Classification	☐ tDS ☐ tGW ☐ PETL/tET/tPET ☐ DS/PDS/PPDS ☐ tM-752N ☐ I/O Card ☐ VXC Card ☐ VxComm ☑ Other (TouchPAD)				
Author	Mike Chou	**Date**	2019-11-29	**NO.**	FAQ034

Q: How do I access a third-party Modbus RTU slave device using a TouchPAD?

A: To access a third-party Modbus RTU slave device using a TouchPAD, refer to the following instructions:

Step 1: Connect the Modbus RTU slave device to the TouchPAD model, e.g., TPD-703-64, on COM1 (RS-485 bus) and apply power to the Modbus RTU slave device and TouchPAD model.

Step 2: Set up the third-party Modbus RTU slave device. In this demo, we will use the "**Modbus Slaver Simulator**" software to simulate a Modbus RTU slave module with four DI, DO, AI and AO channels.
Note that the specific testing method depends on the Modbus RTU slave device being used. Refer to the relevant user manual for details.

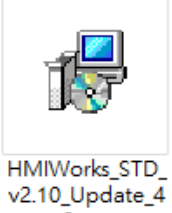
Step 3: Install the HMIWorks driver as well as the driver update program, both of which can be obtained from the ICPDAS website at:

http://ftp.icpdas.com/pub/cd/touchpad/setup/

1. Double-click the icon for the "**HMIWorks_STD_vxxx_setup.exe**" file to execute the driver installation program.



2. Follow the instructions in the installation wizard to install the driver. Once the driver installation is complete, double-click the icon for the "**HMIWorks_STD_vxxx_Update_xx.exe**" file to execute the update program for the driver.

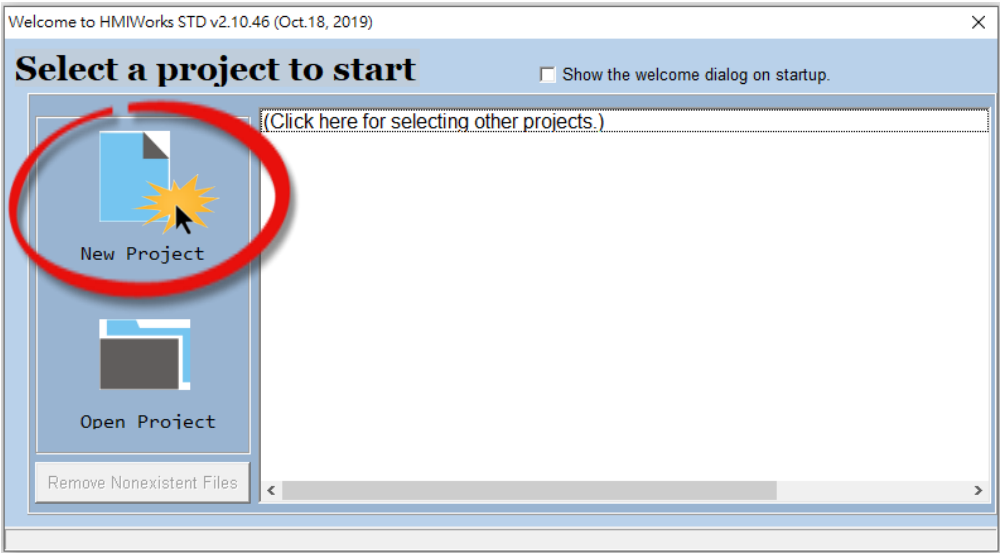


For more detailed information related to the driver installation, refer to Chapter 2 "**Software Installation**" in the HMIWorks Software User Manual document.

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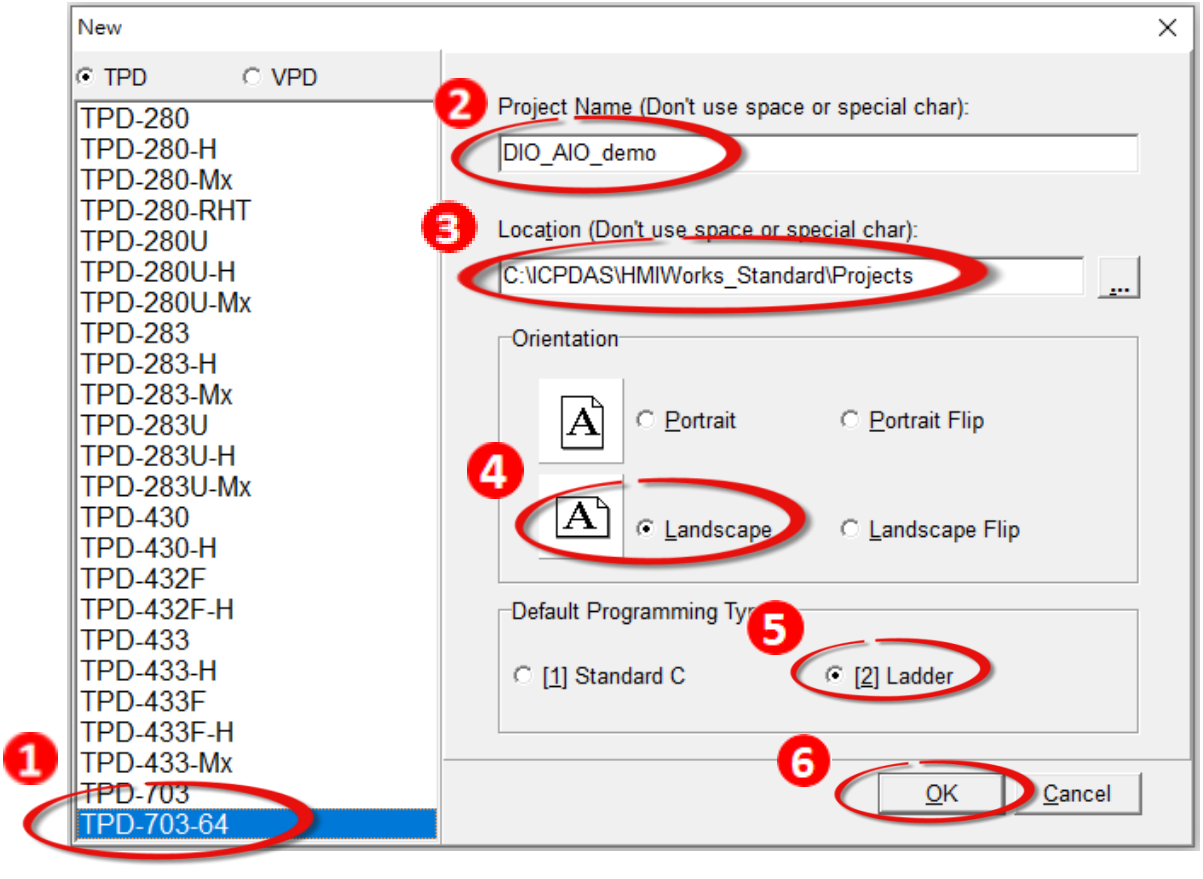
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Step 4: Open the HMIWorks software, and click the "**New Project**" icon to create a new project.



Step 5: In the "**New**" dialog box, configure the parameters for the new project in the following manner:

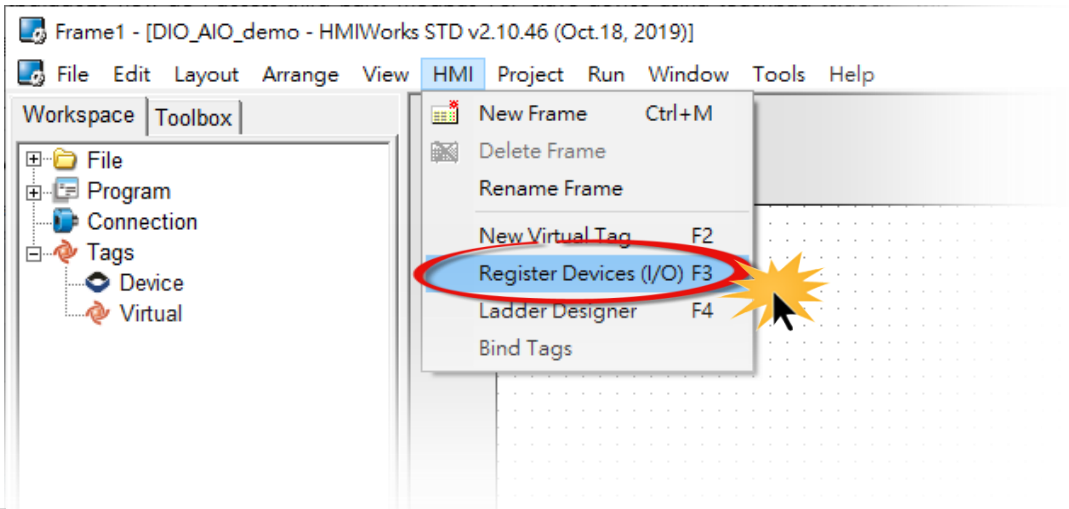
1. Click the name of the TouchPAD model to select it, TPD-703-64 in this case.
2. Enter a name for the project.
3. Select the location where the project should be saved.
4. Select the orientation for the display.
5. Select the Default Programming Type.
6. Click the "**OK**" button to save the configuration and close the dialog box.



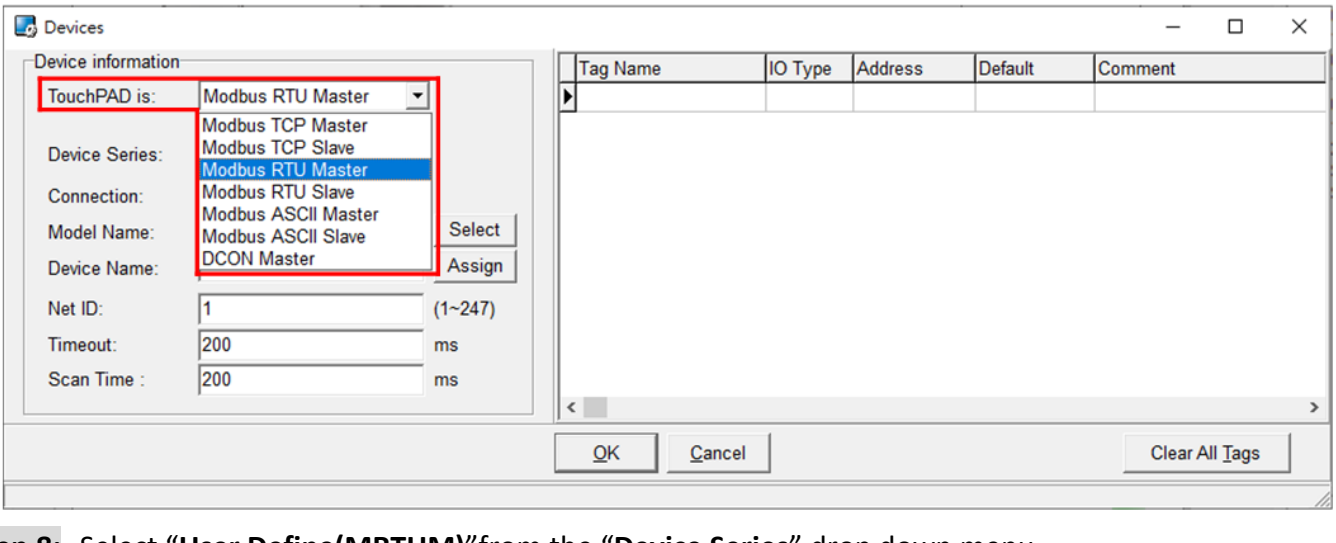
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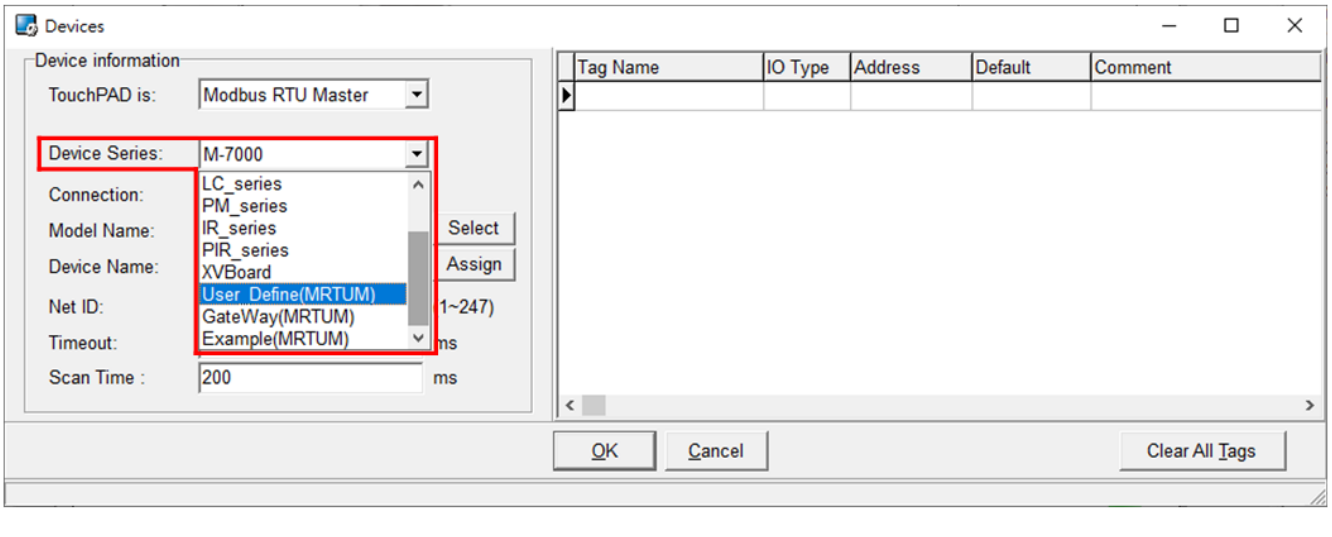
Step 6: Click the "**Register Devices (I/O)**"option from the "**HMI**" menu to open the "**Devices**" dialog box, or press **F3**.



Step 7: Select "**Modbus RTU Master**" from the "**TouchPAD is**" drop down menu.



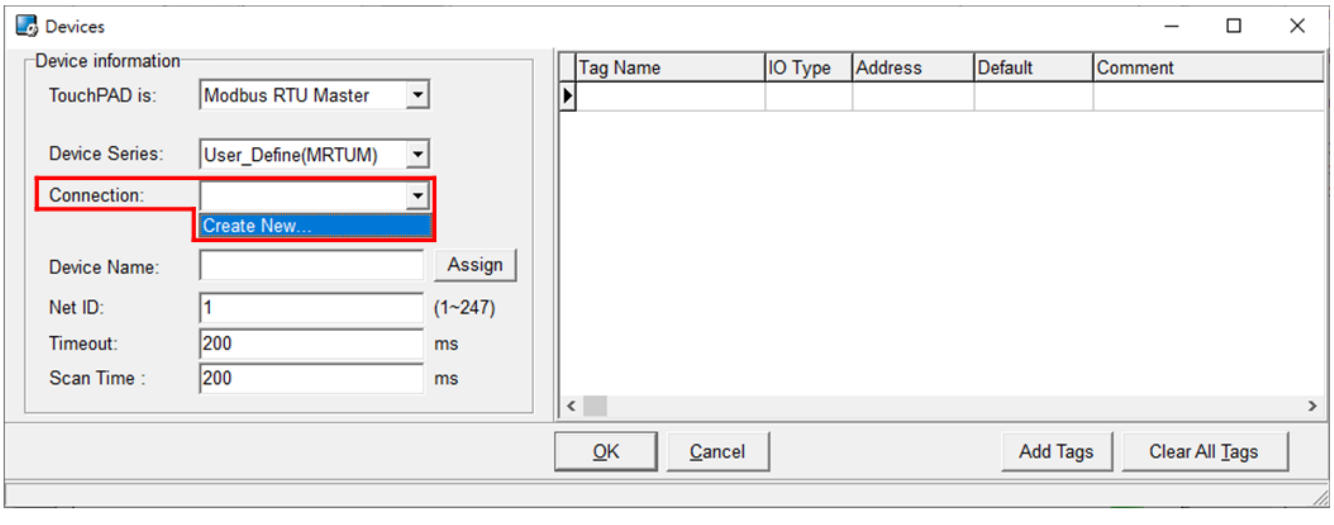
Step 8: Select "**User Define(MRTUM)**"from the "**Device Series**" drop down menu.



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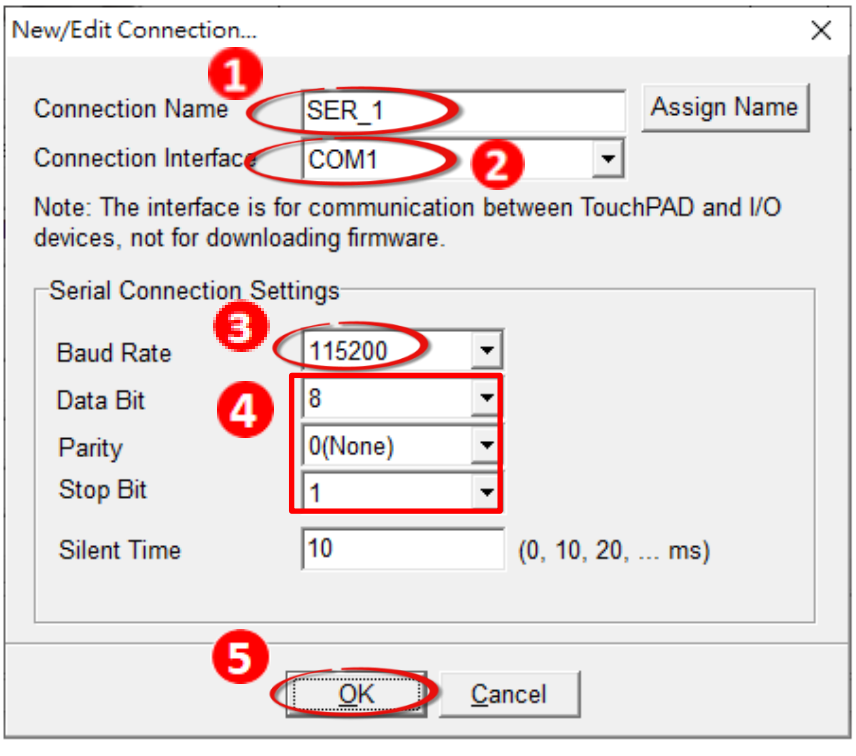
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Step 9: Select "**Create New…**"from the "**Connection**" drop down menu to open the "**New/Edit Connection…**" dialog box.



Step 10: In the "**New/Edit Connection…**"dialog box, configure the connection information for the Modbus RTU slave device in the following manner:

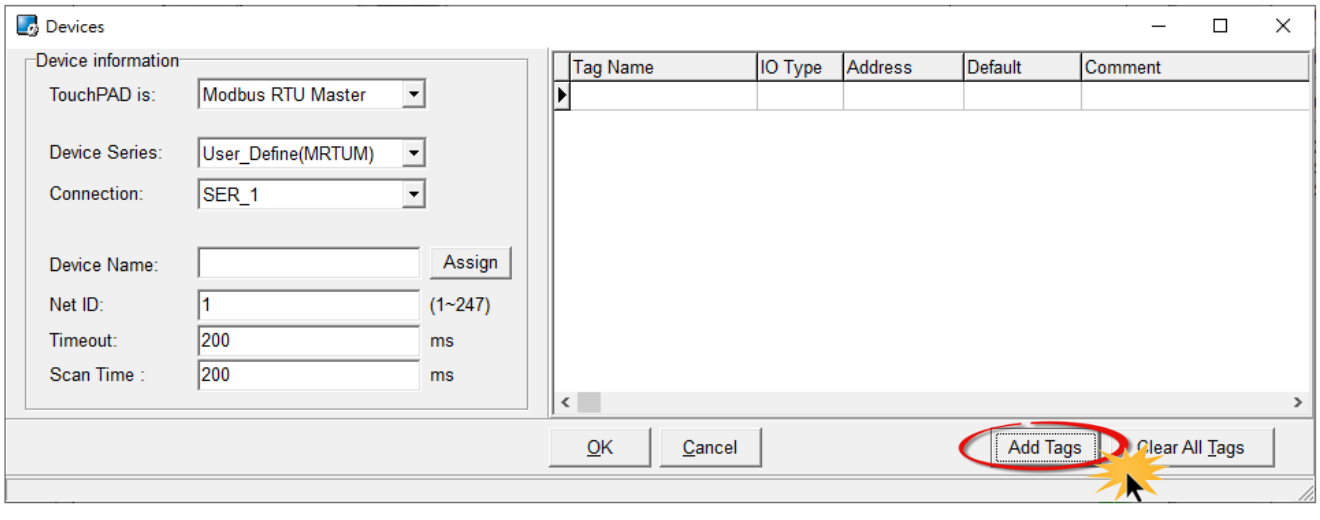
1. Enter a name for the connection (e.g., SER_1) in the "**Connection Name**" field.
2. Select "**COM1**" from the "**Connection Interface**" drop down menu.
3. Select the **Baud Rate of the Modbus RTU slave device** in the "**Baud Rate**" drop down menu.
4. Select the **Data Format of the Modbus RTU slave device** in the "**Data Bit**", "**Parity**" and "**Stop Bit**" drop down menu.
5. Click the "**OK**" button to save the configuration and close the dialog box.



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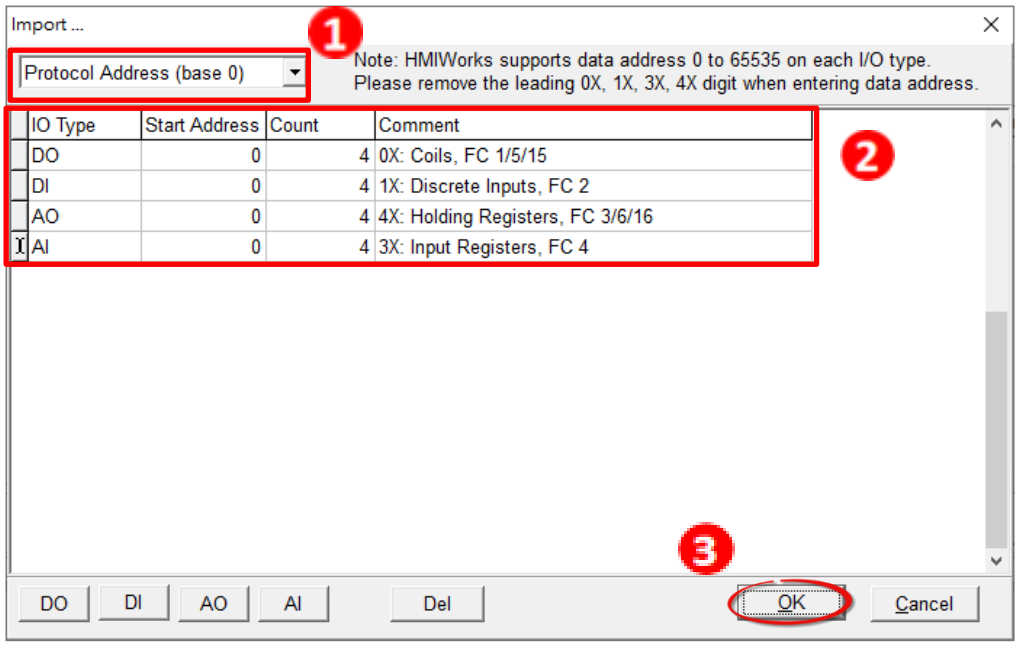
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Step 11: In the "**Devices**" dialog box, click the "**Add Tags**" button to open the "**Import…**"dialog box.



Step 12: In the "**Import…**"dialog box, configure the information for the Modbus RTU slave device in the following manner:

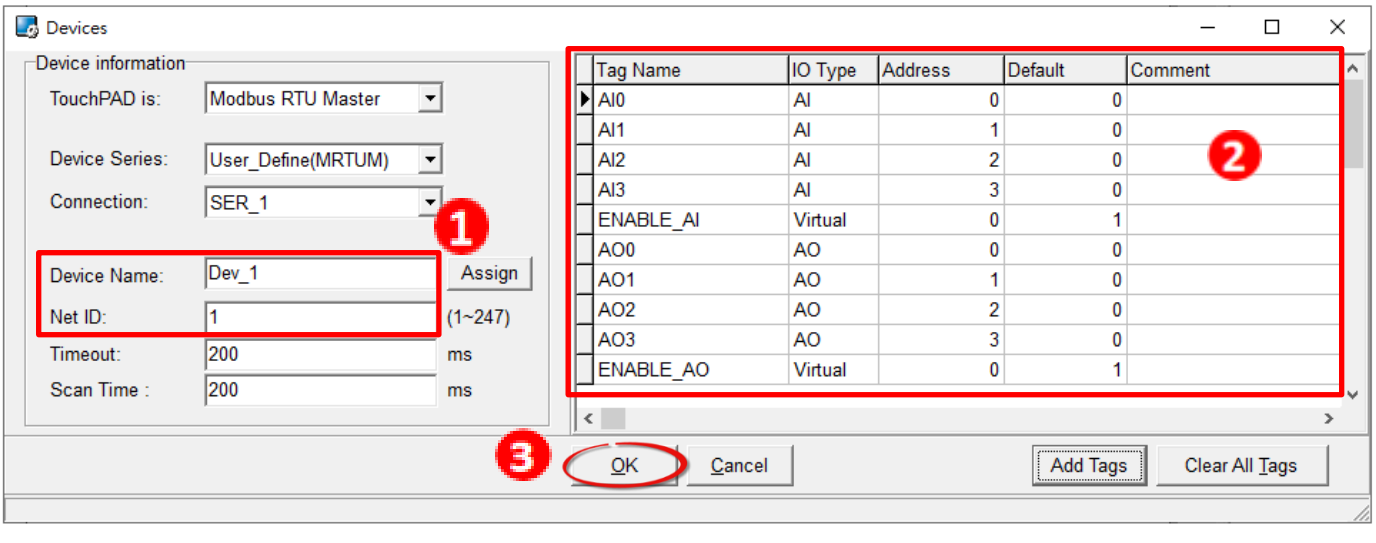
1. Select the "**Protocol Address (Base 0)**"option from the drop-down menu.
2. Set the "**IO Type**", "**Start Address**" and "**Count**" values depending on the parameters of the Modbus RTU slave device, e.g., DO Start Address = 0, DO Count = 4; DI Start Address = 0, DI Count = 4; AO Start Address = 0, AO Count = 4; AI Start Address = 0, AI Count = 4.
3. Click the "**OK**" button to save the configuration and close the "**Import…**"dialog box.



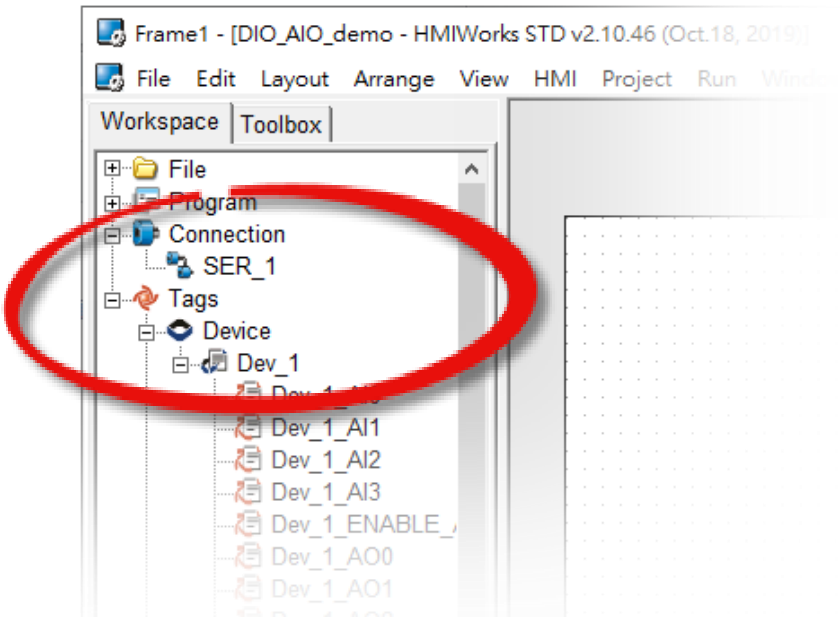
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Step 13: Verify that the **information for the Modbus RTU slave device is correct**, e.g., the Device Name, the Net ID, the Tag Name, the IO Type, the Start Address and the Default Value, etc. and then click the "**OK**" button to save the configuration and close the "**Devices**" dialog box.



Step 14: The creation of the "**SER_1**"connection and the"**Dev_1**"device is now complete and will be displayed in the Connection section in the Workspace pane.



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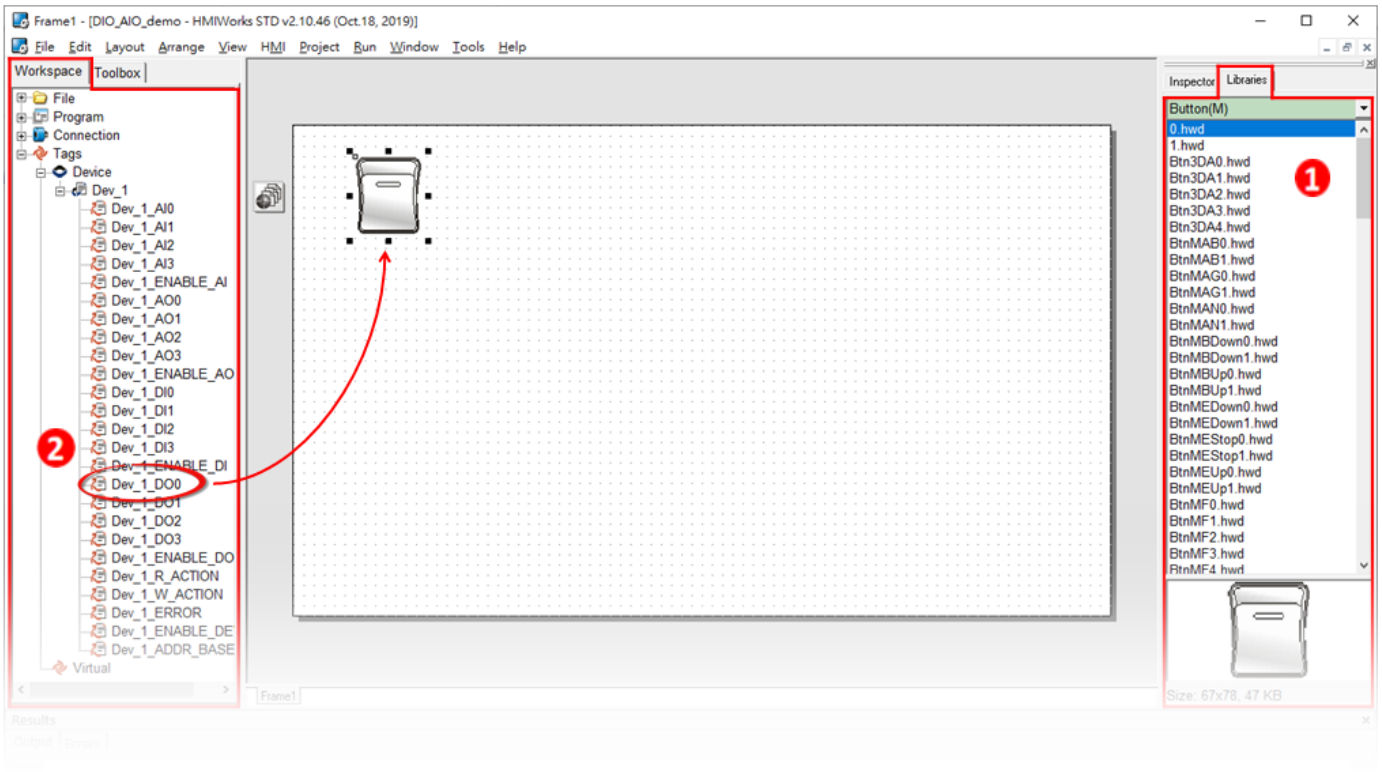
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Step 15: Use the following procedure to create a sample program, e.g., a sample IO program:

Note that the actual sample program depends on the type of Modbus RTU slave device being used. Refer to the relevant user manual for details

DO

1. Select a "**Button**" object from the "**Libraries**" pane to represent the DO0 tag.
2. Drag the "**Dev_1_DO0**" tag (DO channel 0) from the "**Workspace**" pane to the desired position on the design frame.
3. Repeat the previous steps to create a button for the required number of DO objects.

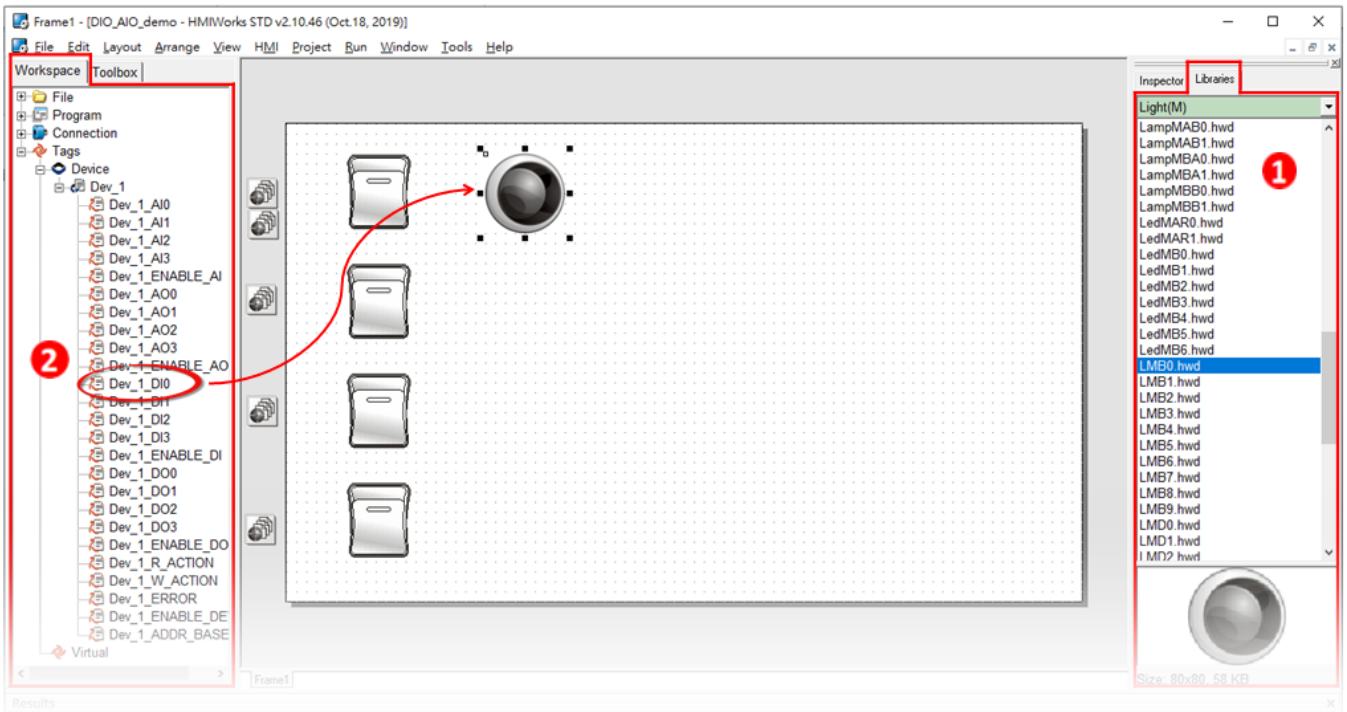


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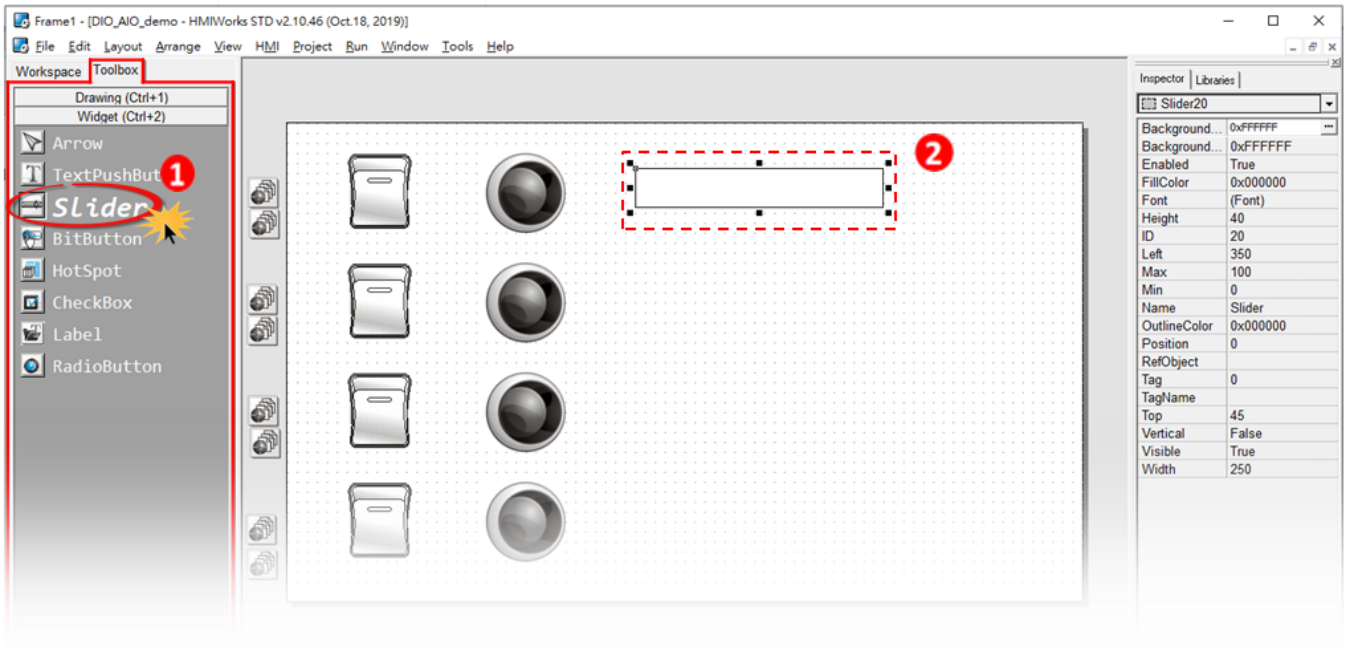
DI

1. Select a “**Button**” object from the “**Libraries**” pane to represent the DI0 tag.
2. Drag the "**Dev_1_DI0**" tag (DI channel 0) from the "**Workspace**" pane to the desired position on the design frame.
3. Repeat the previous steps to create a button for the required number of DI objects.



AO

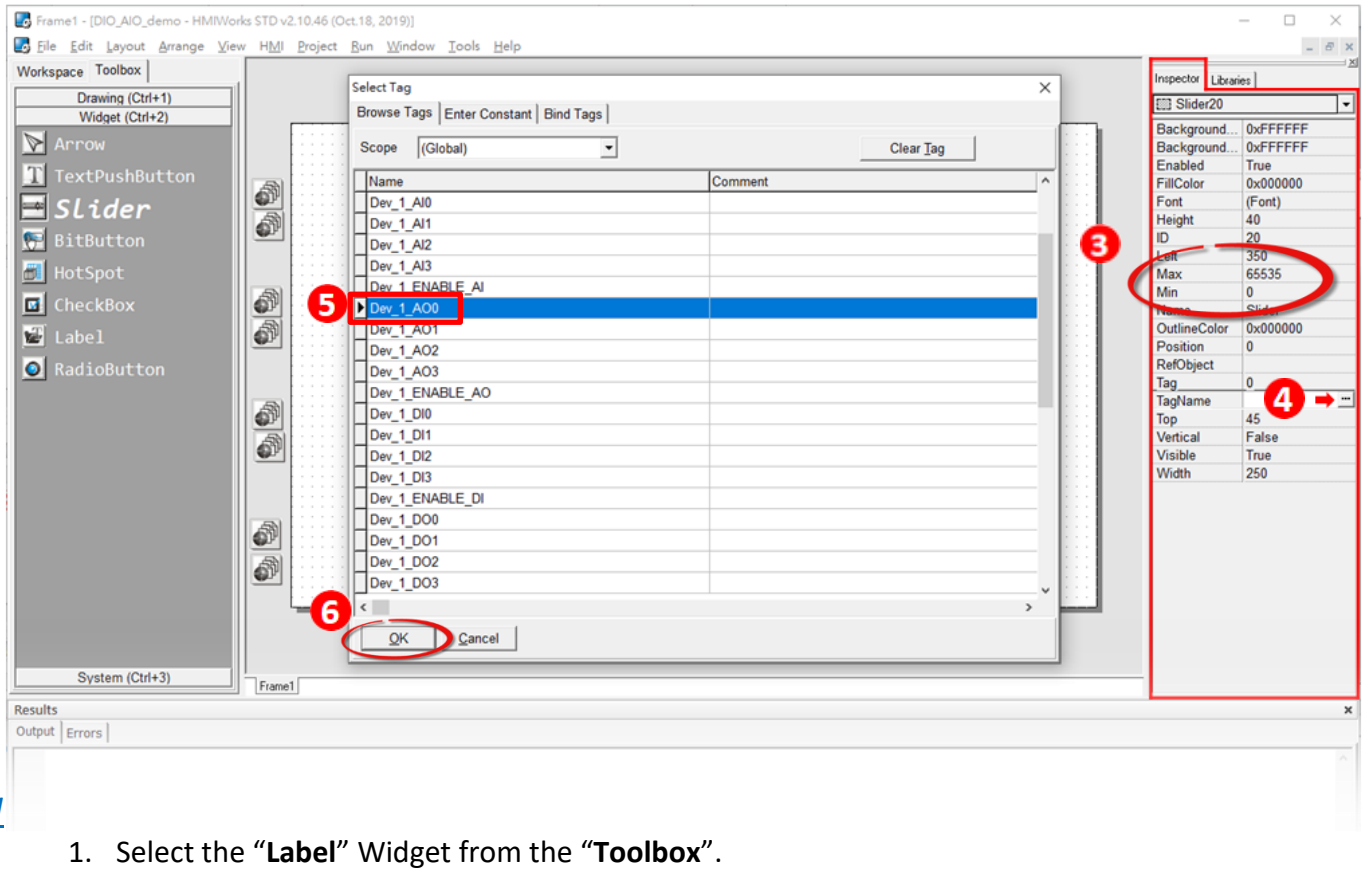
1. Select the “**Slider**” Widget from the “**Toolbox**”.
2. Draw a “**Slider**” on the design frame.



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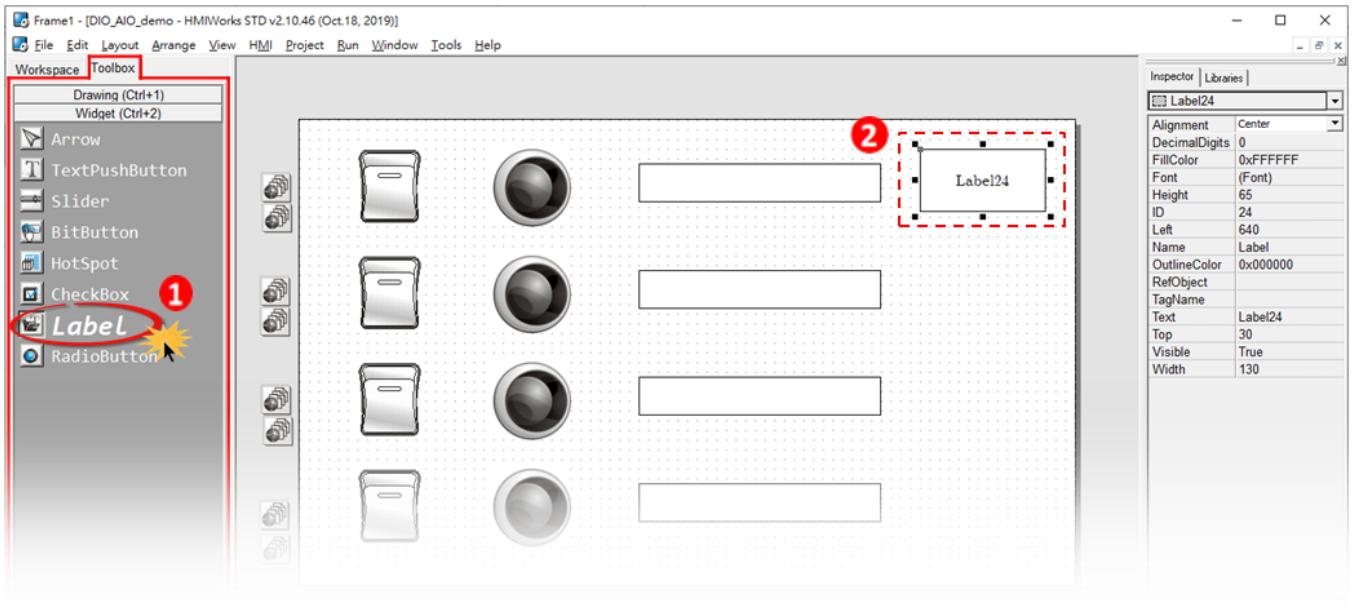
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3. Adjust the "**Max**" and "**Min**" values of AO0 from the "**Inspector**"
4. Click the "**TagName**" button to open the "**Select Tag**" dialog box.
5. Select the "**Dev_1_AO0**" tag from the Name column, and then click the "**OK**" button to connect the Slider and the "**Dev_1_AO0**" tag.
6. Repeat the previous steps to create a slider for the required number of AO objects.



AI

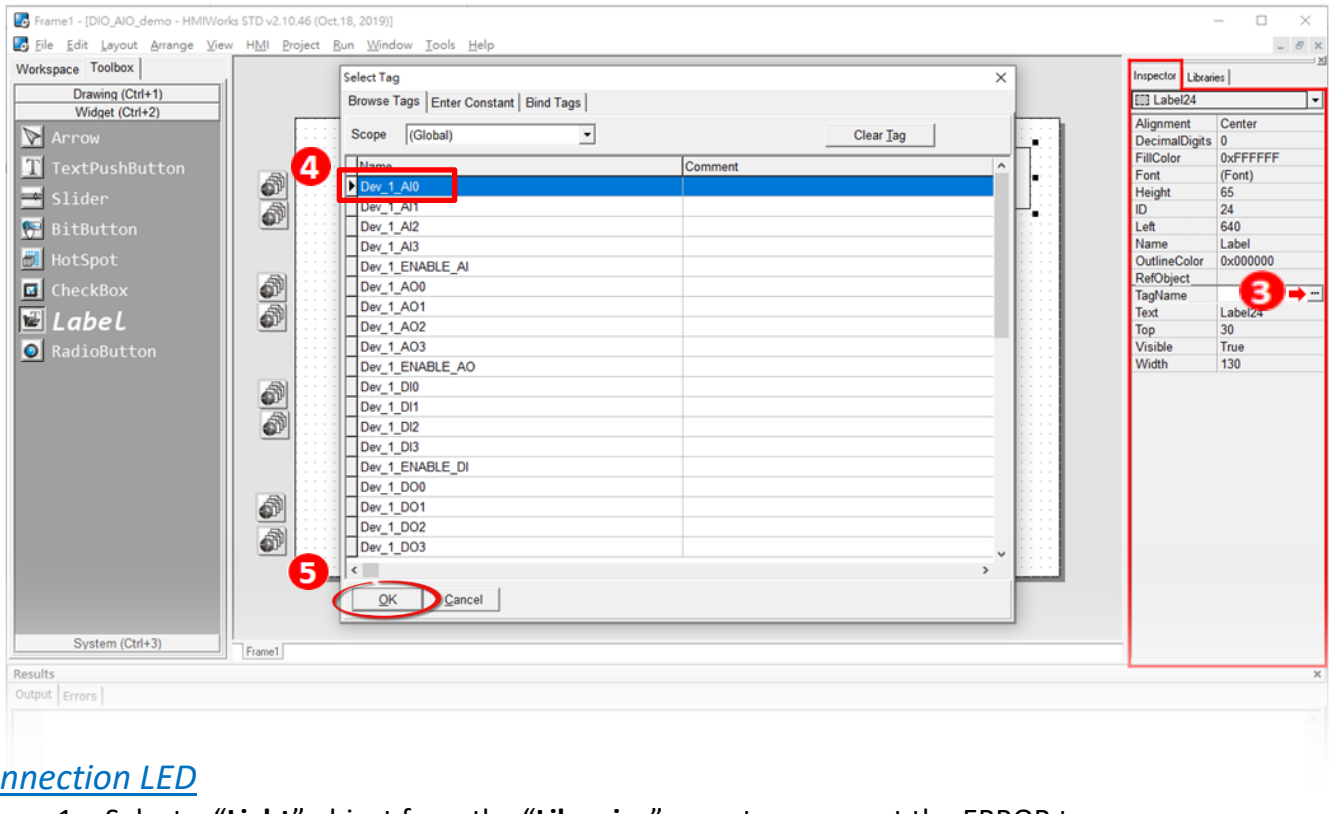
1. Select the "**Label**" Widget from the "**Toolbox**".
2. Draw a "**Label**" on the design frame.



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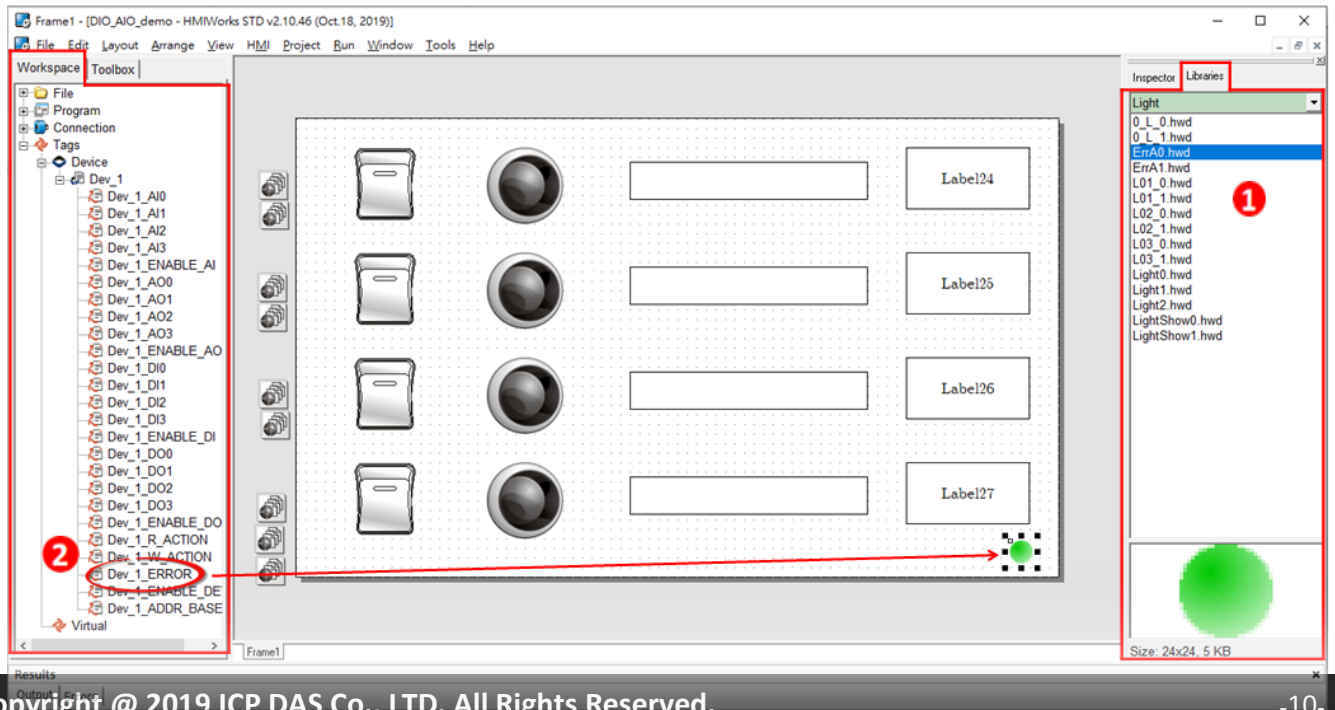
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3. Click the “**TagName**” button to open the “**Select Tag**” dialog box.
4. Select the “**Dev_1_AI0**” tag from the Name column, and then click the “**OK**” button to connect the Label and the “**Dev_1_AI0**” tag.
5. Repeat the previous steps to create a label for the required number of AI objects.



Connection LED

1. Select a “**Light**” object from the “**Libraries**” pane to represent the ERROR tag.
2. Drag the "**Dev_1_ERROR**" tag from the "**Workspace**" pane to the desired position on the design frame.

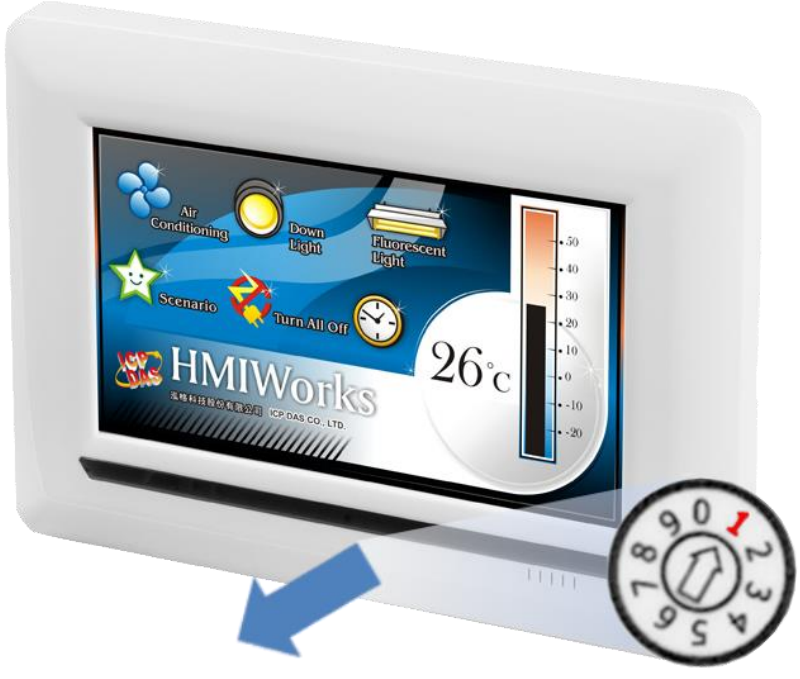


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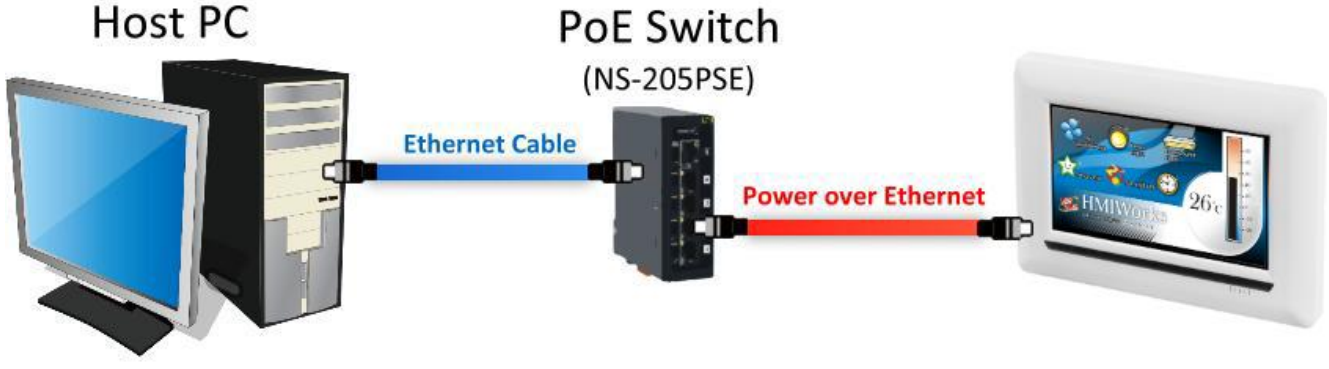
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Step 16: Once the sample program is complete, it can be uploaded to the TPD-703-64 module via the Ethernet. The detailed configuration and wiring information is as follows:

1. Power off the TPD-703-64 module and remove the shell. Using a flat-head screwdriver, set the **Rotary Switch** on the TPD-703-64 module to "**Force Update**" **mode (position 1)**. Note that the default configuration is **"Run & Update" mode (position 0)**.



2. Connect both the TPD-703-64 module and the Host PC to the same sub network, or use a Power over Ethernet Switch, e.g., an NS-205PSE, and supply power to the TPD-703-64 via the PoE Switch.

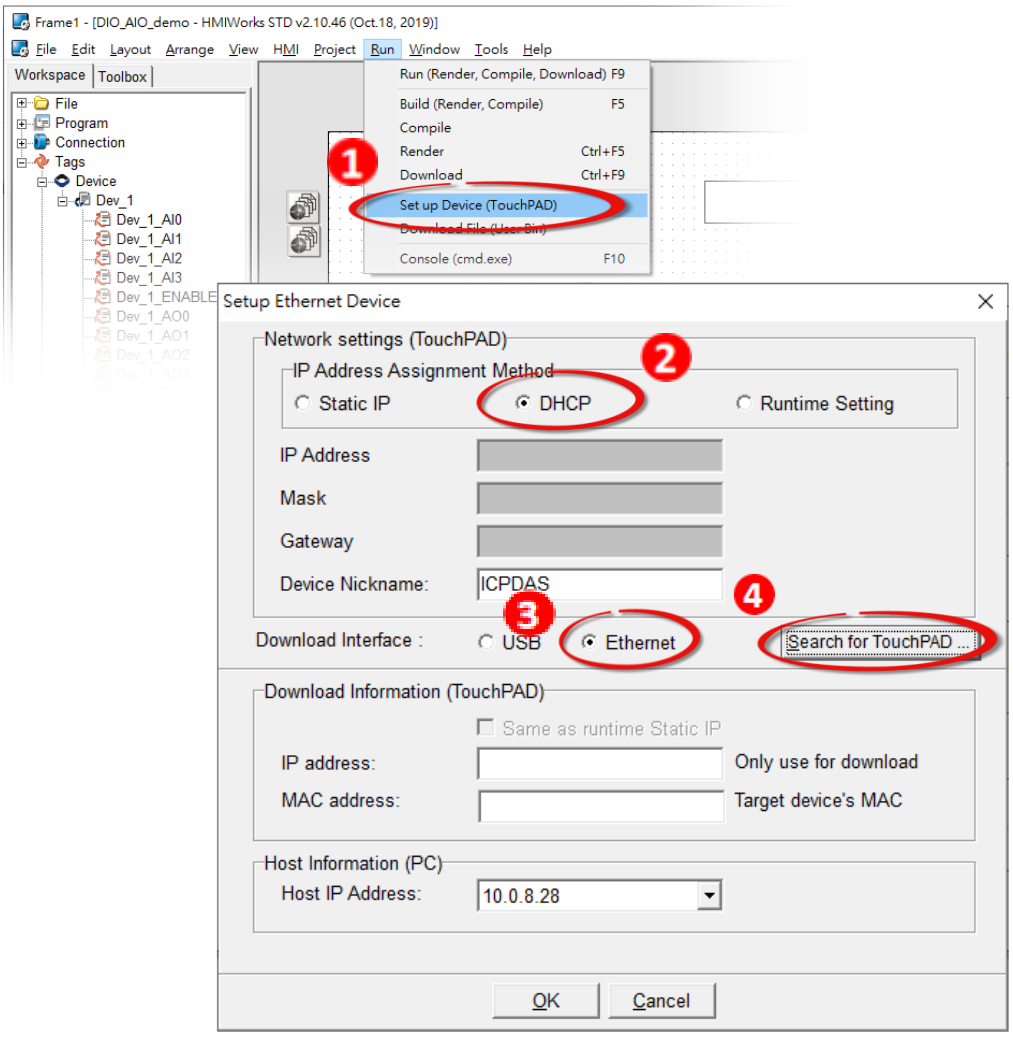


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3. Select the "**Set up Device (TouchPAD)**" item from the "**Run**" menu to open the "**Setup Ethernet Device**" dialog box.
4. Select the "**DHCP**" and "**Ethernet**" options, and then click the "**Search for TouchPAD…**" to search for module.

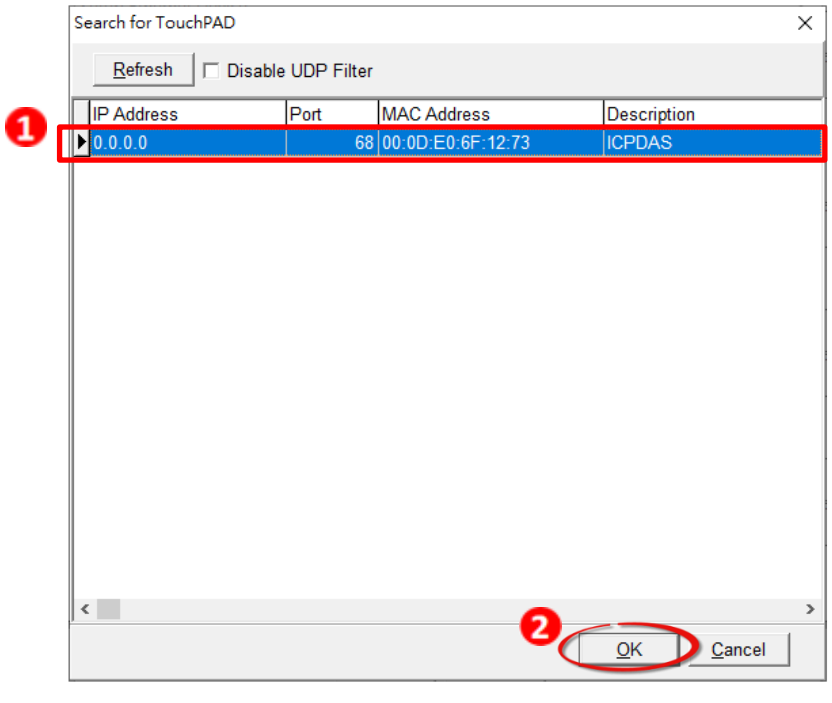
Note: If your network doesn't have access to a DHCP, you can use the Static IP and enter the effective IP information.



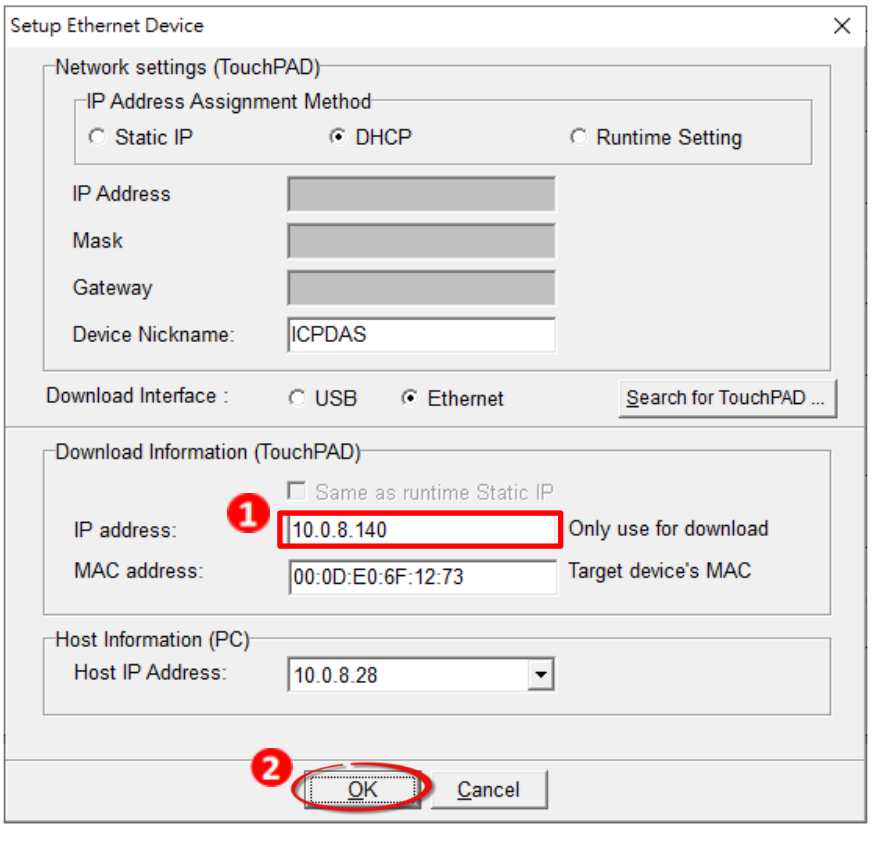
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5. Select the TPD-703-64 module that has the correct MAC address, and then click the “OK” button.



6. Return to “**Setup Ethernet Device**” dialog box and enter an effective “**IP address**” in the “**Download Information (TouchPAD)**”, and then click the “**OK**” button.

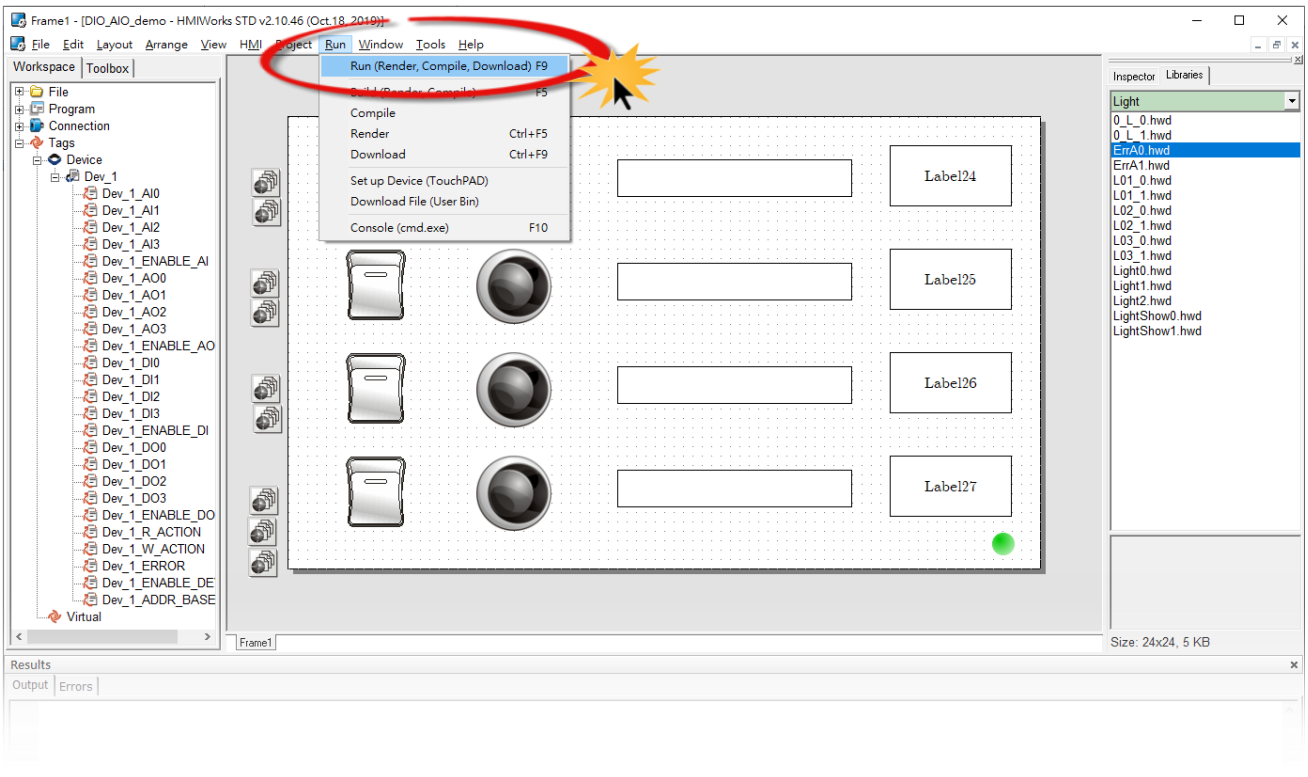


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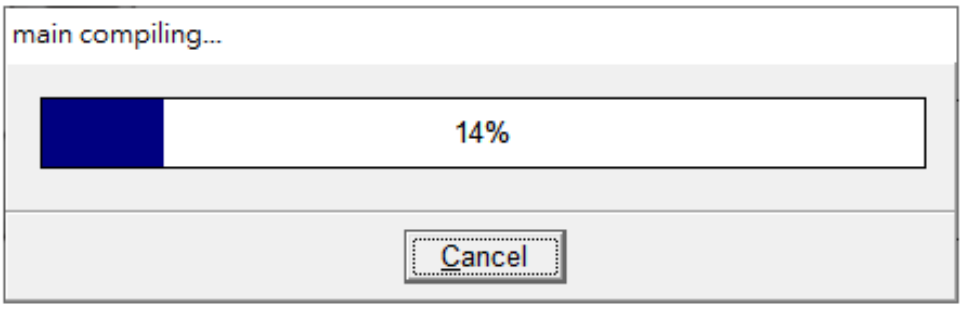
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Step 17: The sample program can now be uploaded to the TPD-703-64 module. To do this, follow the procedure described below:

1. In the HMIWorks application, click the "**Run (Render, Compile, Download) F9**" item from the "**Run**" menu, or press **F9**.



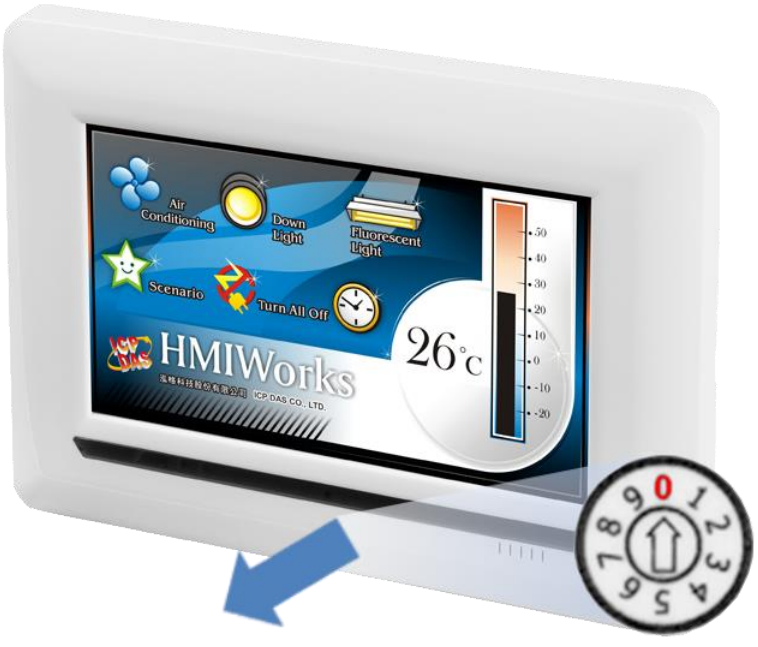
2. The program will now be compiled. Wait until the Build and Download are conpleted.



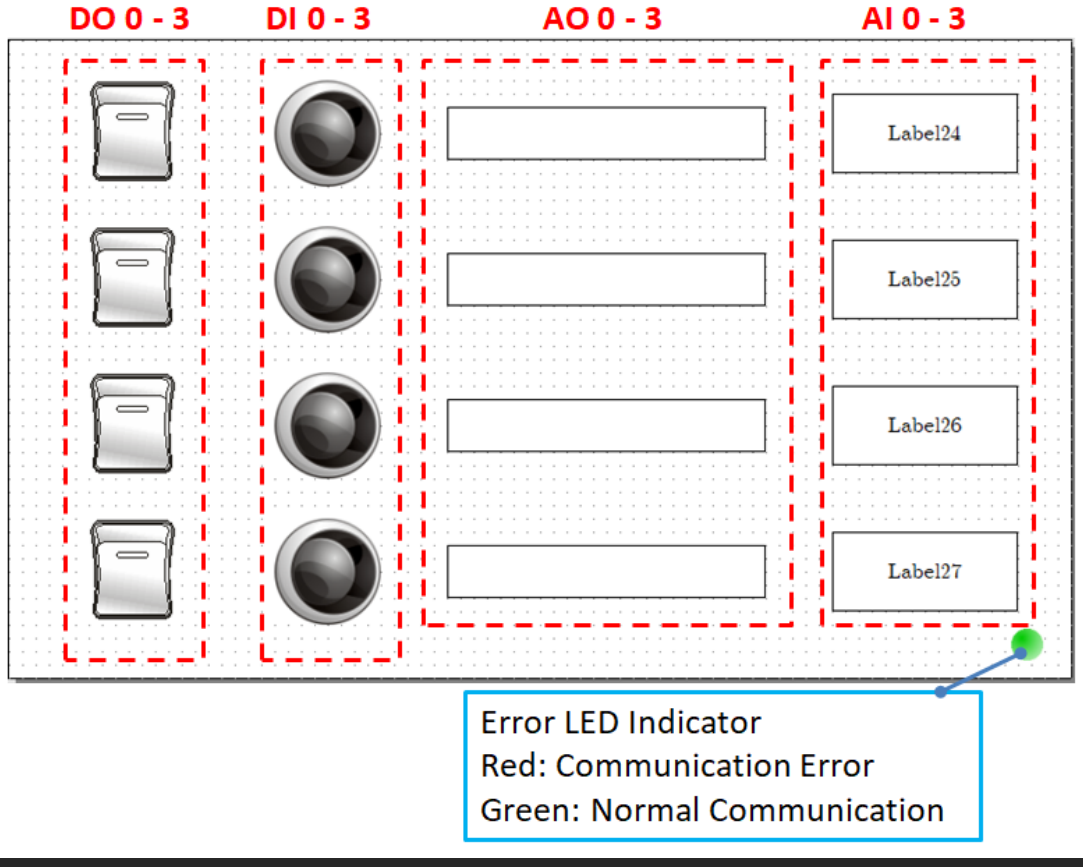
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3. Once the upload is complete, i.e., when the progress indicator reaches 100%, set the **Rotary Switch to "Run & Update" mode (position 0)**.



4. **Reboot** the TPD-703-64 module so that the module is operating in **"Run" mode**. The TPD-703-64 module will then execute the sample program.

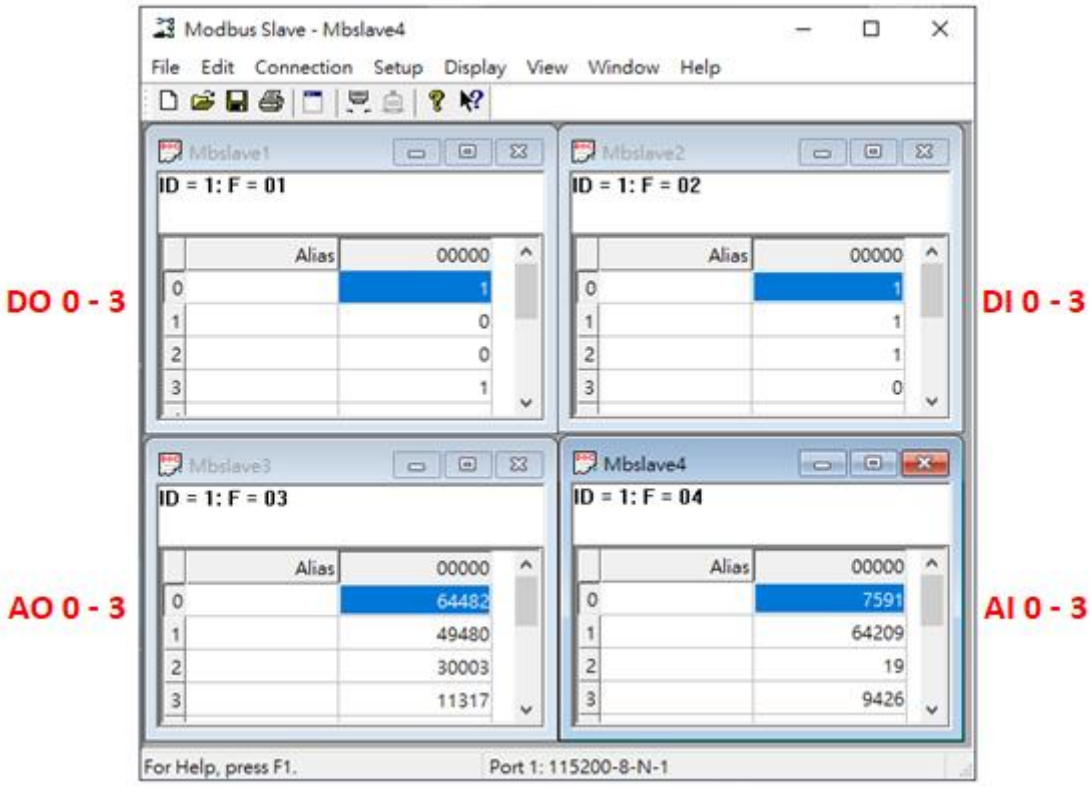


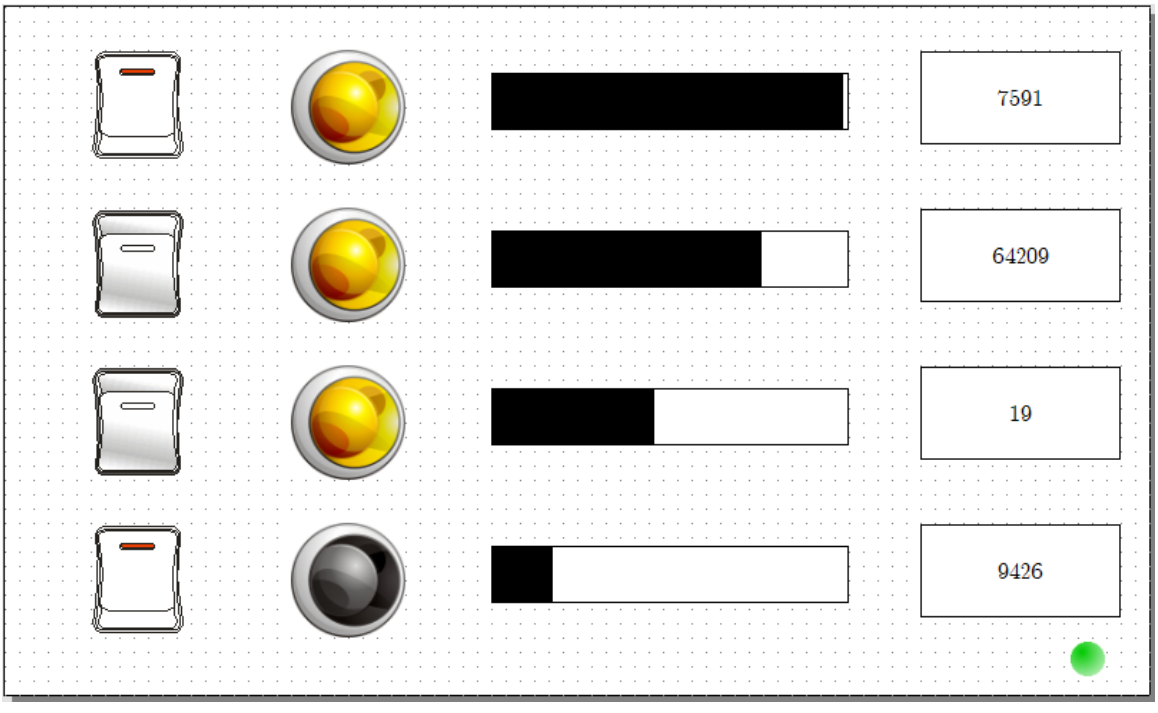
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Step 18: Connect the Slave device to the COM 1 of TPD-703-64 module. Check that the Error LED Indicator displays **Normal Communication**, i.e., Green, and then operate the TPD-703-64 to read/write from/to the IO device.

Note: Operation should be executed according to your Modbus RTU slave device.





The instructions are now complete.

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