the HMI Page

Description of Demo:

In the example, using an eLogger PC Runtime to connect both tM-P3R3 and tSL-P4R1 modules via Modbus RTU (COM3, Baud rate = 9600). tM-P3R3 can be used to simulate the DO output of the machine to control three color segments of stack light. tSL-P4R1 can be used to detect the ON/OFF status of each color segments to display the user-defined number and the duration of the combinatorial status.

At first, the Status lights are ON that indicates the communication of modules is OK.

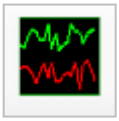
1) Click the tM-P3R3_DO_0 button, the red light becomes ON and the read value is '1'.
2) Click the tM-P3R3_DO_1 button, the orange light becomes ON and the read value is '1'.
3) As the figure, the current combinatorial status is '4' that indicates 'Test-in-process' and the duration of the status is 59 seconds. The previous combinatorial status is '2' that indicates 'waiting for service call' and the duration of the status is 9 seconds.

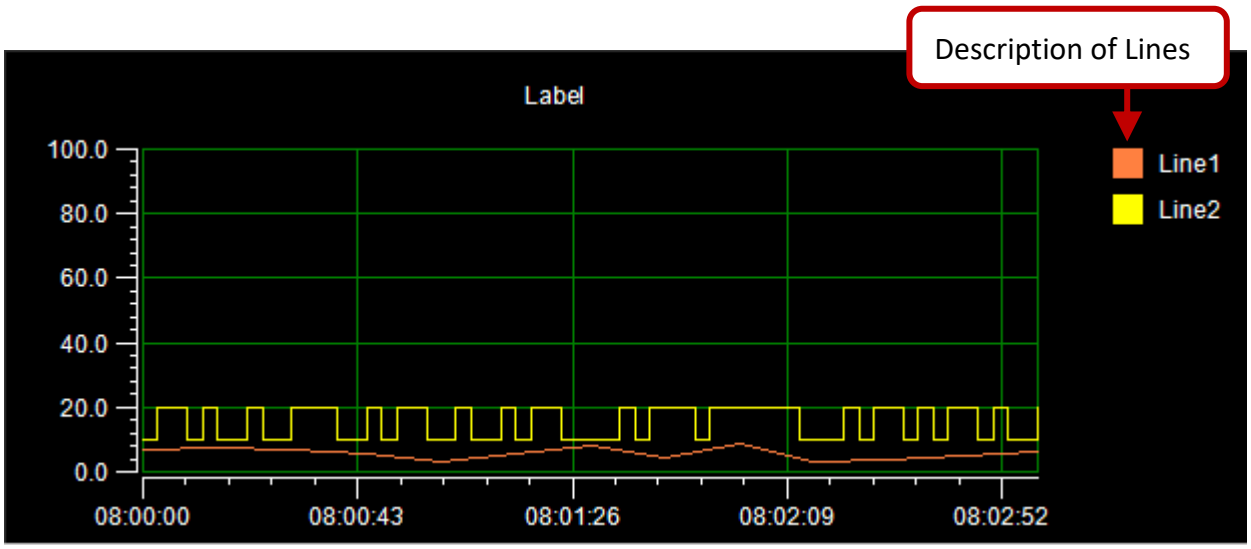


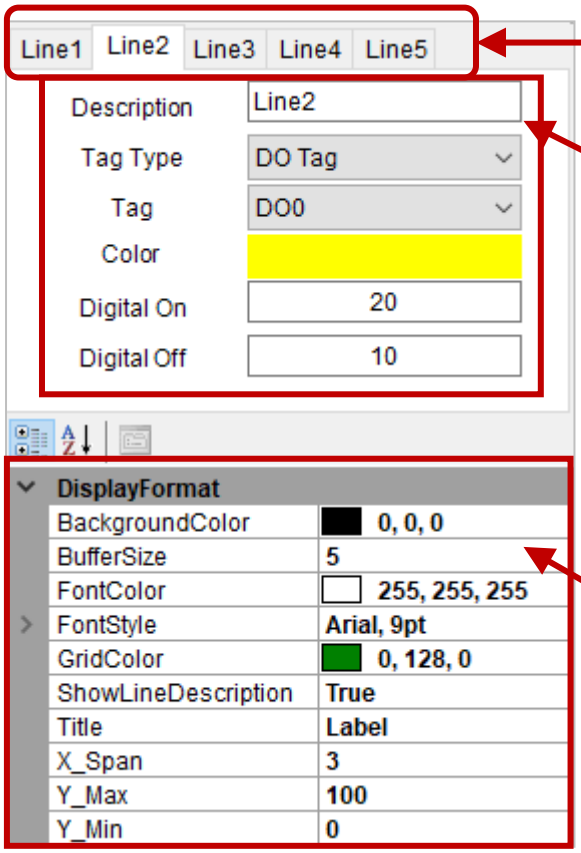
By integrating the **tSL-P4R1/tSL-PA4R1** module that supports Modbus RTU/ASCII or the **SL-P6R6-WF/SL-PA6R6-WF** module that supports Modbus TCP/UDP into your system. It is easy to implement stack light status monitoring on an MES by using SCADA software. Also, the user can remotely get the real-time status of equipment for the utilization analysis.

Appendix A. FAQ

A.1 How do I Setup the Plot's Properties?







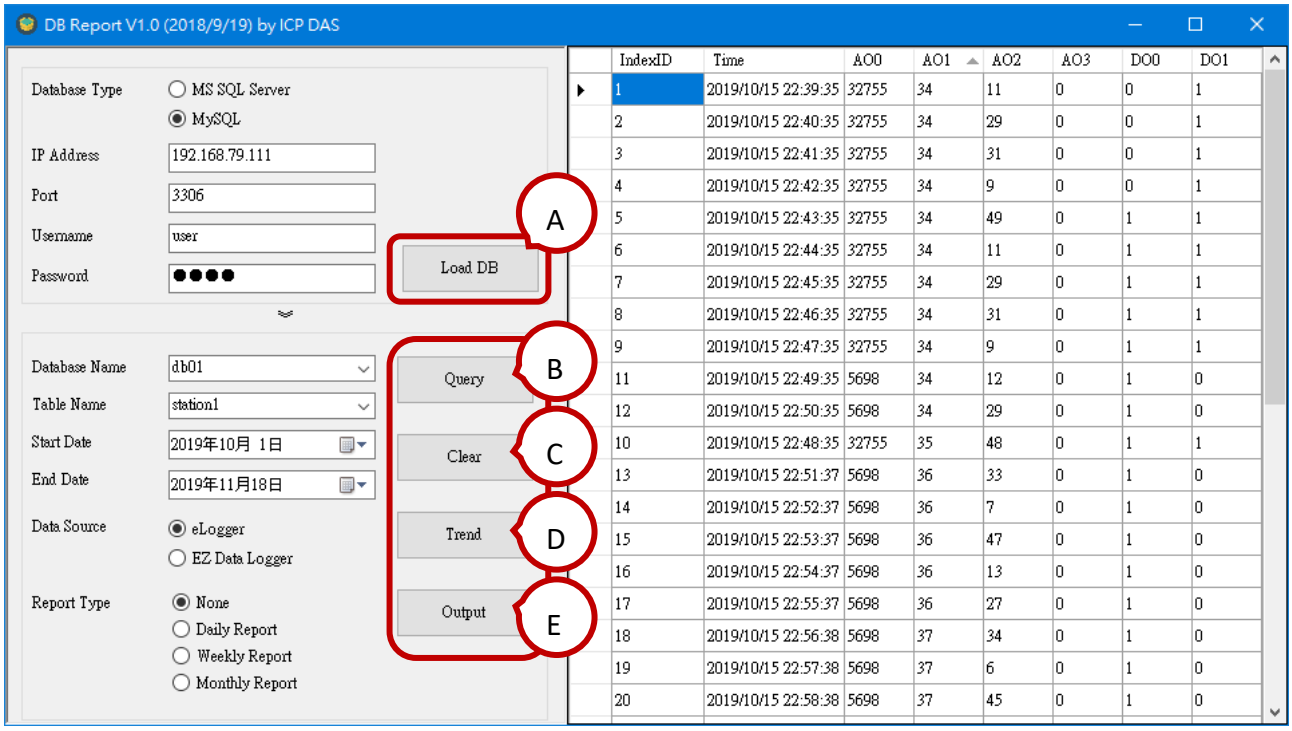
Select Line before setting properties.

Step 1: Enter a name
Step 2: Select the type of tag
Step 3: Specify a I/O tag
Step 4: Specify the color of the line
Step 5: The On/Off value on Y-axis

BufferSize: (Unit: minutes)
How long to retain data before the start time
GridColor: The color of grids
ShowLineDescription:
Set to True to display the description of lines.
Title: The title of the Plot object.
X_Span: (Unit: minutes)
The range of time displayed on X-axis

A.2 How do I Query Data from Database?

Open **DB Report.exe** in the eLogger installation path (e.g., ...\eLogger_Vxxx_YYYYMMDD\ DatabaseReport). The program shows as below.



A. **Load DB:** Select the type of database and enter the parameters, and then click the **Load DB** button to load data.

Database Type: MySQL or Microsoft SQL Server.

IP Address: Enter the IP address of SQL Server.

Port: By default, Port 3306 is for MySQL and Port 1433 is for Microsoft SQL Server.

Username: Enter the user name that has been added in the SQL Server.

Password: Enter the password that has been added in the SQL Server.

B. **Query:** Select the parameters and click the **Query** button, the results will be displayed on the right of pane.

Database Name: Select a database name that be loaded from the SQL Server.

Table Name: Select a table name that be loaded from the SQL Server.

Start/End Date: Select the Start/End date of data

C. **Clear:** Clear the results.

D. **Trend:** Perform querying first and click the **Trend** button to display results with a Trend.

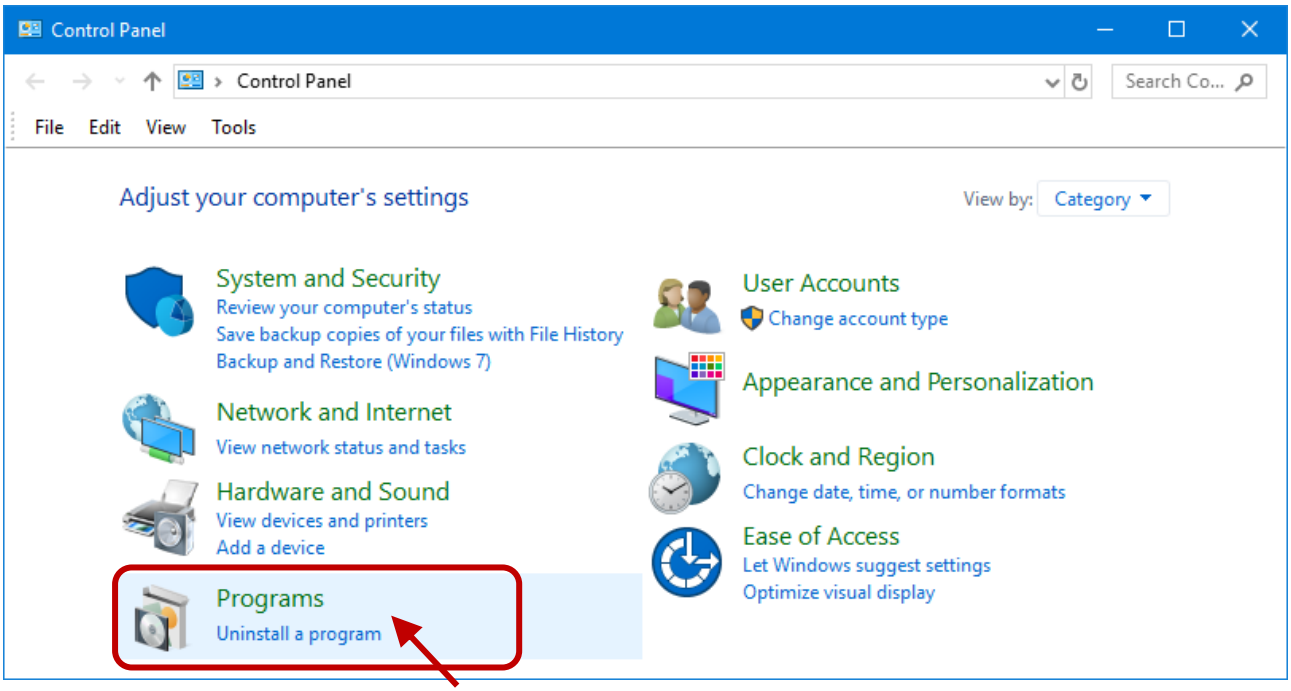
E. **Output:** Save the results to a csv file.
The default path is '..\eLogger_Vxxx_YYYYMMDD\DatabaseReport\export'.

A.3 How do I Configure IIS and ISAPI?

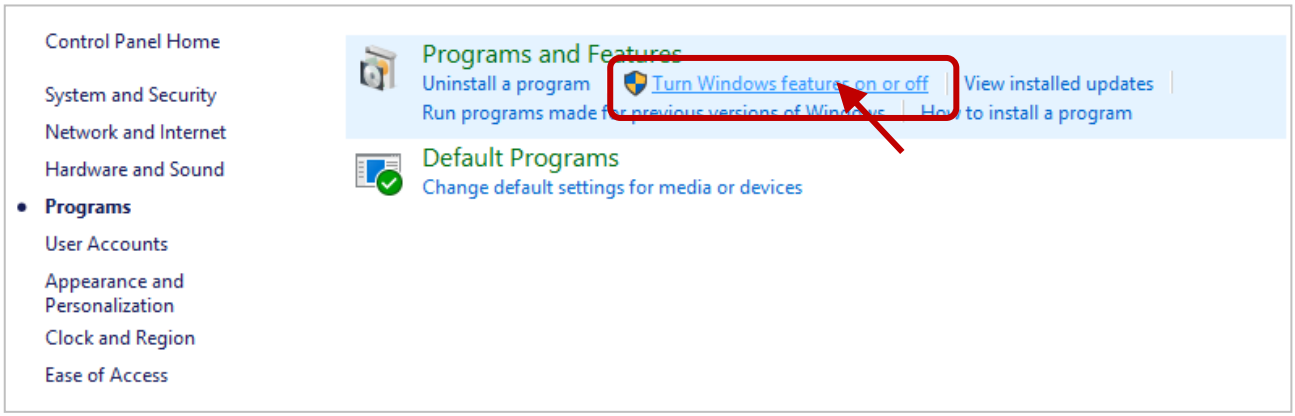
For eLogger web HMI pages to work properly, the user needs to configure IIS and ISAPI. The section describes how to do that on Windows 10.

Configure IIS

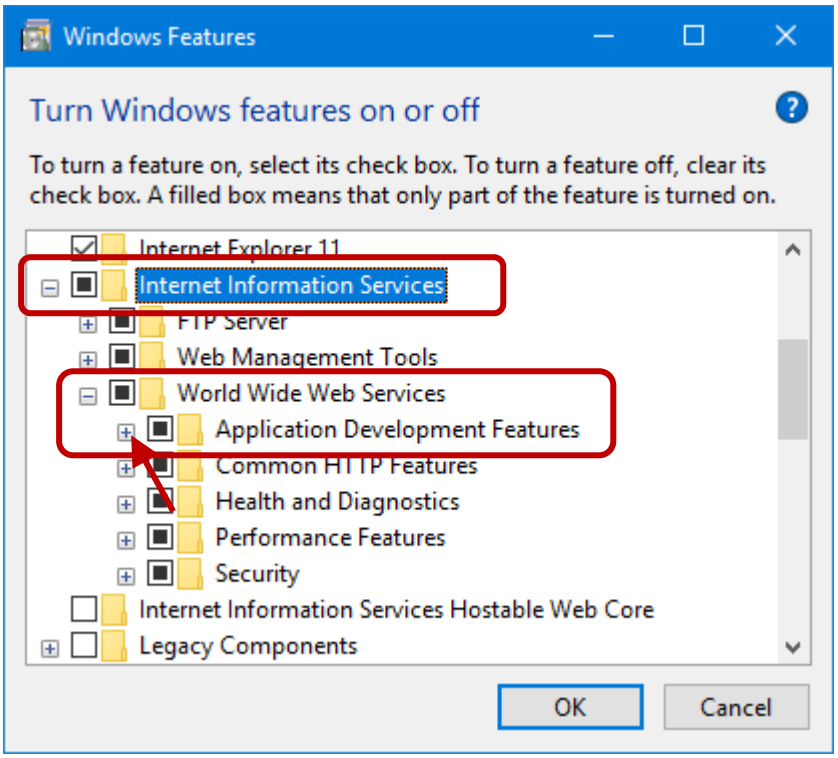
Step1: Click **Programs** in the **Control Panel**.



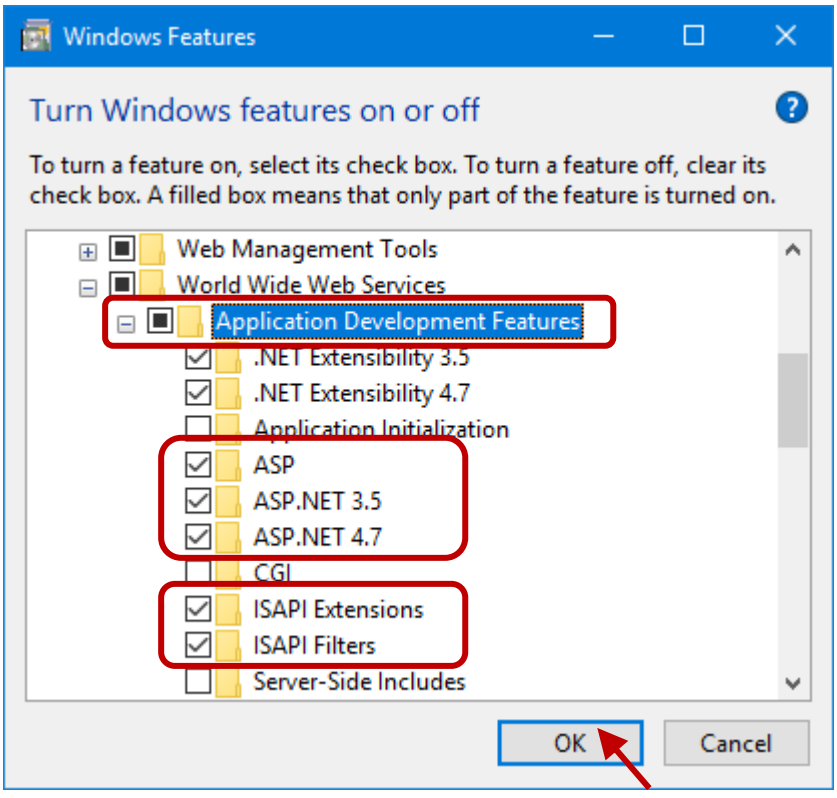
Step 2: Click the **Turn Windows features on or off** link.



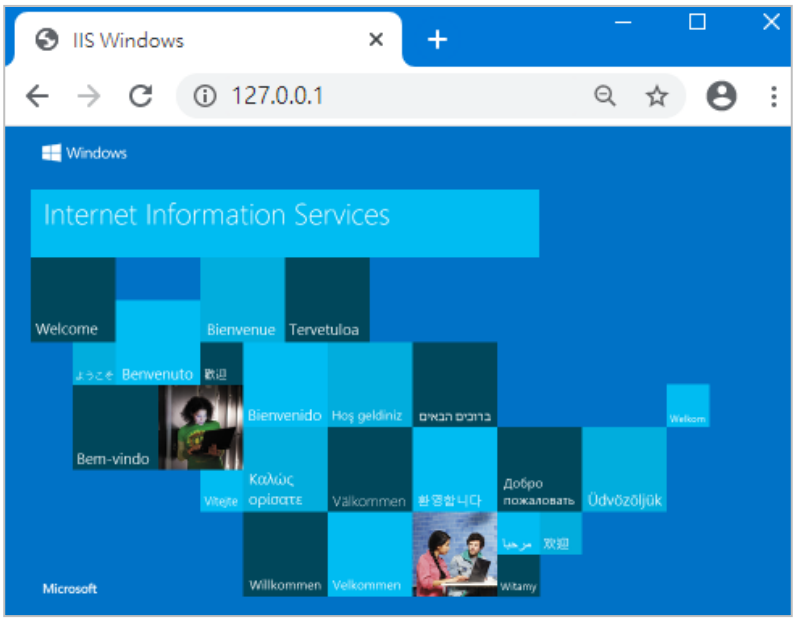
Step 3: click on the **Internet Information Services** check box to enable IIS and expend both the **World Wide Web Services** and **Application Development Features**.



Make sure that the **ASP**, **ASP.NET**, **ISAPI Filters**, and **ISAPI Extensions** are selected, and then click the **OK** button.



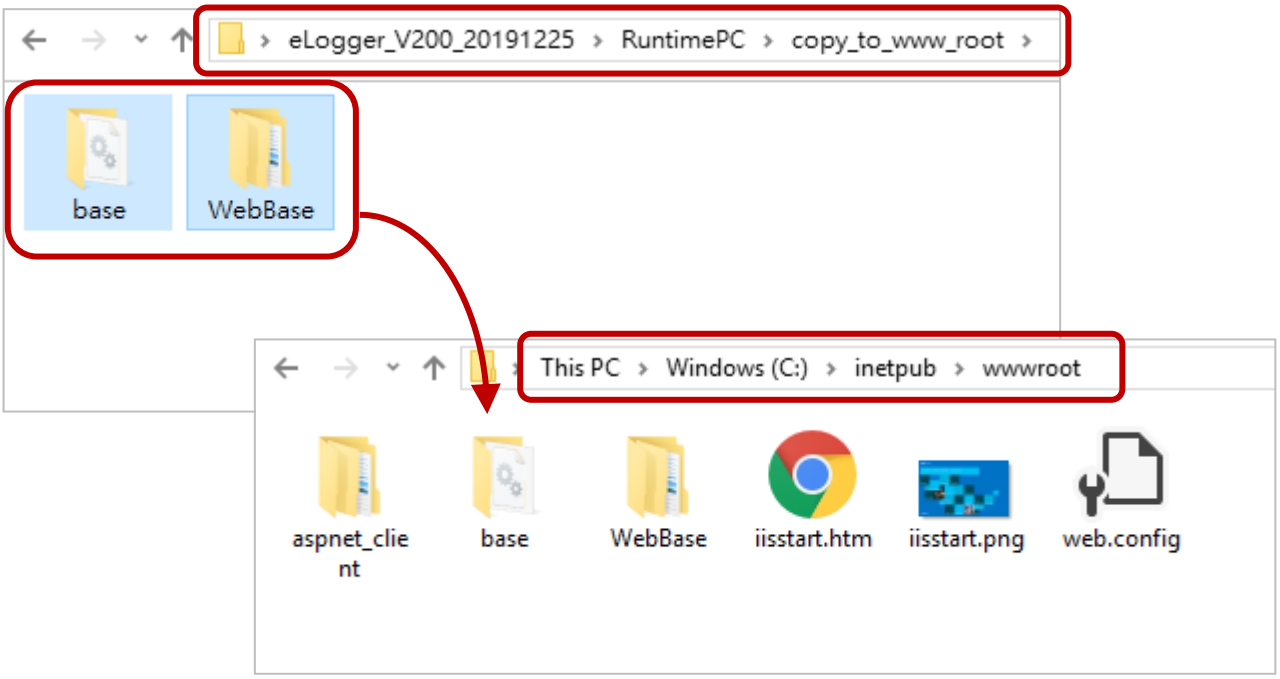
Step 4: After completing the process, start the browser and type http://localhost/ or http://127.0.0.1/ in the address to verify that the IIS has been enabled correctly.



Configure ISAPI

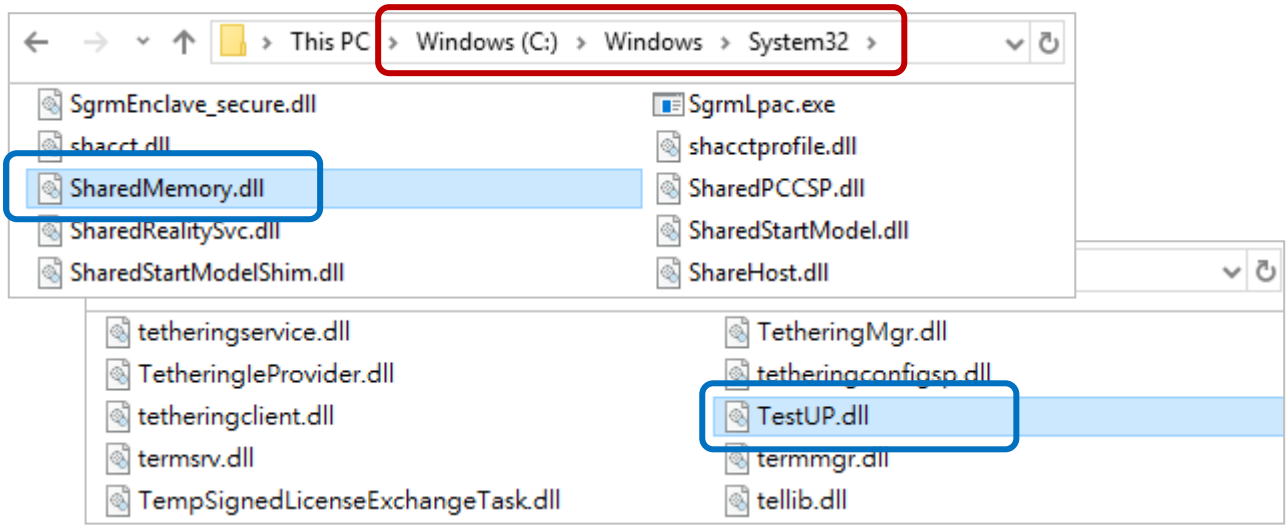
After enabling IIS, the user needs to do the following steps to allow the eLogger web pages to access data via the SharedMemory.

Step 1: Copy both '**base**' and '**WebBase**' folders from **..\eLogger_Vxxx_yyyymmdd\RuntimePC\copy_to_www_root** folder to **C:\inetpub\wwwroot** (the default folder for IIS website).

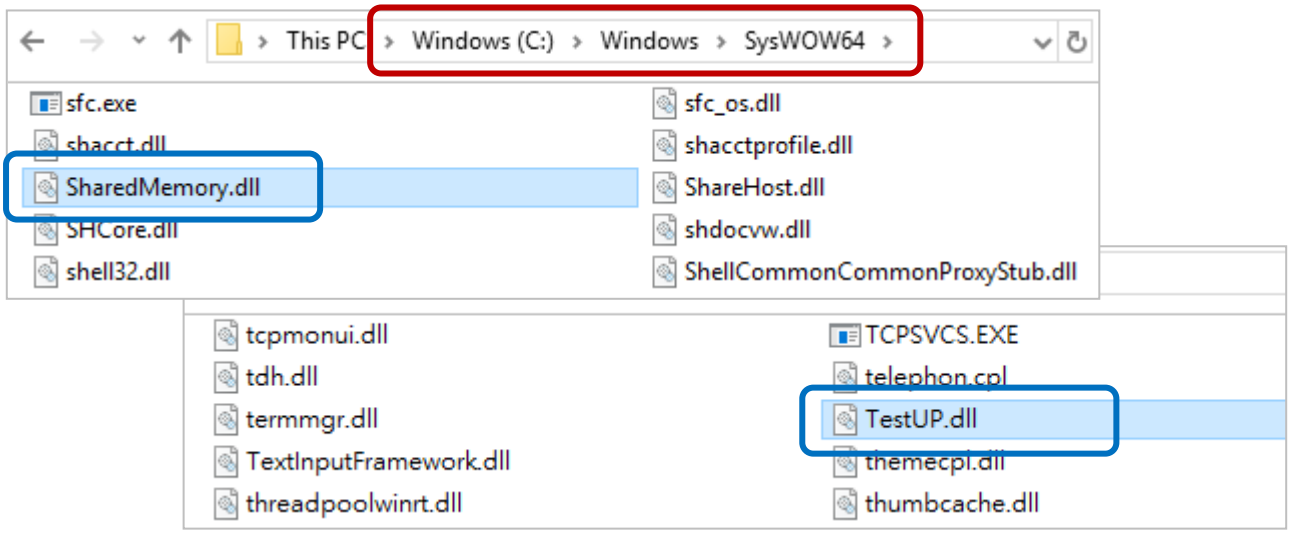


Step 2: Copy both the '**SharedMemory.dll**' and '**TestUP.dll**' from **..\eLogger_Vxxx_yyyymmdd\RuntimePC\copy_to_windows_system32** to **C:\Windows\System32** (32-bit) or **C:\Windows\SysWOW64** (64-bit).

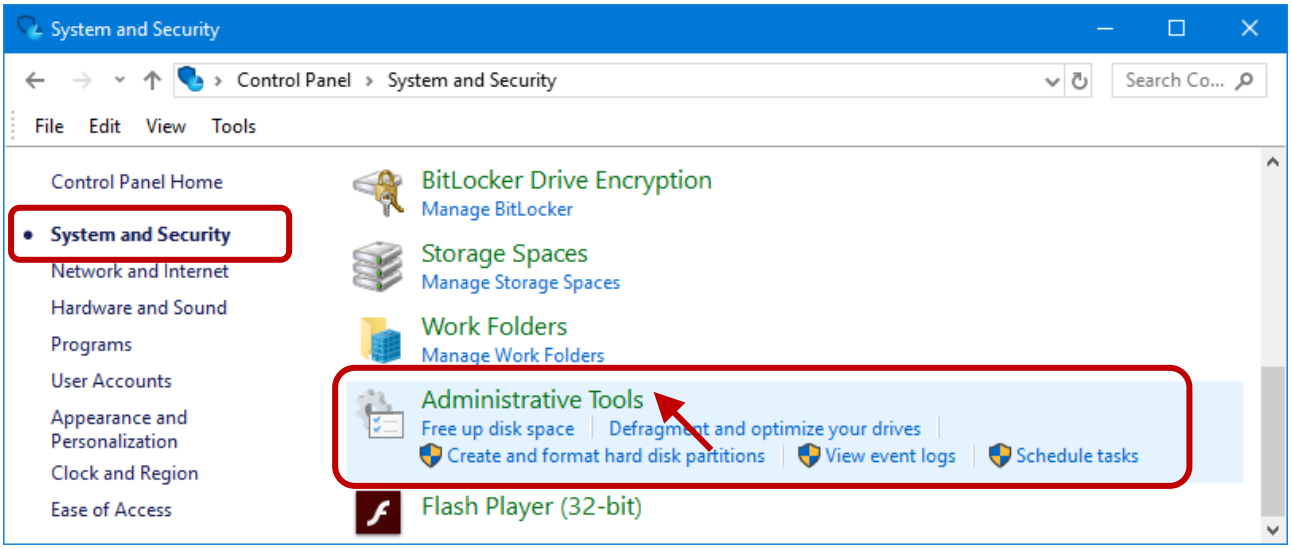
32-bit PC



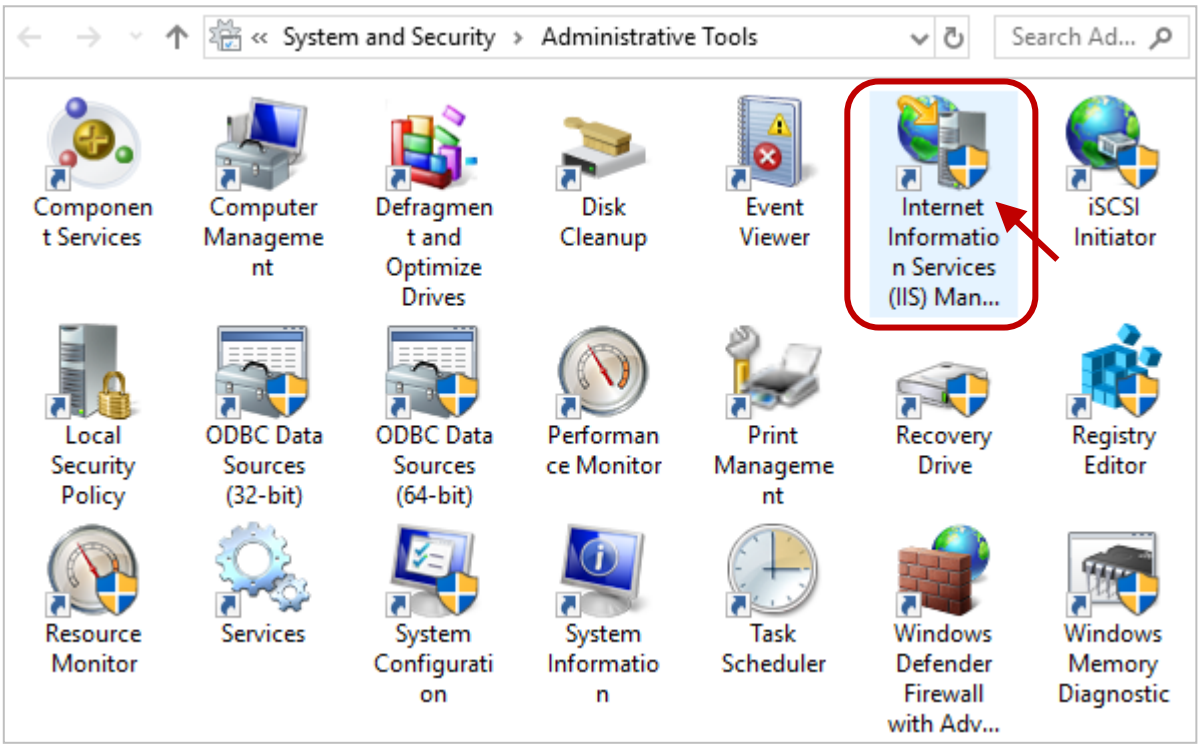
64-bit PC



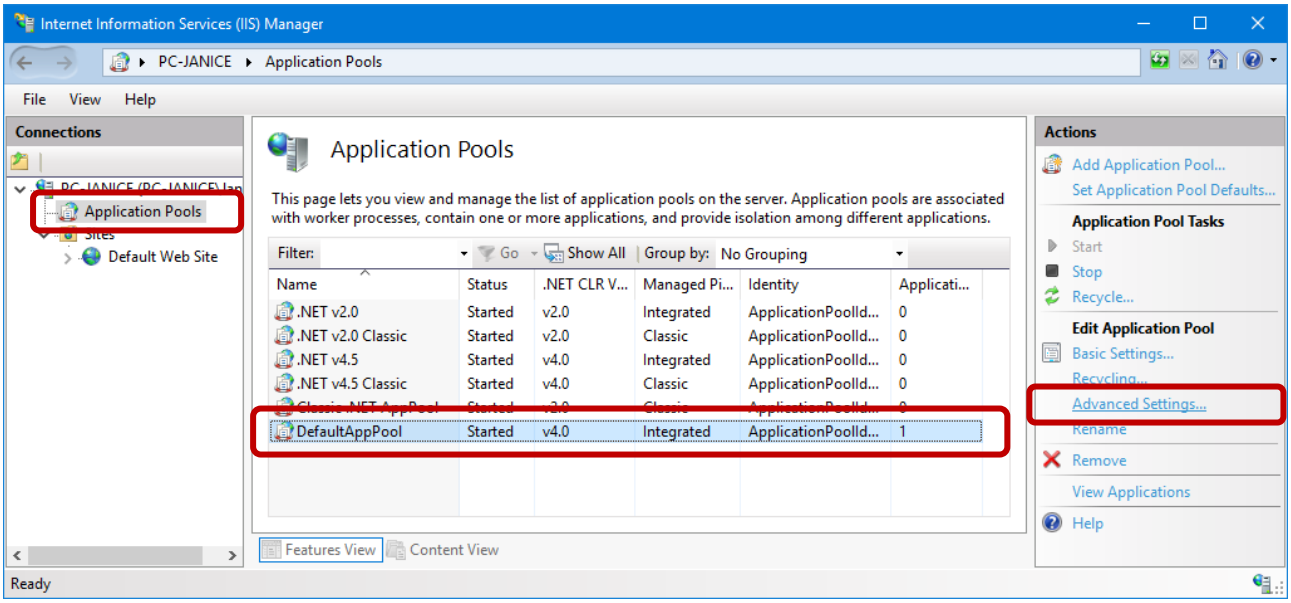
Step 3: Click **System and Security** and click **Administrative Tools** in the **Control Panel**.



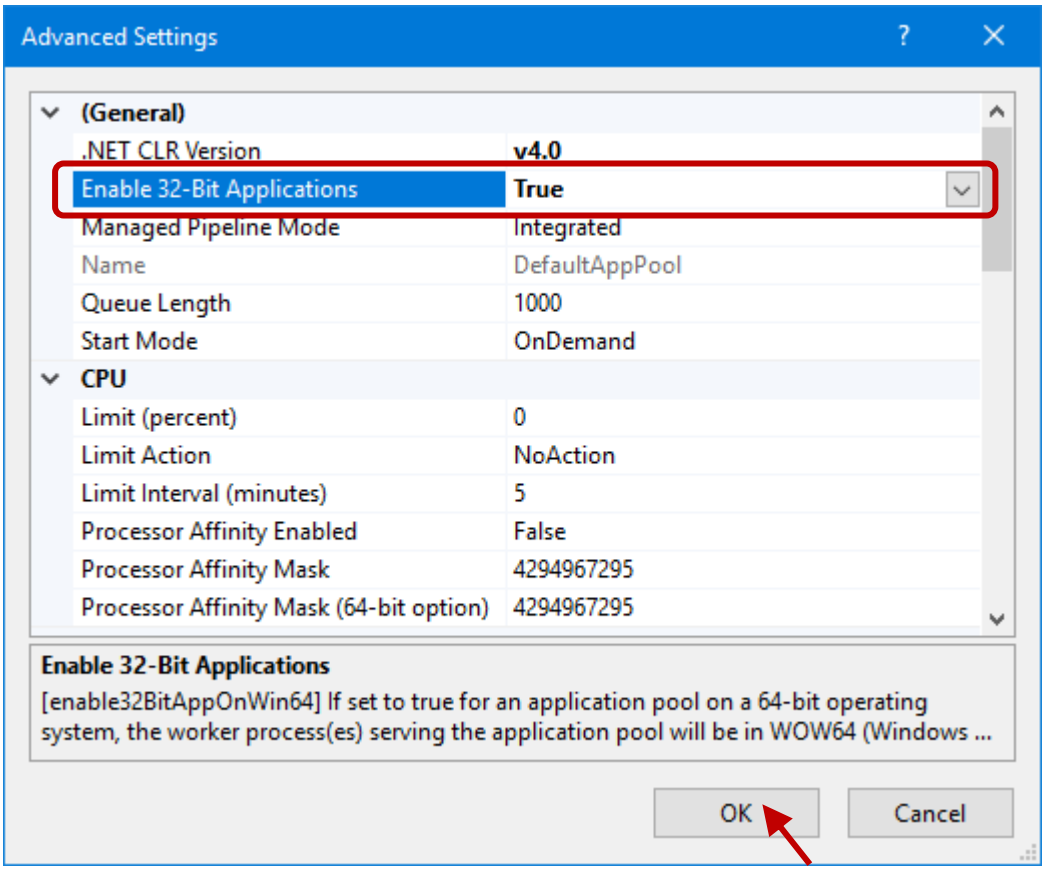
Next, double click on [Internet Information Services (IIS) Manager]



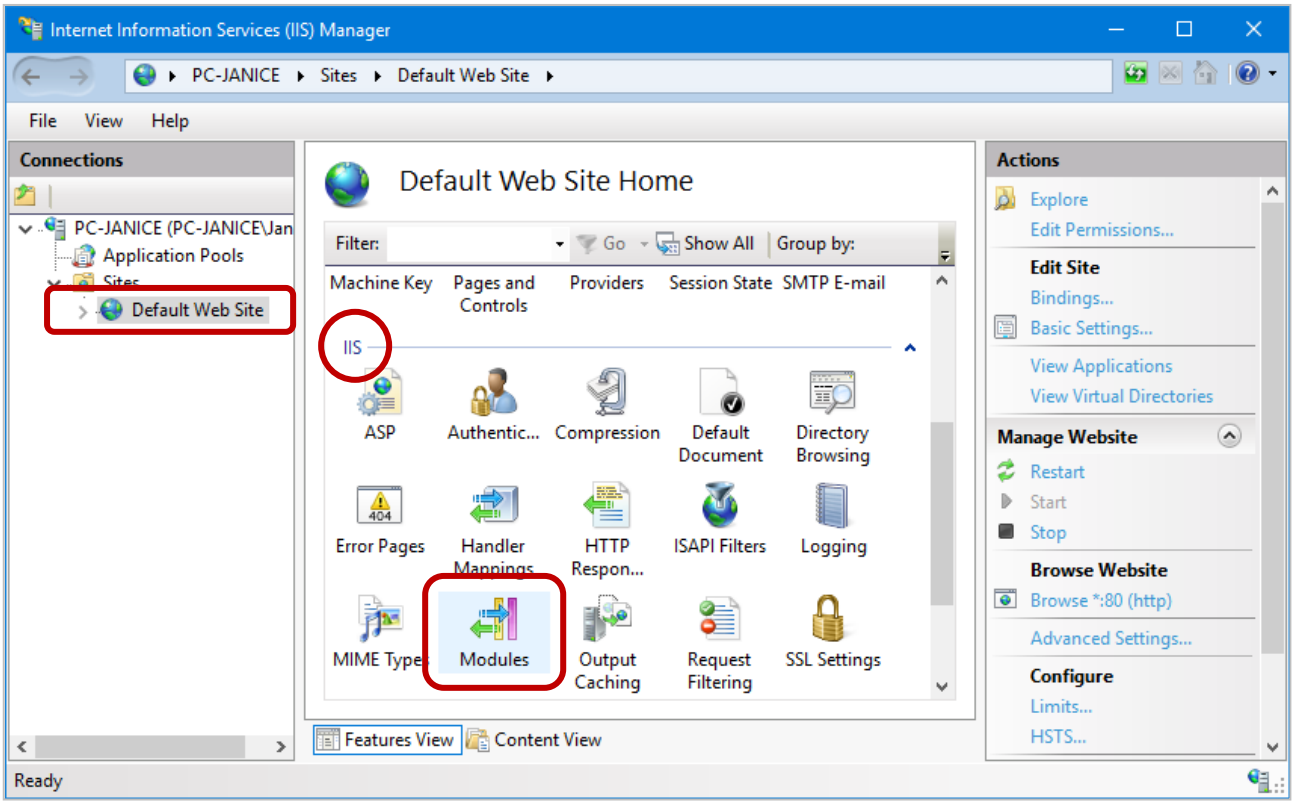
Step 4: Click **Application Pools** and **DefaultAppPool**, and then click **Advanced Settings**.



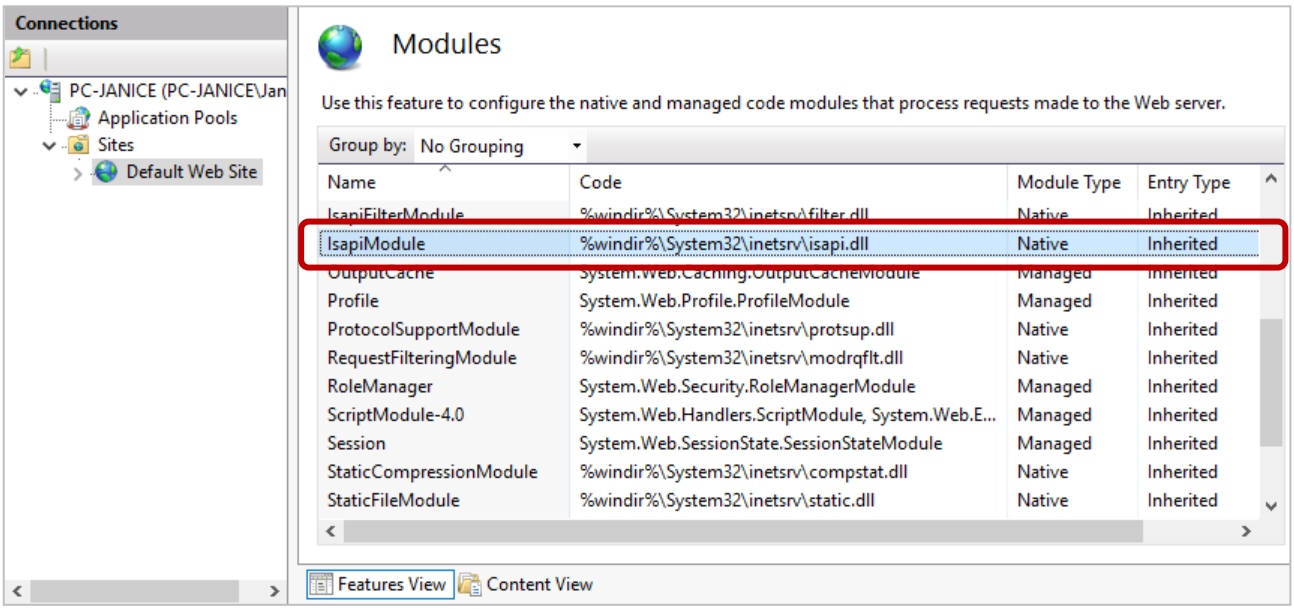
Next, set **Enable 32-bit Applications** to **True** and click the **OK** button.



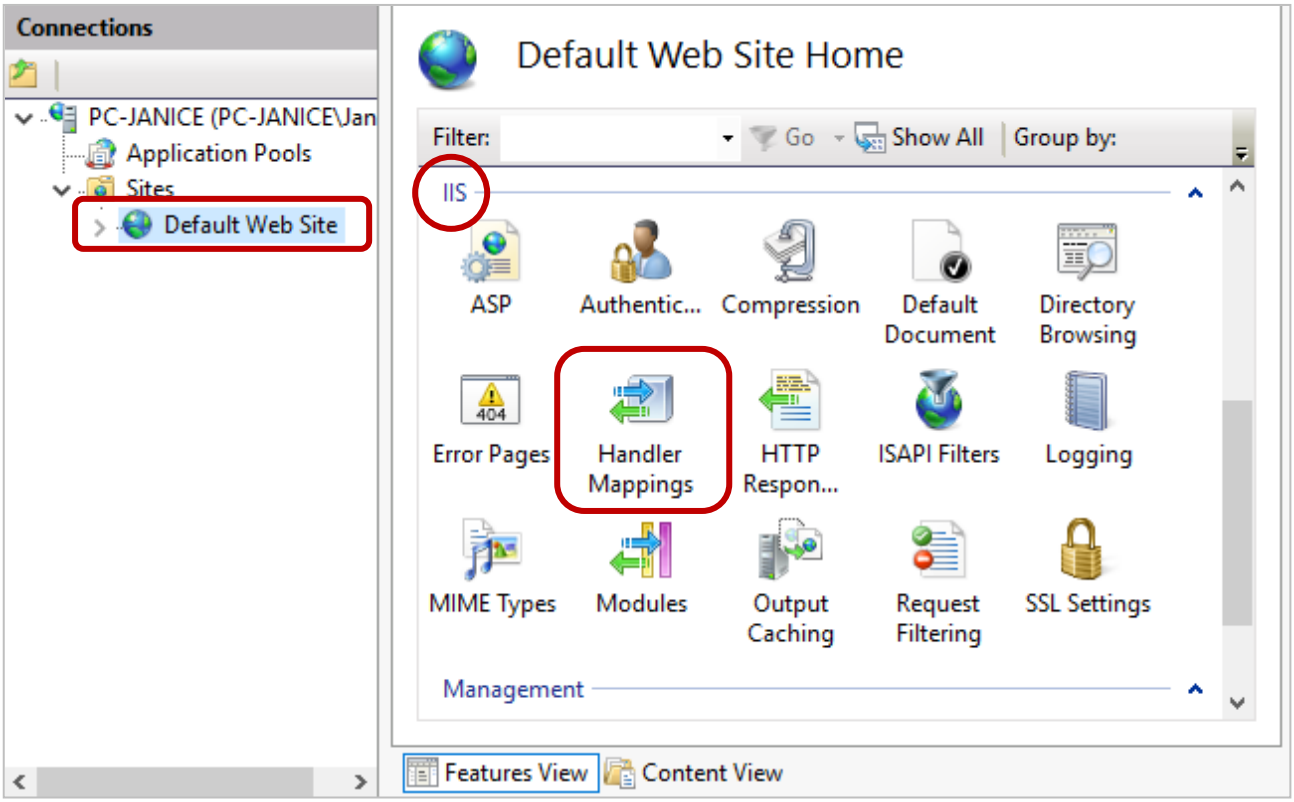
Step 5: Click **Default Web Site** and double-click **Modules** in the **IIS** section.



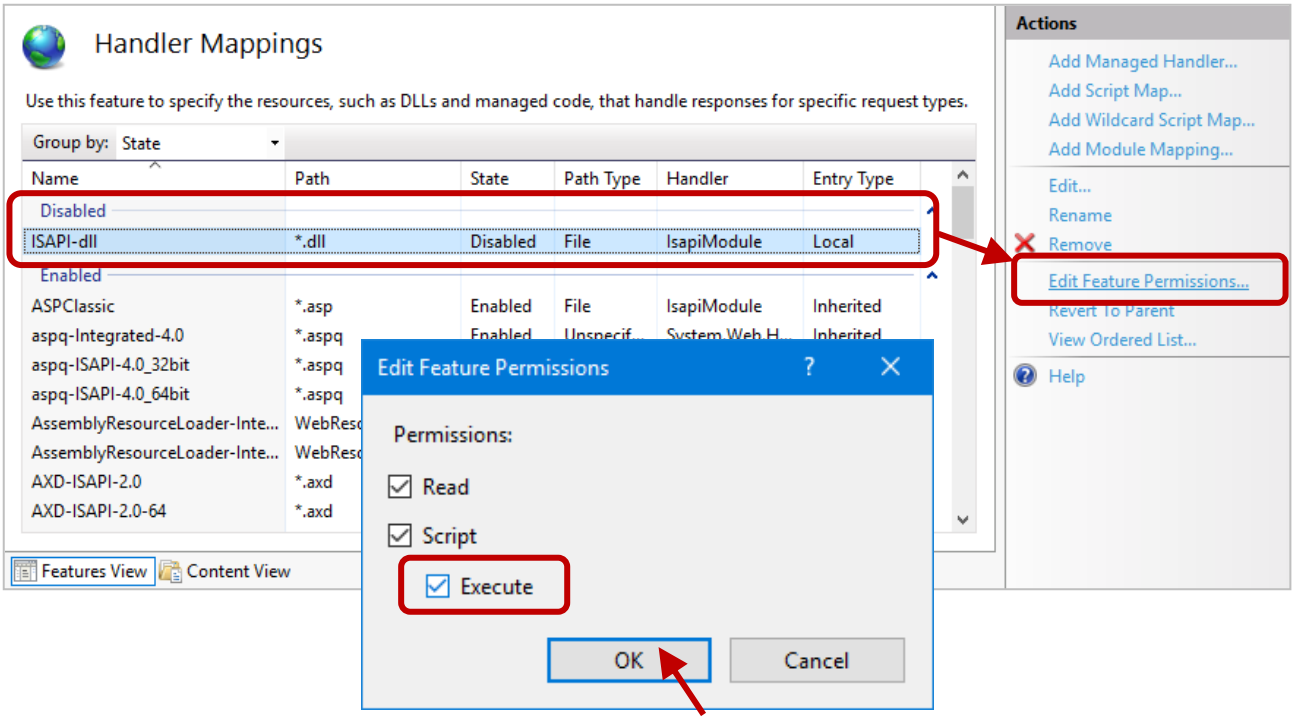
Next, check if the **IsapiModule** exists in the Modules pane.



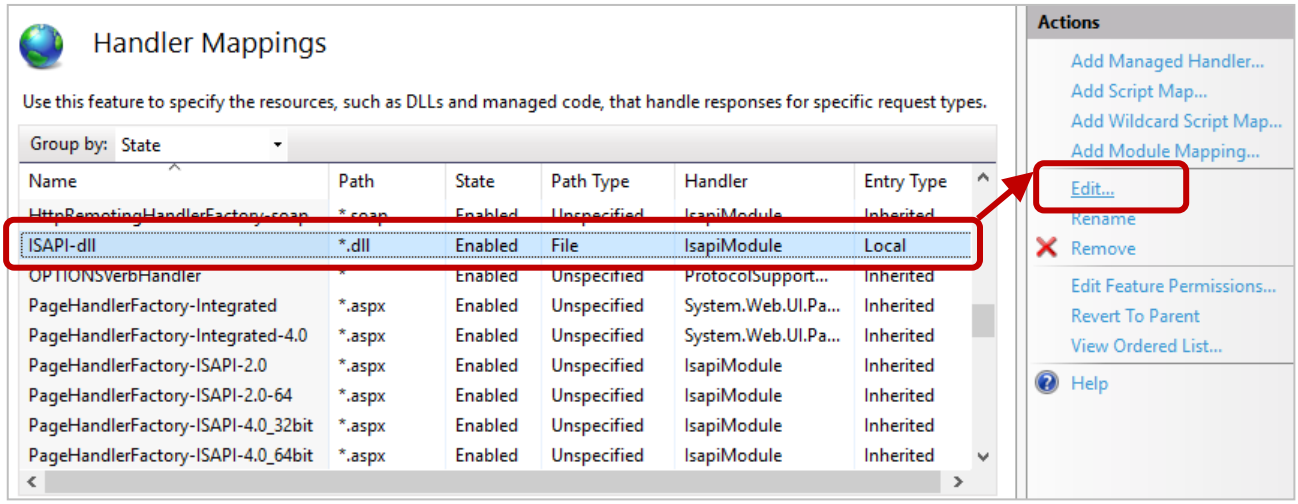
Step 6: Click **Default Web Site** and double-click **Handler Mappings** in the **IIS** section.



If the status of **ISAPI-dll** is disabled, click **Edit Feature Permissions** and select **Execut**e, and then click the **OK** button.



Step 7: Make sure that **ISAPI-dll** has been enabled, and click **Edit**.



In the Executable (optional) field, specify the path to the 'C:\inetpub\wwwroot\base\ register.dll' and click the **OK** button. Then, click Yes when prompted to complete the settings.