# FAQ-DBL-05: UA Web UI Function Wizard – Data Log - How to set up remote database function: Modbus RTU / MySQL(MariaDB) ? (Use M-7026)

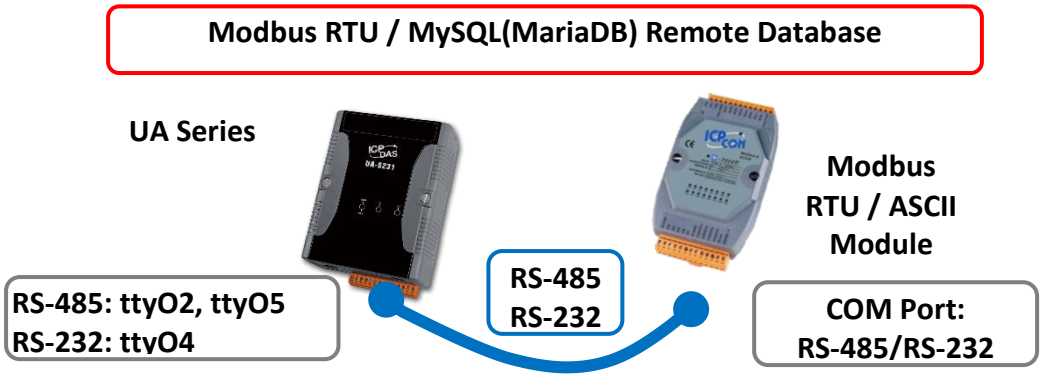
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UA series supports Data Logger function. Its Local Data Logger can save I/O data log to local CSV file, and record I/O status at the scheduled time. Furthermore, users can set the time interval of which CSV file to generate and divide on the local side. Its Remote Database can import I/O data collection directly into the remote SQL database, e.g. MS SQL, MySQL, MariaDB …, for the Big Data analysis.

**UA Data Logger** supports to collect devices I/O status and then directly write into **remote side MySQL /MariaDB Database** for the Big Data analysis.

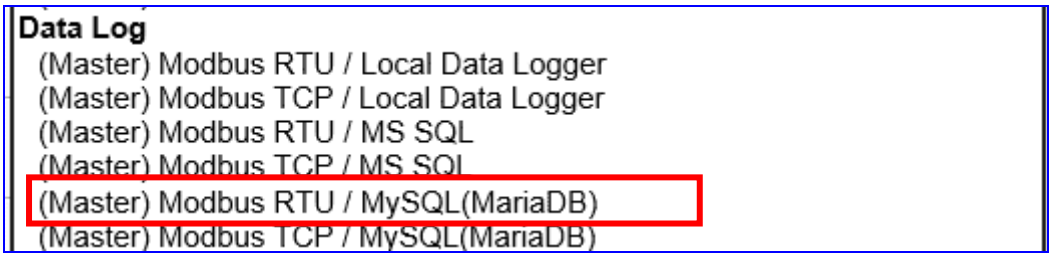
The connection steps for **MySQL and MariaDB** is the same, so here will introduce them together. The Modbus / MySQL and MariaDB Remote Database settings include Modbus RTU and TCP. Here will introduce **Modbus RTU** as the setting sample.

- **Modbus RTU / Remote Database MySQL(MariaDB)**




**Note**: The hardware/network connection methods please see the UA Manual Chapter 2.

When UA series controller connects the Modbus RTU module (via RS-485/232, as the picture), user can choose the item [**Modbus RTU / MySQL(MariaDB**] of the "Data Log" in the Function Wizard.

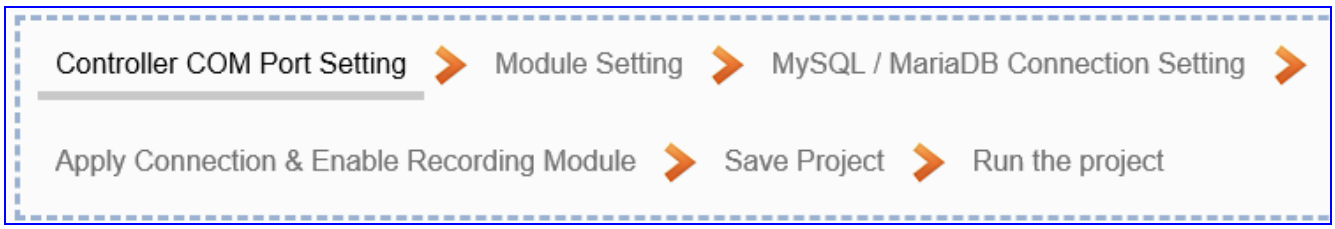





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**[Step Box]:**

The Step Box of the [**Modbus RTU / MySQL(MariaDB**] has 6 steps. When enabling the Step Box, it auto enters the first step setting page (The step with a bold underline means it is the current step.). The user just needs to follow the “Step Box” step-by-step and then can complete the project quickly and rightly.

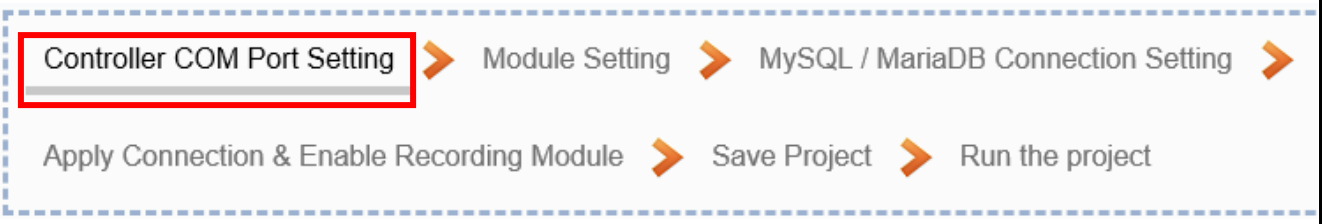



This example: UA-5231M-4GE via ttyO2 port to connect the device M-7026.

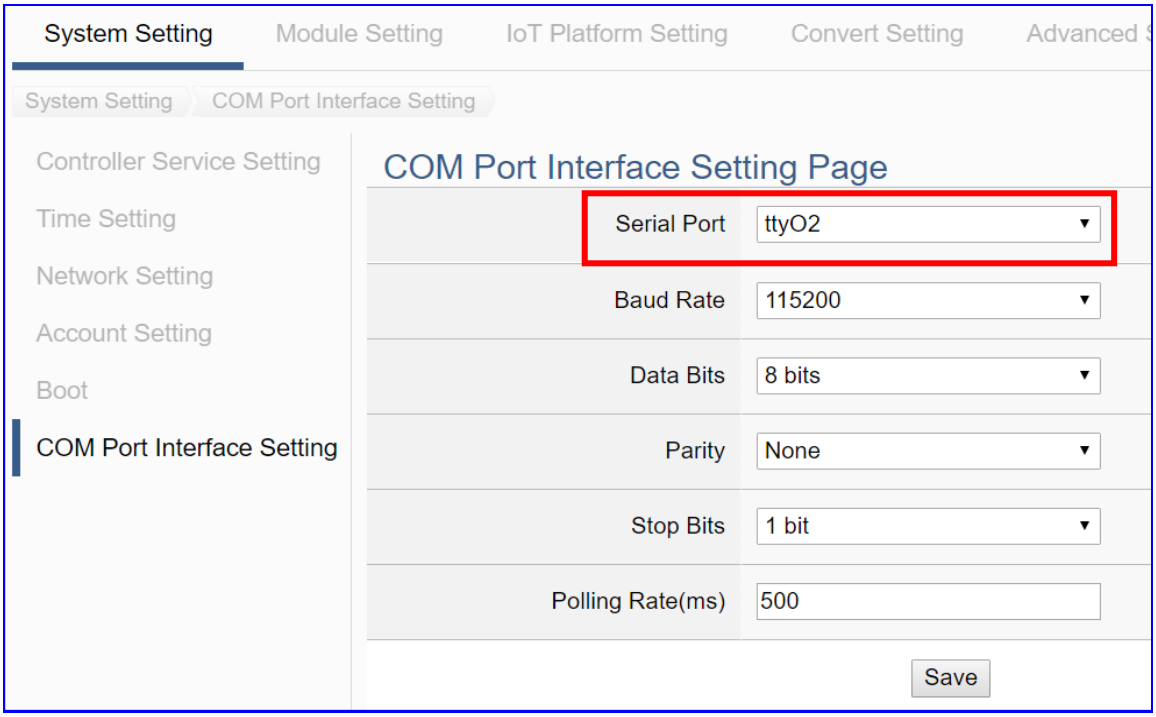


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## Step 1. Controller COM Port Setting




This page allows display and set the COM port interface of the controller for the RS-232/RS-485 serial communication. The user can find the default communication values of our I/O modules from the module CD, manual or I/O Module website.

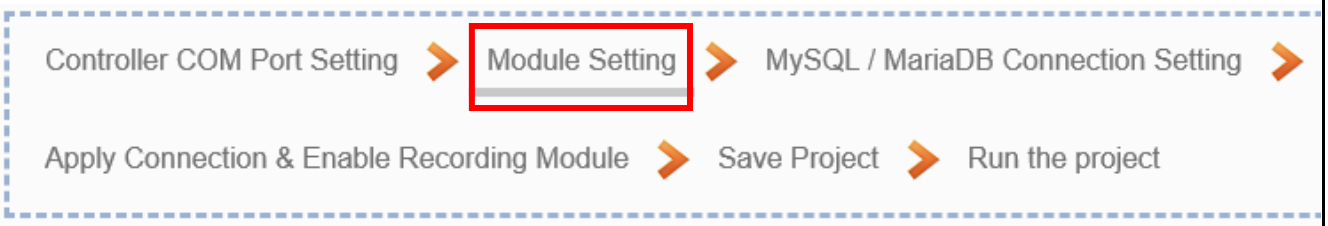



| COM Port Interface Setting Page | |
|---|---|
| Serial Port | Choose the serial port of UA controller that links with the I/O module. ttyO2: RS-485 ; ttyO4: RS-232 ; ttyO5: RS-485 |
| Baud Rate | Choose a baud rate to communicate with the module: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200. The UA controller and the I/O module need have the same baud rate. |
| Data Bits | The number of bits used to represent one byte of data: 7 bits or 8 bits. Default: 8 Bits. |
| Parity | Choose one way for the parity checking.<br>Options: None, Even, and Odd. Default: None. |
| Stop Bits | Choose the number of stop bit: 1 bit or 2 bits. Default: 1. |
| Polling Rate(ms) | Set a time interval for the command. Default: 500 ms |
| Save | Click [Save] button could save the settings of this page. |

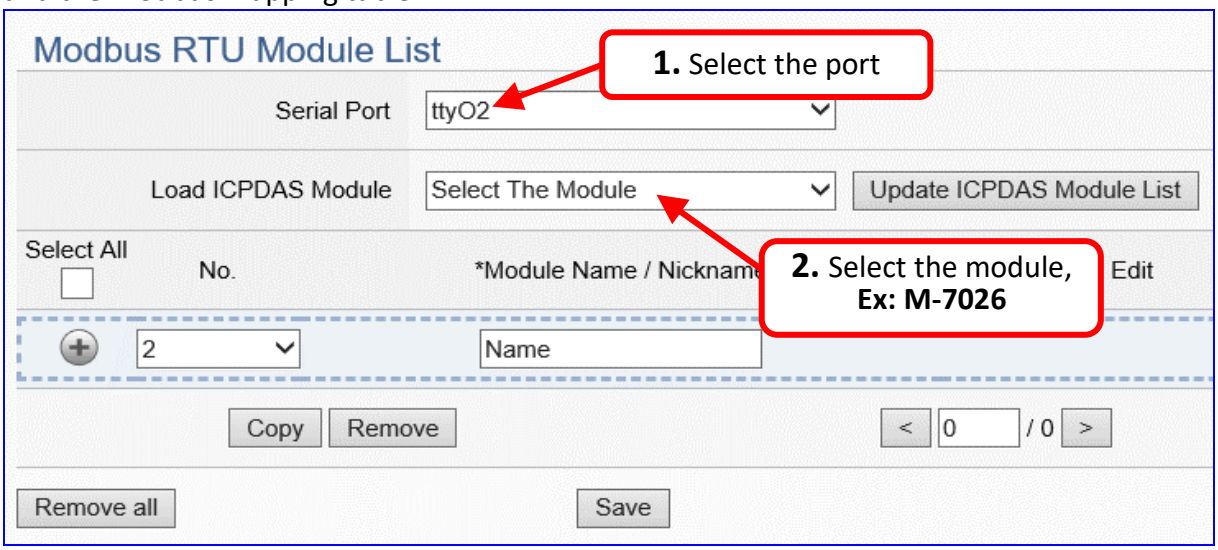


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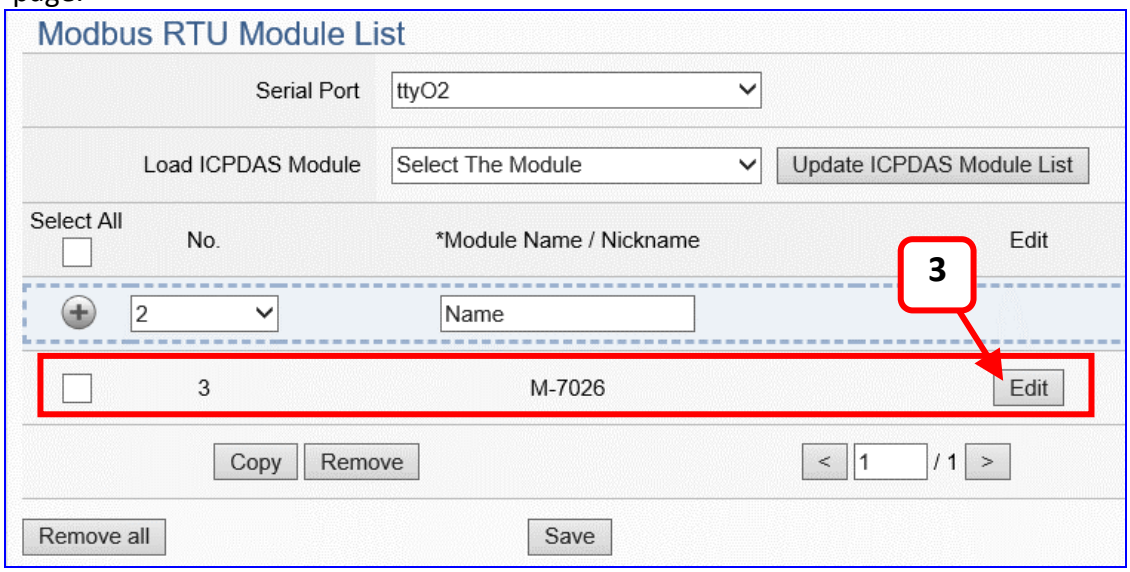
## Step 2. Module Setting




It auto-enter the first step, **Step 2 [Module Setting]** of the UI setting.
This page is for setting the communication values with the connected modules. First check the port that connected with the module, and each module can give a name (Default name: Name). Click [ ] button could add a new module, and then click [Edit] button to configure the module content and the Modbus mapping table.




The module (Ex: **M-7026**) is as below, and then click [**Edit**] button to enter the "Module Content Setting" page.

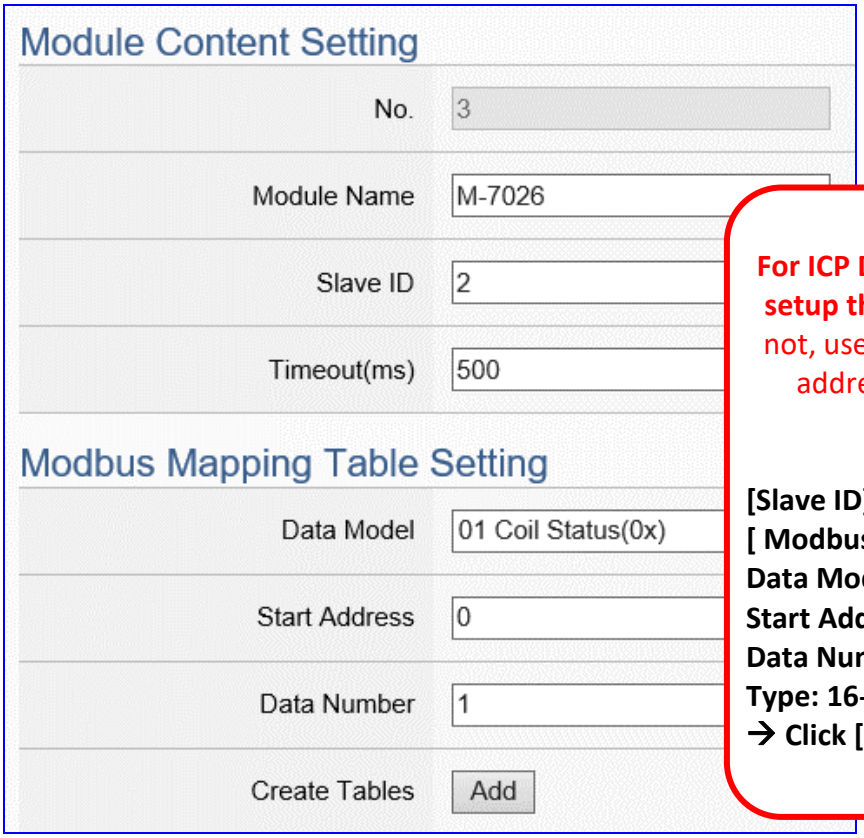



If set up a wrong module, user can click the box in the left side of the module number and click the [Remove] button to delete the module.



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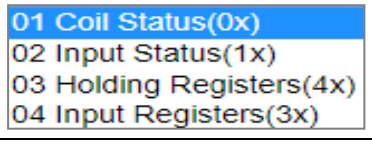
[**Module Content Setting**] page can set up the module and the Modbus mapping table:




**Example: M-7026**

**For ICP DAS module, system will auto setup the Modbus Mapping Table**; if not, user needs to check the Modbus address or I/O number from the module user manual.

**[Slave ID] 2 (by user's real case)**
**[ Modbus Mapping Table Setting ]**
**Data Model: 04 Input Registers(3x)**
**Start Address: 0**
**Data Number: 6**
**Type: 16-bit Short**
**→ Click [ Add ]**

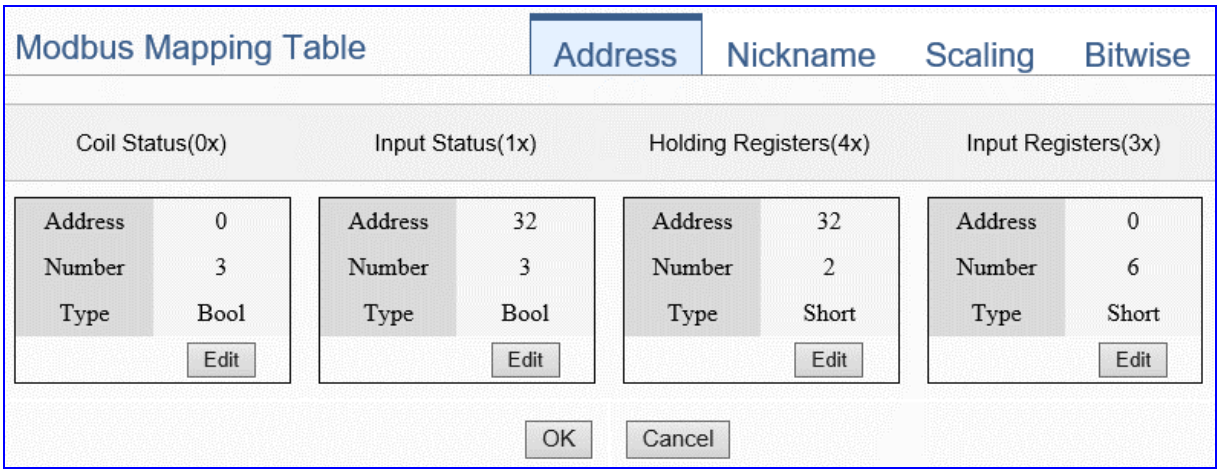
| **Module Content Setting** | |
|---|---|
| No. | The module number in the module list (Not editable here) |
| Module Name | Give a name, e.g. model number or name. Default: Name. |
| Slave ID | Set the module Slave ID of the UA. (Range: 1 ~ 247) |
| Timeout | Set the timeout value for the module. Default: 500 ms |
| **Modbus Mapping Table Setting** | |
| Data Model | System provides 4 Modbus data models "01" ~ "04" for mapping to address of DO, DI, AO and AI. (ex. 01: DO channels, 02: DI, 03: AO, 04: AI)   |
| Start Address | The start address of the Modbus command. **Note:** the Start Address of UA is bass on 0, even if some modules are bass on 1, here it needs to follow UA to set bass on 0. |
| Data Number | The number of the Modbus address. Need to give enough number for the DO, DI, AO, AI channels of the module. Default: 1. |
| Type | This item only when the data model is 03 or 04. Choose the suitable data type: 16-bit Short, 16-bit Unsigned Short, 32-bit Long, 32-bit Unsigned Long, 32-bit Float, 64-bit Double. |
| Create Tables | Click [Add] button, it will add a table in the Modbus mapping table. |



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The finished Modbus Mapping Table as below is in order of mapping DO, DI, AO & AI.

**Address:**
Display and edit the Modbus Mapping Table.



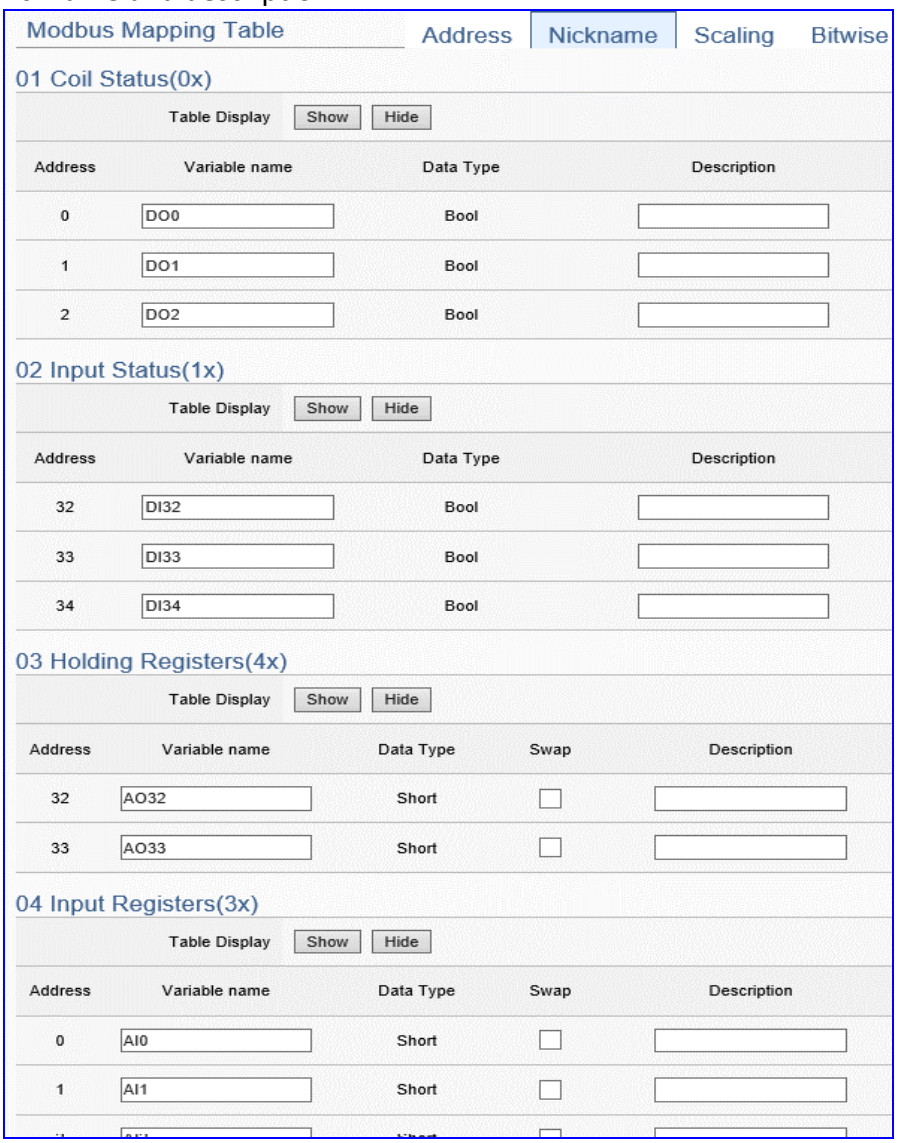

| **Modbus Mapping Table – Address Setting** | |
|---|---|
| Address Setting | The “Address Setting” page of the Modbus Mapping Table |
| Nickname Setting | Click can switch to the The “Nickname Setting” page of the Modbus Mapping Table. (Next page) |
| Modbus Mapping Table | Coil Status(0x): Mapping to DO Modbus address<br>Input Status(1x): Mapping to DI Modbus address<br>Holding Registers(4x): Mapping to AO Modbus address<br>Input Registers(3x): Mapping to AI Modbus address |
| Address | The start address of the Modbus command. Default: 0. **Note:** the Start Address of UA is bass on 0, even if some modules are bass on 1, here it needs to follow UA to set bass on 0. |
| Number | The number of the Modbus address. Need to give enough number for the DO, DI, AO, AI channels of the module. At least 1. |
| Type | DO/DI type: Bool (Boolean)<br>AO/AI type: depend on setting of [Modbus Mapping Table Setting] |
| Edit | Click to change the address and Number. |
| Delete | Click to delete this address table. |
| Save | Click to save and exit this table editing. |
| Cancel | Click to exit without saving and back to the module list page. |
| OK | Click to save this page settings and back to the module list page. |



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**Nickname:**

Setting the variable nickname and description.



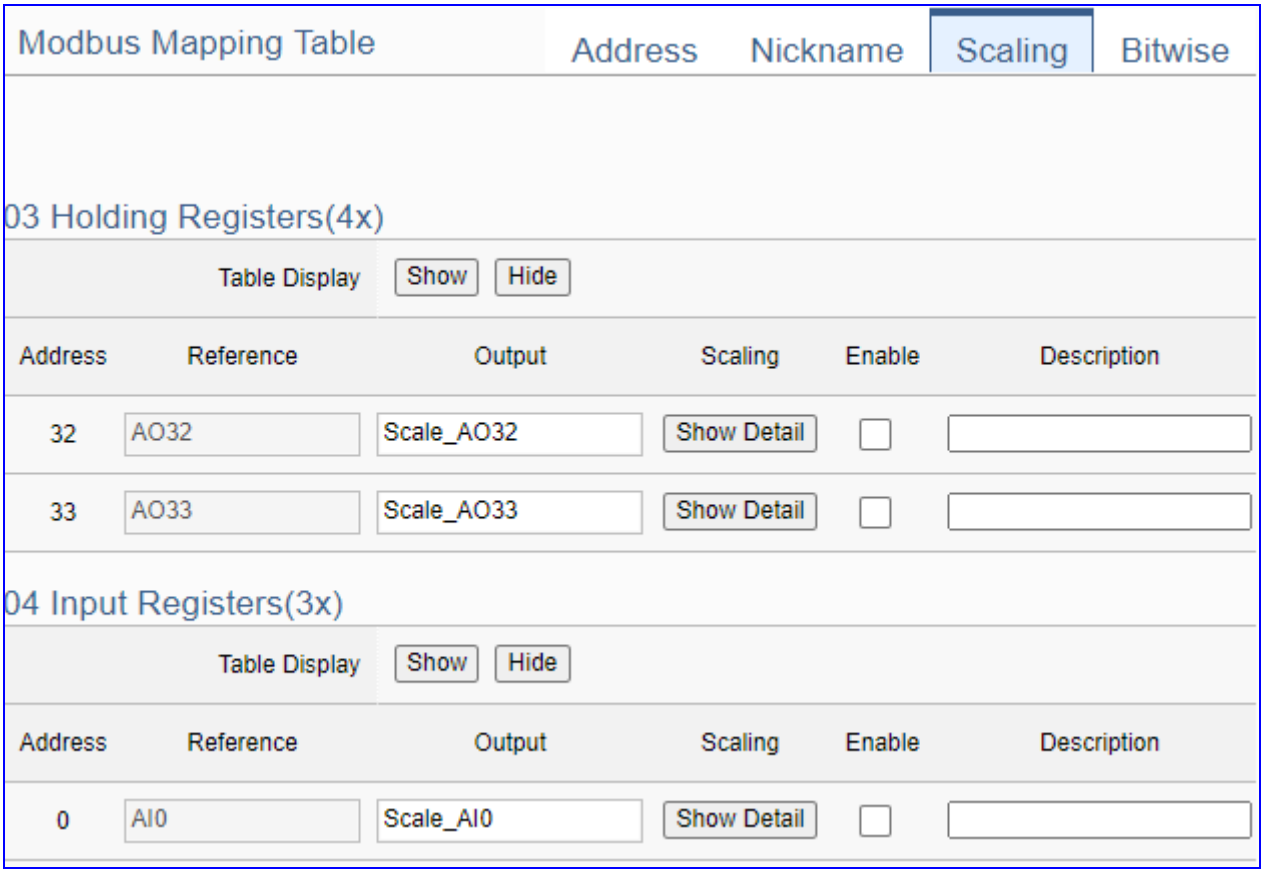

| **Modbus Mapping Table – Nickname Setting** | |
|---|---|
| Modbus Mapping Table | Coil Status(0x): Mapping to DO Modbus address<br>Input Status(1x): Mapping to DI Modbus address<br>Holding Registers(4x): Mapping to AO Modbus address<br>Input Registers(3x): Mapping to AI Modbus address |
| Table Display | Click [Show] to display all fields, click [Hide] to hide some fields. |
| Address | Modbus address. System auto arrange. |
| Variable name | The variable name of the mapping address. Default: Tag0 and auto arrange the number. User can define the name. |
| Data Type | Display data type of the variable. (Not editable) |
| Swap | Check to swap the byte order (Lo-Hi/Hi-Lo) for 4-byte or 8-byte. |
| Description | Write a note for this variable. |
| OK | Click to save this page settings and back to the module list page. |



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**Scaling:**

**Scaling is only available in the AI/AO settings of Modbus RTU/TCP.** When the variable value needs to be scaled or converted before output, click the "**Advanced Setting**" button of the variable on the **Scaling** page, input the **Min**./**Max**./**Offset** of the Reference/Output items, add a description, and check "**Enable**" box, The Scaling conversion function will be activated.



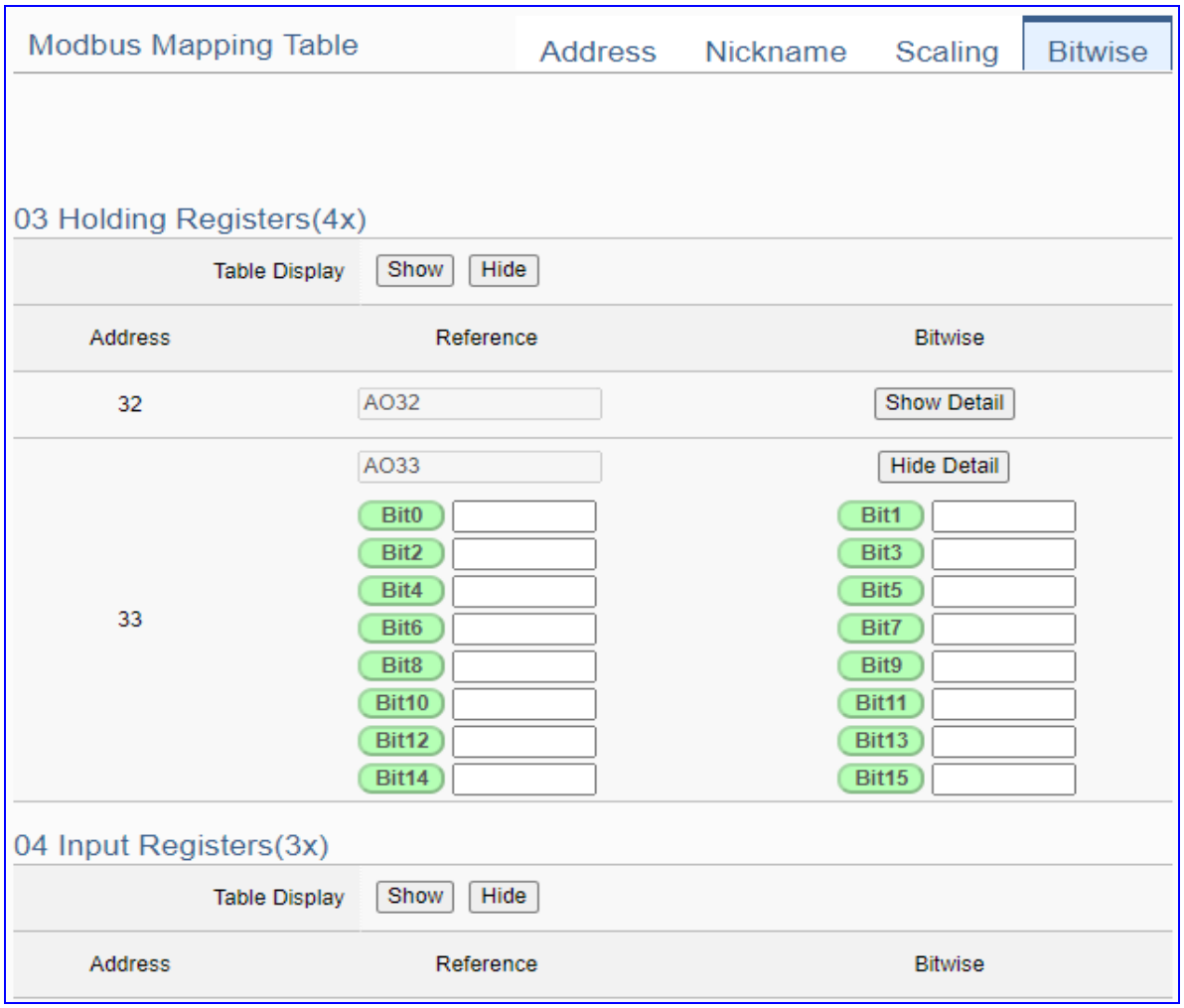

| **Modbus Mapping Table – Scaling** | |
|---|---|
| Modbus Mapping Table | Holding Registers(4x): Mapping to AO Modbus address<br>Input Registers(3x): Mapping to AI Modbus address<br>**Scaling do not support 01 Coil Status(0x):DO & 02 Input Status(1x):DI** |
| Table Display | Click [Show] to display all fields, click [Hide] to hide some fields. |
| Address | Modbus address. System auto arrange. |
| Reference | The I/O variable of the Modbus address. |
| Output | The scaling variable for scaling output. User can define the variable name. |
| Scaling | Click [Show Detail] to set up the Scaling parameters, and click [Hide Detail] to hide the parameters.<br>Fill in the Min/Max range values of the source in the Reference column. Fill in the Min/Max range values after scaling in the Output column. If needs offset, fill the offset value in the Offset item. Remember check “Enable” box. |
| Enable | Check the box of the variable can enable just that variable for scaling. |
| Description | Write a note for this variable. |
| OK | Click to save this page settings and back to the module list page. |



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**Bitwise:**

**Bitwise is only available in the AI/AO settings of Modbus RTU/TCP.** When the data needed to take out the value of the specified bit, fill in the variable name in the specified Bit# of the required address, and the value of the bit can be output to the filled variable.

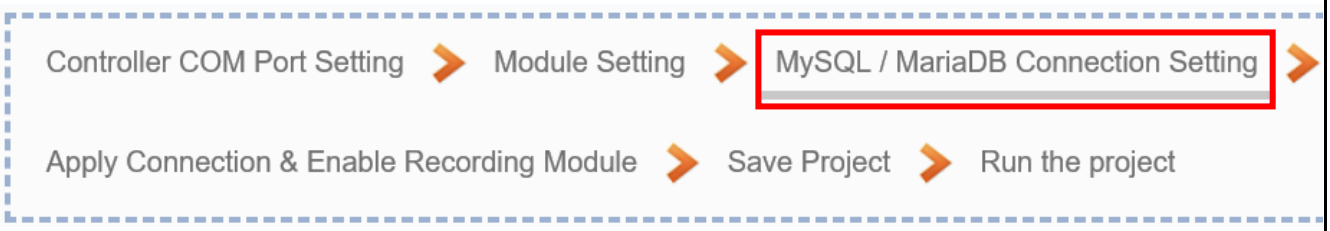



| **Modbus Mapping Table – Bitwise** | |
|---|---|
| Modbus Mapping Table | Holding Registers(4x): Mapping to AO Modbus address<br>Input Registers(3x): Mapping to AI Modbus address<br>**Bitwise do not support 01 Coil Status(0x):DO & 02 Input Status(1x):DI**<br>**Bitwise do not supports 32-bit Float & 64-bit Double data types.** |
| Table Display | Click [Show] to display all fields, click [Hide] to hide some fields. |
| Address | Modbus address. System auto arrange. |
| Reference | The Bit# variables of the Modbus address. |
| Bitwise | Set up the variables for Bitwise. Click [Advanced Settings] to set up the Bitwise parameters, and click [Hide] to hide the parameters.<br>Fill in the variable names to the Bit# that wanted to do the Bitwise. The value in the fixed bit number will be assigned into the variable. |
| OK | Click to save this page settings and back to the module list page. |



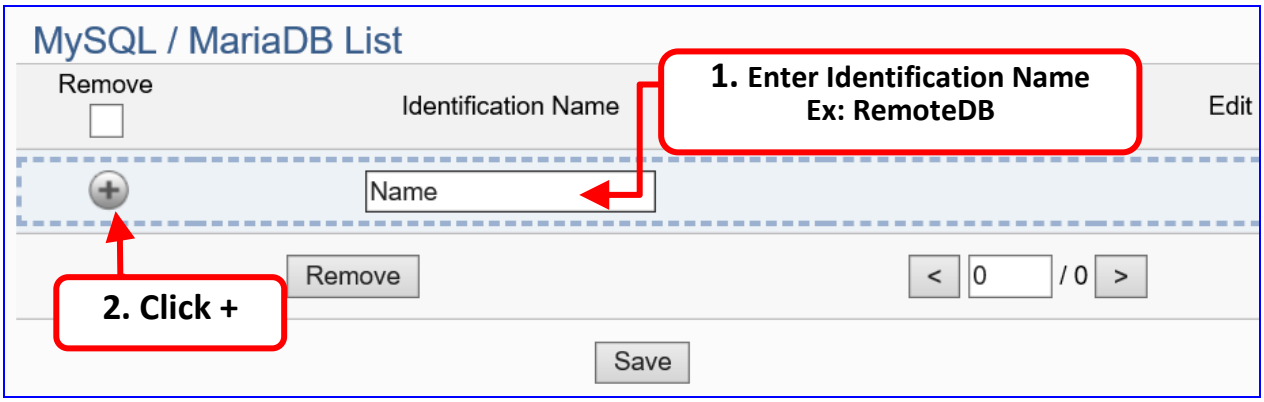
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- **Step 3. MySQL/MariaDB Connection Setting**

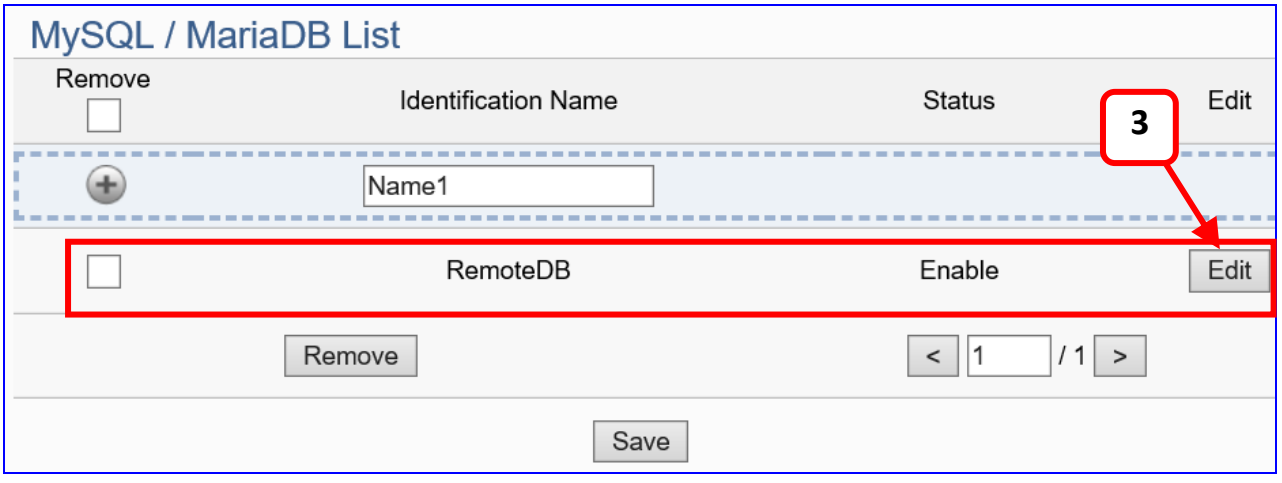



Click the next step, and enter the **Step 3 [MySQL/MariaDB Connection Setting]** of the UI setting. This page is for setting the connecting remote database.

We select the “Modbus TCP / Remote Database” at the beginning, so this step will auto enter the [**Advanced Setting > Data Logger > MySQL / MariaDB**] Setting. The “Step Box” will prevent the user from selecting the wrong platform.




Add a database identification name (Ex: RemoteDB) as below, and then click [**Edit**] button to enter the “MySQL / MariaDB Content Setting” page.

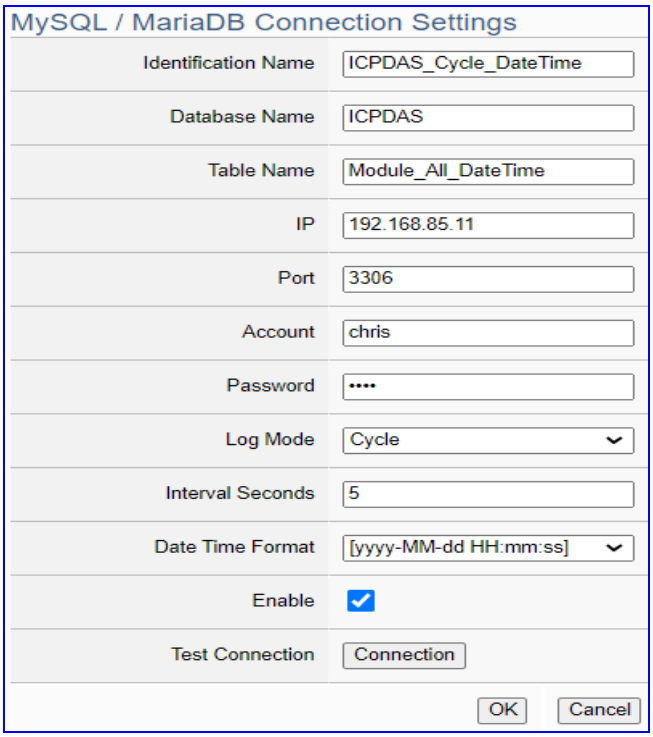



If set up a wrong module, user can click the box in the left side of the module number and click the [Remove] button to delete the module.



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[**MySQL / MariaDB Content Setting**] can set up the database relational setting.

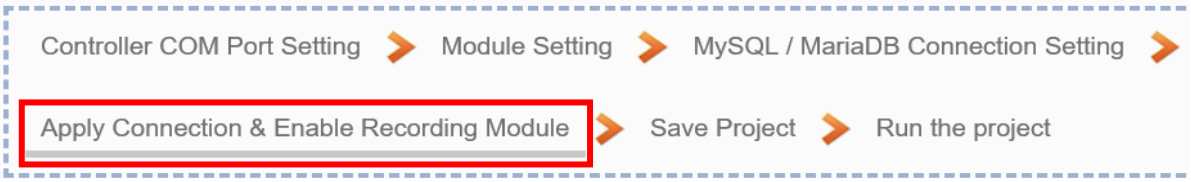



| **Advanced Setting > Data Logger > MySQL/MariaDB – Content Settings** | |
|---|---|
| Identification Name | User defined name to identify the database. |
| Database Name | The name of the remote database. If it does not exist, it will add a new database with this name. |
| Table Name | The table name of the remote database. If it does not exist, it will add a new table with this name. |
| IP | The Server IP and name of the remote database. |
| Port | The port to connect with database. Default: 3306 (for MySQL/MariaDB) |
| Account | The login name of the remote database. |
| Password | The login password of the remote database. |
| Log Mode | **Cycle**: Record one log data at the interval time set below.<br>**Data Change**: Only record when the data has changed. |
| Interval Seconds | Set up the interval time to save the I/O data to the remote database.<br>Unit: Second. |
| Date Time Format | Select to separate the date and time into two [Columns] or combine the date and time in one [Column]. |
| Enable | Check to enable the data logger to the remote database.<br>Default: check. |
| Test Connection | Click to test the connection to the remote database.<br>Result: Success or Failure. |
| OK / Cancel | Click “OK” to save the settings of this page.<br>Click “Cancel” to exit the setting page without saving. |



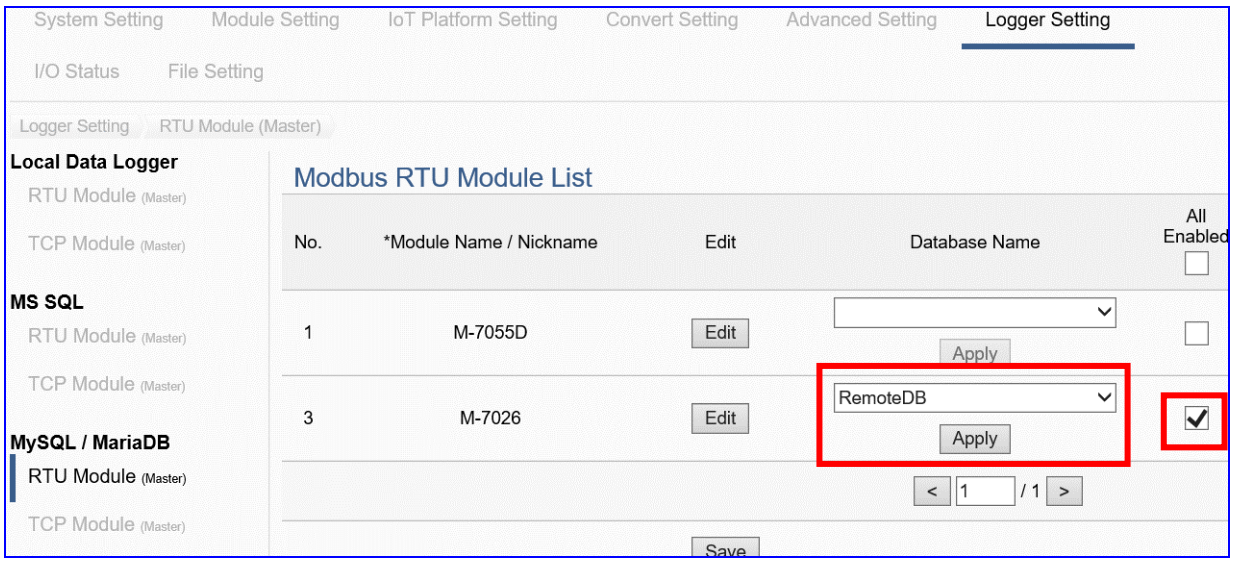
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## Step 4. Apply Connection & Enable Recording Module




Click the next step, and enter the **Step 4 [Apply Connection & Enable Recording Module]** UI setting. This step is to enable the Modbus RTU module and connection.
We select the "Modbus RTU /MySQL(MariaDB)" of "Data Log" at the beginning, so this step will auto enter the [**Logger Setting > MySQL/MariaDB > RTU Module (Master)**] setting page. The "Step Box" will prevent the user from selecting the wrong platform.

Here **select** and **apply** the Database name (Ex: RemoteDB), and **enable** the M-7026.



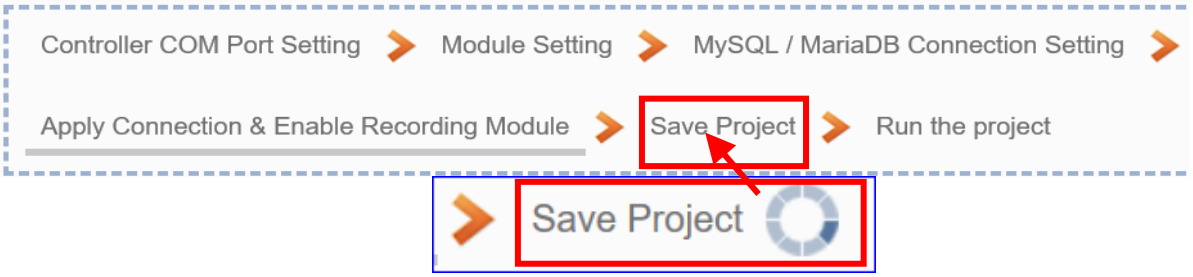

| Logger Setting > MySQL/MariaDB > RTU Module (Master) | |
|---|---|
| No. | The module number in the module list (Not editable here) |
| *Module Name / Nickname | The module name set in the module list (Not editable here) |
| Edit | If user wants to enable some I/O channels for data logger, click [Edit] of that module to enter the "Content Setting". It is normal to set all channels as enabled, and the function will not affect the unconnected channels. |
| Database Name | Select and apply the recording remote database name. |
| All Enabled | Check [All Enabled] box to enable all modules in list for data logger. Default: Uncheck. Check the "box" of each module can enable just that module for data logger. |
| < 1 / 1 > | The page number of the module list: Current page / Total pages. Click < or > to go to the previous or next page. |
| Save | Click to save the settings of this page. |



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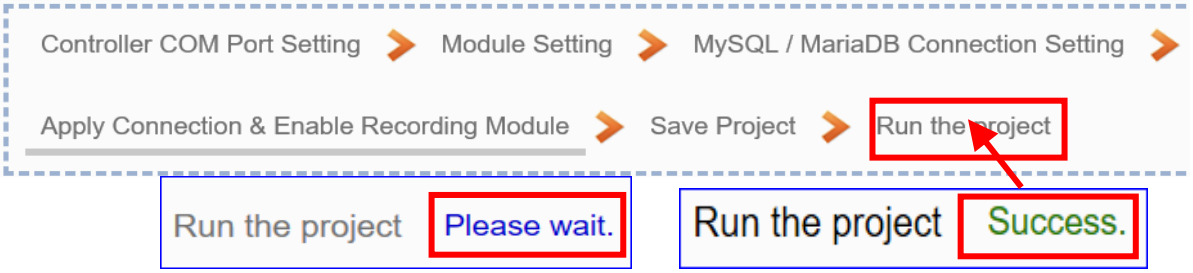
## Step 5. Save Project

The setting of this example is finished now. Click the next step **[Save Project],** the Step Box will show an animation as below picture, that means the project is saving. When the animation vanished, the project is saved completely.



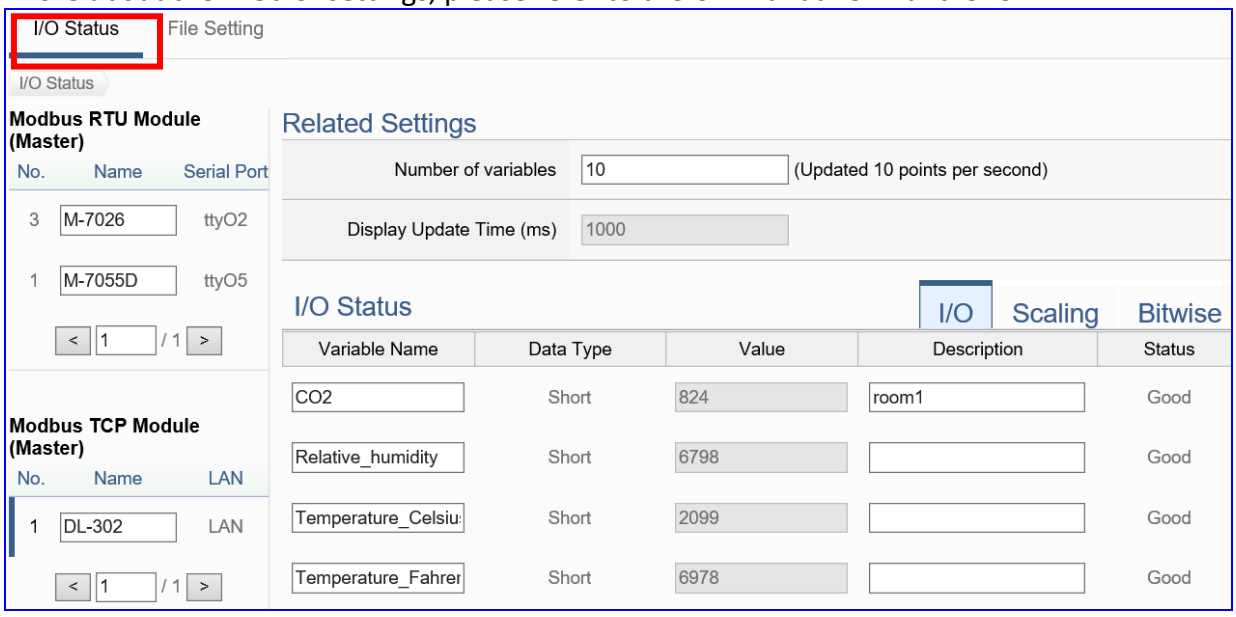

## Step 6. Run the Project

The project, after saving, needs to be executed. Click the next step **[Run the Project]**. This step can also via the [**System Setting** > **Controller Service Setting** > **Run Project**] to Stop and Run the project.




When the words "**Please wait**" disappears, the new words "**Success**" appears, that means the UA controller is running new project successfully. Then the Step Box will disappear automatically now, and back to the first screen view of the Web UI.

The new project now completes the setting, uploading and running in the UA controller and can process the new project communication. Users can see the I/O status from the menu [**I/O Status**]. For more about the Web UI settings, please refer to the UA Manual CH4 and CH5.






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- **MySQL/MariaDB Remote Database Example Descriptions:**

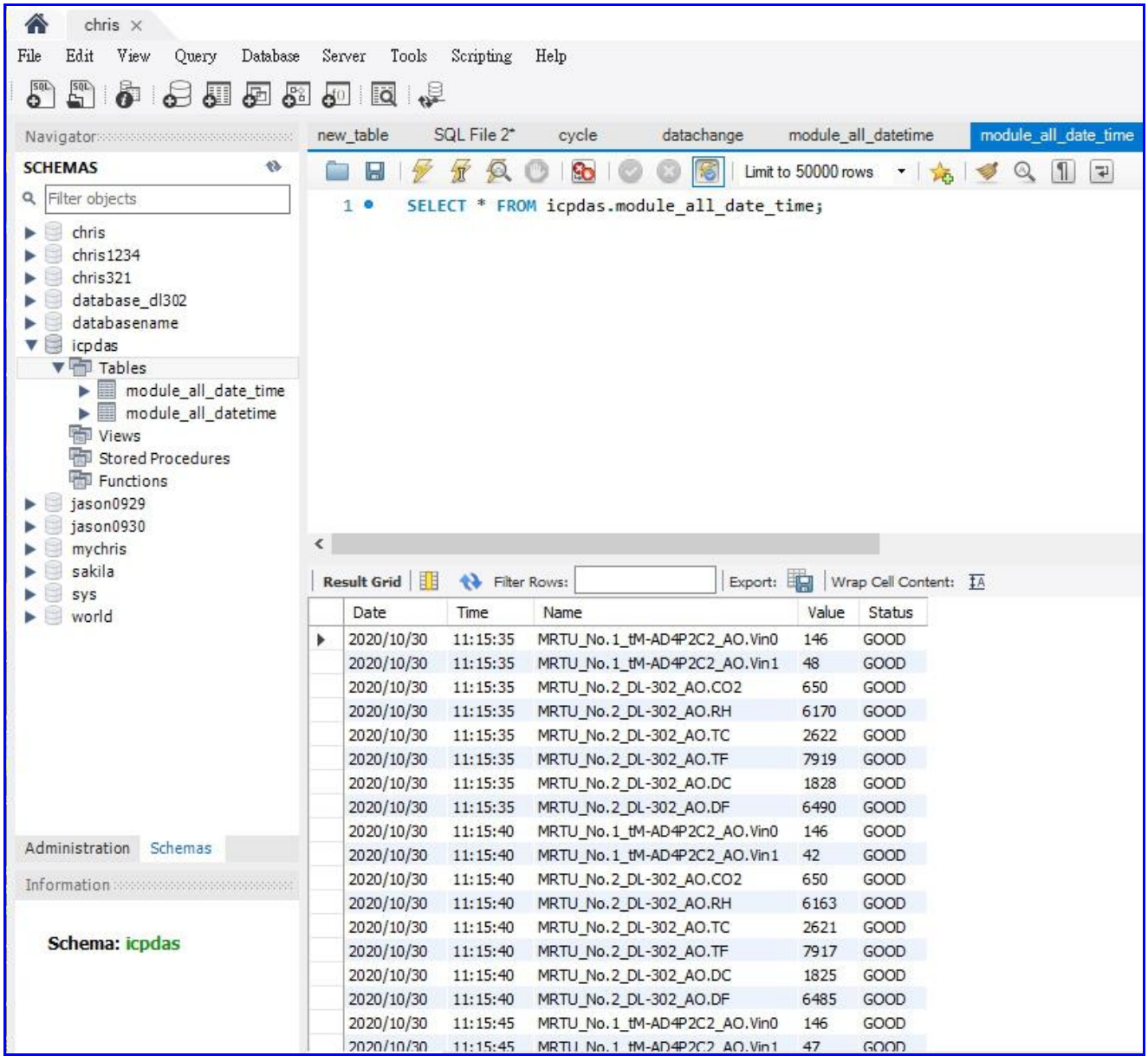
**Each tag data and status are recorded in each separate row, the row is added down for each interval, and the tag data is recorded in time sequence.**

For database operation, please refer to **FAQ-002 (MySQL)** of the **UA series FAQ list**:

FAQ-002_How to save the UA collected data into SQL and then show trend chart in InduSoft? (Take MySQL Installer 5.7.31 as an example)

The connection screen view of the **MySQL Remote Database**.

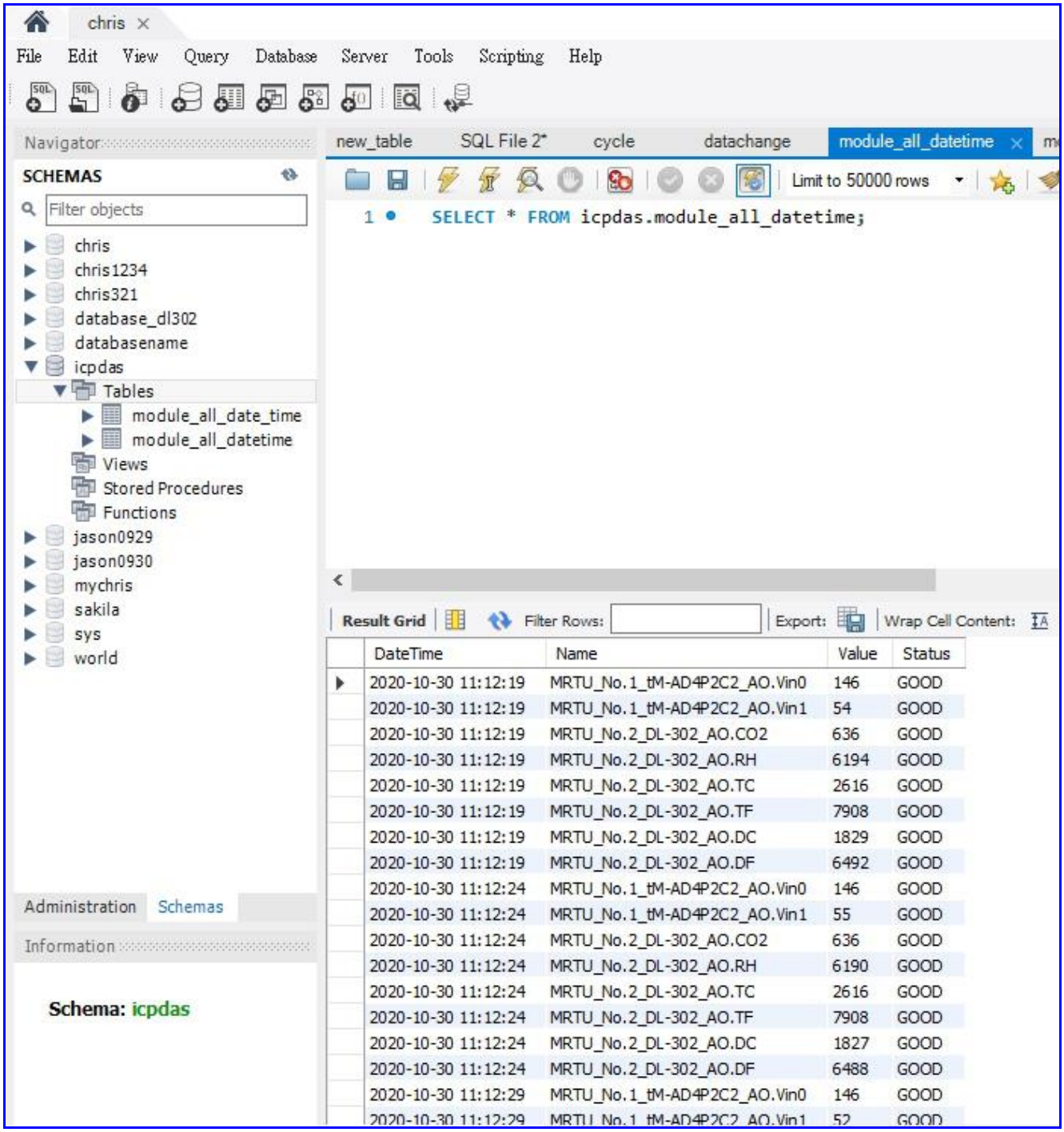
**1. MySQL database screen view: Date/Time column separated (reference)**






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**2. MySQL database screen view: Date/Time column combined (reference)**

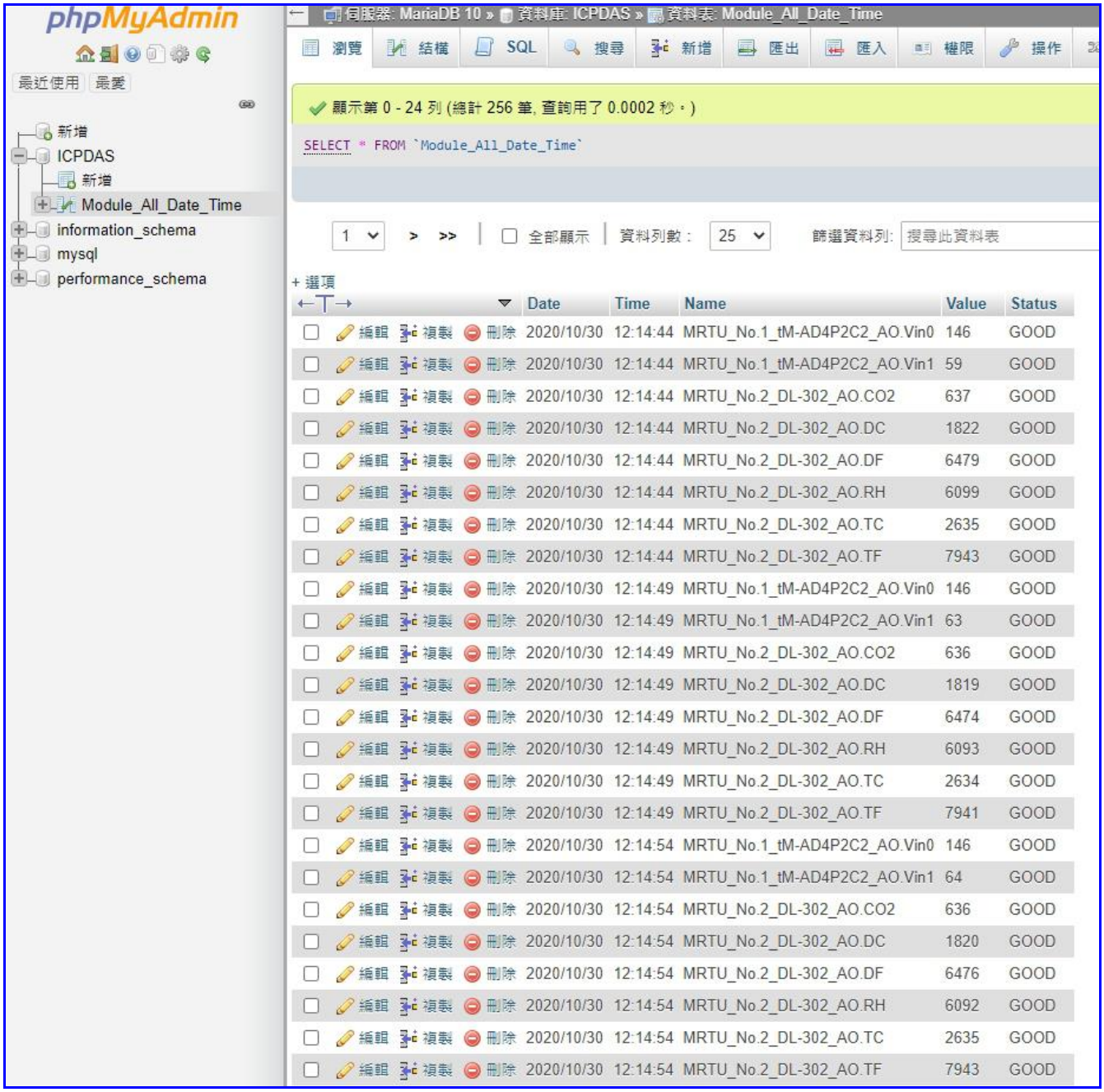





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The connection screen view of the **MariaDB Remote Database**.

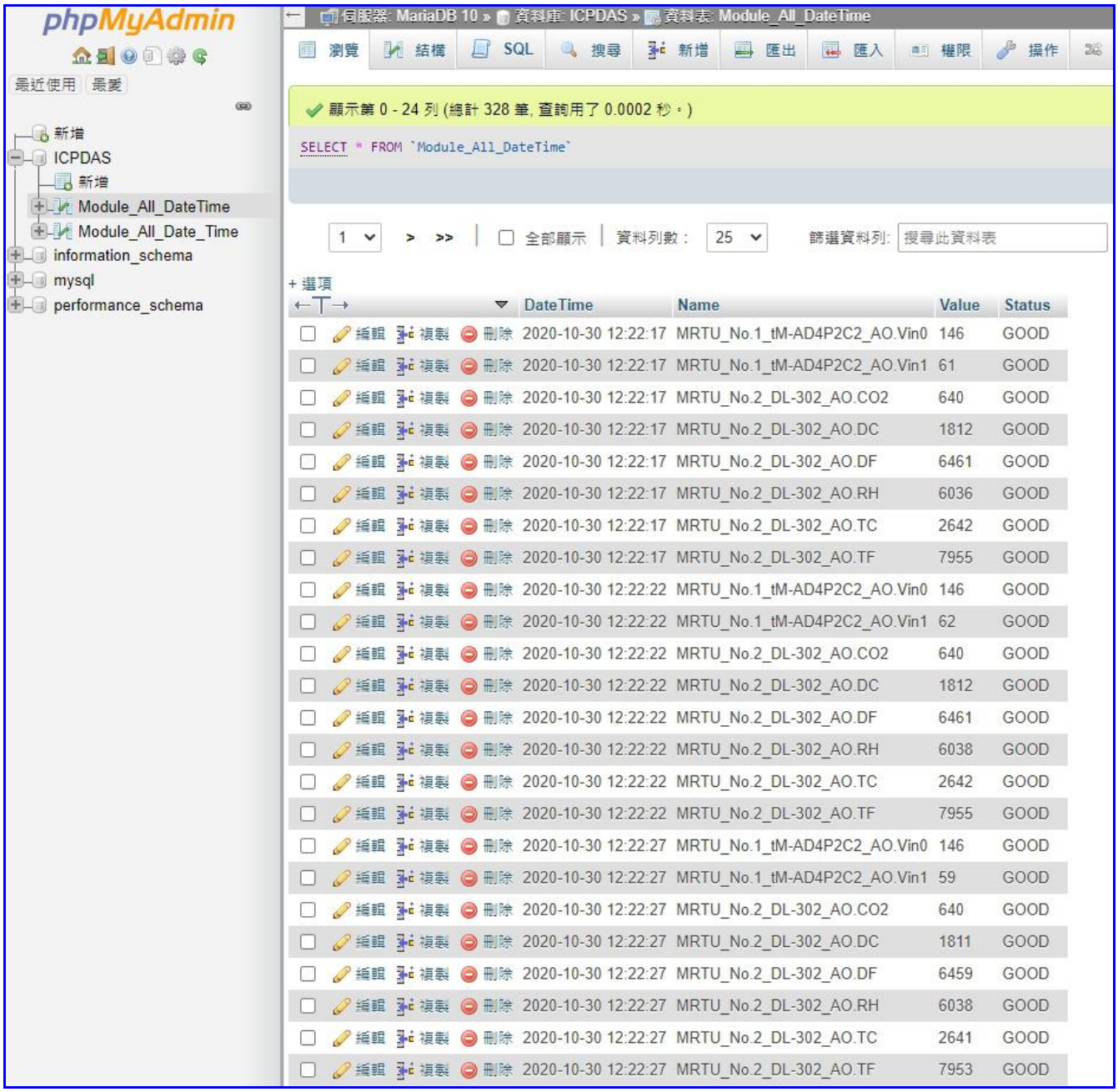
**1. MariaDB database screen view: Date/Time column separated (reference)**






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**2. MariaDB database screen view: Date/Time column combined (reference)**






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