

User Manual for ICP DAS IoTstar IoT Cloud Management Software

[Version 3.0.0 - 2021/10/18]



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Introduction

IoTstar is a software developed by ICP DAS for use in remote monitoring and management of the WISE / PMC / PMD controllers in a variety of Industrial IoT applications. IoTstar can be installed on a general PC platform and works as a Private Cloud management system of WISE / PMC / PMD controller, or on the VM (Virtual Machine) platform of Microsoft Azure, IBM Bluemix or Amazon AWS, etc. and works as a Public Cloud management system of WISE / PMC / PMD controller. In addition to provide the remote maintenance and firmware update services on WISE / PMC / PMD controllers, IoTstar also can collect the I/O channel data and power data from the I/O modules (or Sensor) and Power Meter connected to WISE / PMC / PMD, and import these data into the Database to provide the services such as status query and display on the automation control and monitoring system with Cloud environment.

With IoTstar, users can complete the system setting only by a few clicks on Web page, and perform the Remote Access Service (Status Monitoring, System Setting, and Firmware Update), Sensor Data Service (Sensor data collected and imported into Database), Bot Service (Query and monitor sensor data by mobile phone Bot service), Dashboard Service (Review sensor data through Dashboard interface) and Report Service (Provide statistical report for sensor data) operations for each WISE / PMC / PMD. Through the SQL database command, IoTstar can be quickly integrated with the Cloud platforms, data analysis tools (Power BI, Google Data Studio, etc.) or SCADA systems to help users quickly build the Cloud “IoT + Big Data” application and significantly reduce the time and cost of building the Cloud “IoT + Big Data” application.

Currently IoTstar supports the following ICP DAS IoT controllers.

- WISE-523x series, WISE-2x4x series
- PMC-5231 series, PMC-2x4x series
- PMD series

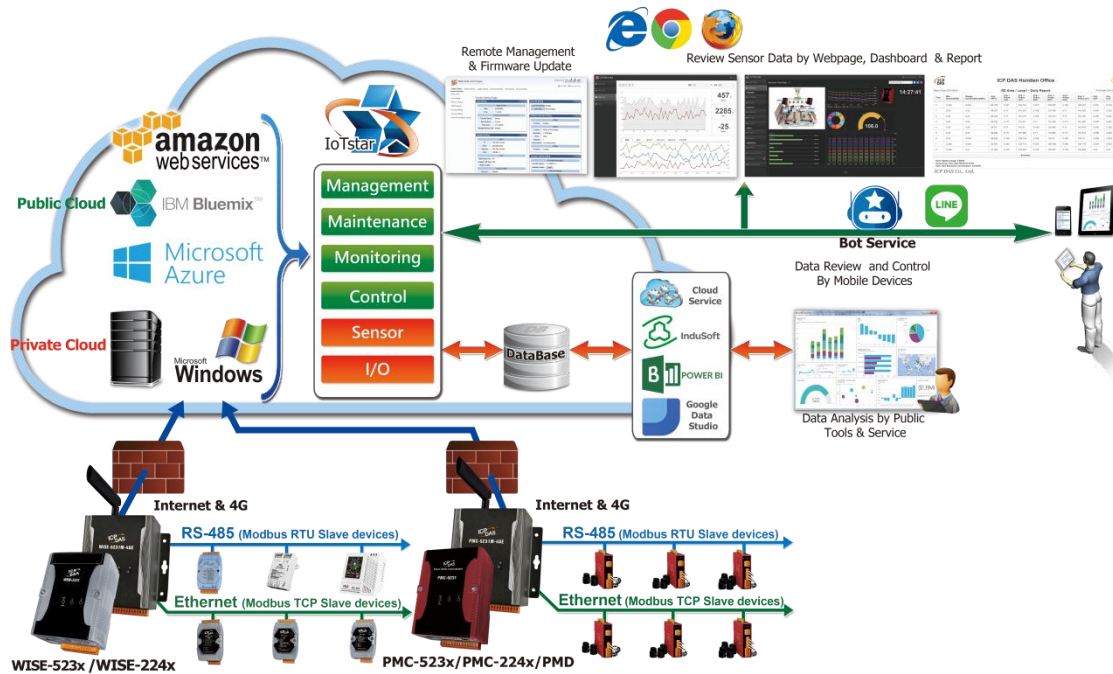


Figure 1-1 IoTstar System Architecture

The IoTstar system features are as below.

- Flexible installation environment supported to quickly set up IoT Cloud system
 - ✓ According to the needs of the field site, the installation environment can be flexibly selected.

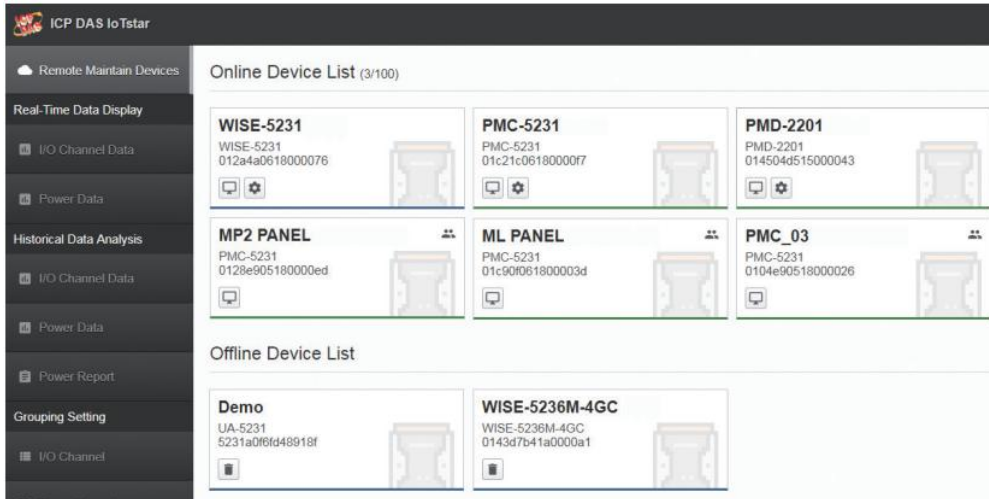
IoTstar can be installed on the VM (Virtual Machine) platform of the Public Cloud platform such as: Microsoft Azure, IBM Bluemix, Google Cloud or Amazon AWS to implement the Public IoT Cloud system on WISE/PMC/PMD controllers. It can reduce the loading for maintaining the IoT Cloud operating environment.



If the user concerns about the environment of the system operation or data storage, the IoTstar can also be installed on a private Windows PC (Windows 7/8/10, Windows Server) to implement the Private IoT Cloud solutions on the WISE/PMC/PMD controllers, and then the user can manage the environment by himself.

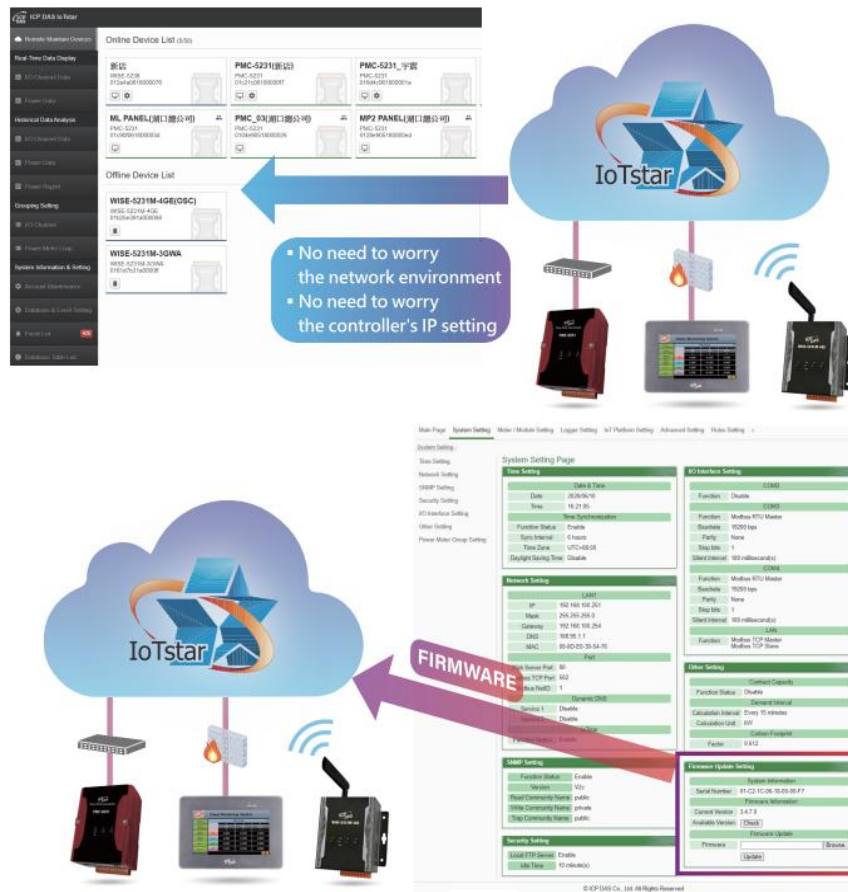


- ✓ No more programming! Using Browser to set up the IoT Cloud system
- It allows to perform Remote Maintenance service on WISE/PMC/PMD controllers, and provides the Database import, query and display services for the sensor data (and/or Power data) collected from the WISE/PMC/PMD controllers.



- Remote Access Service - Remote maintenance for Controllers

With IoTstar, users do not need to worry about the network environment of the WISE/PMC/PMD controller, regardless of whether the controller uses the static IP, dynamic IP, virtual IP or physical IP, user can perform the status monitoring, system setting adjusting, and update the firmware of the controllers through the web interface provided by IoTstar. It can reduce the time and cost of personnel travel due to performing the maintenance operations of controllers.



- Sensor Data Service - Collect sensor data and import data into database
 - ✓ Sensor data collection and import the data into the database at the cloud
- With IoTstar, the Sensor Data Service can be performed to collect the Historical and Real-Time sensor data (and/or Power data) from the WISE/PMC/PMD controllers, and import the data to the Database at the cloud. The users can quickly setup the Data Lake for the IoT and Big Data applications. The users can also modify the data in the database to change the status of the DO/AO channel of the sensor connected to controllers through the SQL command. **Please note: IoTstar currently support MS SQL.**

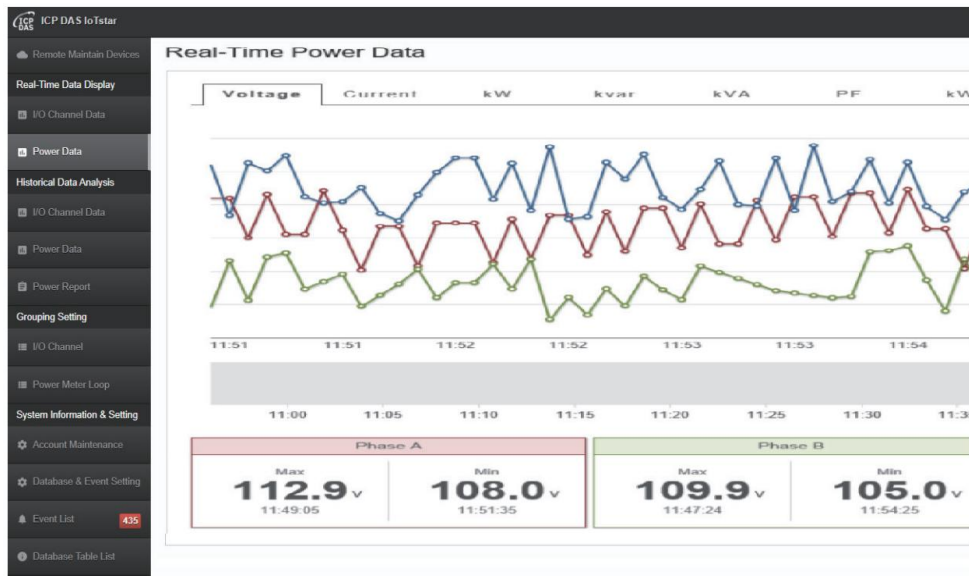


- ✓ Support SQL interface to speed up the integration of OT and IT systems
- With the support of SQL command interface, the sensor data stored by IoTstar can be connected easily with the third-party data analysis tools (such as: Power BI, Google Data Studio, SCADA and ERP/MES systems). It can assist user to integrate the OT(Operational Technology) and IT(Information Technology) systems quickly and seamlessly.



- Sensor Data Visualization Service

With the built-in standard web page of IoTstar, user can directly query and review the real-time or historical sensor data (and/or Power data) collected from the WISE/PMC/PMD controllers.



IoTstar also provides IoTstar Dashboard Service package. Through the Dashboard editor and a variety of Widget components provided by IoTstar Dashboard Service, user can quickly setup the Dashboard page for the Real-Time sensor data (and Power data) collected from the WISE/PMC/PMD controllers according to their needs to review the operation status of the application system in real time.

Please note: IoTstar Dashboard Service is an optional package for IoTstar.



- Bot Service - Interactive operation through mobile phone

IoTstar provides IoTstar Bot Service package for two-way message interactions between the WISE/PMC/PMD controller managed by IoTstar and LINE chat rooms. Users can query the real-time sensor data (and/or Power data) collected from the WISE/PMC/PMD controllers and be able to change the value of DO/AO output channels anytime and anywhere by LINE App. In addition, with the ICP DAS iCAM IP Camera, it can also receive the video recording events on the application site, so that the users can review the operating status of the equipment through their mobile phones even they are not close by. **Please note: IoTstar Bot Service (Supported LINE App) is a optional package for IoTstar.**



- **Sensor Data Report Service**

IoTstar features IoTstar Report Service which provides statistic report service for the sensors connected to WISE/PMC/PMD controllers. By using IoTstar Report Service, the data measured by the sensors can be converted into valuable statistical reports, so that the statistical reports of the operation status of the machines, equipment and facilities monitored by WISE/PMC/PMD controllers can be provided as the basis for making decisions, avoid biases and blind spots in decision-making, and be able to adjust the operation modes of the machines, equipment, and facilities to most appropriate to optimize the maximum benefit of system. **Please note: IoTstar Report Service is a optional package for IoTstar.**

Power meter loop report PMC-5231(Xindian office) / PM-4324-MTCP(Power meter of Area A) / Loop1(wall socket 1)

Day Week Month Quarter Year > Single Mode > Today 2021/10/08 > Data Shown > [Template Management](#) [Download PDF](#) [Download Excel](#)

Time	Max. Demand(kW)	Energy Consumption(kWh)	Avg. PF(%)	Avg. I Phase A(A)	Avg. V Phase A(V)	Avg. I Phase B(A)	Avg. V Phase B(V)	Avg. I Phase C(A)	Avg. V Phase C(V)	Avg. kVA	Avg. kvar
0	0.048	0.047	90.011	0.165	107.849	0.164	107.845	0.165	107.855	0.053	0.023
1	0.048	0.048	89.676	0.166	108.607	0.166	108.604	0.167	108.613	0.054	0.024
2	0.049	0.048	89.734	0.166	108.812	0.165	108.808	0.166	108.818	0.054	0.023
3	0.049	0.049	89.57	0.168	108.977	0.167	108.973	0.168	108.983	0.054	0.024
4	0.049	0.049	89.478	0.169	109.092	0.168	109.088	0.169	109.098	0.054	0.024
5	0.049	0.049	89.318	0.167	109.258	0.167	109.254	0.168	109.264	0.055	0.024
6	0.049	0.048	89.628	0.166	108.734	0.165	108.73	0.166	108.74	0.054	0.024
7	0.049	0.048	89.913	0.166	108.324	0.165	108.32	0.166	108.329	0.053	0.023
8	0.047	0.045	91.828	0.155	104.762	0.155	104.759	0.155	104.768	0.049	0.019
9	0.045	0.044	91.552	0.156	104.732	0.155	104.728	0.156	104.736	0.049	0.019
10	0.044	0.044	91.384	0.156	104.273	0.155	104.269	0.156	104.277	0.048	0.019
Summary											
Daily Highest Usage: 0.049kW Occurrence Time: 2021-10-08 05:23:00 Daily Total Electricity Consumption: 0.721kWh											

Optional Software package provided

- **IoTstar Bot Service (Supported LINE App)**

It is an optional software package for IoTstar that provides users two-way message interactions between the WISE / PMC / PMD controller managed by IoTstar and LINE chat rooms. IoTstar Bot Service provides an easier and more convenient mechanism for user to manage his/her remote controllers with LINE App. It does not like the traditional Chatbot which get the information or service by entering the text message; it provides a friendly user interface that includes buttons and dialogue menu to perform the monitoring of remote controllers in an easy way. With IoTstar Bot Service, users can query the real-time I/O Channel data (or power data) of the on-site I/O modules or power meters and be able to change the value of DO/AO output channels anytime and anywhere. IoTstar Bot Service also provides functions to receive, store, and query the event messages. The controllers can be triggered to send event messages to IoTstar Bot Service by IF-THEN-ELSE rules. After IoTstar Bot Service receive these event messages, it would process and send them to relative LINE users for real-time alarm

notification. In addition, IoTstar Bot Service also provides the function to store and query the historical received event messages for system operation analysis.

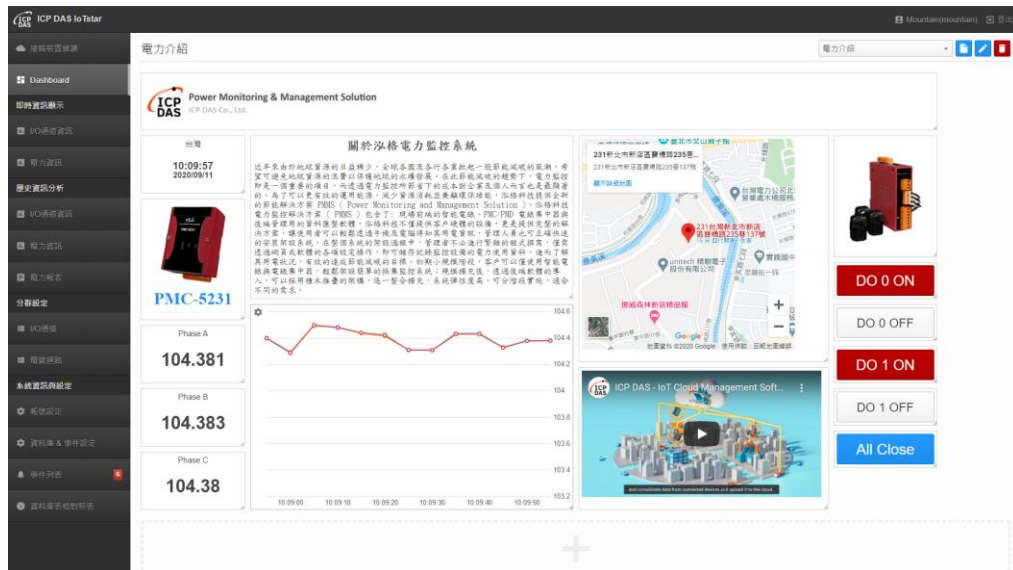


- **IoTstar Dashboard Service**

IoTstar Dashboard Service provides the Dashboard editor and a variety of Widget components. User can setup the Dashboard pages to review the Real-Time sensor data (and Power data) from the I/O modules (or Sensor) and Power Meter connected to WISE / PMC / PM controllers through the IoTstar Dashboard Service.

Following are the Widget components provided by IoTstar Dashboard Service and the examples of Dashboard built by IoTstar Dashboard Service.





● IoTstar Report Service

IoTstar Report Service provide users the statistic report service for the sensors connected to WISE/PMC/PMD controller. The main features are as follows:

- Provide a variety types of statistical reports for sensors and power meters.
- In addition to the report for single I/O channel (or power meter loop), it also provides the report for group of I/O channels (or power meter loops).
- Support the query of the "Daily/Weekly/Monthly/Quarterly/Yearly" statistical report with customized date.
- Provide data comparison function for comparing values of I/O channel (or power meter loop).

- Built-in editor for users to flexibly edit the report content (header and footer) to create desired report format.
- PDF & Excel file format supported for report output.

The following is the examples of the function provide by IoTstar Report Service:

➤ Report for "Power Meter Loop"

Power meter loop report PMC-5231(Xindian office) / PM-4324-MTCP(Power meter of Area A) / Loop1(wall socket 1)

Day Week Month Quarter Year > Single Mode > Today 2021/10/08 > Data Shown > [Template Management](#) [Download PDF](#) [Download Excel](#)

Time	Max. Demand(kW)	Energy Consumption(kWh)	Avg. PF(%)	Avg. I Phase A(A)	Avg. V Phase A(V)	Avg. I Phase B(A)	Avg. V Phase B(V)	Avg. I Phase C(A)	Avg. V Phase C(V)	Avg. kVA	Avg. kvar
0	0.048	0.047	90.011	0.165	107.849	0.164	107.845	0.165	107.855	0.053	0.023
1	0.048	0.048	89.676	0.166	108.607	0.166	108.604	0.167	108.613	0.054	0.024
2	0.049	0.048	89.734	0.166	108.812	0.165	108.808	0.166	108.818	0.054	0.023
3	0.049	0.049	89.57	0.168	108.977	0.167	108.973	0.168	108.983	0.054	0.024
4	0.049	0.049	89.478	0.169	109.092	0.168	109.088	0.169	109.098	0.054	0.024
5	0.049	0.049	89.318	0.167	109.258	0.167	109.254	0.168	109.264	0.055	0.024
6	0.049	0.048	89.628	0.166	108.734	0.165	108.73	0.166	108.74	0.054	0.024
7	0.049	0.048	89.913	0.166	108.324	0.165	108.32	0.166	108.329	0.053	0.023
8	0.047	0.045	91.828	0.155	104.762	0.155	104.759	0.155	104.768	0.049	0.019
9	0.045	0.044	91.552	0.156	104.732	0.155	104.728	0.156	104.736	0.049	0.019
10	0.044	0.044	91.384	0.156	104.273	0.155	104.269	0.156	104.277	0.048	0.019
Summary											
Daily Highest Usage: 0.049kW Occurrence Time: 2021-10-08 05:23:00 Daily Total Electricity Consumption: 0.721kWh											

➤ Report for "Power Meter Loop Group (Loop Comparison mode)"

Power meter loop group report PM Group

Day Week Month Quarter Year > Custom Date 2021/09/29 > Loop Comparison > Avg. V > [Template Management](#) [Download PDF](#) [Download Excel](#)

Time	Xindian office Power meter of Area B Loop1	Xindian office Power meter of Area A Loop2	Xindian office Power meter of Area A Loop3	Xindian office Power meter of Area A Loop5	Xindian office Power meter of Area A Loop6	Xindian office Power meter of Area A Loop7
0	109.437	109.394	109.392	109.411	109.402	109.397
1	110.25	110.207	110.204	110.223	110.212	110.209
2	110.325	110.282	110.278	110.297	110.287	110.283
3	110.495	110.454	110.45	110.469	110.459	110.456
4	110.456	110.414	110.409	110.429	110.418	110.416
5	110.417	110.372	110.37	110.389	110.378	110.373
6	109.78	109.737	109.734	109.753	109.743	109.739
7	108.815	108.775	108.771	108.791	108.781	108.779
8	105.546	105.504	105.5	105.516	105.508	105.506
9	104.663	104.625	104.62	104.635	104.627	104.627
10	104.432	104.394	104.388	104.403	104.397	104.396
Summary						
Daily electricity consumption of each loop	0	0	0	0	0	1.149
Daily Total Electricity Consumption	1.149					

➤ Report for "I/O Channel"

I/O Channel report PMC-5231(Xindian office) / DL-1023(Air quality for factory) / A11(CO2)

Day Week Month Quarter Year > Single Mode > Today 2021/10/08 > Data Shown > [Template Management](#) [Download PDF](#) [Download Excel](#)

Time	Maximum(ppm)	Minimum(ppm)	Average(ppm)	Final Value(ppm)	Total Value(ppm)
0	528	518	522.9	520	31374
1	524	519	521.266	520	31276
2	521	513	517.266	513	31036
3	517	508	512.433	508	30746
4	510	505	508.116	507	30487
5	510	504	506.866	504	30412
6	507	501	504.266	504	30256
7	509	500	504.55	509	30273
8	542	510	526.633	542	31598
9	622	540	583.466	622	35008
10	644	618	630.95	644	37857
Summary					
Daily maximum: 681 ppm Time of maximum daily value occurs: 2021-10-08 14:45:00		Daily minimum: 500 ppm Time of minimum daily value occurs: 2021-10-08 07:27:00		Daily average: 569.338 ppm Daily total value: 530052 ppm	

➤ Report "Template Management (Editing for Report header and footer)"

Template Management

ICP DAS 2 📄 ⚙️ 📄 🗑️

Header

Arial 15px A 🔍 B I U ↺

ICP DAS Hsintien Office

POWERED BY TINY

Footer

Arial 15px A 🔍 B I U ↺

ICP DAS Co., Ltd.

POWERED BY TINY

OK
Cancel

➤ Report download (PDF file format)



ICP DAS Hsintien Office



Report Date:2021/09/29

Hsintien Office / RD Area / Loop1 - Daily Report

Print Date:2021/09/29

Time	Max. Demand(kW)	Energy Consumption(kWh)	Avg. PF(%)	Avg. I Phase A(A)	Avg. V Phase A(V)	Avg. I Phase B(A)	Avg. V Phase B(V)	Avg. I Phase C(A)	Avg. V Phase C(V)	Avg. kVA	Avg. kvar
0	0.049	0.049	89.708	0.167	109.391	0.167	109.387	0.168	109.397	0.055	0.024
1	0.05	0.05	89.397	0.17	110.203	0.169	110.199	0.17	110.209	0.056	0.025
2	0.05	0.05	89.244	0.17	110.278	0.169	110.274	0.17	110.284	0.056	0.025
3	0.05	0.05	89.196	0.171	110.45	0.17	110.446	0.171	110.456	0.056	0.025
4	0.05	0.05	89.23	0.17	110.41	0.169	110.406	0.17	110.416	0.056	0.025
5	0.05	0.05	89.206	0.171	110.368	0.17	110.364	0.171	110.374	0.056	0.025
6	0.05	0.049	89.642	0.168	109.734	0.168	109.73	0.168	109.74	0.055	0.024
7	0.049	0.048	90.087	0.166	108.772	0.165	108.768	0.166	108.778	0.054	0.023
8	0.048	0.045	91.459	0.158	105.502	0.157	105.498	0.158	105.507	0.049	0.02
9	0.044	0.044	91.354	0.155	104.622	0.154	104.618	0.155	104.627	0.048	0.019
10	0.044	0.037	91.19	0.156	104.417	0.155	104.413	0.156	104.422	0.048	0.02
Summary											
Daily Highest Usage: 0.05kW Occurrence Time: 2021-09-29 03:18:00 Daily Total Electricity Consumption: 0.527kWh											

ICP DAS Co., Ltd.

The following is the function comparison table of different versions of IoTstar.

Version (*1)	Standard Function			Optional package (*2)		
	Remote Access Service	Sensor Data Service	Performance Optimization	Bot Service	Dashboard Service	Report Service
v1.x	Yes	Yes	—	—	—	—
v2.x	Yes	Yes	Yes	Yes	Yes	—
v3.0	Yes	Yes	Yes	Yes	Yes	Yes
Note 1 : IoTstar provides free upgrade from v1.x/2.x to v3.0. Support WISE-523x/WISE-2x4x series (with v1.5.1 or later version firmware) and PMC-523x/PMC-2x4x/PMD series (with v3.4.7 or later version firmware). Note 2 : "Bot Service" requires the purchase of IoTstar Bot Service (supporting LINE App) package.						

	<p>"Dashboard Service" requires the purchase of IoTstar Dashboard Service package.</p> <p>"Report Service" requires the purchase of IoTstar Report Service package.</p> <p>***The above packages all provide "30 days free trial" service.</p>
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2 Install IoTstar

IoTstar can be installed on Windows 7 / 8 / 10 or Windows Server OS system. It also need to work with the IIS Web Server and MS SQL database system. The following is the suggested system requirements for IoTstar.

Item	Specification Suggestions
CPU	64-bit (x64); 3.0 GHz or higher GHz Processor.
RAM & Hard Disk Space	<ul style="list-style-type: none">● Minimum 8 GB for RAM. Minimum 64GB for Hard Disk space.● As the number of controllers, the number of sensors, and the size of Database is increasing, please do not forget to increase the size of the RAM and Hard Disk space as needed to ensure the best performance of the system.
OS System	Windows 7, Windows 8, Windows 10, Windows Server 2012 or later OS system. (64-bit Windows required)
.NET Framework required	Microsoft .NET Framework 4.5 or later installed.
Notes	IoTstar needs to work with the IIS Web Server and MS SQL database system.

Please Note:

1. If user want to use IoTstar to perform remote monitoring and management of the front-end WISE / PMC / PMD controllers directly in the Intranet environment, please make sure the PC (or platform) to install the IoTstar on must be “Static IP” setting.
2. If user want to use IoTstar to perform remote monitoring and management of the front-end WISE / PMC / PMD controllers directly in the Internet environment, please make sure the PC (or platform) to install the IoTstar on must be with “Public Static

IP” or “Dynamic IP + DDNS” setting.

The following sections will describe the download, installation and setting procedures for IoTstar (Please Note: It is for IoTstar v2.1. About the installation of IoTstar v1.x ~ v2.0, please refer to [Installation Guide for IoTstar v1.x ~ v2.0](#)). In addition, it will also describe the settings of WISE / PMC / PMD controller for the connection with IoTstar.

2.1 Download IoTstar (Basic version)

Users can download IoTstar (Basic version) from IoTstar official website. Please follow the steps below:

- I. Go to IoTstar official website <http://iotstar.icpdas.com/en/index.php>, and click the “Download” button on the main page.



- II. On the “Download” page, click the “Free Download” button of “Basic version” section to enter the download page of IoTstar software (Basic version).

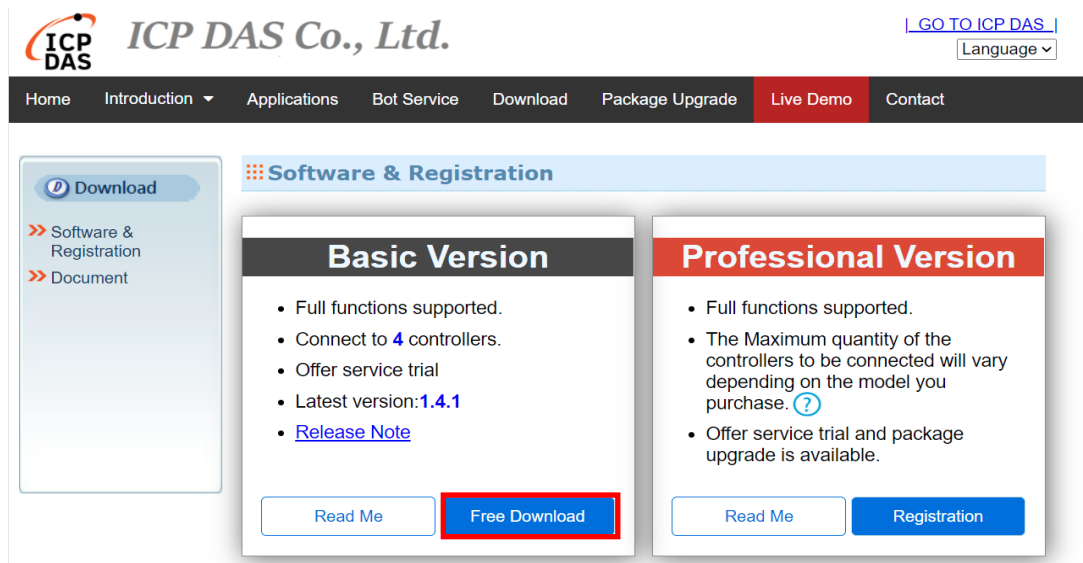


Figure 2-1 Download IoTstar (Basic version) (1)

III. On the download page of IoTstar (Basic version), enter the following information: “First Name”, “Last Name”, “Company”, “Country”, and “E-mail”, and then click the “Send Software Link” button. An email with the download link of IoTstar software (Basic version) would be sent to the email address account you entered.



Figure 2-2 Download IoTstar (Basic version) (2)

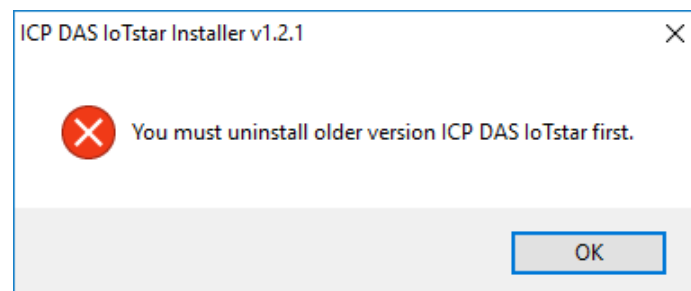
IV. Check your mailbox and find the email sent by IoTstar, and then download the IoTstar (Basic version) from the download link in the email.

Please note: The email sent by IoTstar may be found in the spam/trash folder of your mailbox according to different mail servers, Please also check the spam/trash folder of your mailbox if you does not find it in the Inbox folder.

2.2 Install IoTstar (Basic version)

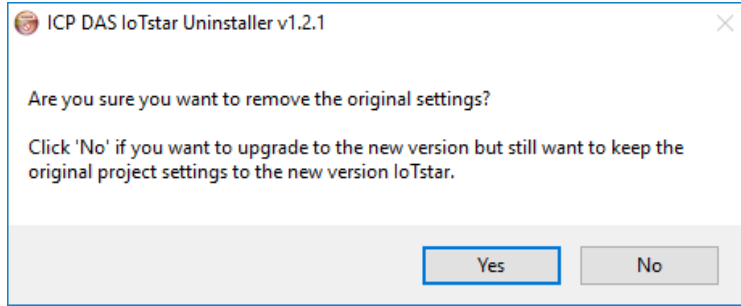
After download the installation file of IoTstar (Basic version), please refer to the following steps to install IoTstar software (Basic version).

- I. Click the installation file of IoTstar (Basic version).
- II. If you have installed IoTstar before, the Installer of IoTstar will pop up a message window for the notification of the un-installation of the old version IoTstar. Please click the “OK” button to start the un-installation process. After the un-installation, please click the installation file again to restart the installation operation.



III. The Installer of IoTstar will pop up a window to inform you to remove the project setting of the old version IoTstar, or not.

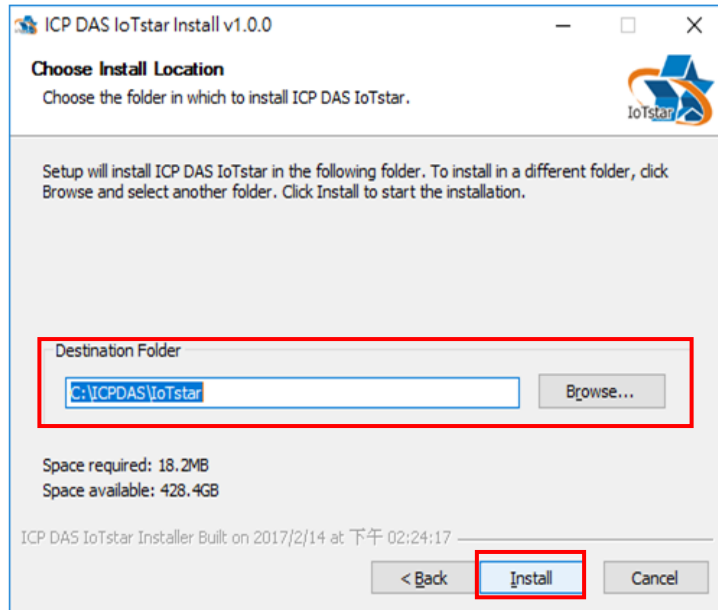
Please Note : Remember to click the “No” button, if you just want to upgrade to the new version IoTstar but still want to keep the original project settings for the new version IoTstar.



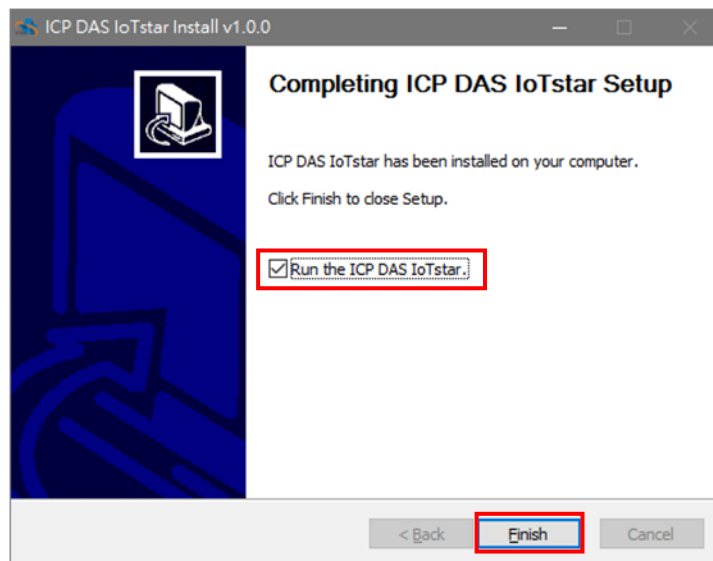
IV. Click the "Next" button.



V. In the "Destination Folder" field, enter the location which will be used to install IoTstar. Click "Install" to start the installation.



VI. When the installation is completed, check “Run the ICP DAS IoTstar.” and click the “Finish” button.



2.3 MS SQL Server Setting

I. Install MS SQL Server

The version of the Server used in the following example is SQL Server 2016 (Express Edition), the management tool is SQL Server Management Studio (16.5.1).

- SQL Server (Express Edition) can be downloaded at:

<https://www.microsoft.com/en-US/download/details.aspx?id=56840>

- Microsoft Server Management Studio can be downloaded at:

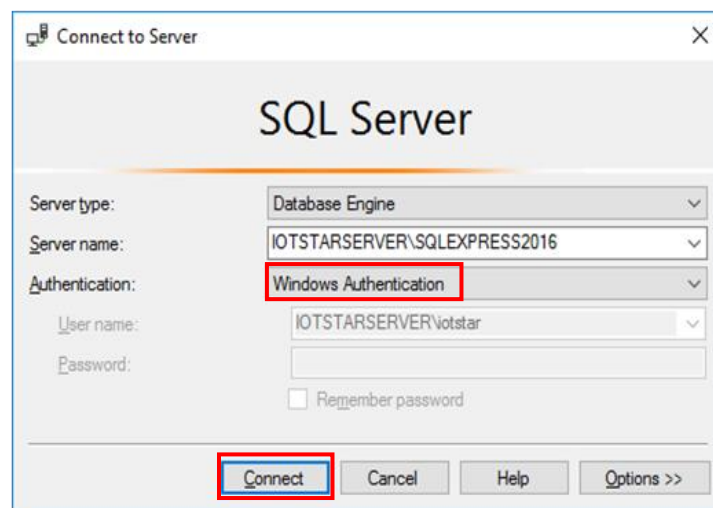
<https://msdn.microsoft.com/library/mt238290.aspx>

After download the two software tools, please also install both of them.

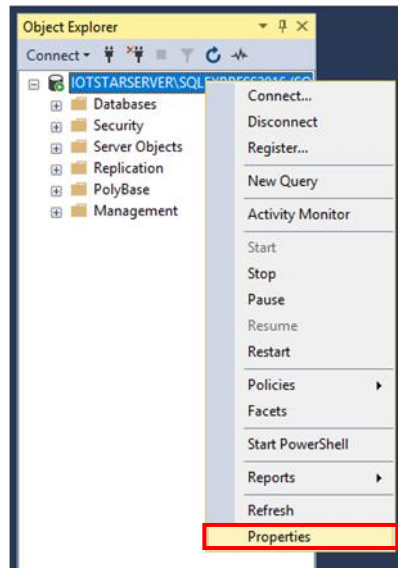
Please note: The system administrator account **sa** and its password will be used later when setup the database and perform connection operation. Please keep the password in a safe place. If the “Server Authentication” is not “SQL Server and Windows Authentication mode” after the installation, please refer to the following steps to enable the “SQL Server and Windows Authentication mode”.

II. Execute SQL Server Management Studio.

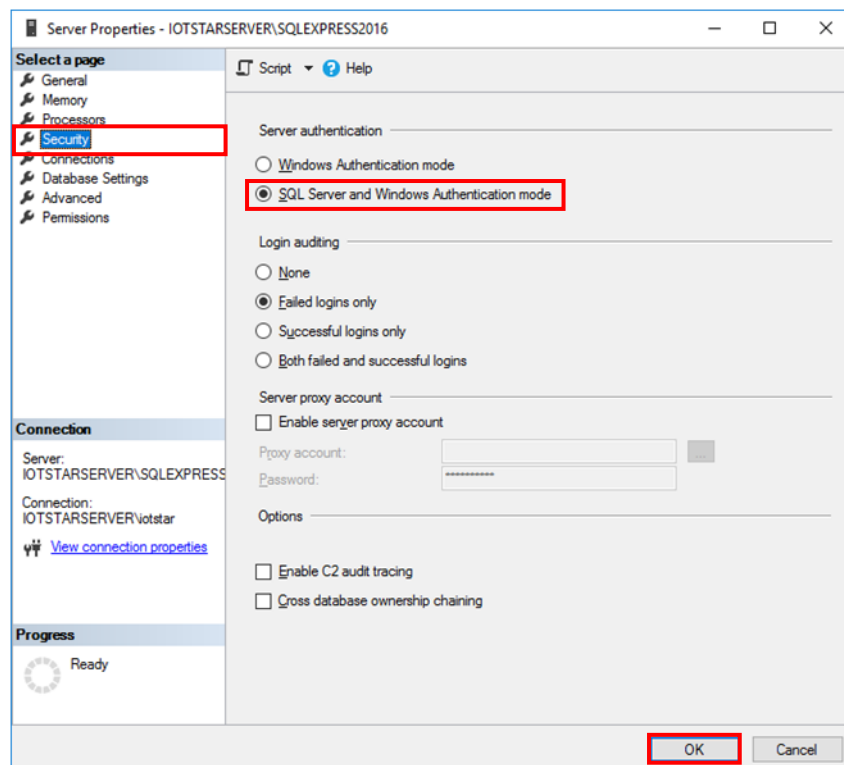
III. Login by selecting “Windows Authentication”; then click “Connect”.



IV. Right-click on the name of the database and select “Properties” to bring up the Properties window.

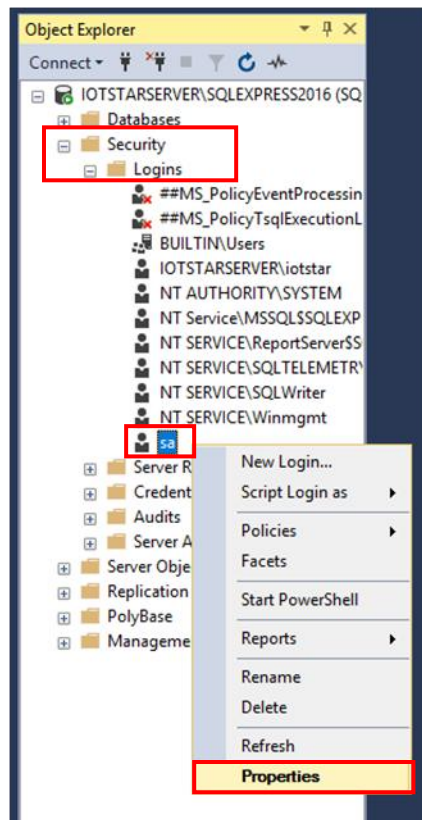


V. On the left side of the setup window, click the “Security” to open the “Security” page. Under the “Server authentication” section, select “SQL Server and Windows Authentication mode”. Click “OK” to complete the setting.



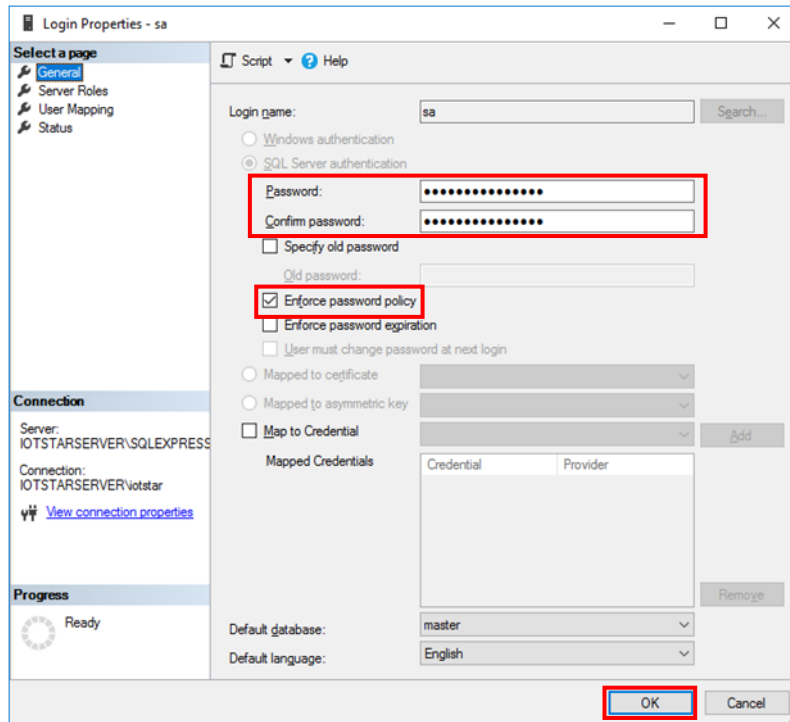
VI. Return to the main settings window, expand “Security” and “Logins”, find and

right click on the “sa” account, select “Properties” to bring up the Properties window.

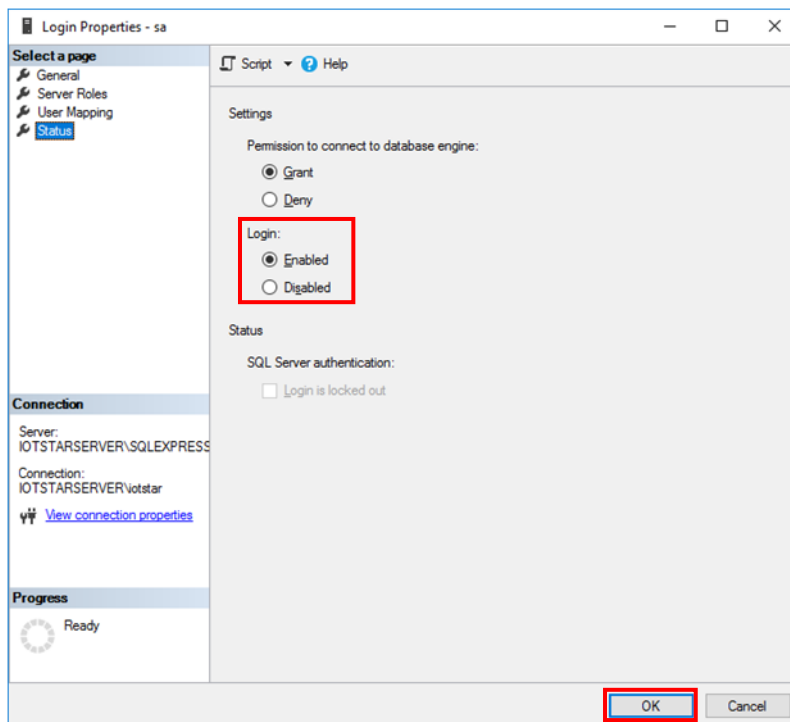


VII. Change the password on the “General” page and click “OK”.

Please note: If you check “Enforce password policy”, the system will perform the rigorous password verification policy for the new password setting. If the password you assign is too simple, the system will reject the new password setting.

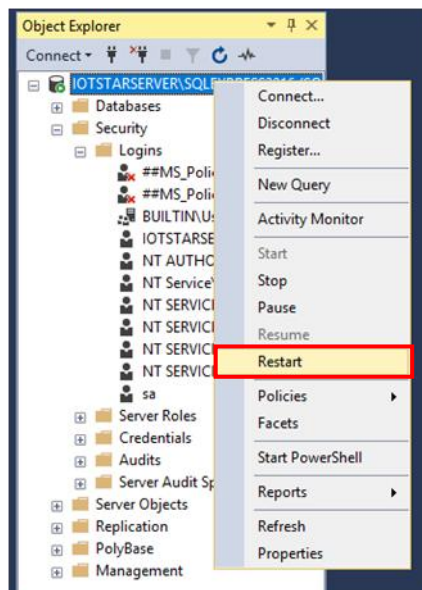


VIII. Switch to the “Status” page; select “Enabled” under the “Login” section, and click “OK”.

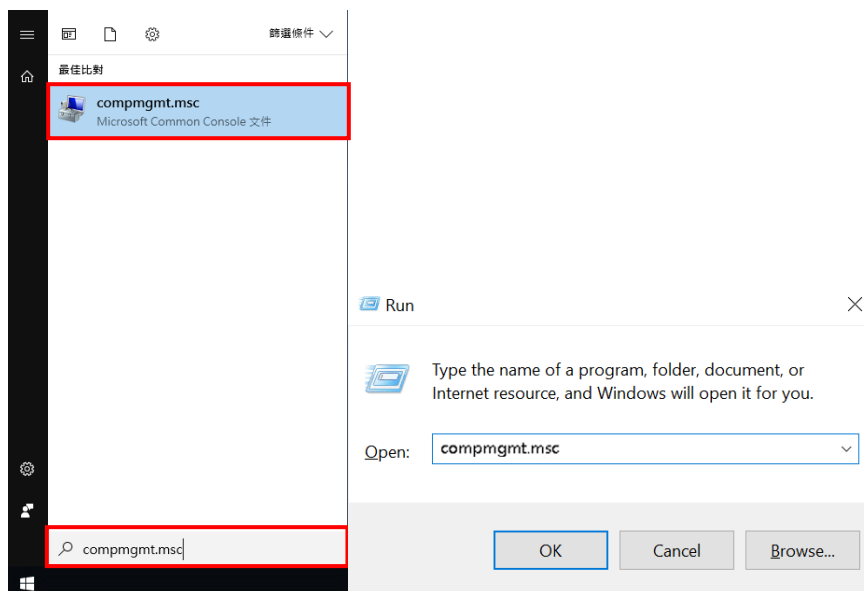


IX. Return to the main setting window and right click on the name of the main

database and select “Restart” to complete the settings of “SQL Server and Windows Authentication mode” for the SQL Server.

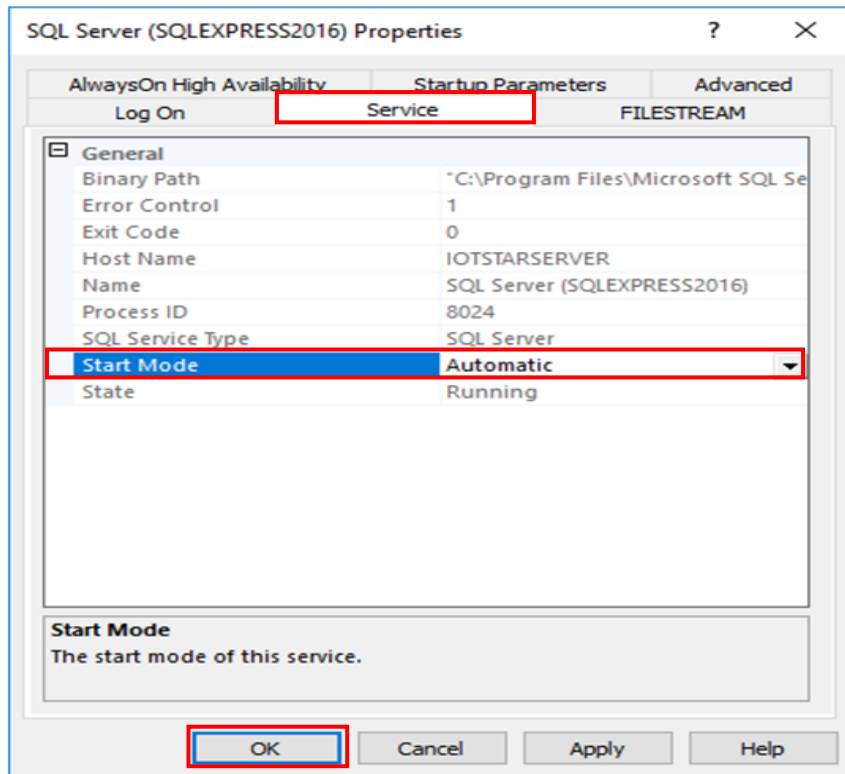
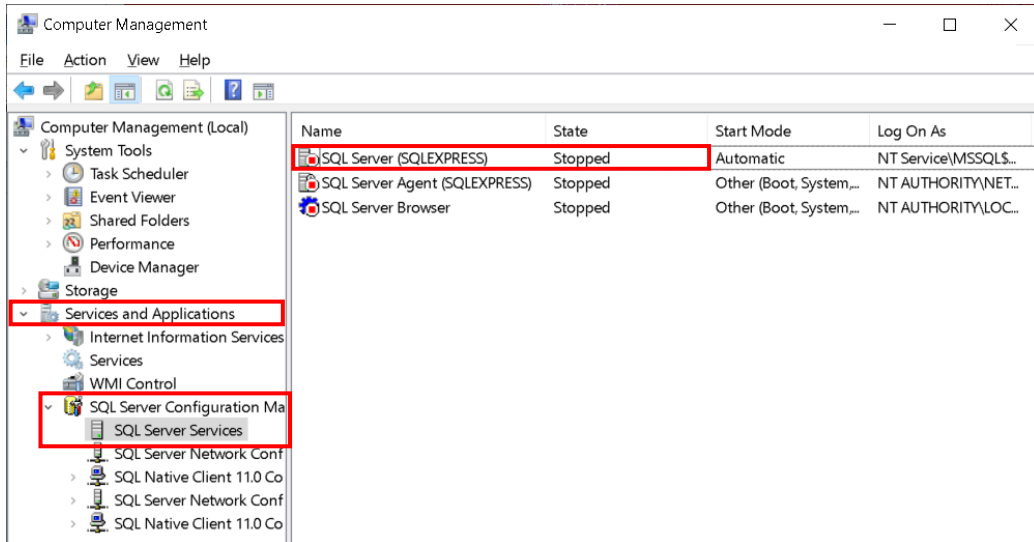


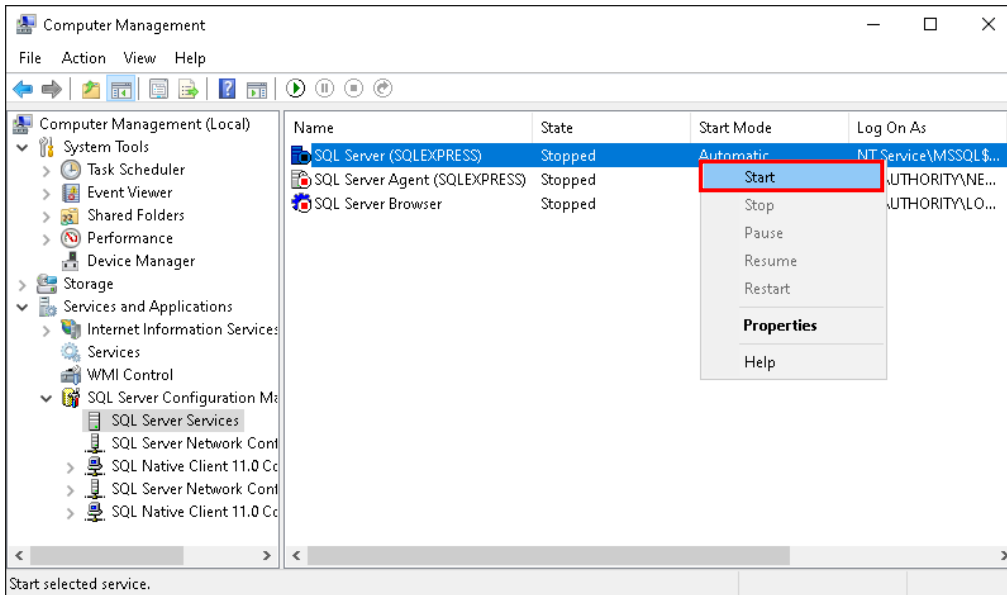
X. Click "Start" button, or press the "WIN key + R key" on the keyboard to open the "RUN" box, and enter “compmgmt.msc” to open the “Computer Management” window.



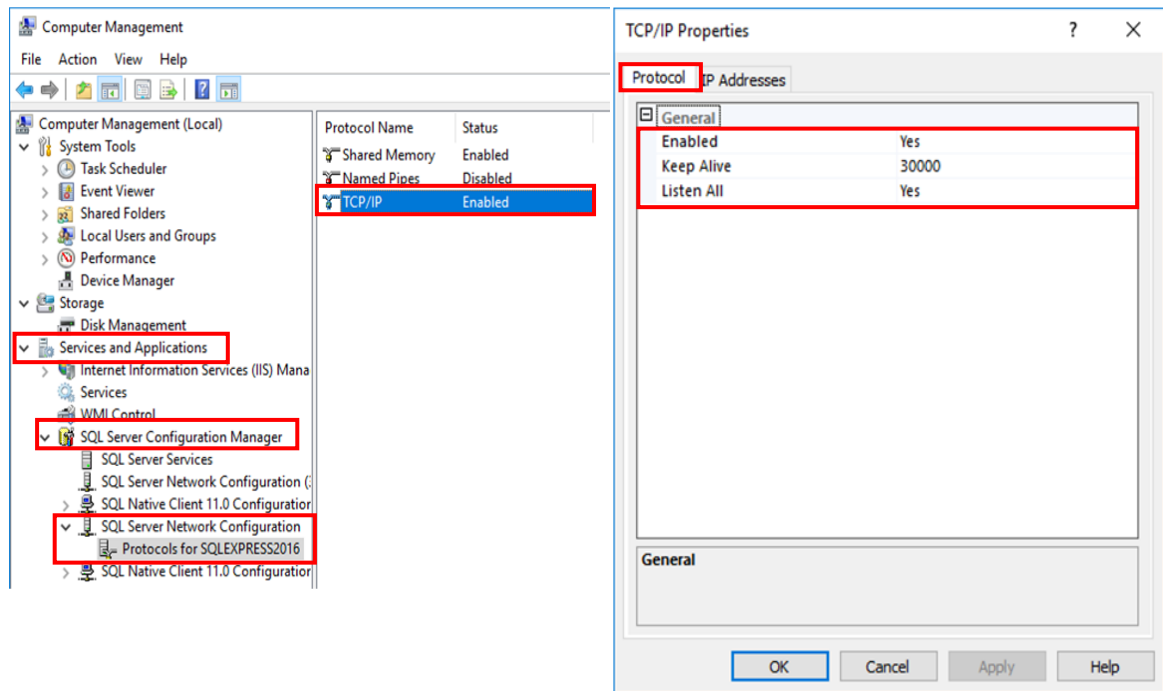
XI. In the left half of the “Computer Management” window, expand “Services and

Applications” and then find “SQL Server Configuration Manager” and expand the folder; select “SQL Server Services” and check if the “State” of SQL Server (SQLEXPRESS2016) is “Running” and the “Start Mode” is “Automatic” or not (In this example the name of the SQL Server name is “SQLEXPRESS2016”, this name will be used in the following sections). If it is not, please right click on the SQL Server (SQLEXPRESS2016) and select “Properties” to open the “Properties” window. In the pop-up window, select “Service” tab, change the “Start Mode” to “Automatic”, click “Apply” and click “OK”. After return to “SQL Server Services” page, right click on SQL Server (SQLEXPRESS2016) and select “Start”.

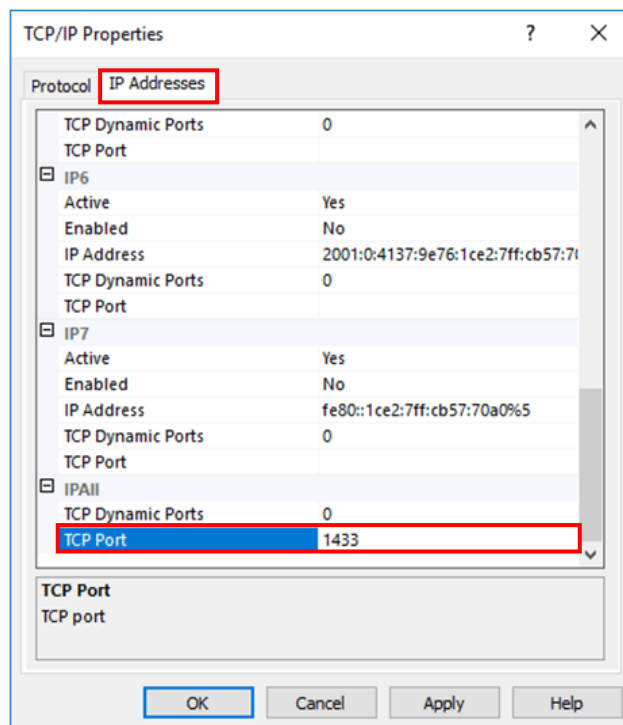




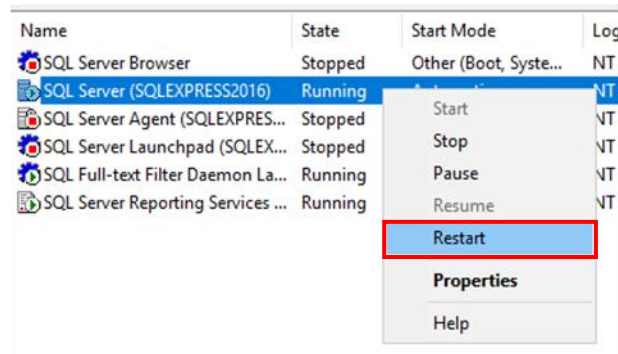
XII. In the left half of the “Computer Management” window, expand “Services and Applications” item and then find “SQL Server Configuration Manager” and expand the folder; select “SQL Server Network Configuration”; select “Protocols for SQLEXPRESS2016” to verify if the “TCP/IP” protocol is Enabled or not. If not, please right click on the TCP/IP to open the “TCP/IP Properties” window. In the pop-up window, select “Protocol” tab, change the “Enabled” to “Yes”, and click “Apply”.



XIII. Click on “IP Addresses” tab of the “TCP/IP Properties” window. Change the value of the “TCP Port” of the “IPAI” section to 1433, and then click “Apply” and “OK” to complete the settings.

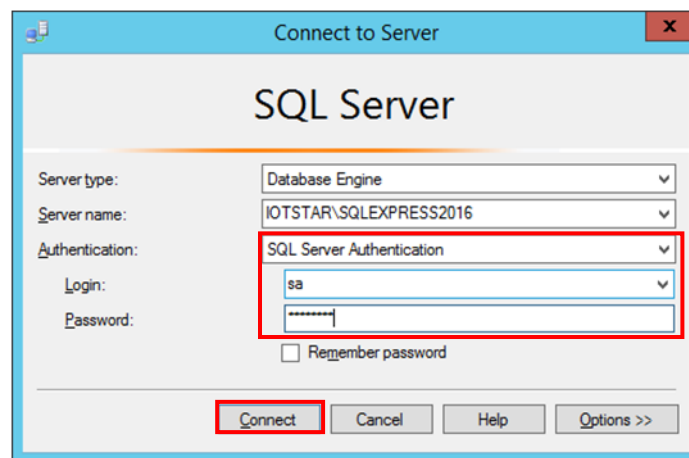


XIV. After return to “SQL Server Configuration Manager”, find “SQL Server services”, right click on the “SQL Server (SQLEXPRESS2016)” and select “Restart”.



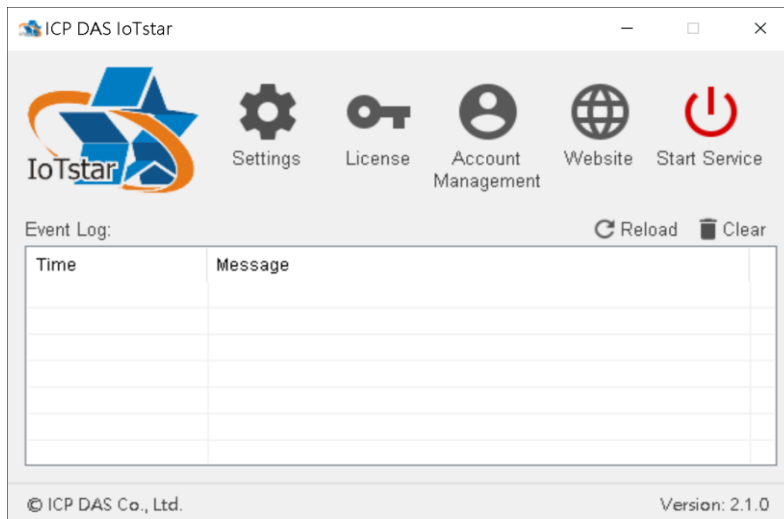
XV. Login by “SQL Server Authentication”

Select “SQL Server Authentication” for the Authentication field, enter “sa” as the login name, and input the password you previous set on the Login windows, then click “Connect” to check if you can login by using “SQL Server Authentication”.

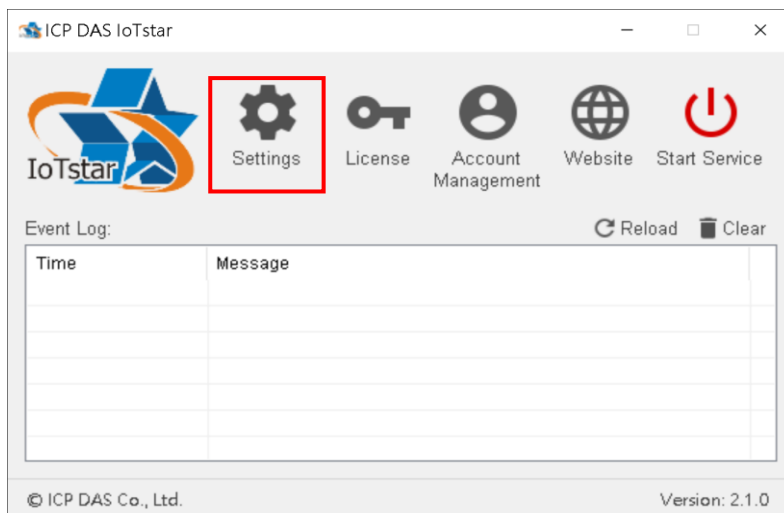


2.4 Initialization Setting of IoTstar

I. After complete the installation of IoTstar and the setting of MS SQL, you can launch IoTstar, and the “ICP DAS IoTstar” system interface will be shown to help to perform the initialization setting of IoTstar.

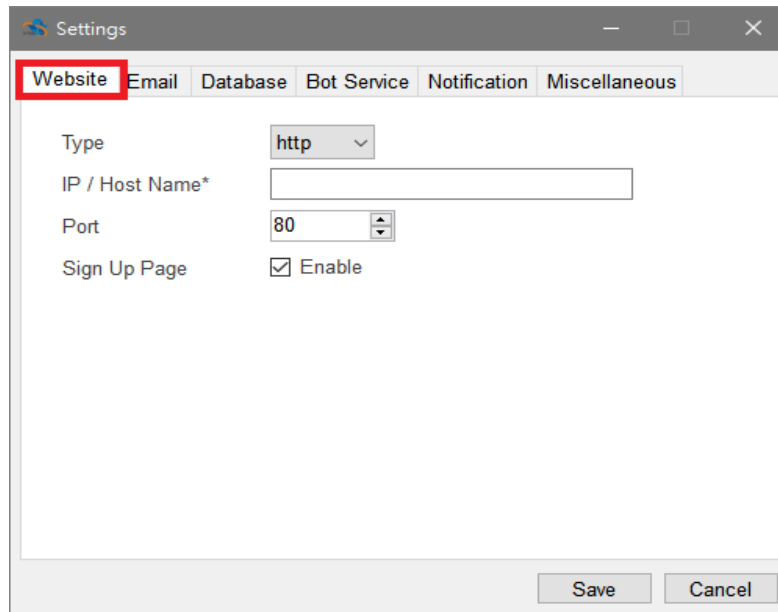


II. Click the “Settings” button on the “ICP DAS IoTstar” system interface.



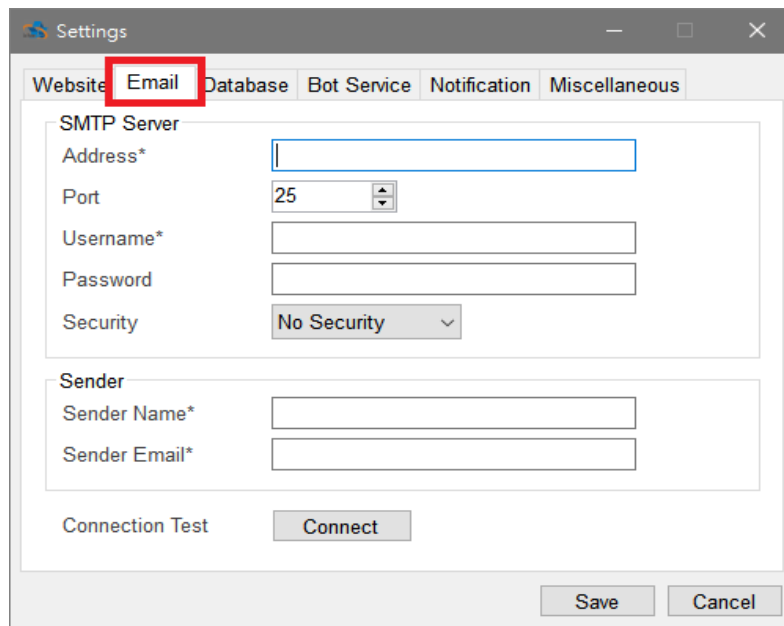
※ Please complete the following settings by the actual network environment of the hardware platform which IoTstar installed.

III. Complete the following settings in the “Website” tab of the “Settings” window:



- Type : Select the communication protocol used by the IoTstar.
- IP / Domain Name: Input the IP address or the domain name of the PC (or Platform) with IoTstar installed.
- Port : Input the port number which IoTstar will use.
- Sign Up Page: When administrator uncheck the “Enable” of the “Sign Up Page” field, the account creation function of IoTstar will be closed.

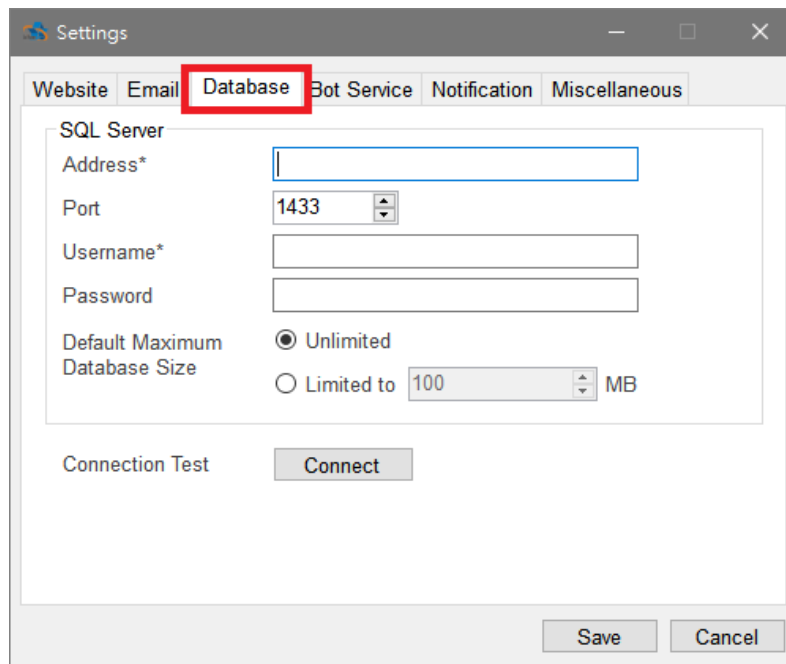
IV. Complete the SMTP server settings on the “Email” tab of the “Settings” window. After the user applying a login account of IoTstar, IoTstar will send an authentication Email to the user via the SMTP server. The user will then be able to follow the steps on the email to complete the authentication process and complete the registration of the IoTstar account.



- Address: Input the IP address or the domain name of the SMTP server.
- Port: Input the port number of the SMTP server. The default setting is 25.
- Username: Input the username of the SMTP server.
- Password: Input the password of the SMTP server.
- Security: Select the security setting to be “No Security”, “TLS”, or “SSL” from the dropdown list.
- Sender Name: Input the name of the sender.
- Sender Email: Input the email address of the sender.
- Connection Test: After complete the setting, you can click this button to test the setting.

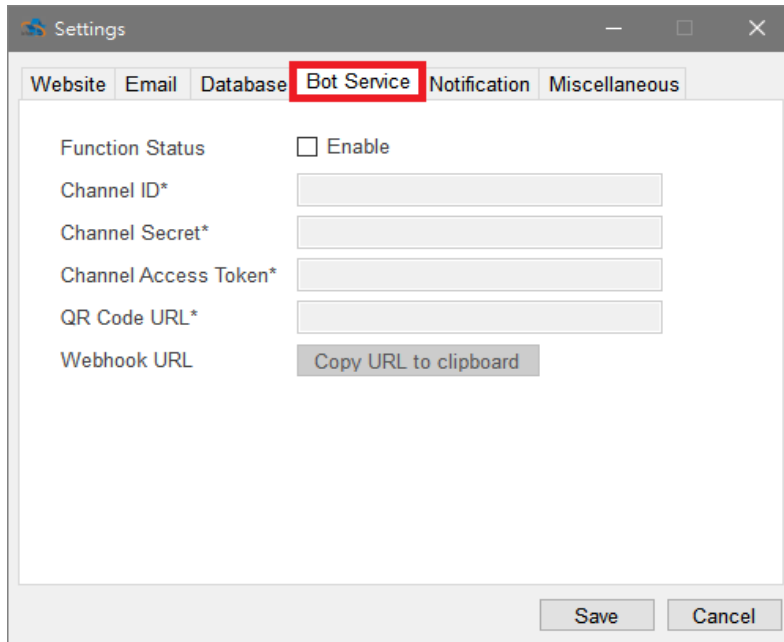
Please note: IoTstar would also send the notification emails to the administrator via this SMTP server when the special situation or abnormal event occurs.

V. Input the following settings in the “Database” tab of the “Settings” window:

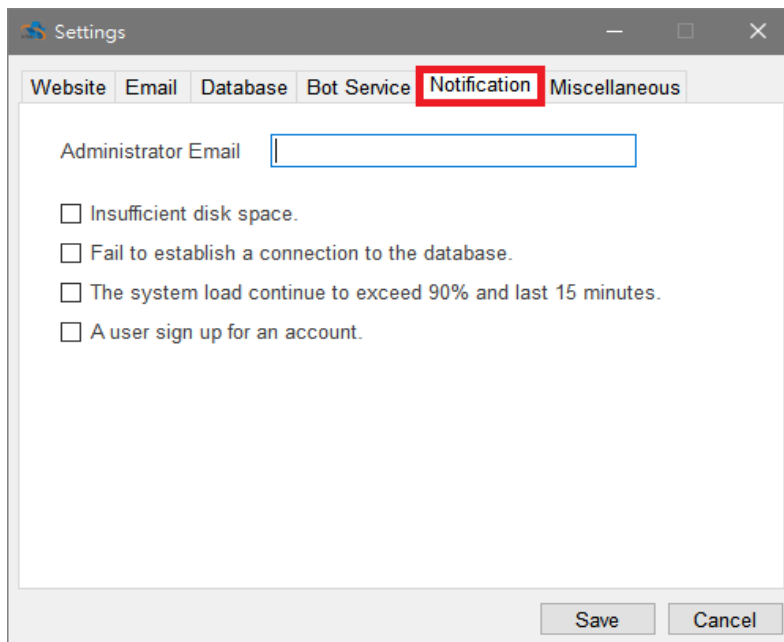


- Address: Input the IP address of the database which IoTstar will connect to.
- Port: Input the port of the database. The default port number is set as 1433.
- Username: Input “sa”.
- Password: Input the password of the account “sa” when you perform the authentication settings of the SQL server.
- Default Maximum Database Size: The administrator can pre-set the Maximum size of database which will be allocated to the user accounts of IoTstar.
- Connection Test: After complete the setting, you can click this button to test the setting.

VI. If you have purchased the "IoTstar Bot Service" package, please refer to "ICP DAS IoTstar Bot Service User Manual" to complete the setting in the "Bot Service" tab of the “Settings” window.



VII. Input the administrator email and select the notification options in the “Notification” tab of the “Settings” window. And then when any of the selected notification options happens; IoTstar will send the alarm notification email to the administrator.

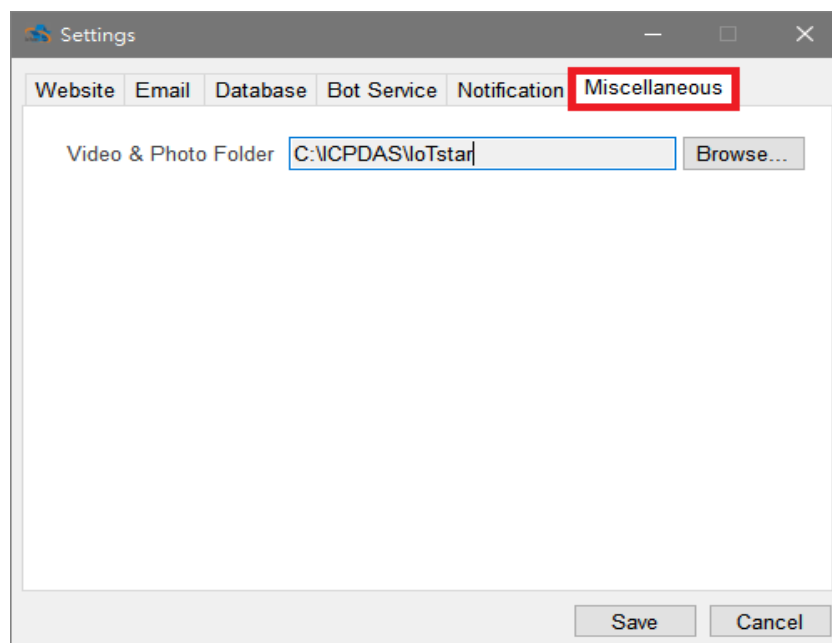


- Insufficient disk space: When the computer platform which IoTstar installed has the status of insufficient hard disk space, IoTstar will send a notification email to the

administrator.

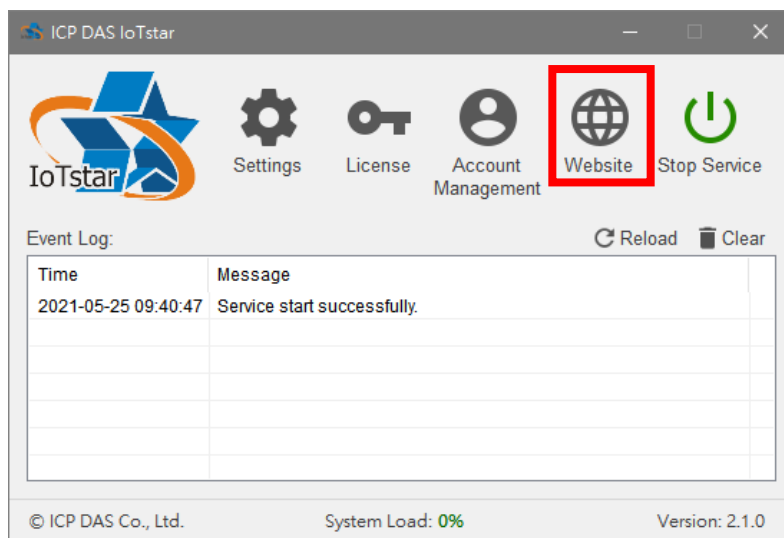
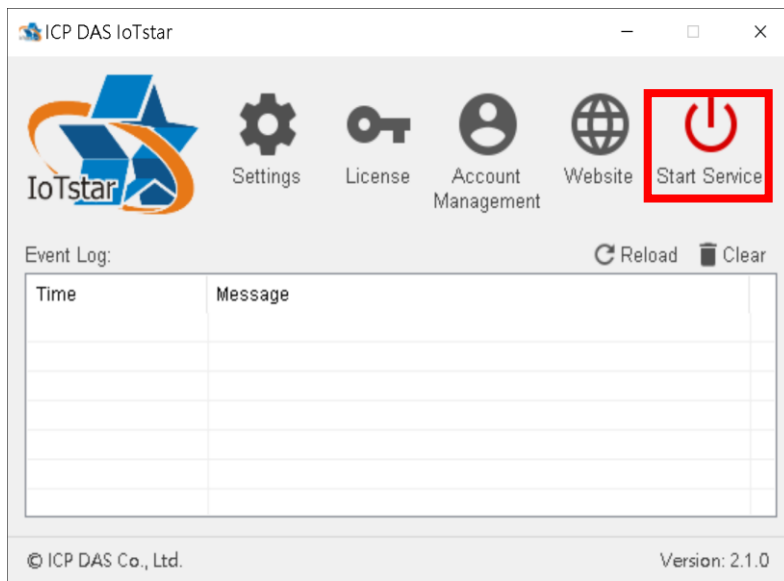
- Fail to establish a connection to the database: When IoTstar cannot connect to the database successfully, IoTstar will send a notification email to the administrator.
- The system load continue to exceed 90% and last 15 minutes: When IoTstar is in the high system loading (90%; lasts 15 minutes), IoTstar will send a notification email to the administrator.
- A user sign up for an account: When a user applies for an account of IoTstar, IoTstar will send an email to the administrator of IoTstar, and the administrator can confirm whether to allow the application of the account, or not.

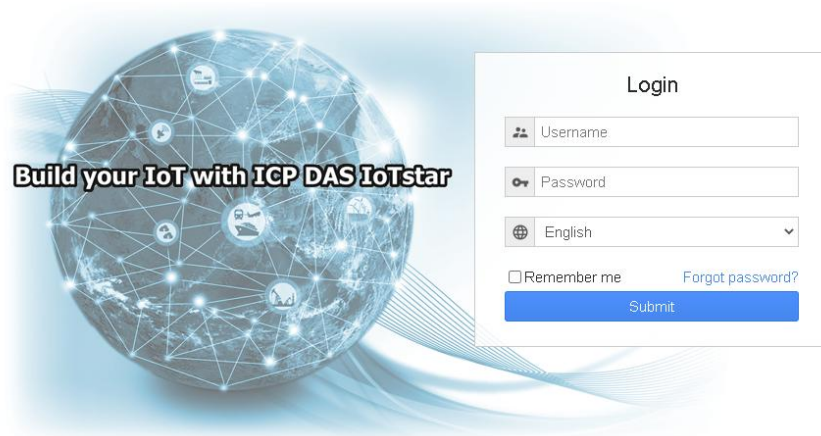
VIII. If the front-end WISE controllers work with ICP DAS iCAM IP Camera, and you need the WISE controllers to upload the photo or video files which WISE receive from iCAM IP Camera to IoTstar, then input the storage folder of IoTstar in the “Miscellaneous” tab of the “Settings” window.



IX. After the settings of initialization are completed, click “Start Service” to active

IoTstar, and then click "Website" to open the IoTstar Website directly.





IoTstar v2.1.0 © ICP DAS Co., Ltd. All Rights Reserved

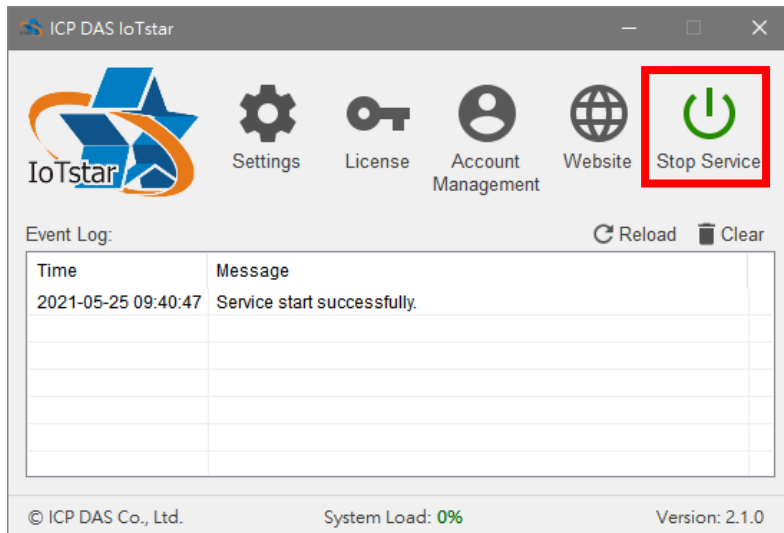
2.4.1 Troubleshooting & Debugging

After user start IoTstar, if there are errors occur during the operation of IoTstar, please refer to the following information for troubleshooting.

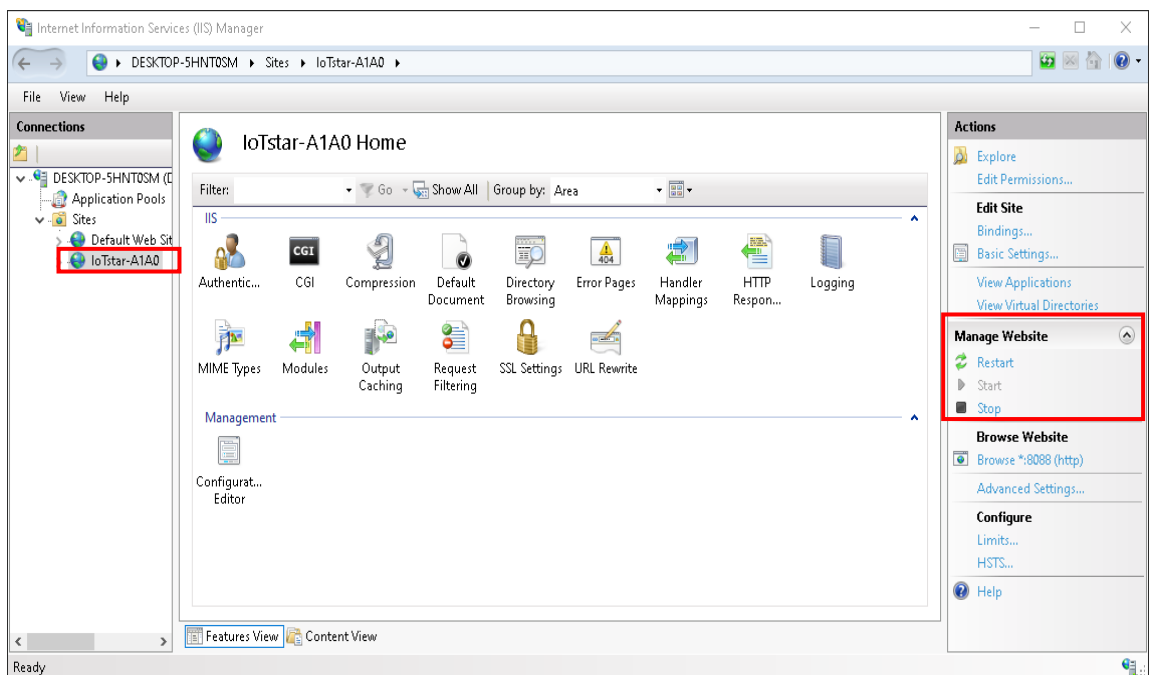
Error1. HTTP error 404 : Page not found.

Please check if the Web site of IoTstar exist, and the service of IoTstar also has been started, or not.

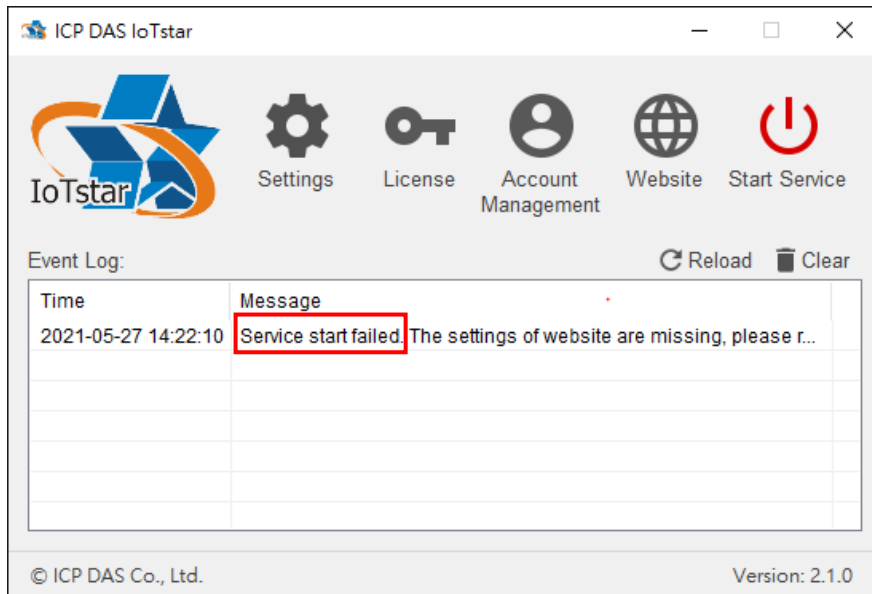
1. Confirm whether the IoTstar service has been started, or not (When the IoTstar service has been started, the button in the red rectangle will be green color as following, and the Event Log list will display the "Service start successfully" message.)



- Open IIS (Internet Information Services) Manager and confirm whether the IIS for IoTstar web site exists and has been started.



Error2. "Service start failed" shown on IoTstar system interface as below.

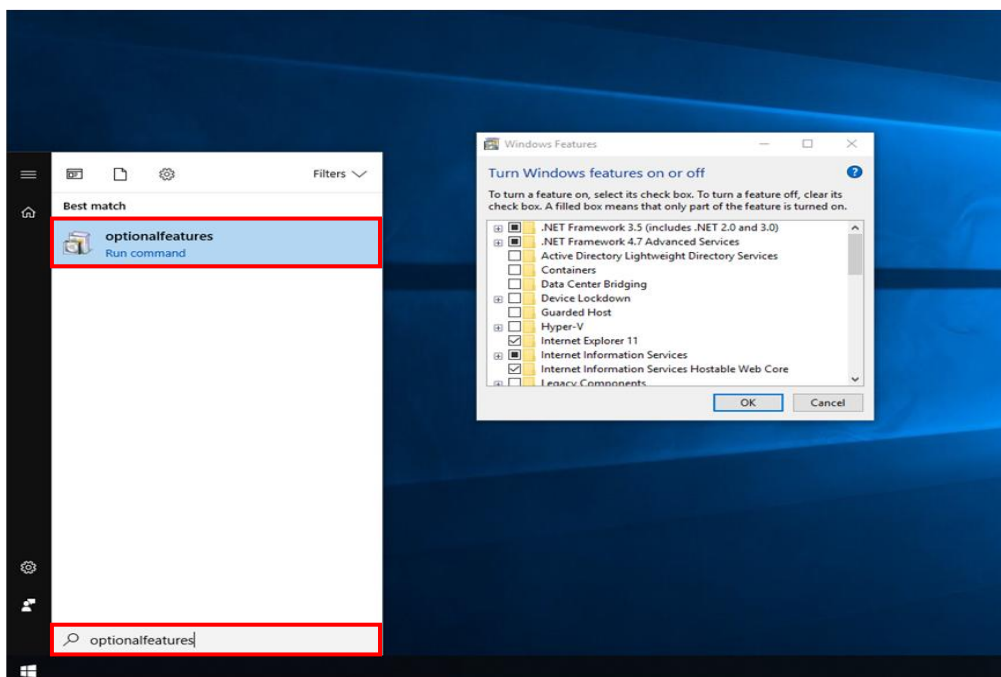


Please Confirm whether IIS (Internet Information Services) has been installed, or not. If it has not been installed, please refer to the following steps to complete the installation.

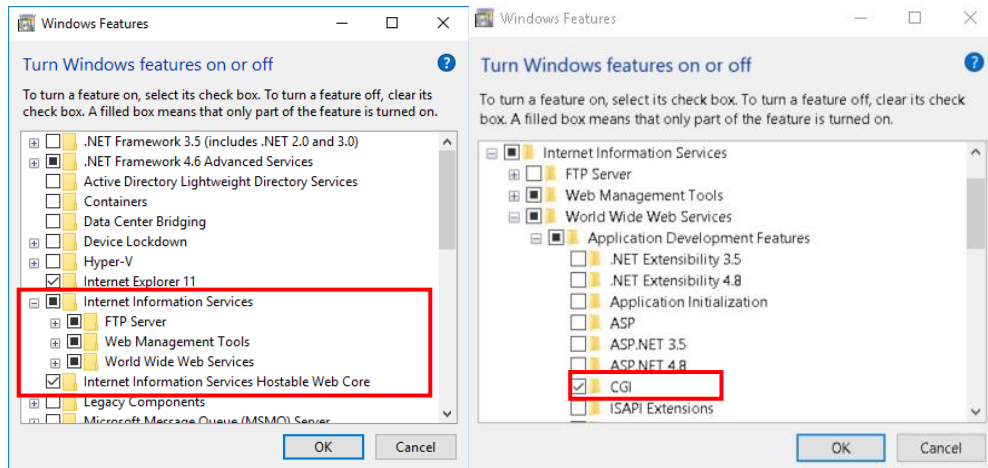
1. The installation of IIS (Internet Information Services)

- Windows 10

Click "Start" button, or press the "WIN key" on the keyboard, enter the keyword of "optionalfeatures" to open "Windows Features" window.

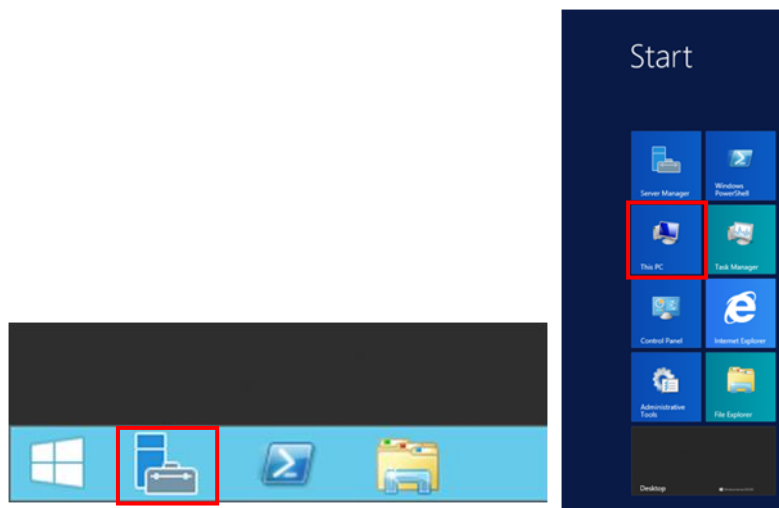


On the “Windows Features” window, enable all options under the “Internet Information Services” and enable “Internet Information Services Hostable Web Core”. Please also enable the "CGI" item, then click “OK” to apply the changes and close the program.

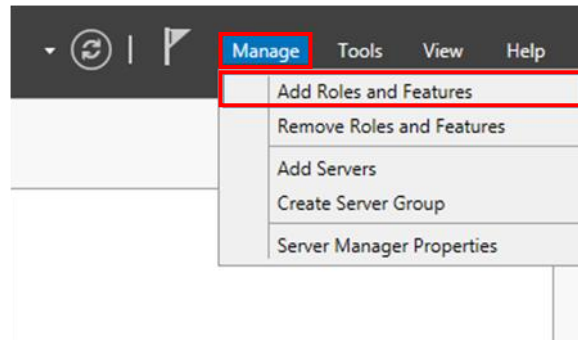


- Windows Server 2012

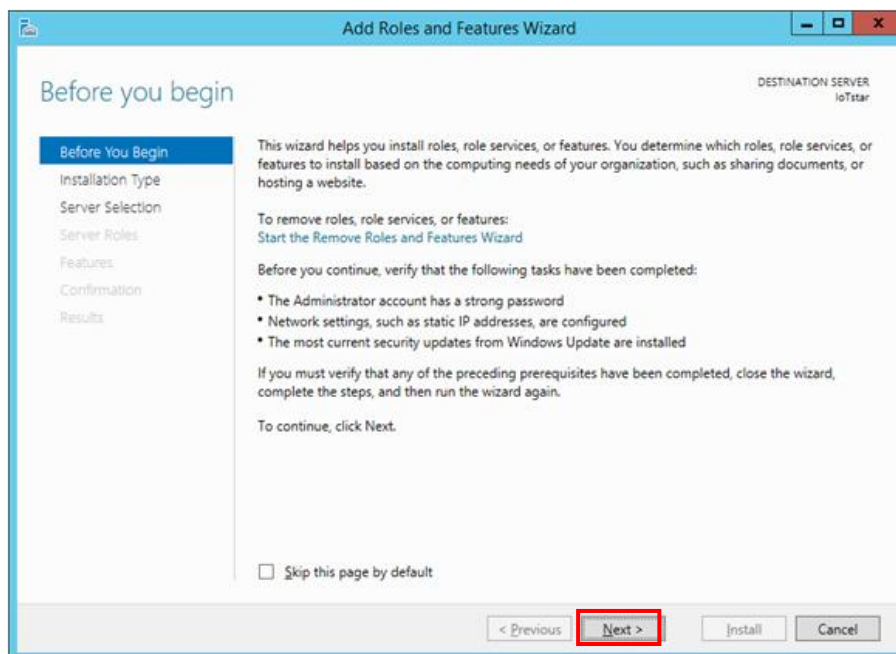
Open “Server Manager” in “Taskbar” or “Start Menu”



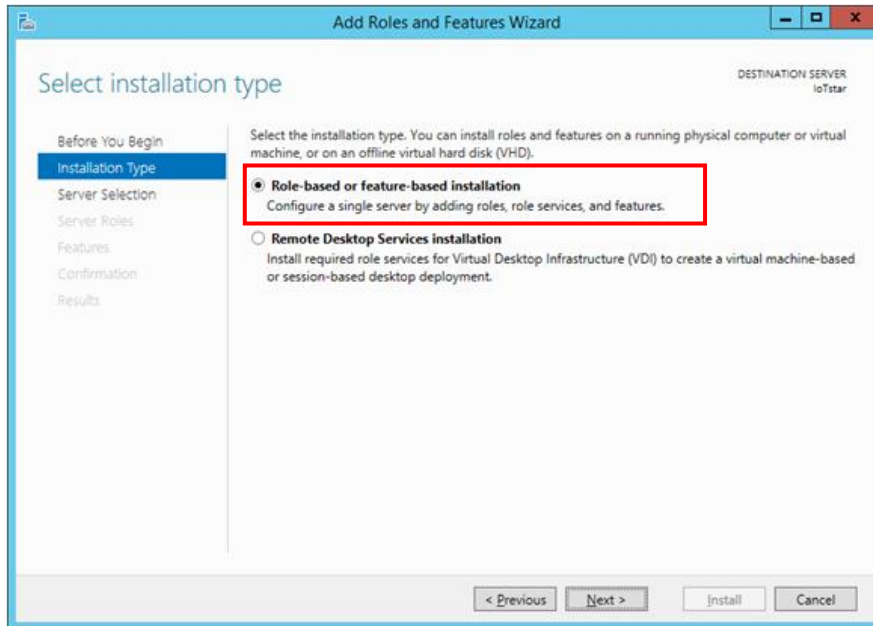
Click “Manage” on the right upper side on the “Server Manager” window, and then click “Add Roles and Features”.



The “Add Roles and Features Wizard” window will pop up; read the information in “Before you begin”, then click “Next”.

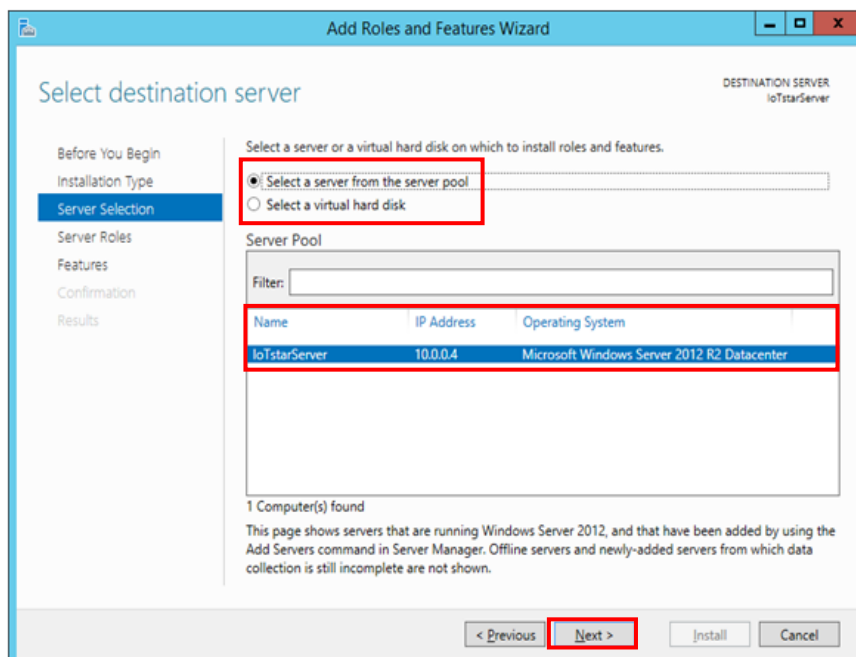


In the “Select installation type” window, select “Role-based or feature-based installation”, then click “Next”.



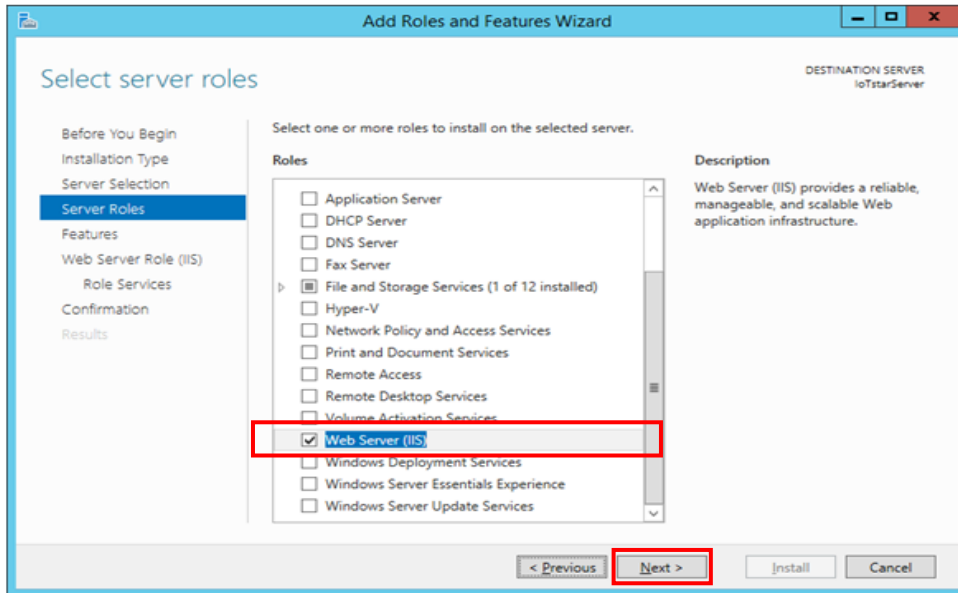
In the “Select destination server” window, select which server you are going to install “Server Roles and Features” on, and then click “Next”.

Please note: In the following example, the “Select a server from the server pool” item is selected and the server “IoTstarServer” in the “Server Pool” is selected to perform the installation. Please select the server for the installation as you require.

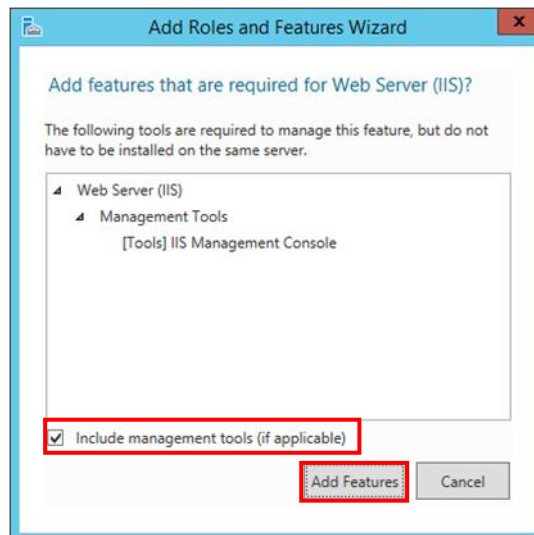


In the “Select server roles” window, select the server roles you need from the list and click “Next”.

Roles
A. Web Server (IIS)



Please note: after the “Web Server (IIS)” is checked, the following window will pop out, please check the “Include management tools (if applicable)”, and then click “Add Features”.

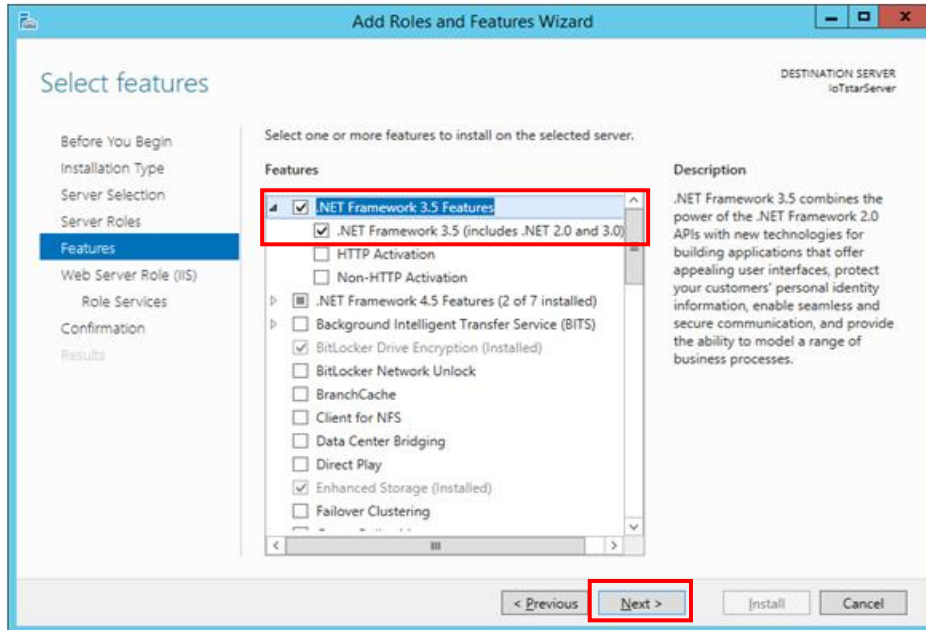


In the “Select features” window, select the Features as required from the list and then click “Next”

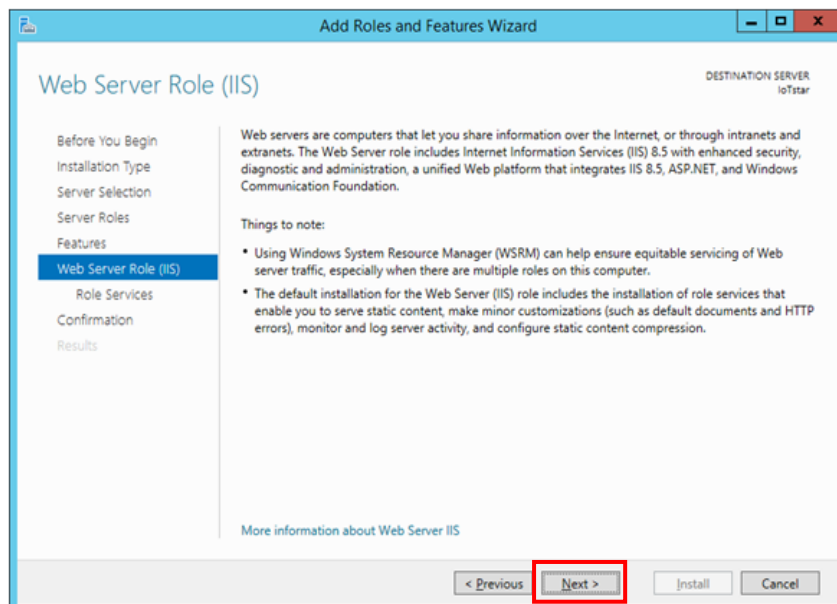
Features

A. .NET Framework 3.5 Features

I. .NET Framework 3.5 (includes .NET 2.0 and 3.0)



Read the information on the “Web server Role (IIS)” window and then click “Next”.



In the “Select Role Services” window, select the Web Server Roles as you need from the list and then click “Next”.

Role Services

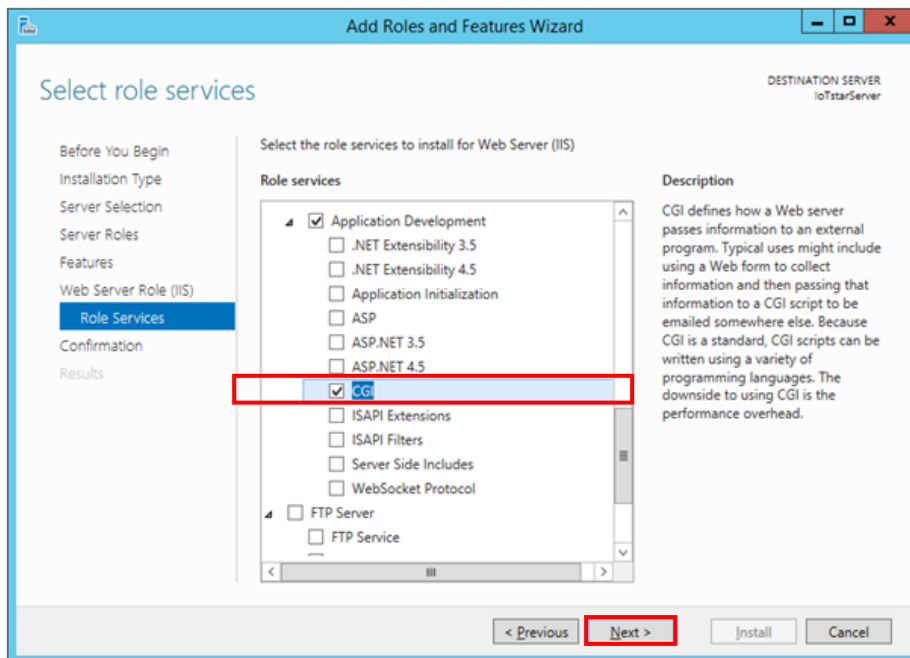
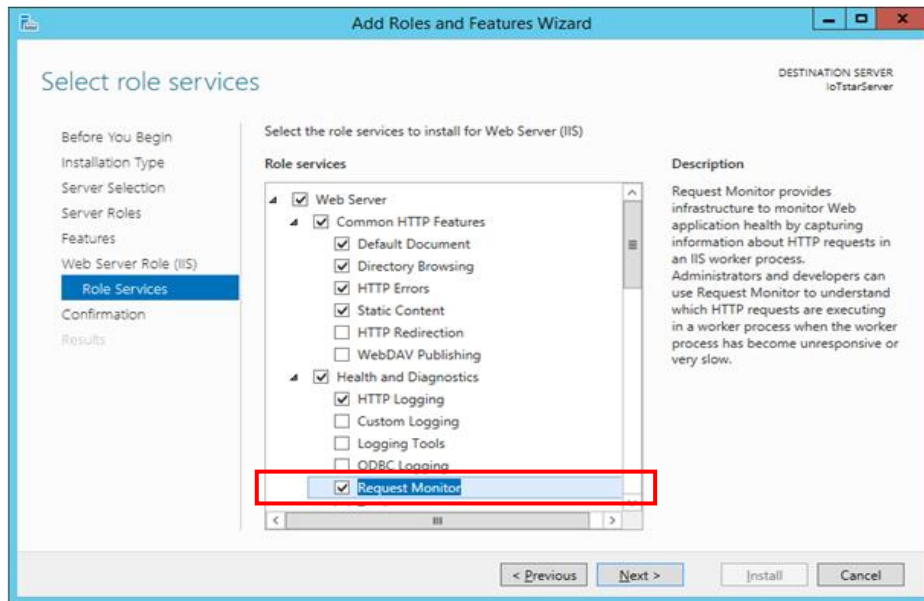
A. Web Server

I. Health and Diagnostics

i. Request Monitor

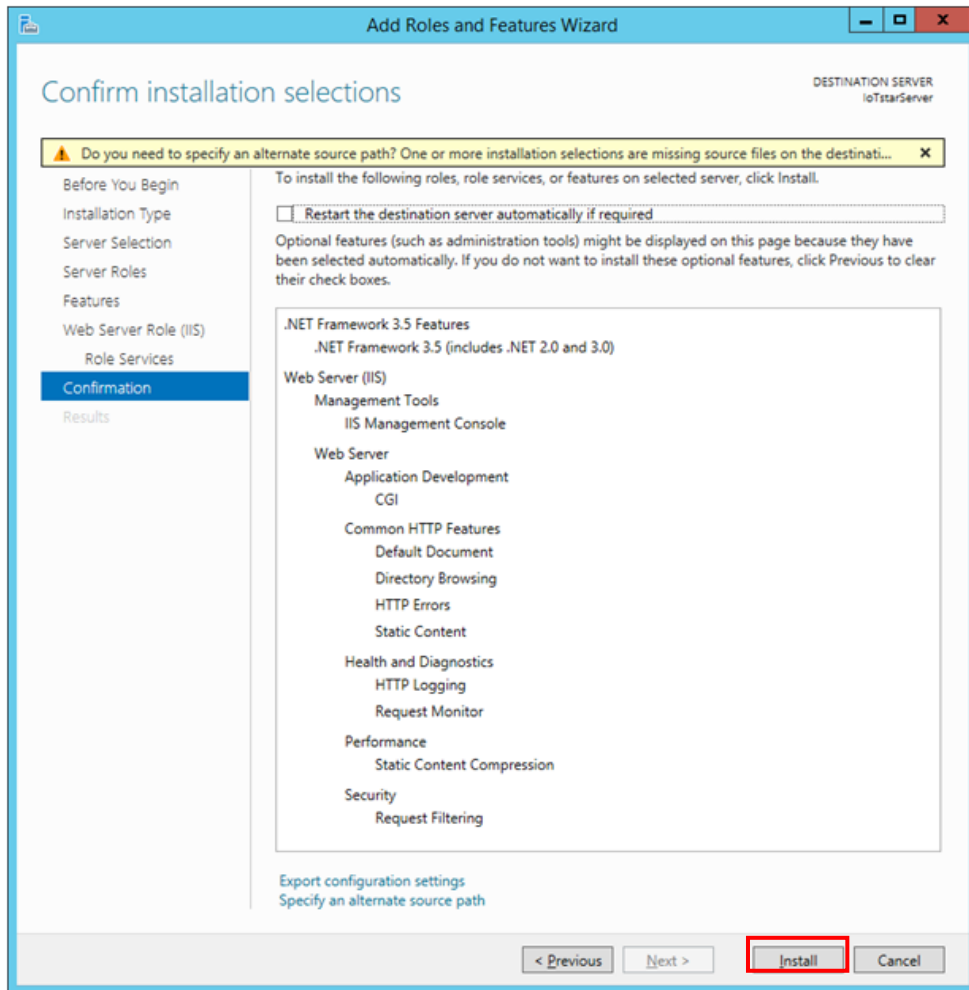
II. Application Development

i. CGI

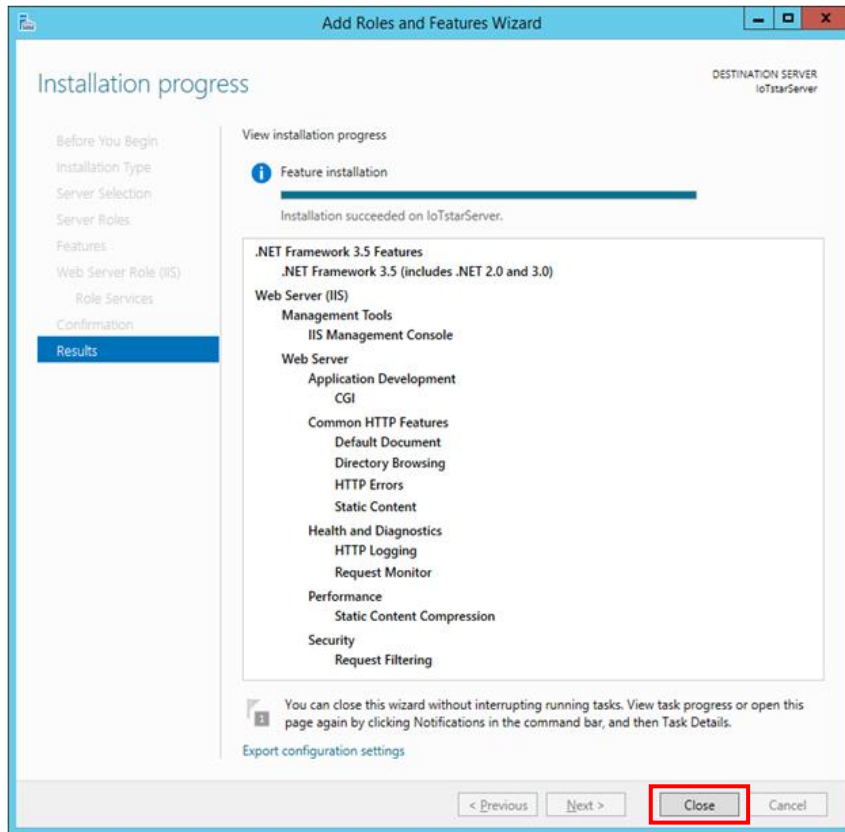


In the “Confirm installation selections” window, verify if the selected items are correct (please note: it will only list the items that have not been installed; the already installed items will not be listed). After you verify the items to be

installed are selected, click “Install” to perform the installation.

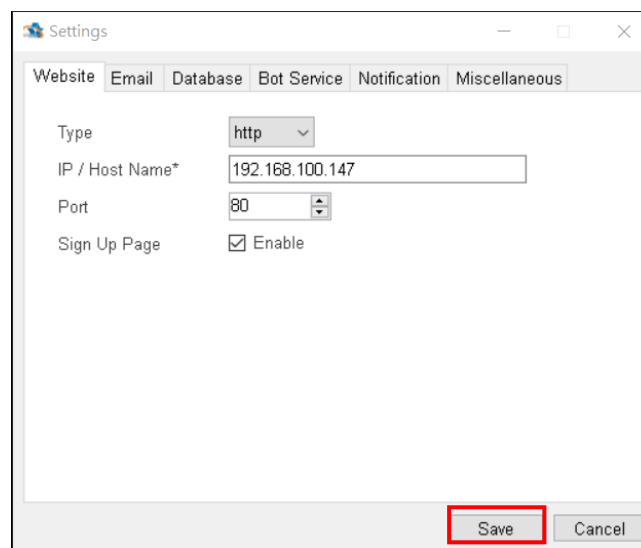
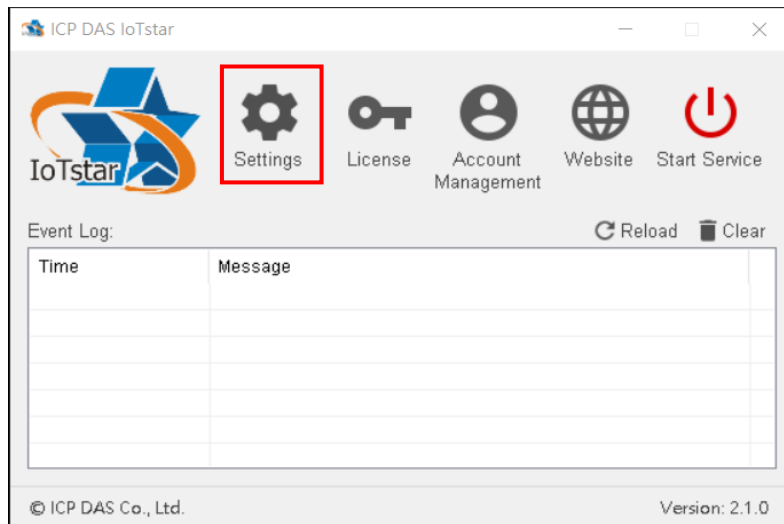


After the installation is completed, click “Close” to close the window.



2. IoTstar Settings

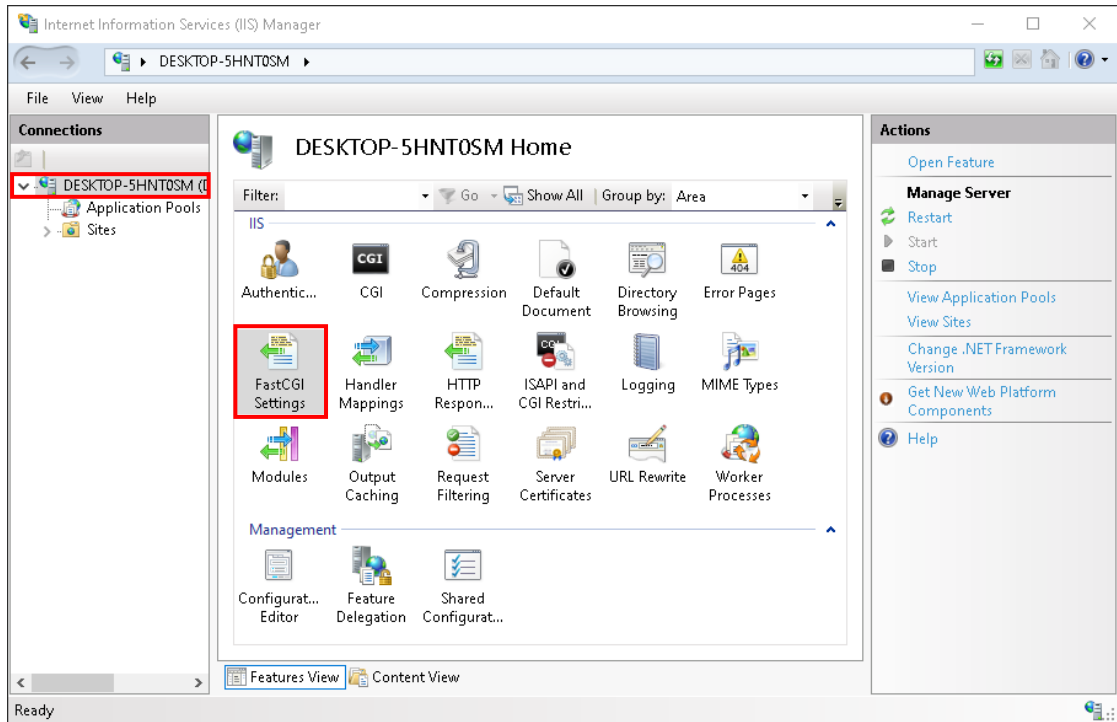
After complete the installation of IIS (Internet Information Services), please open IoTstar, and the “ICP DAS IoTstar” system interface will be shown. Click the “Settings” button on the “ICP DAS IoTstar” system interface, verify the settings in the “Website” tab of the “Settings” window, click "Save" button, then Web site of IoTstar will be automatically established.



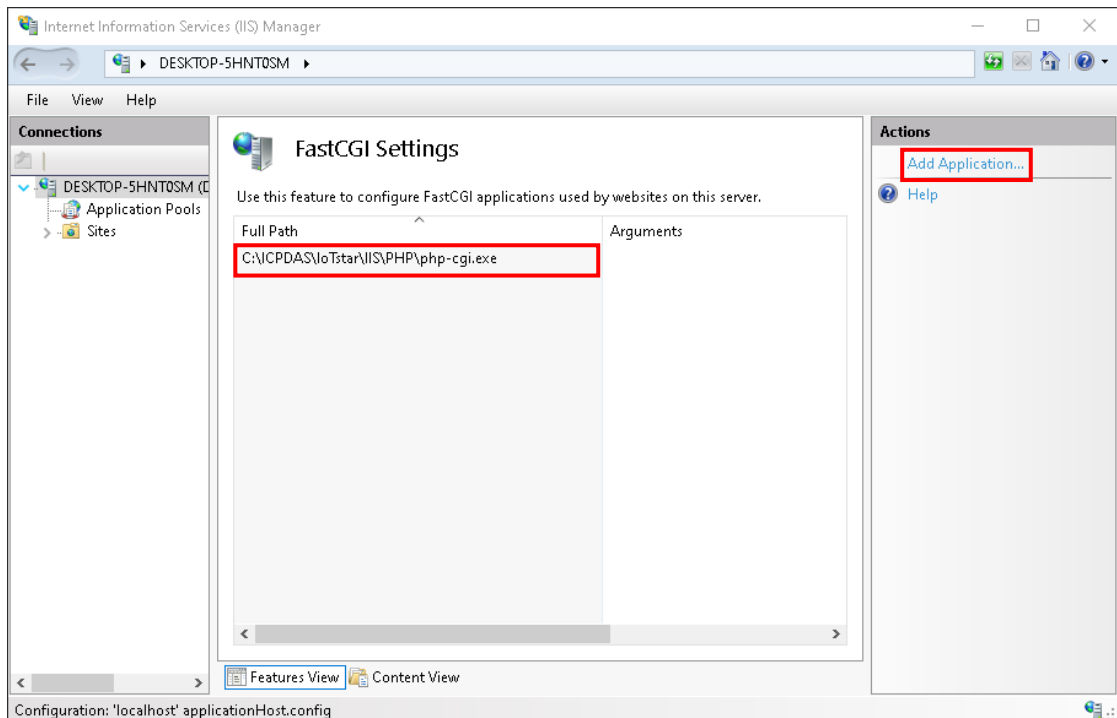
Error3. "HTTP Error 500 : Internal Server Error".

It is because of the FastCGI module cannot be found, please confirm the setting of FastCGI module.

1. Open IIS (Internet Information Services) manager, and click the FastCGI setting of IIS.



2. Confirm the directory of "IoTstar installation directory\IIS\PHP\php-cgi.exe" is in the FastCGI setting as below, or not.



3. If it is not in the FastCGI setting, please click "New Application", and add the setting by yourself. About the parameter setting, please refer to following.

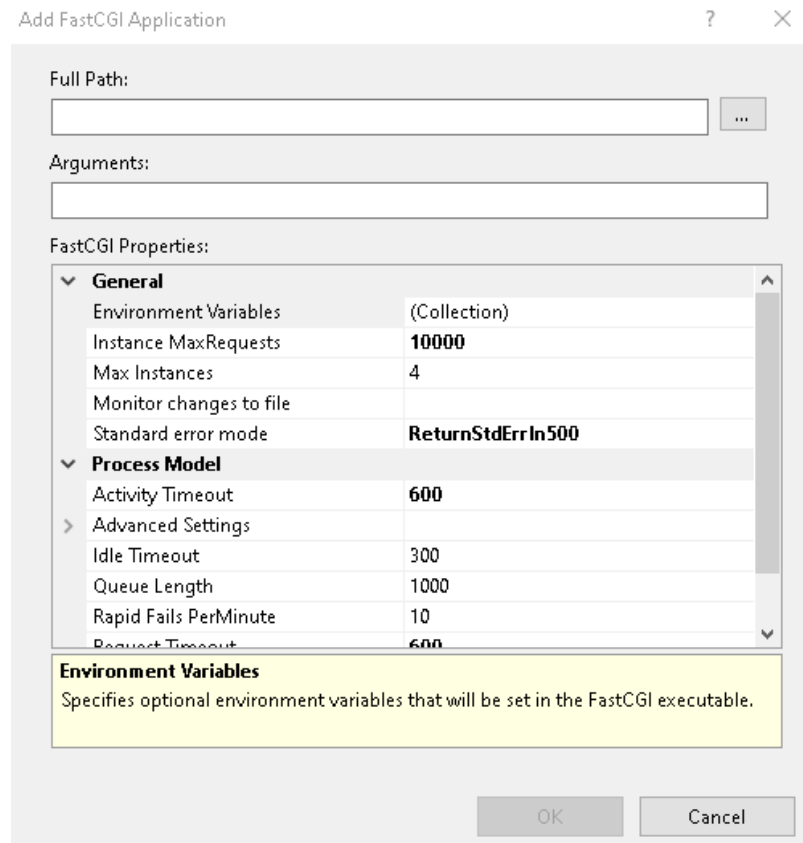
Full Path: IoTstar installation directory\IIS\PHP\php-cgi.exe

Instance MaxRequests: 10000

Activity Timeout: 600

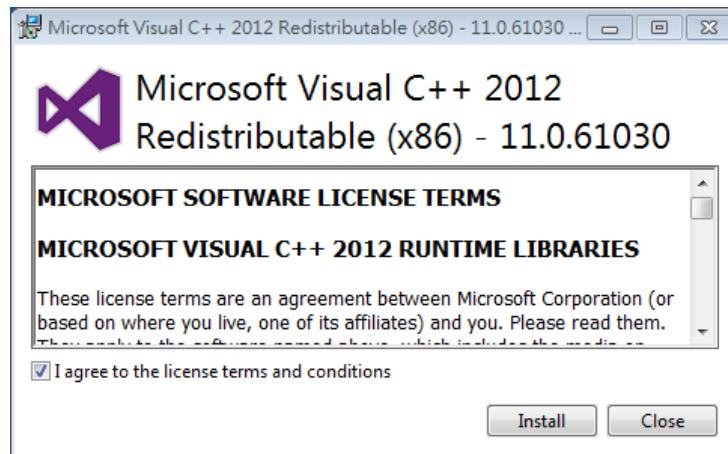
Request Timeout: 600

Idle Timeout: 300



Error4. "HTTP Error 500 : The FastCGI process exited unexpectedly"

The cause of the error is "Visual C++ Redistributable (x86) for Visual Studio 2012 Update 4" is not installed. Please download the package from <https://www.microsoft.com/en-US/download/details.aspx?id=30679> and install it.



Error5. "HTTP Error 500.19 : Internal Server Error"

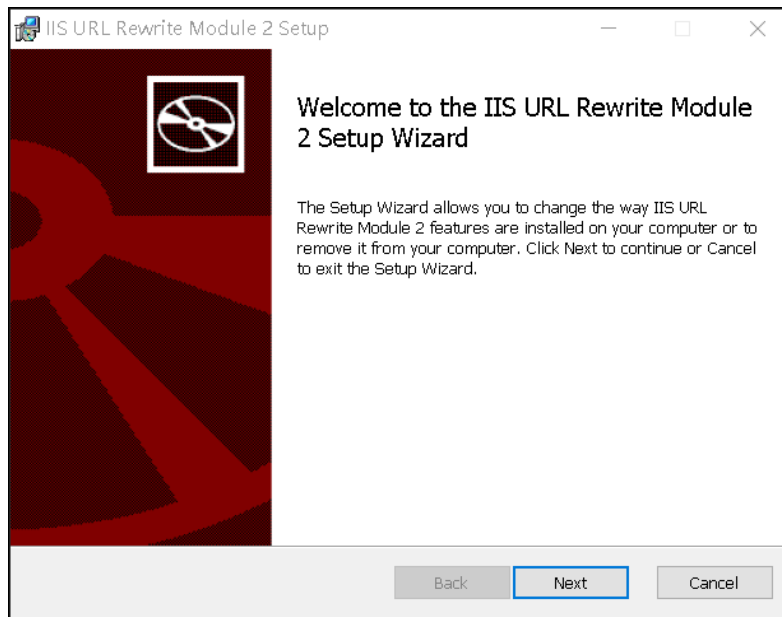
The cause of the error is "URL Rewrite(x64)" is not installed. Please download the package from

<https://www.iis.net/downloads/microsoft/url-rewrite#additionalDownloads> and install

it.

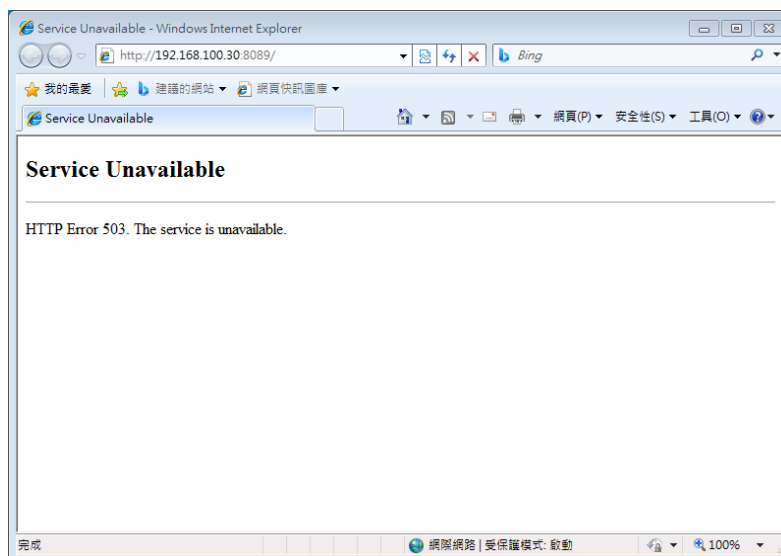
Download URL Rewrite Module 2.1

- English: [Web Platform Installer \(Web PI\)](#) / [x86 installer](#) / [x64 installer](#)
- German: [x86 installer](#) / [x64 installer](#)
- Spanish: [x86 installer](#) / [x64 installer](#)
- French: [x86 installer](#) / [x64 installer](#)
- Italian: [x86 installer](#) / [x64 installer](#)
- Japanese: [x86 installer](#) / [x64 installer](#)
- Korean: [x86 installer](#) / [x64 installer](#)
- Russian: [x86 installer](#) / [x64 installer](#)
- Chinese Simplified: [x86 installer](#) / [x64 installer](#)
- Chinese Traditional: [x86 installer](#) / [x64 installer](#)



Error6. "HTTP Error 503. Service unavailable"

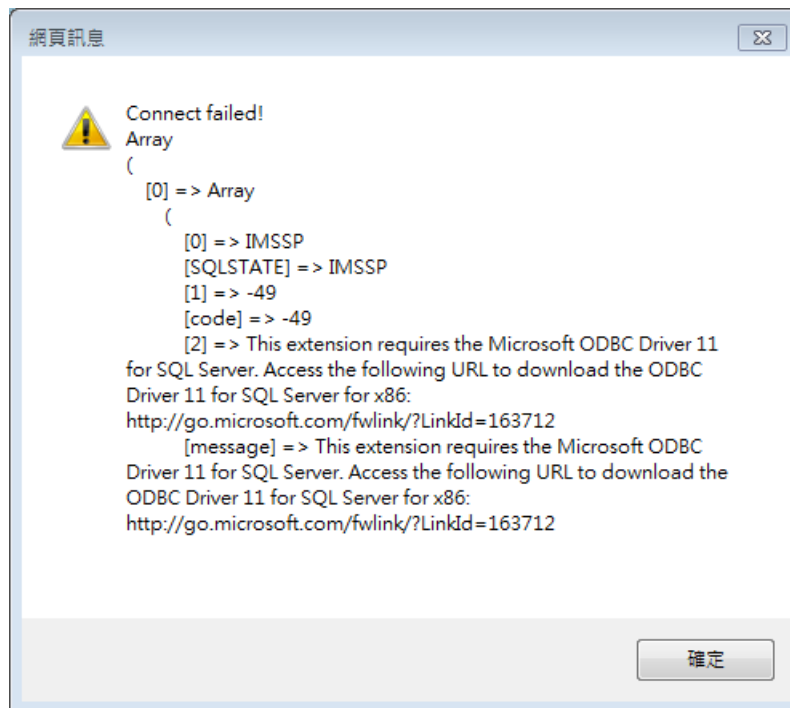
It means the IIS (Internet Information Services) stopped.



The cause of the error is the PC (or platform) IoTstar installed is used an older version of Operating System. Please update the version of Operating System to the latest version.

Error7. Connect to IoTstar Login page via Web browser, input the username and password, click the "Submit" button to login IoTstar, and then system displays the

error message (as shown below).

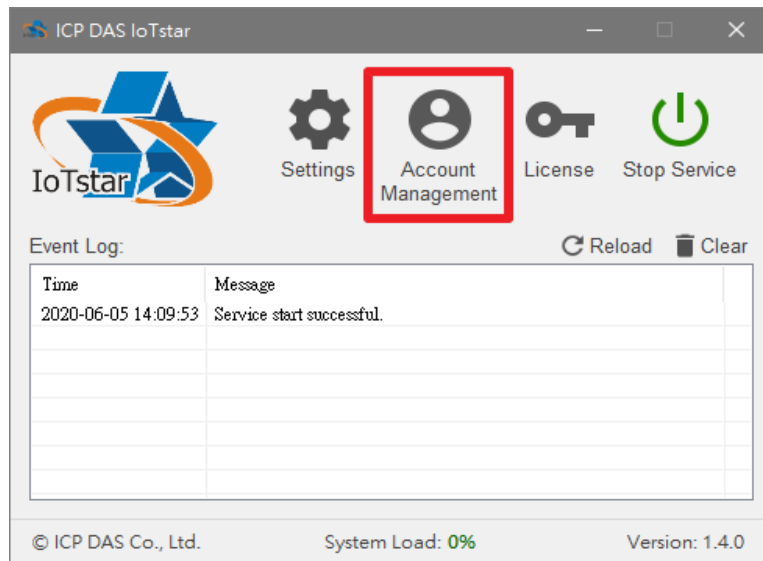


The cause of the error is "Microsoft ODBC Driver 11 for SQL Server (x64)" is not installed. Please download the package from <https://www.microsoft.com/en-US/download/details.aspx?id=36434> and install it.

2.5 Account Management

There is no number limitation of login accounts for IoTstar Basic version and Professional version. Therefore, IoTstar provides the Account Management interface for the administrator to remove useless accounts. When one account is removed, all the settings, data, and records would be deleted together.

Click the "Account Management" button on the IoTstar system interface to bring up the "Account Management" window.



Click the “Create” button, enter the user's email address in the “Email Address” field of “Account Creation” window, and press the “Send” button. The system will send the verification email to the user's Email account. User only needs to click the link in the Email to complete the verification procedure for the creation of user account of IoTstar.

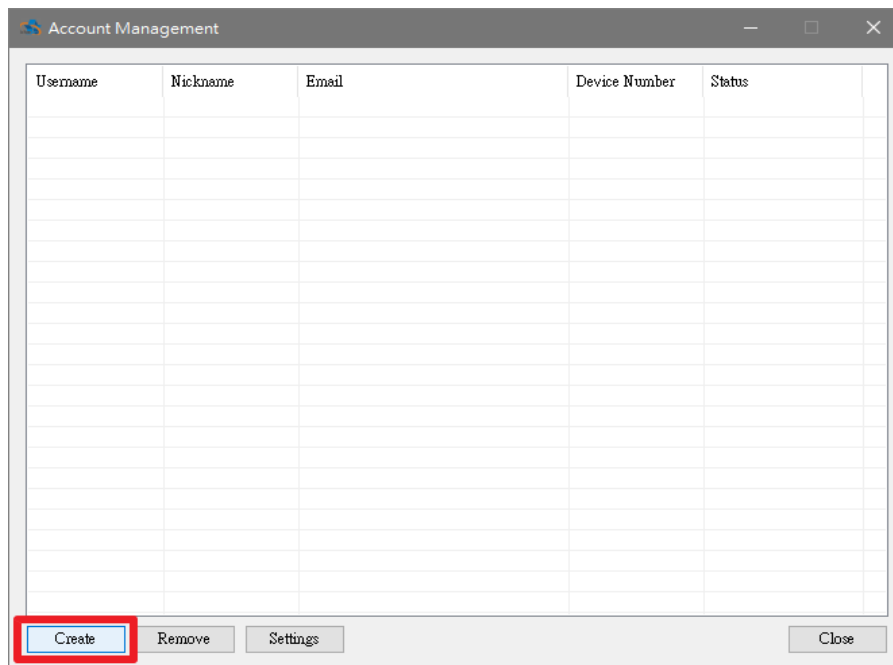
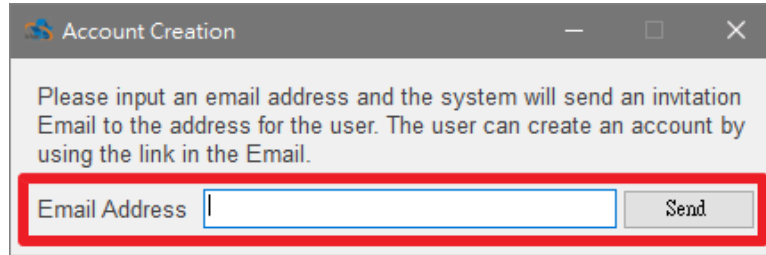
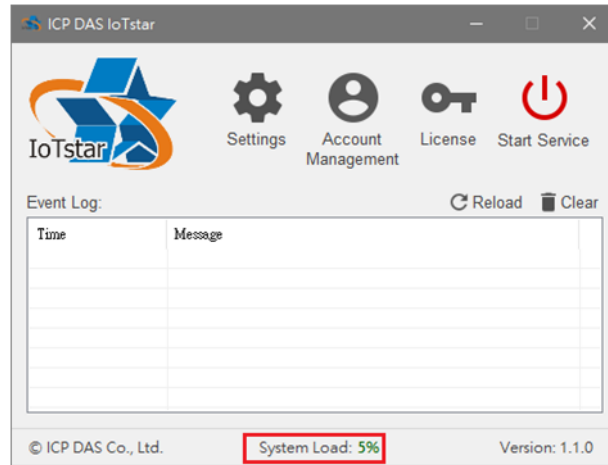


Figure 2-3 Create user account



To enable or change the user's account settings, please select the user account first, click the “Setting” button, then the “Account Settings” window will be shown. Please follow the items as below to enable or change the user account settings.

- Active: Activate this account (Before modify the setting as below items, user must activate the account first. The button will disappear after activation).
- Username: Change the Username of the account in the field.
- Password: Change the Password of the account in the field. Please leave blank if you do not want to change the Password.
- Device Number: Assign the number of controllers that the user account can connect (manage)
- Maximum Database Size : The Maximum size of database which will be allocated to the user account can be changed in the field.



2.7 The Network Connection Setting of WISE / PMC / PMD and IoTstar

Currently IoTstar supports ICP DAS WISE-523x / WISE-2x4x, PMC-523x / PMC-2x4x and PMD series controllers. Before setting up the network connection and data upload operation between WISE / PMC / PMD and IoTstar, please make sure the firmware version of the WISE / PMC / PMD controllers you use meet the requirements as below:

Controller		Firmware version
WISE Series	WISE-523x series, WISE-2x4x series	V1.5.1 or later version
PMC / PMD Series	PMC-523x series, PMC-2x4x series, PMD series	V3.4.7 or later version

If the WISE / PMC / PMD controller you use now is early firmware version, please visit the following link to download the new version firmware and refer to the user manual to complete the firmware update process.

- WISE Series

✓ The download link for the latest firmware version of WISE-523x/WISE-2x4x :
<http://wise.icpdas.com/Download.html#firmware>

✓ The download link for WISE-523x/WISE-2x4x User Manual :
<http://wise.icpdas.com/Download.html#manual>

● PMC / PMD Series

✓ The download link for the latest firmware version of PMC-523x/PMC-2x4x /PMD : http://pmms.icpdas.com/en/download.html#firm_ware

✓ The download link for PMC-523x/PMC-2x4x/PMD User Manual :
<http://pmms.icpdas.com/en/download.html#manual>

About the connection and data upload setting between WISE / PMC / PMD and IoTstar, please refer to the following sections for detail.

Appendix I: WISE Connection setting for IoTstar

Appendix II: Enable "Data Upload Operation" from WISE to IoTstar

Appendix III: PMC / PMD Connection setting for IoTstar

Appendix IV: Enable "Data Upload Operation" from PMC/PMD to IoTstar

Please Note : After completing the network connection setting of WISE / PMC / PMD and IoTstar, please also confirm the following items to ensure the controller can successfully connect to IoTstar.

1. Confirm the Network domain which WISE / PMC / PMD belongs can connect to IoTstar.
2. If the network environment is equipped with Firewall, please open "Port 1230 ~ Port 1235", "Port 7000 ~ Port 7100" and "IIS station port".

3 IoTstar (Professional version) Setting with License file

The Professional version of IoTstar includes three options: IoTstar-RC050, IoTstar-RC200 and IoTstar-RC500. To upgrade the IoTstar (Basic version) to IoTstar (Professional version), please refer to the steps below:

- I. Please contact with the sales or distributors of ICP DAS to buy IoTstar (Professional version). When the procurement procedure is completed, ICP DAS would send the package of IoTstar to you.
- II. When you receive the package of IoTstar, please confirm that there is an IoTstar CD in the package, and a sticker of IoTstar serial number on the CD.
- III. Please follow the sections “2. Install IoTstar” to complete the installation and initialization of IoTstar (Basic version). If you have completed the setting and installation of IoTstar (Basic version), please skip this step.
- IV. Go to IoTstar official website <http://iotstar.icpdas.com/en/index.php>, and click the “Download” button on the main page.



- V. In the “Download” page, click the “Registration” button of the “Professional version” section to enter the registration page of IoTstar.

☰ **Software & Registration**

D Download

- >> Software & Registration
- >> Document

Basic Version

- Full functions supported.
- Connect to **4** controllers.
- Offer service trial
- Latest version: **1.4.1**
- [Release Note](#)

Read Me
Free Download

Professional Version

- Full functions supported.
- The Maximum quantity of the controllers to be connected will vary depending on the model you purchase. ?
- Offer service trial and package upgrade is available.

Read Me
Registration

Figure 3-1 Registration for IoTstar (Professional version) (1)

VI. On the registration page of IoTstar (Professional version), enter the following information: “First Name”, “Last Name”, “Company”, “Country” and “E-mail”. Please enter the “Serial Number” which you get from the sticker on the IoTstar CD. For the “Hardware ID”, please click the ? button next to the “Hardware ID” field and follow the instructions on the Pop-up window to get the Hardware ID of the platform which IoTstar is installed and enter the Hardware ID you get in the “Hardware ID” field. Click the “Registration” button to save these settings. If the key-in registration information is correct, an email with the license file of IoTstar (Professional version) would be sent to the email address you entered.

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Registration & Getting License File for IoTstar (Professional Version)

Build your IoT with ICP DAS IoTstar

First Name :

Last Name :

Company :

Country :

E-mail :

Serial Number :

Hardware ID : ?

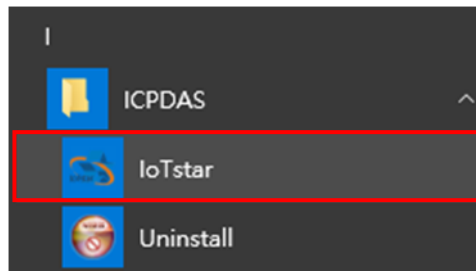
Figure 3-2 Registration for IoTstar (Professional version) (2)

Please note:

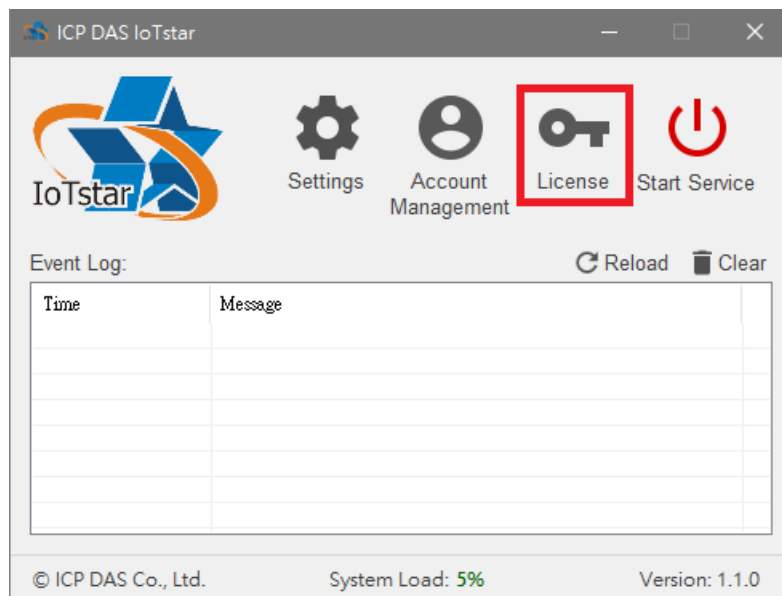
1. The email sent by IoTstar website may be sent to the spam/trash folder of your mailbox according to different mail servers. Please also check the spam/trash folder of your mailbox if you didn't find it in inbox.
2. The license file of IoTstar is single platform license. Each license is unique and can only be assigned to the PC/Platform with the Hardware ID you provide.
3. If you need to change the PC/Platform's component (CPU, Hard Disk with OS image or motherboard), or the original PC/Platform with IoTstar is damaged and you need to switch IoTstar to other PC/Platform, please follow the steps above to get the new IoTstar license file for the PC/Platform (with the new component) or the new PC/Platform. Each serial number on IoTstar CD allows maximum 3 applications of the license file. Please be careful about it.

VII. When you receive the license file of IoTstar (Professional version), click “Start

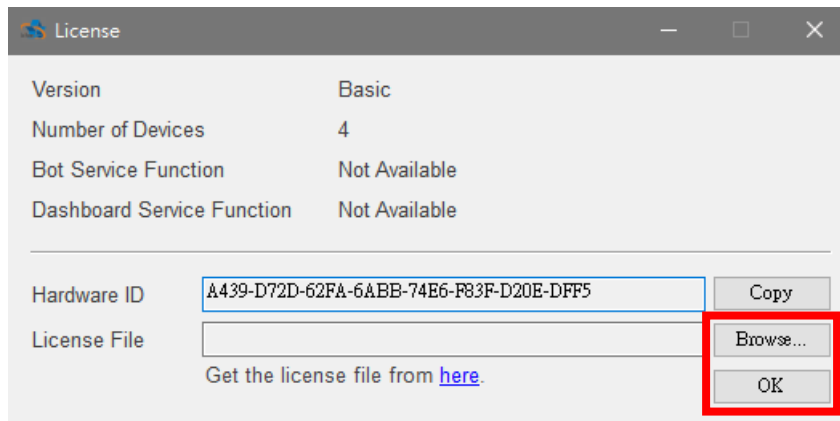
Menu”→ “All apps”→ “ICPDAS”→ “IoTstar” to open the IoTstar system interface.



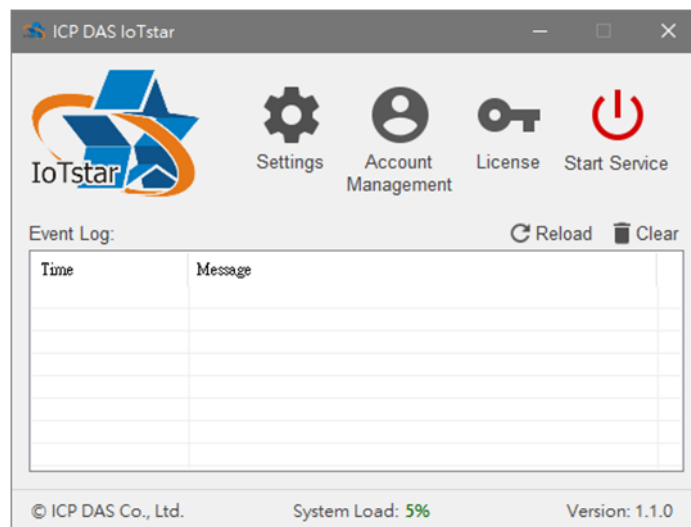
VIII. Click the “License” button on the IoTstar system interface to enter the License setting window.



IX. In the “License” setting window, click the “Browse...” button to find the location of the IoTstar(Professional version) license file, and then click the “OK” button.



X. If the license file is valid, the IoTstar (Basic version) would be upgraded to IoTstar (Professional version). The registration procedure of IoTstar (Professional version) is completed and the title of IoTstar System Interface will not show the message of “Basic version”.



The “License” setting window will also display the version of IoTstar, the number of controllers it support and the optional function IoTstar support (Following is an example of IoTstar-RC500).

License

Version	Professional
Number of Devices	500
Bot Service Function	Not Available
Dashboard Service Function	Not Available

Hardware ID

License File

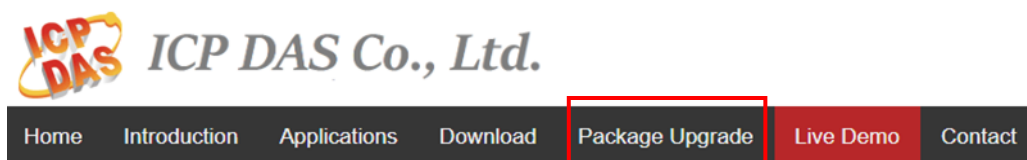
Get the license file from [here](#).

4 IoTstar Optional Package Upgrade

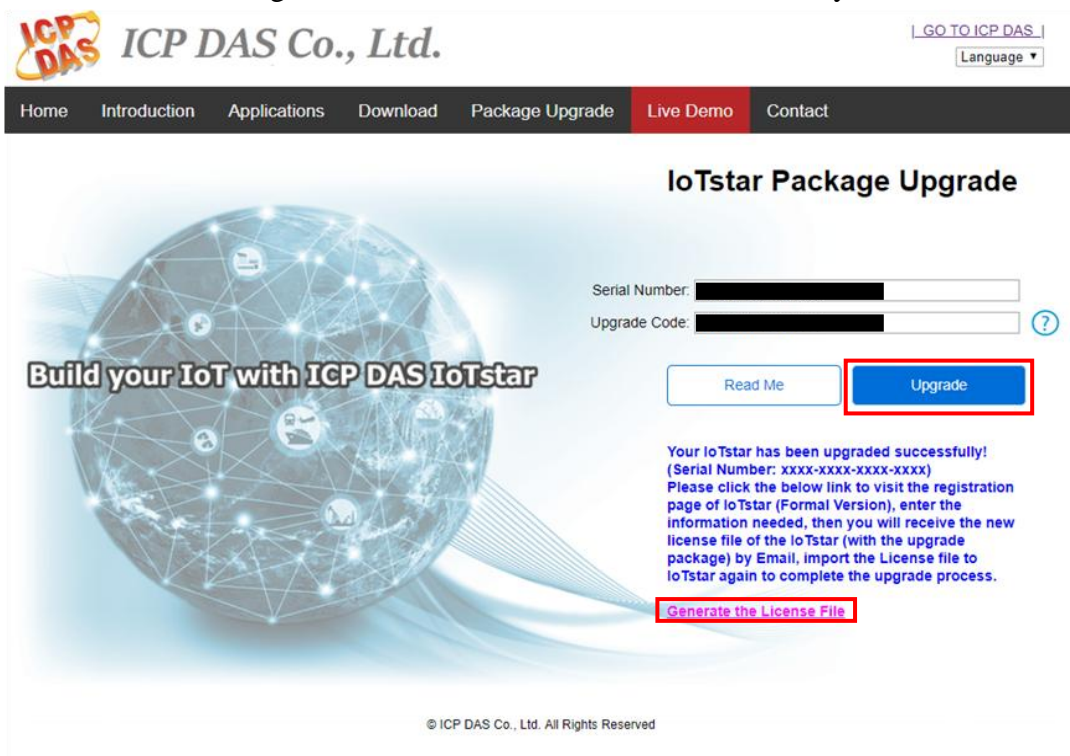
If users want to upgrade IoTstar with the IoTstar Optional Package (IoTstar upgrade package, IoTstar Bot Service, IoTstar Dashboard Service), please refer to the following steps.

I. Please contact with the sales or distributors of ICP DAS to order the IoTstar optional package (IoTstar upgrade package, IoTstar Bot Service or others). When the procurement procedure is completed, ICP DAS would send the upgrade code of the IoTstar optional package to you.

II. Go to IoTstar website <http://iotstar.icpdas.com/en/index.php>, and click the “Package Upgrade” button on the main page.



III. On the "Package Upgrade" page of IoTstar, enter the “Serial Number” of the IoTstar you have installed and the “Upgrade Code” of the IoTstar optional package you order. Click the “Upgrade” button to save these settings, then click the “Generate the License File” to generate the new license file for the IoTstar you install.



ie "

Registration & Getting License File for IoTstar (Professional version)" page, please follow the description of "Step VI ~ Step X" of the "3. IoTstar (Professional version) Setting with License file" chapter to complete the registration process of the IoTstar software (with the optional package).

5 System Login

When connect to IoTstar via Web browser (IE 11 / Firefox 53 / Chrome 58 version or above are recommended), in order to get a better operation experience, 1280x1024 resolution or more higher resolution is recommended. The Login page of IoTstar is shown as below:

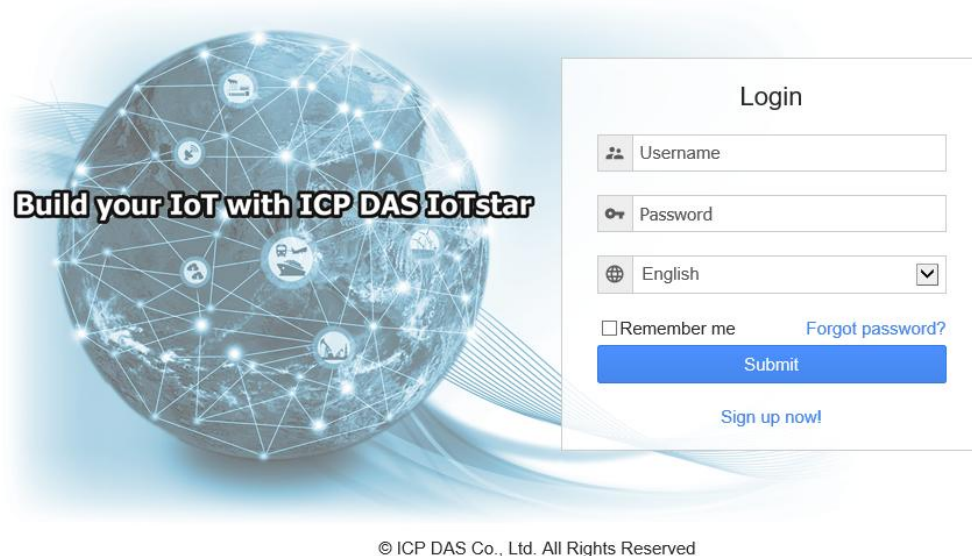


Figure 5-1 IoTstar Login Page

Before login to IoTstar, users have to create a user account of IoTstar by the following steps:

- I. Click the “Sign up now!” button on the Login webpage of IoTstar to enter the sign-up page.

The image shows a login form titled "Login". It contains three input fields: "Username" with a person icon, "Password" with a key icon, and "English" with a globe icon and a dropdown arrow. Below these fields are a "Remember me" checkbox and a "Forgot password?" link. A blue "Submit" button is positioned below the checkbox. At the bottom of the form, a red-bordered box highlights a "Sign up now!" link.

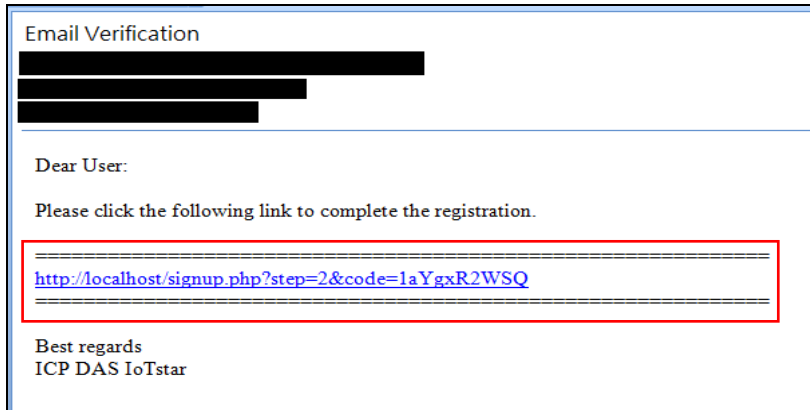
II. Input your email address in the “Email” field and click the “Verification” button.

IoTstar will send a verification email to this email address later.

The image shows a "Sign Up" form with a progress indicator at the top consisting of three circles labeled 1, 2, and 3. Below the circles are the labels "Email Verification", "Registration", and "Done". The form contains a text instruction: "Please enter your Email address. To confirm your Email address is correct, the system will send an Email to your mailbox." Below this instruction is an input field labeled "*Email:" which is highlighted with a red border. Below the input field is a blue "Verification" button, also highlighted with a red border.

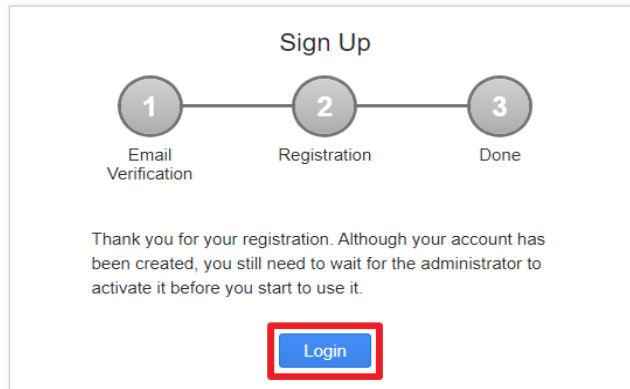
III. Check your mailbox and find the Verification email sent by IoTstar. Click the link in the email to complete the procedure of the email verification.

Please note: The email sent by IoTstar website may be sent to the spam/trash folder of your mailbox according to different mail servers. Please also check the spam/trash folder of your mailbox if you didn't find it in inbox.

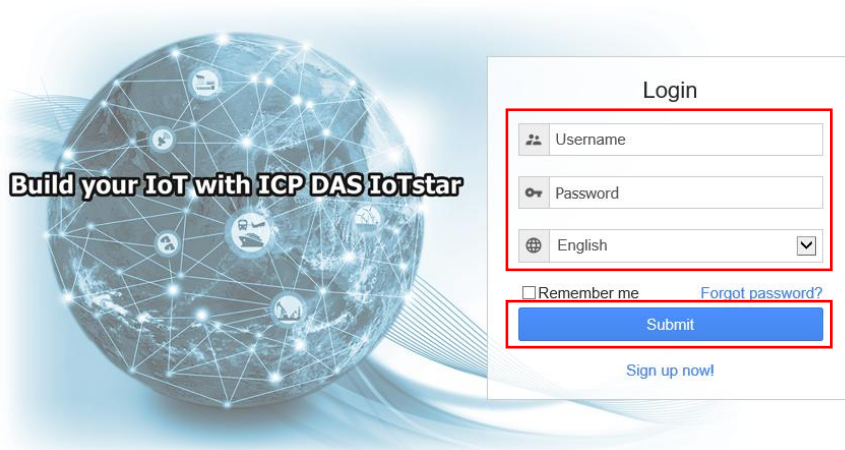


IV. The verification link would lead you to the next sign-up page of IoTstar. Key in the following information: “Username”, “Password”, “Retype Password”, “Nickname”, “E-mail”, “Company”, and “Country / Region “, and then click the “Submit” button. **Please note that the username can only contain lowercase letters and numbers.**

V. If the information is valid, the following screen will be displayed and the application of IoTstar user account will be completed. After the administrator activates this user account, user can click the "Login" button to visit IoTstar’s Account login page



VI. Input the username, password, and select the language, and then click the “Submit” button to login IoTstar.



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Please note:

1. The user can select the preferred language of the IoTstar webpage on the login page. After login into the system, if the user want to change the language again, logout and re-select the language on the Login page.
2. Before starting the system, please make sure the browser you are using already enable JavaScript support, otherwise the system will not function properly.

6 IoTstar Web Page Overview

After the user login into the IoTstar with individual information successfully, the IoTstar home page will be displayed as below. The home page will list all the WISE /PMC / PMD controllers that the user has the authority for maintenance/monitoring and the WISE / PMC / PMD controllers that are shared from other accounts. For assigning the authority setting of WISE / PMC / PMD to individual IoTstar user account, please refer to “Appendix I: WISE Connection setting for IoTstar” section and “Appendix III: PMC / PMD Connection setting for IoTstar” section.

IoTstar home page is mainly divided into 2 parts:

- A. System Function
- B. Data Review/System Setting

More detailed information for each part will be given in the following section.

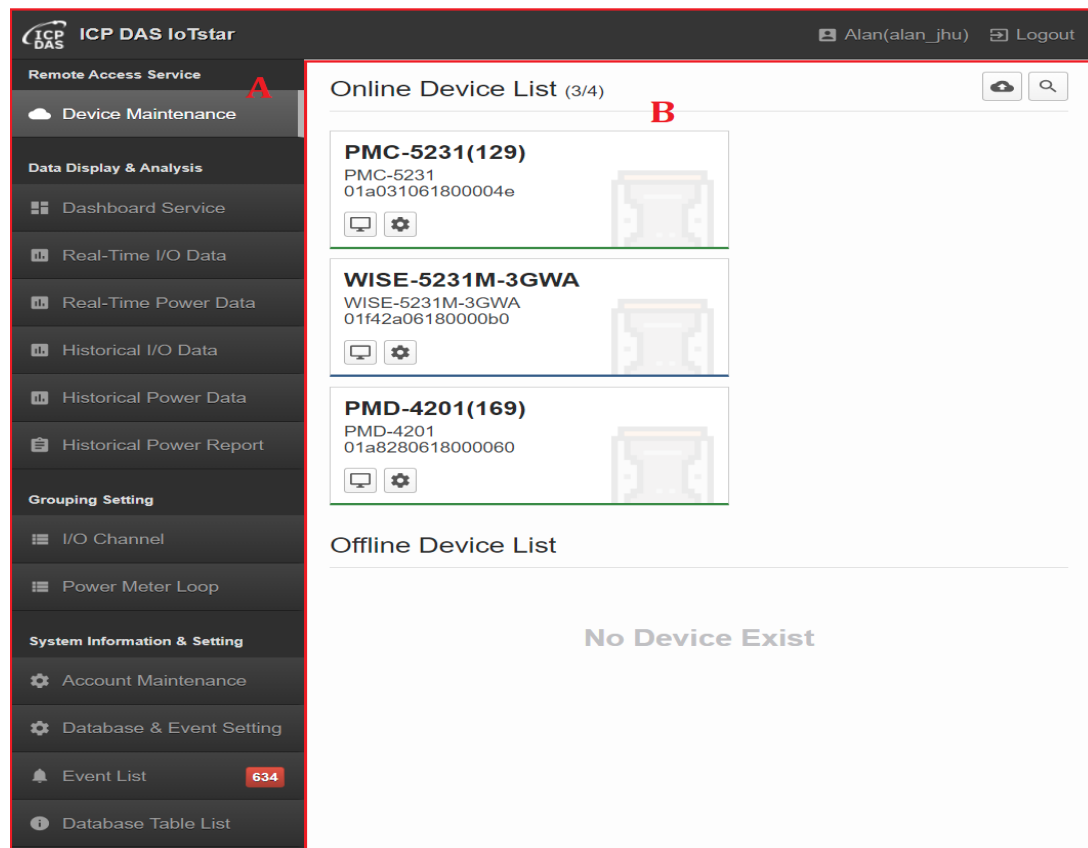


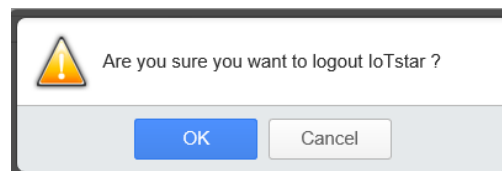
Figure 6-1 IoTstar Home Page

6.1 System Function area

System function area provides immediately access to the main functions of IoTstar, such as: Remote Maintain Devices, Real Time Data Display, Historical Data Analysis, System Information & Settings, and logout IoTstar, etc. Each function in system function area is listed as the following:

- Logout

Logout button is at the right upper of IoTstar Webpage. Click on logout button and then click “OK” to logout the system.



- Account Maintenance

There is the “Account Maintenance” button at the right upper of IoTstar Webpage. Click on the button with user's nickname to enter the Account Maintenance page.

- System Function Toolbar

System function toolbar is at the left side of the IoTstar Webpage. The System function toolbar includes the following function options. The following chapters will provide more detailed description of these functions.

- Chapter 7: Remote Access Service
- Chapter 8: Data Display
- Chapter 9: Grouping Setting
- Chapter 10: System Information & Setting

6.2 Data Review/System Setting area

Data review/System setting area allows to set system parameters and data review of WISE / PMC / PMD controller, the content of this area will be varied according to the selected system function. After the user login into the IoTstar, the Data review/System setting area of home page will list all the WISE /PMC / PMD controllers that the user account has the authority for maintenance/monitoring and the WISE / PMC / PMD controllers that are shared from other accounts. The following is an example.

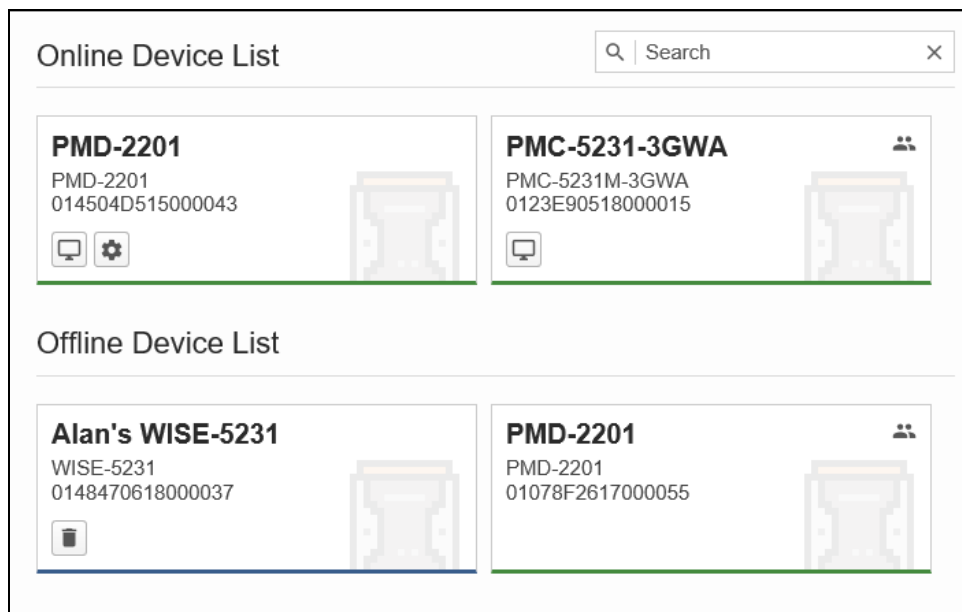


Figure 6-2 Data Review/System Setting area

7 Remote Access Service

After login into the IoTstar, click on the “Device Maintenance” button in the “Remote Access Service” section on the “System Function” area of IoTstar Webpage, the “Data review/System setting” area will list all the WISE / PMC / PMD controllers that the user has the authority for maintenance/monitoring and the WISE / PMC / PMD controllers that are shared from other accounts. According to the connection status between controller and IoTstar, the WISE / PMC / PMD controllers could be divided into “Online Device List” and “Offline Device List” groups as below.

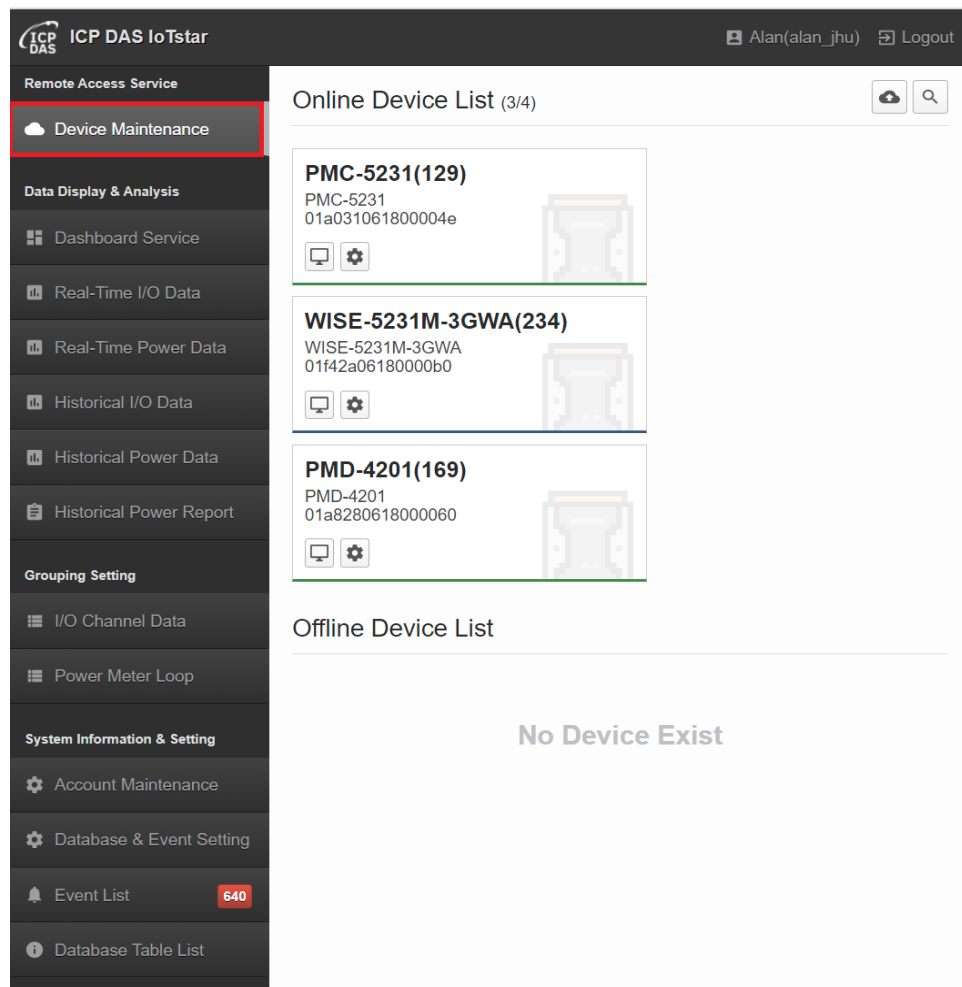



Figure 7-1 Device Maintenance page

In the “Online Device List” group, if the user is authorized to access the controller for

maintenance/monitoring, user can click the  button below the controller to launch the Webpage of the selected WISE / PMC / PMD controller and login the controller for remote maintenance, status monitoring and system setting operations.




Please Note :

1. For the setting of WISE, please refer to WISE User manual

(<http://wise.icpdas.com/Download.html#manual>).

2. For the setting of PMC / PMD, please refer to PMC / PMD User manual

(<http://pmms.icpdas.com/en/download.html#manual>).

In addition, if the configuration of WISE / PMC / PMD is modified and the configuration file is downloaded to the controller via the IoTstar's interface, these previous configuration files will be backup in IoTstar. To restore the configuration, click on the  button below the controller, and specify the desired configuration file, click the “Restore” button of the file, then IoTstar will download the desired configuration file into the controller and restore to the previous configuration.




Please Note : IoTstar will only keep the latest 30 previous configuration files for each controller.

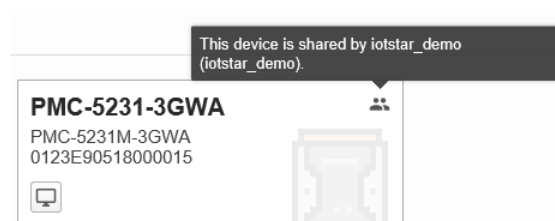





Time	Size	Action
2017-05-08 09:49:26	77.2 KB	Restore
2017-05-08 09:48:38	78.8 KB	Restore
2017-05-05 17:28:30	77.6 KB	Restore
2017-05-05 17:27:43	77.6 KB	Restore
2017-05-05 17:26:33	77.6 KB	Restore
2017-05-05 10:04:08	76.0 KB	Restore
2017-05-05 10:03:52	77.6 KB	Restore
2017-05-05 09:35:26	76.0 KB	Restore
2017-05-05 09:34:50	77.6 KB	Restore
2017-05-05 09:33:52	77.6 KB	Restore
2017-05-05 09:33:26	77.6 KB	Restore
2017-05-05 09:32:59	76.0 KB	Restore

Close

In the “Online Device List” area, if there is the  icon at the right upper of WISE / PMC / PMD controller, it means the controller is shared from the other account. Move the mouse over the  icon, a message will appear to show who owns the authority of the controller. Click on the  button below the controller to launch the Webpage of the selected WISE / PMC / PMD controller, and then you can login as a **Guest** to review the status of the controllers.



For the WISE / PMC / PMD controllers in the “Offline Device List” group, it means the Network connection between the controller and IoTstar is in offline status. So the user cannot perform the operations such as: remote maintenance, status monitoring, system setting, and firmware update. If the Network connection between the controller and the IoTstar is no longer needed, user can click on the  button below

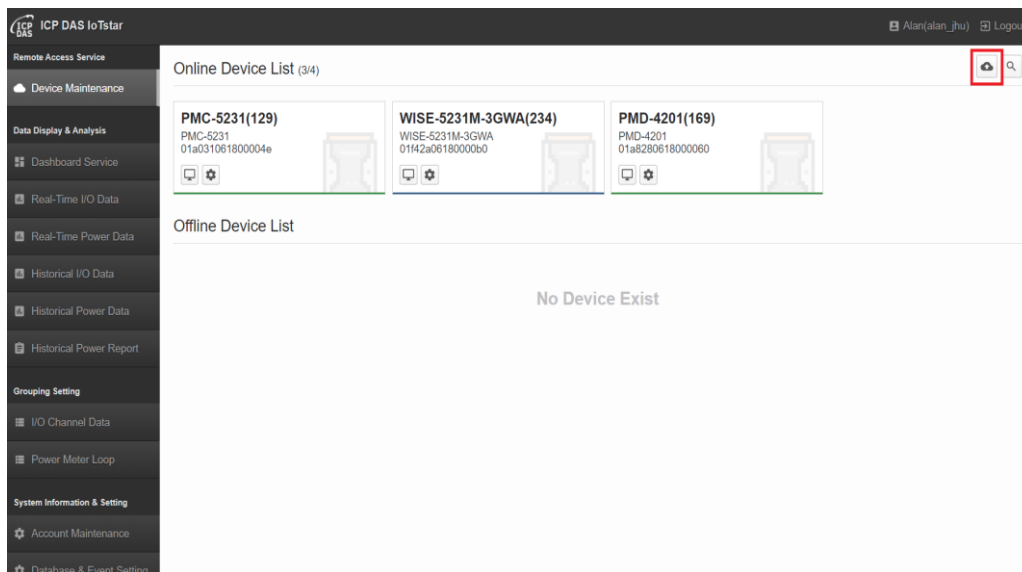
the controller to remove the controller from the “Offline Device List” group.

Please Note : The “Remove” function will also remove all previous configuration files of the controller.

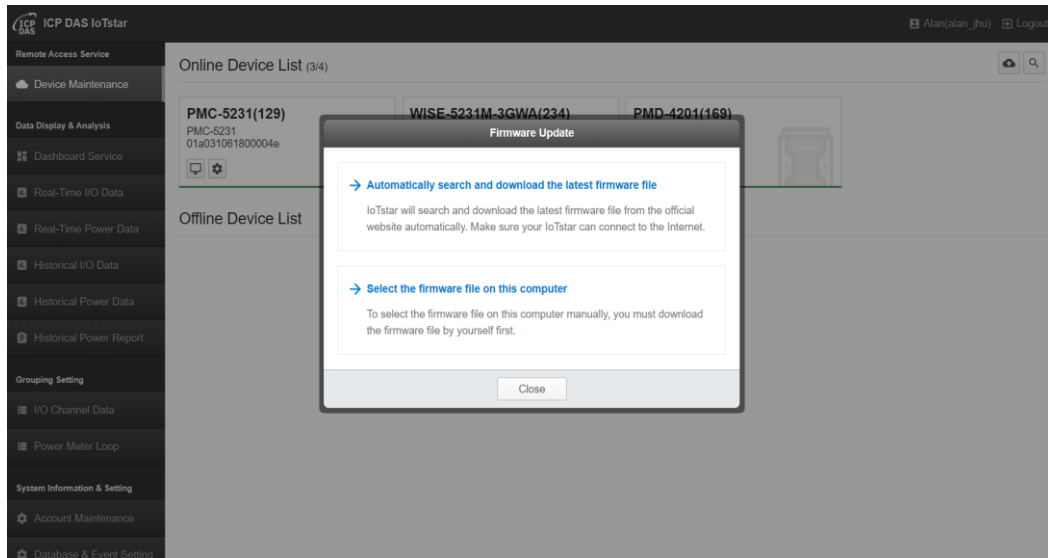


In addition, IoTstar can perform the “Batch operation of Firmware Update” for the remote WISE / PMC / PMD controllers located in the “Online Device List” area. Users only need to complete the corresponding settings, and then IoTstar will automatically perform remote firmware update on all selected WISE / PMC / PMD controllers. It will help user to conveniently and quickly complete the operation of remote firmware update on multiple controllers simultaneously. For the setting of “Batch operation of Firmware Update”, please refer to the steps as below.

I. Click the “Firmware Update”  button at the right top corner of the “Online Device List” area.

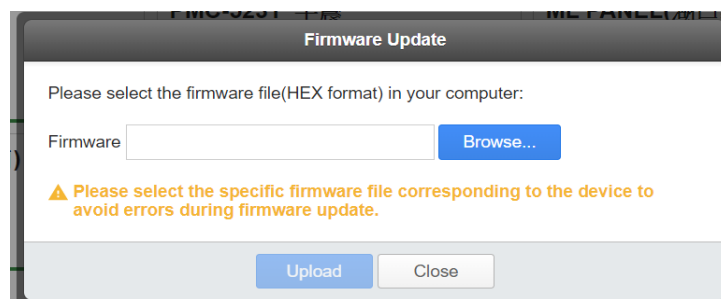


II. For the firmware file required in the firmware update operations of WISE / PMC / PMD controllers, IoTstar provides two options for the selection of firmware file.



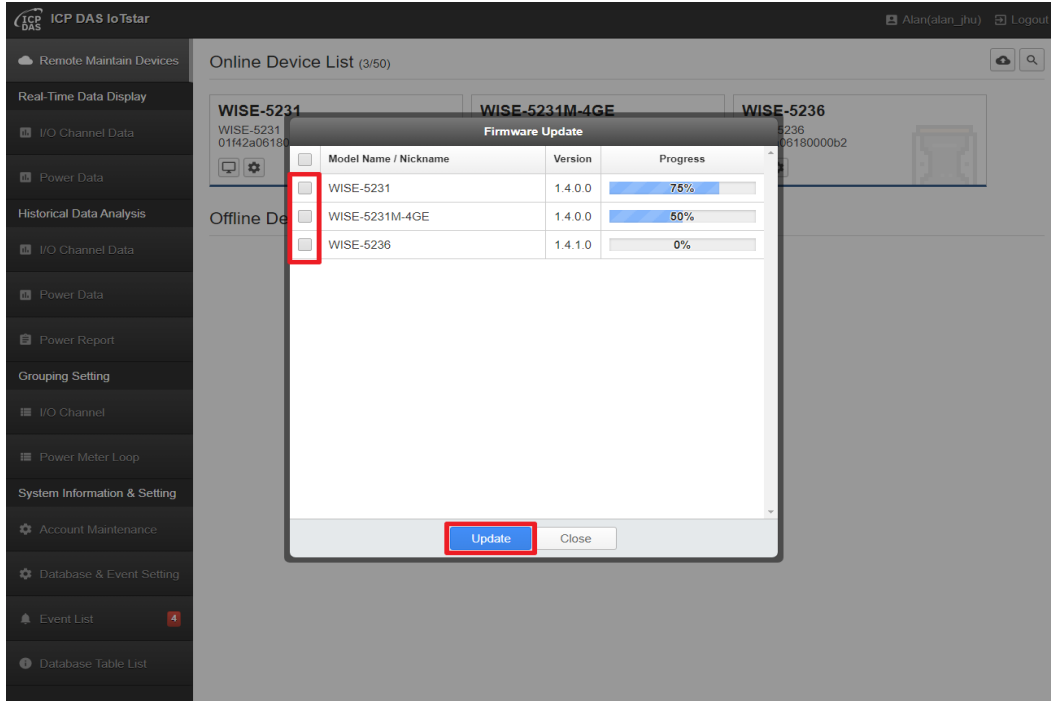
- Automatically search and download the latest firmware files: IoTstar will automatically download the latest version of WISE / PMC / PMD firmware files from the official website of WISE / PMC / PMD controller and use the files in the firmware update operation.

- Browse the firmware files on this computer: If user has previously downloaded the WISE / PMC / PMD firmware files, he can browse and select the WISE / PMC / PMD firmware files on the computer where IoTstar is installed, and use the files in the firmware update operation.



III. After the selection of firmware files is completed, user can select the WISE / PMC / PMD controllers which need to perform the firmware update operation from

the list of WISE / PMC / PMD controller and then clicks the “Update” button. Now IoTstar will automatically perform the firmware update operation for all the selected controllers simultaneously. Users can review the status of the firmware update process for each controller through the “Progress Rate” field.



8 Data Display & Analysis

“Data Display & Analysis” allows inquiry and display of the I/O channel data and power data of the WISE / PMC / PMD controllers connected to IoTstar. “Data Display & Analysis” section includes 3 major services: “Dashboard”, “Real-time Data” and “Historical Data”.

“Dashboard” service provides the Dashboard editor and a variety of Widget components. User can setup the Dashboard pages to review the Real-Time sensor data (and Power data) from the I/O modules (or Sensor) and Power Meter connected to WISE / PMC / PM controllers.

“Real-time Data” service allows inquiry and display of the real-time power data and I/O channel data of the WISE / PMC / PMD controllers connected to IoTstar by chart.

“Real-time Data” service includes 2 options: “Real-Time I/O Data” and “Real-Time Power Data”.

“Historical Data Analysis” service allows inquiry and display of the historical power data and I/O channel data of the WISE / PMC / PMD controllers connected to IoTstar. It allows doing data analysis and cross-match operations of these historical data with ease. “Historical Data” service includes 3 options: “Historical I/O Data”, “Historical Power Data” and “Historical Power Report”.

More detailed information for each service will be given in the following sections.

8.1 Dashboard Service

IoTstar can use the Dashboard editor and a variety of Widget components provided by IoTstar Dashboard Service to setup the Dashboard pages to review the Real-Time sensor data (and Power data) from the I/O modules (or Sensor) and Power Meter connected to WISE / PMC / PM controllers. User can click on the “Dashboard Service“ button in the “Data Display & Analysis” section on the “System Function”

area of IoTstar Webpage to enter the Dashboard Service page. For the function description of "Dashboard Service", please refer to "ICP DAS IoTstar Dashboard Service User Manual" for detail.

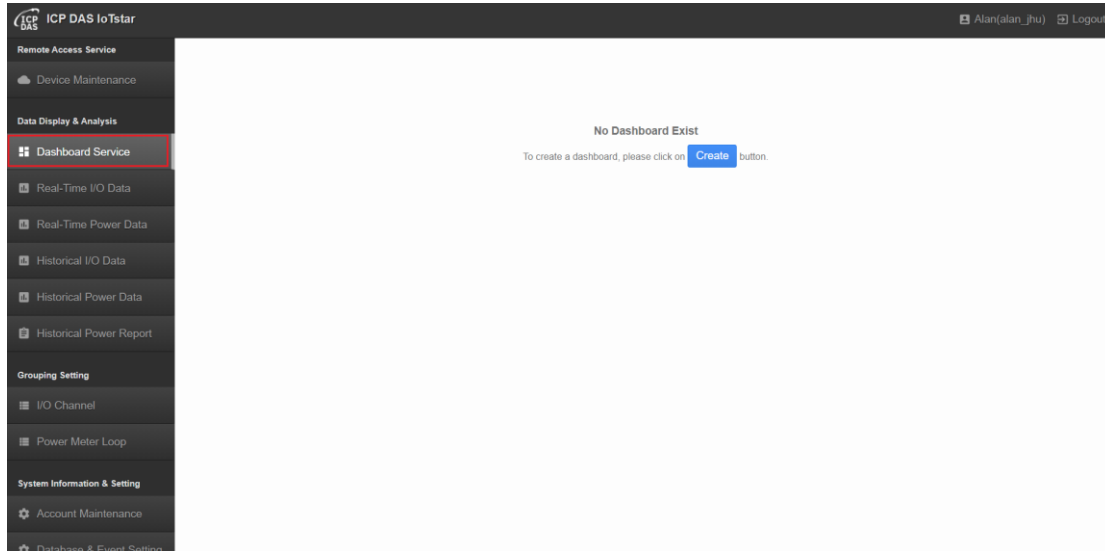


Figure 8-1 Dashboard Service page

8.2 Real-Time I/O Data

Click on the “Real-Time I/O Data” button in the “Data Display & Analysis” section on the “System Function” area of IoTstar Webpage; the list of WISE / PMC / PMD controllers connected to IoTstar and the I/O Channel groups will be shown in the Data Review/System Setting section. The user can select the desired I/O Channel of the I/O module or the I/O Channel group, then the corresponding Real-Time I/O Channel data will be shown in Chart. The “Real-Time I/O Data” page is as below:

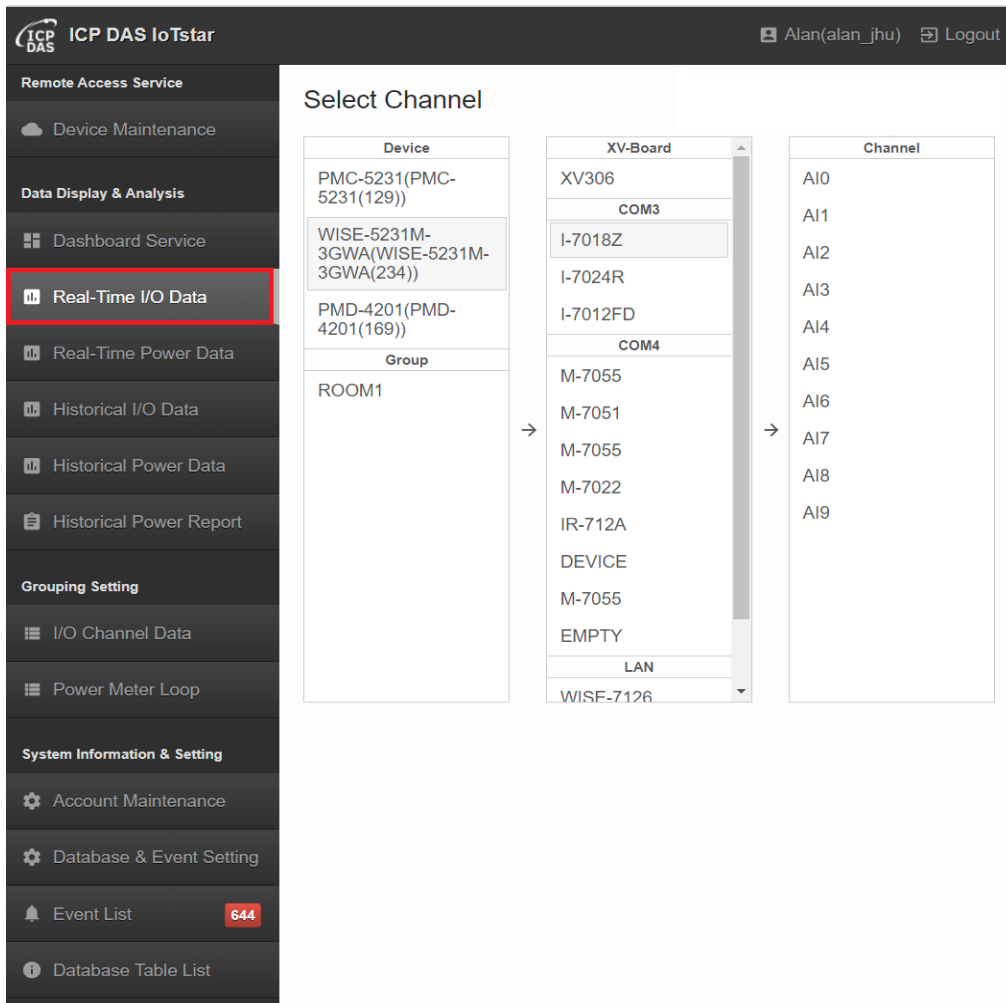



Figure 8-2 Real-Time I/O Data - I/O Module List

User can follow the sequence as: “Select the specified WISE / PMC / PMD controller -> Select the specified I/O module connected to the controller -> Select the I/O channel of the I/O module” or “Select the I/O Channel group directly”, then IoTstar will show the real-time Data of the I/O channel in Chart. Click on the **Add** button below the Chart to add other I/O channel's real-time Data into the Chart for data display and cross-match operation. And if you click on the **Remove** button next to the I/O channel, the real-time data of the specified I/O channel will be removed and not displayed.

If the I/O channel cannot be selected, please remember to update the firmware of

WISE / PMC / PMD controller first (WISE needs to be updated to v1.5.0 firmware or later version; PMC / PMD needs to be updated to v3.4.6 firmware or later version), visit the “IoT Platform Setting > IoTstar Setting > Real-time Data Sending Setting” page of WISE / PMC / PMD, and insert the I/O channels which need to actively send the Real-Time data to IoTstar, then click “Save” button to save the setting.

The following figure shows an example of the displayed data in Chart. The user can flexibility move the  buttons forward and backward on the Timeline to display the corresponding I/O channel real-time Data of specified time range in the Chart.

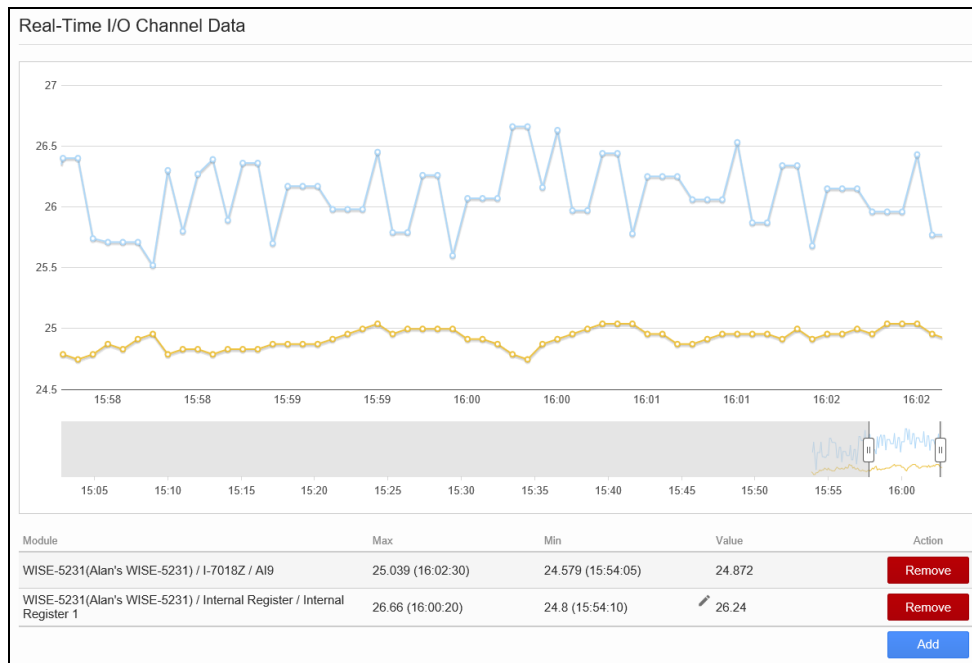




Figure 8-3 Real-Time I/O Data - I/O Channel Data Display

There is the I/O Channel list under the real-time data chart. If the Channel is Internal Register, DO channel or AO channel, IoTstar will provide a  button behind the channel. Click the  button, a pop-up window will be shown to let user to enter the new value for the output channel. After complete the setting, IoTstar will assign the new value to the I/O module to update the value of the corresponding output channel.

Please Note : For the DO channel setting, 1 is ON, 0 is OFF.

Module	Max	Min	Value	Action
WISE-5231(Alan's WISE-5231) / I-7018Z / AI9	25.039 (16:02:30)	24.579 (15:54:05)	24.872	Remove
WISE-5231(Alan's WISE-5231) / Internal Register / Internal Register 1	26.66 (16:00:20)	24.8 (15:54:10)	26.24	Remove

[Add](#)

Value Setting

Please enter the value:

16.86
x

OK
Cancel

Figure 8-4 Real-Time I/O Data - IR, DO/AO channel Setting

8.3 Real-Time Power Data

Click on the “Real-Time Power Data” button in the “Data Display & Analysis” section on the “System Function” area of IoTstar Webpage; the list of PMC / PMD controllers connected to IoTstar will be shown in the Data Review/System Setting section. The user can select the desired Loop of the power meter, then the corresponding real time power data will be shown in Chart. The “Real-Time Power Data” page is as below.

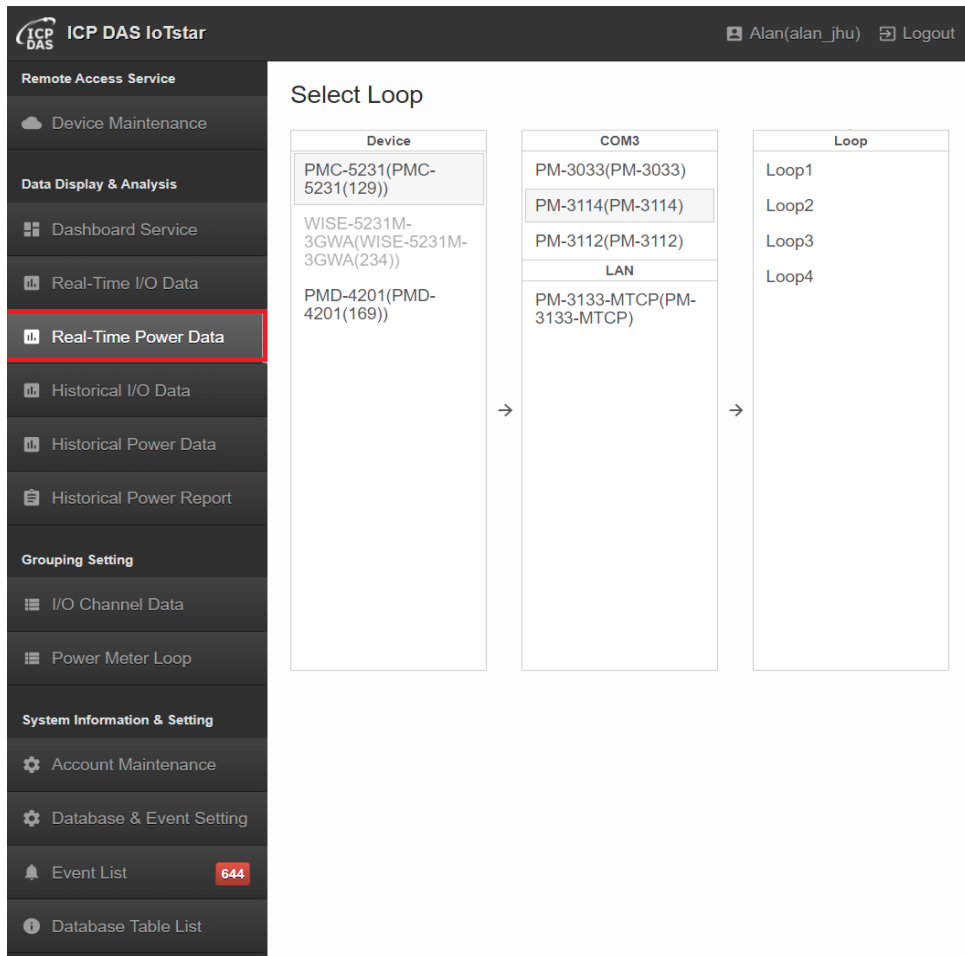



Figure 8-5 Real-Time Power Data - Power Meter List

User can follow the sequence as: “Select the specified PMC / PMD controller -> Select the specified power meter connected to the controller -> Select the Loop of the power meter” in “Power Data” page, then IoTstar will show the real-time power data information in Chart. Currently it provide the Voltage, Current, kW, kvar, kVA, PF, kWh, kvarh and kVAh information display.

If the loop of the power meter cannot be selected, please remember to update the firmware of PMC / PMD controller first (PMC / PMD needs to be updated to v3.4.6 firmware or later version), visit the “IoT Platform Setting -> IoTstar Setting -> Real-time Data Sending Setting” page of PMC / PMD, and insert the loop of the power meter which need to actively send the Real-Time power data to IoTstar, then

click “Save” button to save the setting.

The following figure shows an example of the displayed data in Chart. The user can

flexibility move the  buttons forward and backward on the Timeline to display the corresponding real-time power data of specified time range in the Chart.

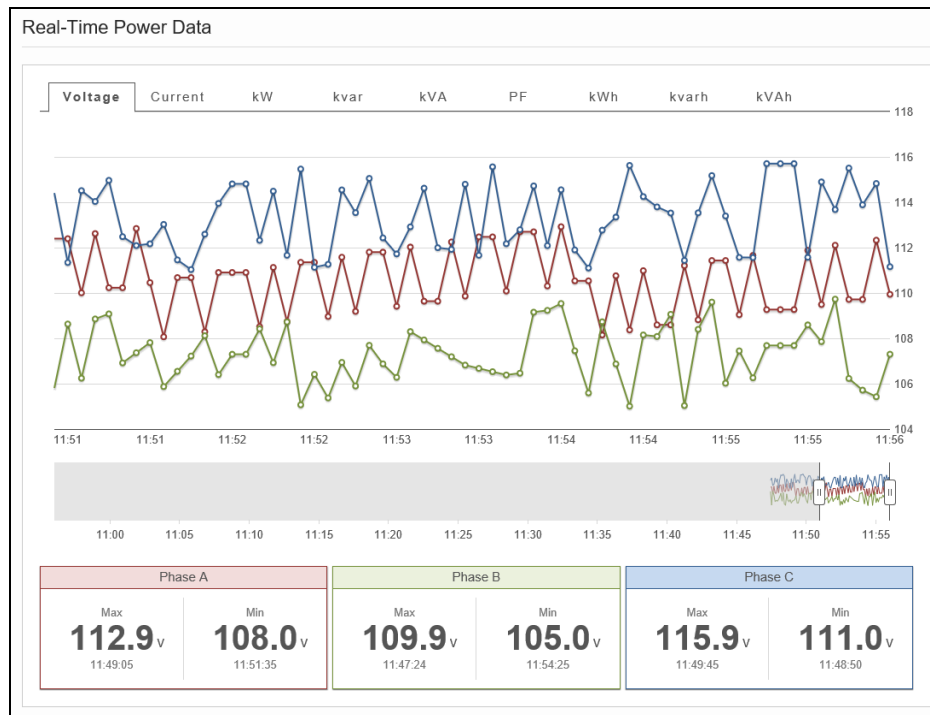


Figure 8-6 Real-Time Power Data - Power Data Display

8.4 Historical I/O Data

Click on the “Historical I/O Data” button in the “Data Display & Analysis” section on the “System Function” area of IoTstar Webpage; the list of WISE / PMC / PMD controllers connected to IoTstar and the I/O Channel groups will be shown in the Data Review/System Setting section. The user can select the desired I/O Channel of the I/O module or the I/O Channel group, then the corresponding historical I/O Channel data will be shown in Chart. The “Historical I/O Data” page is as below:

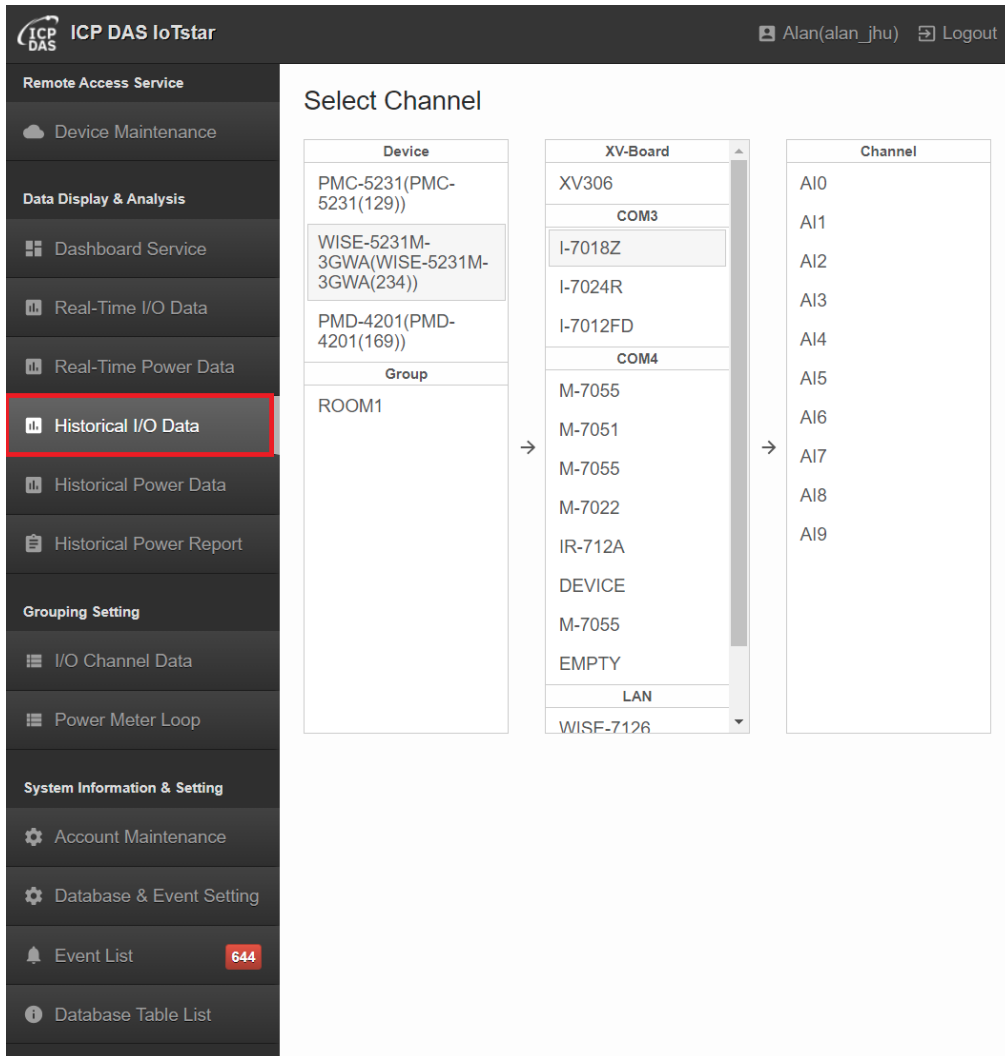



Figure 8-7 Historical I/O Data - I/O Module List

User can follow the sequence as: “Select the specified WISE / PMC / PMD controller -> Select the specified I/O module connected to the controller -> Select the I/O channel of the I/O module” or “Select I/O Channel group directly”, then IoTstar will show the historical Data of the I/O channel in Chart. Click on the **Add** button below the Chart to add other I/O channel's historical Data into the Chart for data analysis and cross-match operation. And if you click on the **Remove** button next to the I/O channel, the historical data of the specified I/O channel will be removed and not displayed.

The Time range setting of the Chart can be adjusted as required to show the I/O

channel data of the corresponding time range. Check the “Sync Selector” will synchronize the Time range setting of all I/O channel of the Chart. The following figure shows an example of the displayed data in Chart. The user can flexibility move the  buttons forward and backward on the Timeline to display the corresponding I/O channel historical Data of specified time range in the Chart.

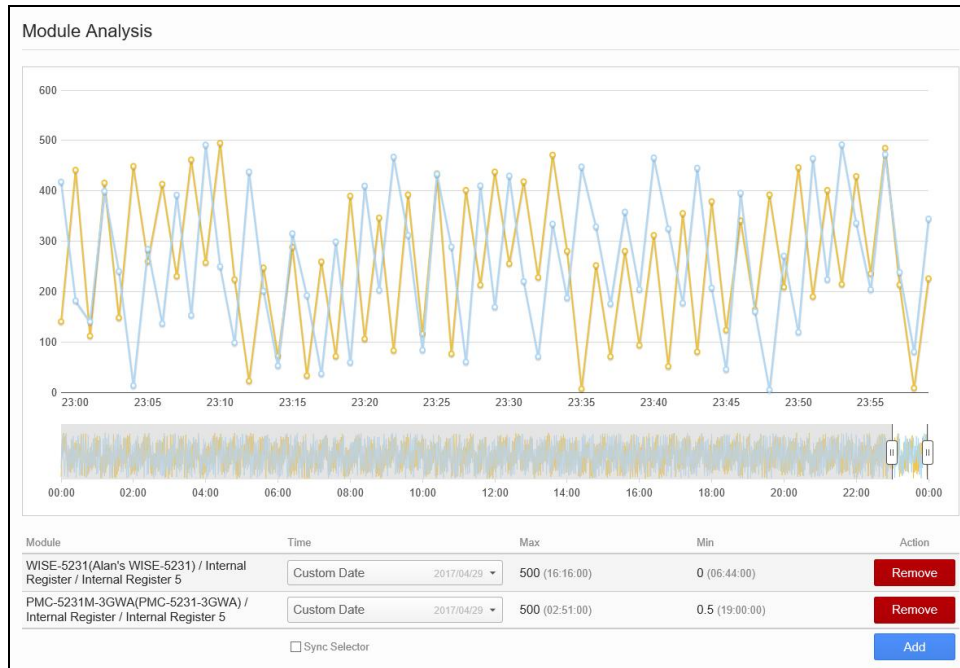


Figure 8-8 Historical I/O Data - I/O Channel Data Analysis

8.5 Historical Power Data

Click on the “Historical Power Data” button in the “Data Display & Analysis” section on the “System Function” area of IoTstar Webpage; the list of PMC / PMD controllers connected to IoTstar and power meter groups will be shown in the Data Review/System Setting section. The user can select the desired Loop of the power meter or the power group, then the corresponding historical power data will be shown in Chart. The “Historical Power Data” page is as below:

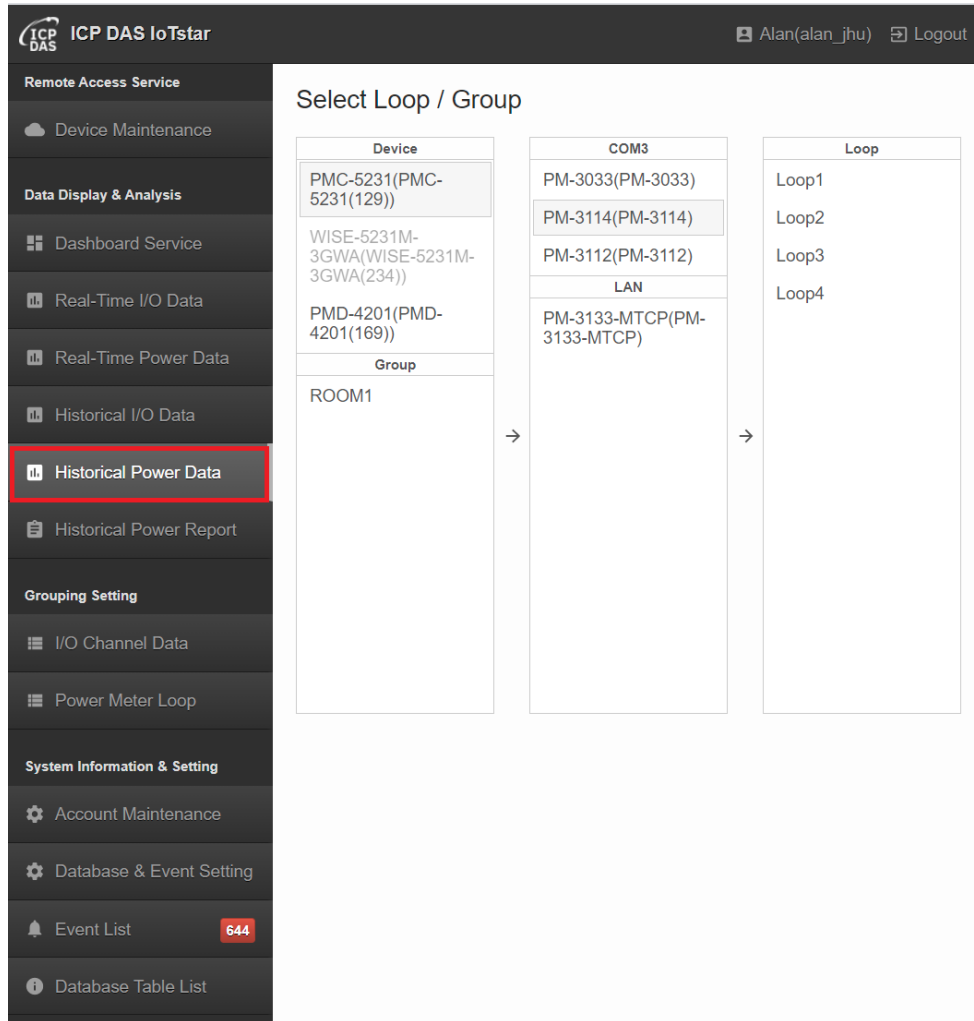



Figure 8-9 Historical Power Data - Power Meter List

IoTstar provide the “Power Data Analysis for Power Meter” or “Power Data Analysis for Power Meter Group” functions. The following sections will describe detailed information.

8.5.1 Power Data Analysis for Power Meter

User can follow the sequence as: “Select the specified PMC / PMD controller -> Select the specified power meter connected to the controller -> Select the Loop of the power meter” in “Power Data” page, then IoTstar will show the “Energy Analysis” and “Power Data Analysis” information of the corresponding historical power data in

Chart.

- **Energy Analysis:** For the Energy data (kWh) analysis, 5 options of Chart's Timeline setting are provided: “Day”, “Week”, “Month”, “Quarter” and “Year” (at the left upper of the Chart). Setup the Timeline and then specify the start day of the Timeline from the “Time” filed; then the corresponding historical power data of the Loop of the power meter will be displayed. By using the “Compared” function, the user can specify a start day of the compared group's historical power data; the chart will be shown to compare the historical power data of these two groups at the same time for data cross-match analysis. In the “Energy Analysis” section, it also provides the current and compared information as kWh, “Carbon Footprint” and “Growth Rate” for reference. Click the  button at the right upper of “Carbon Footprint” will provide the interface for adjusting the parameters of Carbon Footprint.

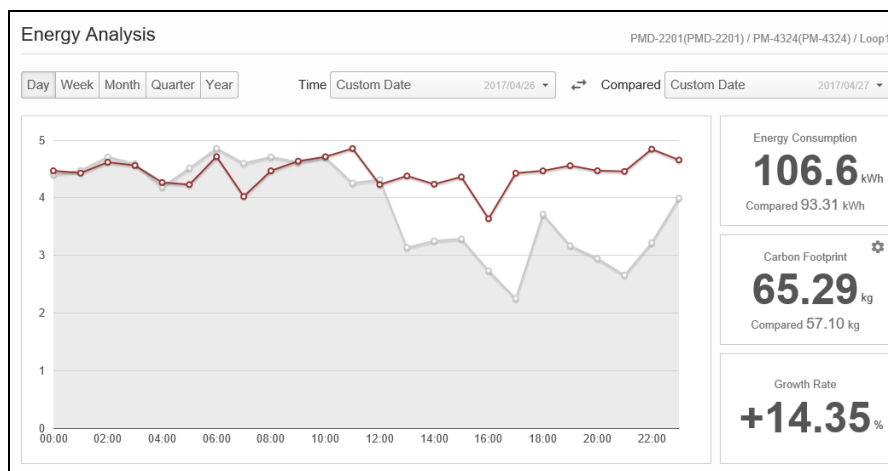


Figure 8-10 Historical Power Data - Energy Analysis for Power Meter


- **Power Data Analysis:** 5 options of Chart's Timeline setting are provided: “Day”, “Week”, “Month”, “Quarter” and “Year” (at the left upper of Chart) for the power data analysis. After adjusting the Timeline setting, please specify the start day of the Timeline from the “Time” filed at the top of chart, then the chart will display the corresponding historical power data of the Loop/Phase of the power meter. Currently

the “Power Data Analysis” section provides the Voltage, Current, kW, kvar, kVA and PF information display.



Figure 8-11 Historical Power Data - Power Data Analysis for Power Meter

8.5.2 Power Data Analysis for Power Meter Group

Select the specified power meter group in the “Power Data” page; then the IoTstar will show the “Energy Analysis” information for the corresponding historical power data of the power meter group in chart. 5 options of chart's Timeline setting are provided: “Day”, “Week”, “Month”, “Quarter” and “Year” (at the left upper of chart) for the Energy data (kWh) analysis. Setup the Timeline setting and then specify the start day of the Timeline from the “Time” filed; then the corresponding historical power data of the power meter group will be displayed. By using the “Compared” function, the user can specify a start day of the compared group's historical power data; the chart will be shown to compare the historical power data of these two groups at the same time for data cross-match analysis. In the “Energy Analysis” section, it also provide the current and compared information of kWh, “Carbon Footprint” and “Growth Rate” for reference. Click the  button at the right upper of “Carbon Footprint” will provide the interface for adjusting the parameters of Carbon Footprint.

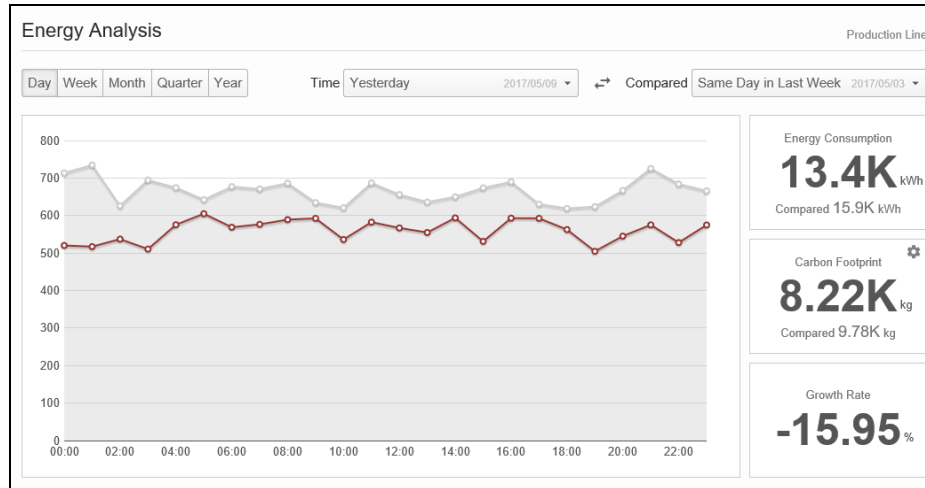


Figure 8-12 Historical Power Data - Energy Analysis for Power Meter Group

8.6 Report Service

IoTstar provide the statistical report query function for the sensors connected to WISE/PMC/PMD controller by the IoTstar Report Service. By using IoTstar Report Service, the data measured by the sensors can be converted into valuable statistical reports for references and as basis for making decisions. User can click on the “Report Service” button in the “Data Display & Analysis” section on the “System Function” area of IoTstar Webpage to enter the IoTstar Report Service page. For the function description of "Report Service", please refer to "ICP DAS IoTstar Report Service User Manual" for detail.

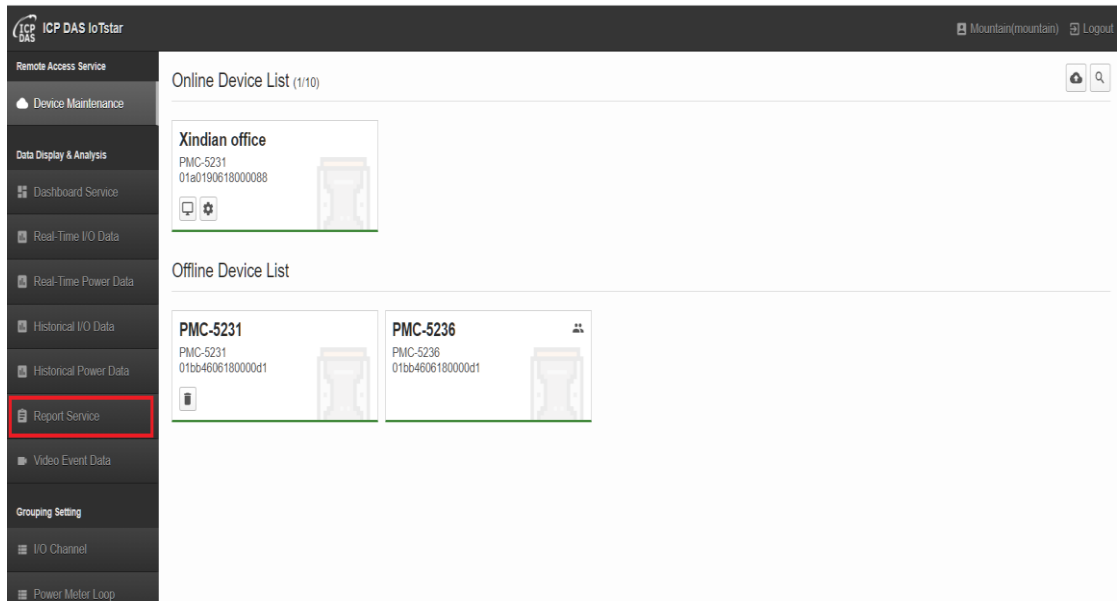



Figure 8-13 Report Service page


Please Note: IoTstar has removed the original "Historical Power Report" query function after v3.0, and this function is now provided by the IoTstar Report Service package. If you need to use the original "Historical Power Report" query function, please do not install IoTstar v3.0.0 (or later version).

8.7 Video Event Data

Click on the "Video Event Data" button in the "Data Display & Analysis" section on the "System Function" area of IoTstar Webpage; the video event data uploaded by WISE controllers will be shown in the Data Review/System Setting section, and user can query and play the image/video files uploaded by WISE controllers. The "Video Event data" page is as below:

2021 / 6					2021 / 7					2021 / 8					2021 / 9													
W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S	
2	3	4	5		27	28	29	30	1	2	3		1	2	3	4	5	6	7		29	30	31	1	2	3	4	
9	10	11	12		4	5	6	7	8	9	10		8	9	10	11	12	13	14		5	6	7	8	9	10	11	
16	17	18	19		11	12	13	14	15	16	17		15	16	17	18	19	20	21		12	13	14	15	16	17	18	
23	24	25	26		18	19	20	21	22	23	24		22	23	24	25	26	27	28		19	20	21	22	23	24	25	
30	1	2	3		25	26	27	28	29	30	31		29	30	31	1	2	3	4		26	27	28	29	30	1	2	
7	8	9	10		1	2	3	4	5	6	7		5	6	7	8	9	10	11		3	4	5	6	7	8	9	

 Warning, a moving object is detected!
11:30:36

 Warning, a moving object is detected!
11:30:18






Figure 8-14 The "Video Event Data" Page

Users can click the  button on the right upper of page to instantly update the video event currently received by IoTstar, reload the latest video events, and play the image/video file bound with latest event on the page. In addition, user can click the  button to enable the "Device Filter" function. Through the function, user can select the desired WISE controller and review the video event uploaded by the WISE.

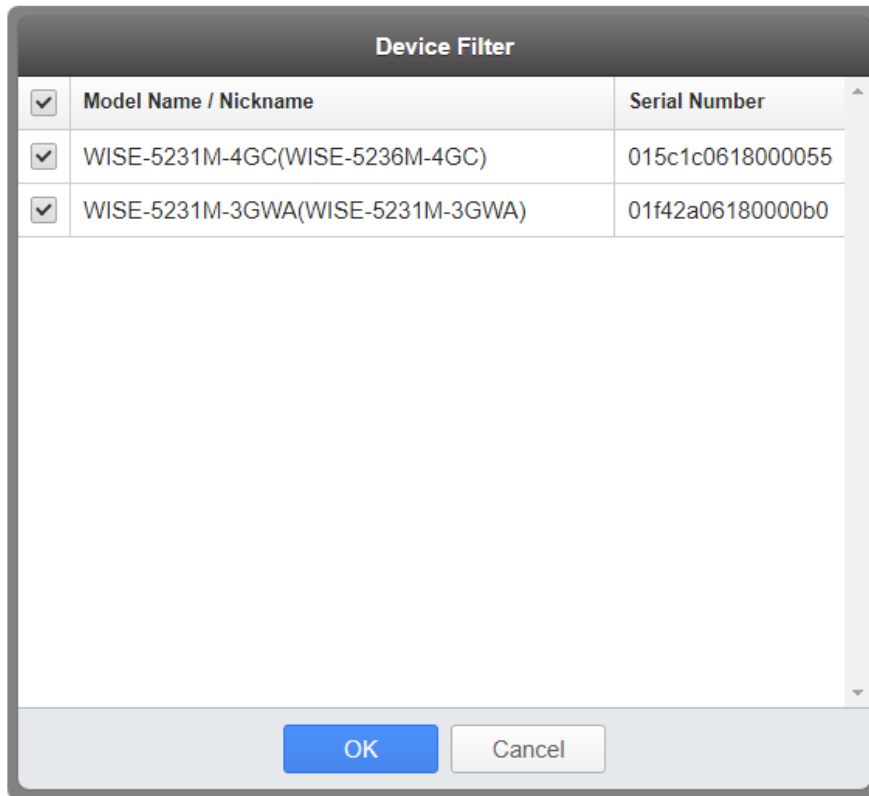







Figure 8-15 The Interface of "Device Filter" Function

The “Video Event Data” page provides the calendar interface. If the date of the calendar bound with a triangle symbol in the upper left corner of the date, it mean there is the event occurred on the date. In addition, user can keep the mouse on the calendar and scroll the mouse wheel to scroll the calendar or scroll the calendar through the buttons on the left and right side of the calendar to review the video event on other months.

2021 / 6						2021 / 7						2021 / 8						2021 / 9					
S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F
1	2	3	4	5	6	27	28	29	30	1	2	1	2	3	4	5	6	29	30	31	1	2	3
7	8	9	10	11	12	3	4	5	6	7	8	7	8	9	10	11	12	4	5	6	7	8	9
13	14	15	16	17	18	9	10	11	12	13	14	13	14	15	16	17	18	10	11	12	13	14	15
19	20	21	22	23	24	15	16	17	18	19	20	19	20	21	22	23	24	16	17	18	19	20	21
25	26	27	28	29	30	21	22	23	24	25	26	25	26	27	28	29	30	22	23	24	25	26	27
31						27	28	29	30	31		31	1	2	3	4		28	29	30	31		

Figure 8-16 The Calendar Interface

User can click on the date bound with the triangle symbol, then the system will list all video events that occurred on that date in the video event list. Each event will show the information as the thumbnail of the event, the time of the occurrence of the event, the description of the event, and the event type (Icon  means this event is a video event; Icon  means this event is a image event; Icon  means this event is an event from a controller shared by other accounts. If user move the mouse to the icon, it will show the account name and nickname of the sharer).

When the mouse is moved to any video event, a check box will be shown at the left of the event. User can click the check box, and the advanced operation buttons will be shown at the bottom of the list. Click  button can be used to select or deselect all events. Click  button can be used to remove the selected events.

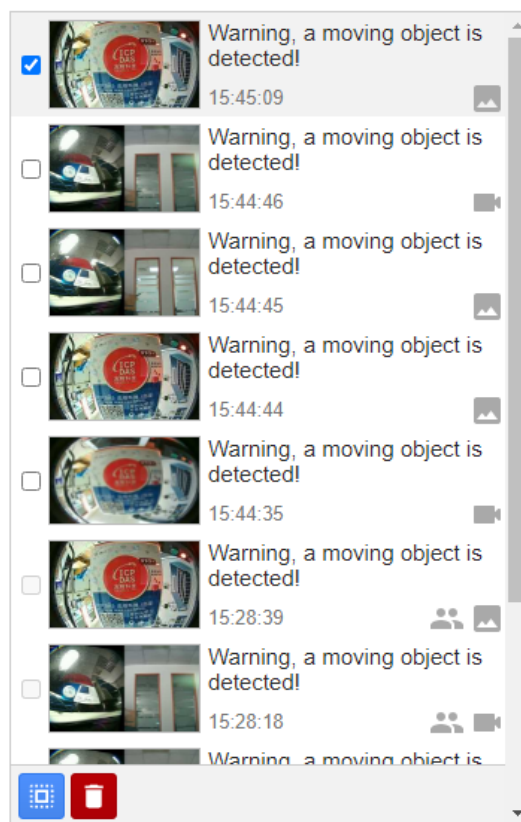


Figure 8-17 The Video Event List

When user clicks the event in the video event list, the system will display the video/image file bound with the event in the video playback area.



Figure 8-18 The Video Playback Area

9 Grouping Setting

The Grouping Setting allows user to create groups that contain the I/O Channels of I/O modules or the Loops of Power Meters for easy group classification. These pre-set groups can be inquired in “Real-Time Data Display” page and “Historical Data Analysis” page for data display. It includes 2 options: “I/O Channel” and “Power Meter Loop”. More detailed information for each option will be given in the following section.

9.1 I/O Channel

Click on the “I/O Channel” button in the “Grouping Setting” section on the “System Function” area of IoTstar Webpage; the list of I/O Channel Group will be shown in the Data Review/System Setting area. The I/O Channel grouping function allows user to create groups that contain the I/O Channels of I/O modules for easy group classification. These pre-set groups can be inquired in “Real-Time Data Display” page and “Historical Data Analysis” page for data display. The I/O Channel group setting page is shown as below:

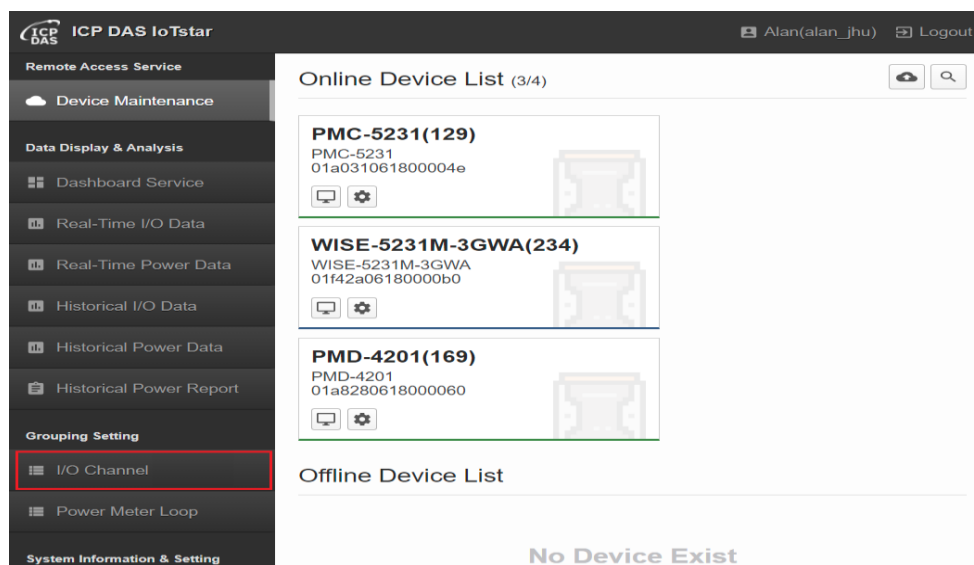


Figure 9-1 Grouping Setting for I/O Channel

Click the **Add New Group** button or **+ Add** button; enter the group name in the “Group Name” field, then click “OK” to create a new I/O Channel group.

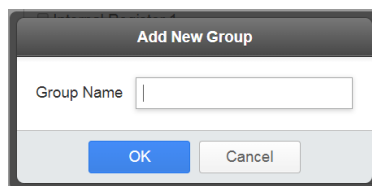
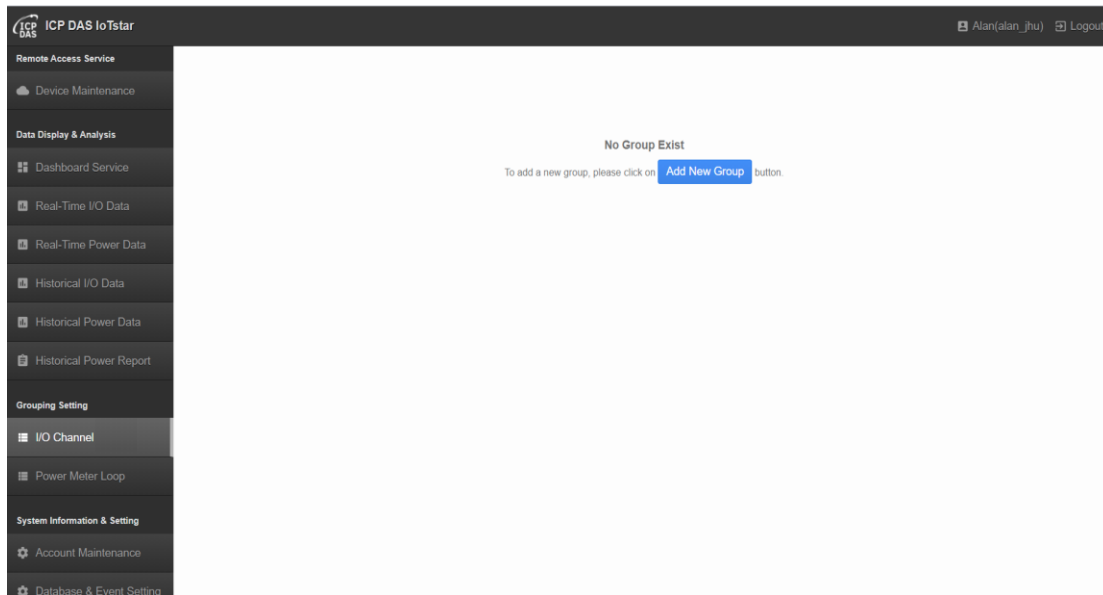


Figure 9-2 Create I/O Channel Group

After creating a new I/O Channel group, please click the **+** button in the Data Review/System Setting section on the IoTstar Webpage; and specify the desired I/O Channel of the I/O module to add to the group. After completing the setting, click “OK” button to save the setting.

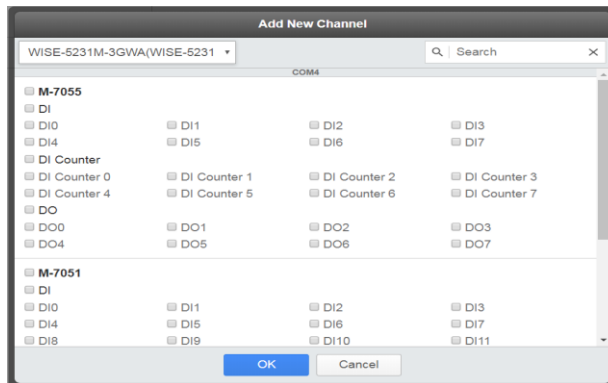
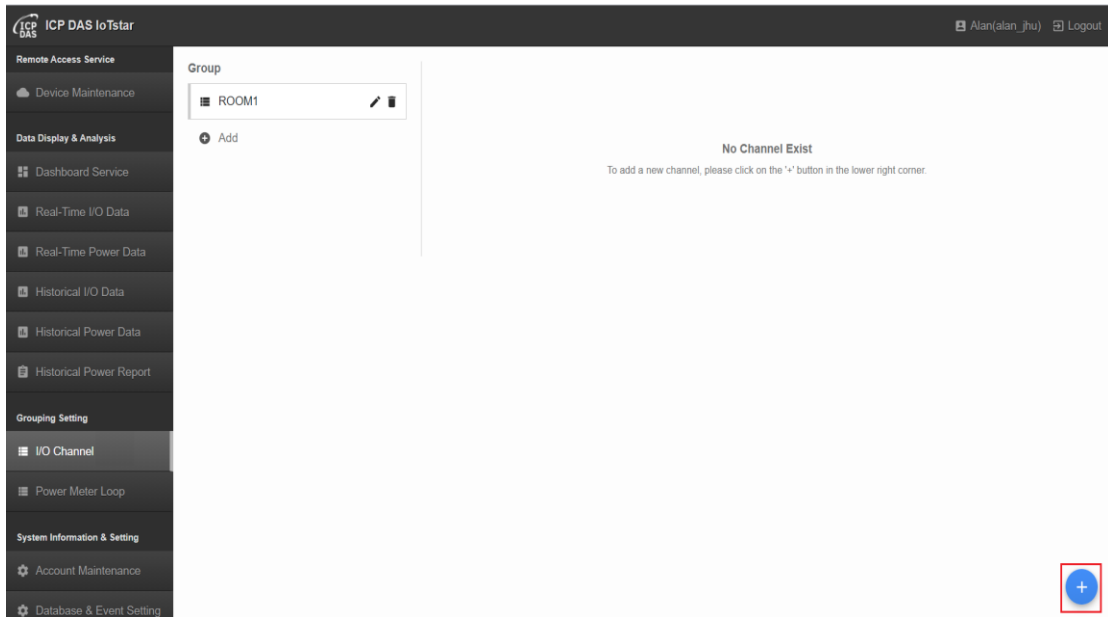






Figure 9-3 Add I/O Channel to Group

If required, user can click the  button to edit the name of the I/O Channel group. Or click the  button to remove the I/O Channel group setting.

Click on a I/O Channel group on the I/O Channel group list, all I/O Channels of the I/O Modules that are included in the group will be displayed in the Data Review/System Setting section. If required, the user can also specify the I/O Channel(s), and click the  button to remove the I/O Channel(s) from the group. Click the  button to cancel the remove operation.

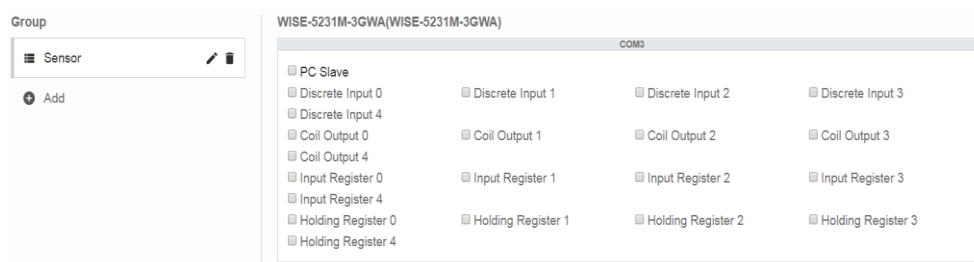


Figure 9-4 List of the I/O Channel

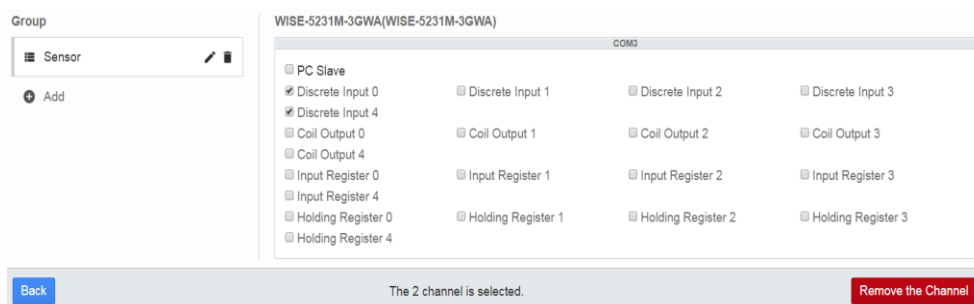


Figure 9-5 Remove I/O Channel from the I/O Channel Group

9.2 Power Meter Loop

Click on the “Power Meter Loop” button in the “Grouping Setting” section on the “System Function” area of IoTstar Webpage; the list of Power Meter Loop Group will be shown in the Data Review/System Setting area. The Power Meter Loop grouping function allows user to create groups that contain specific loops of power meters for easy group classification. These pre-set groups can be inquired in “Real-Time Data Display” page and “Historical Data Analysis” page for data display. The power meter group setting page is shown as below:

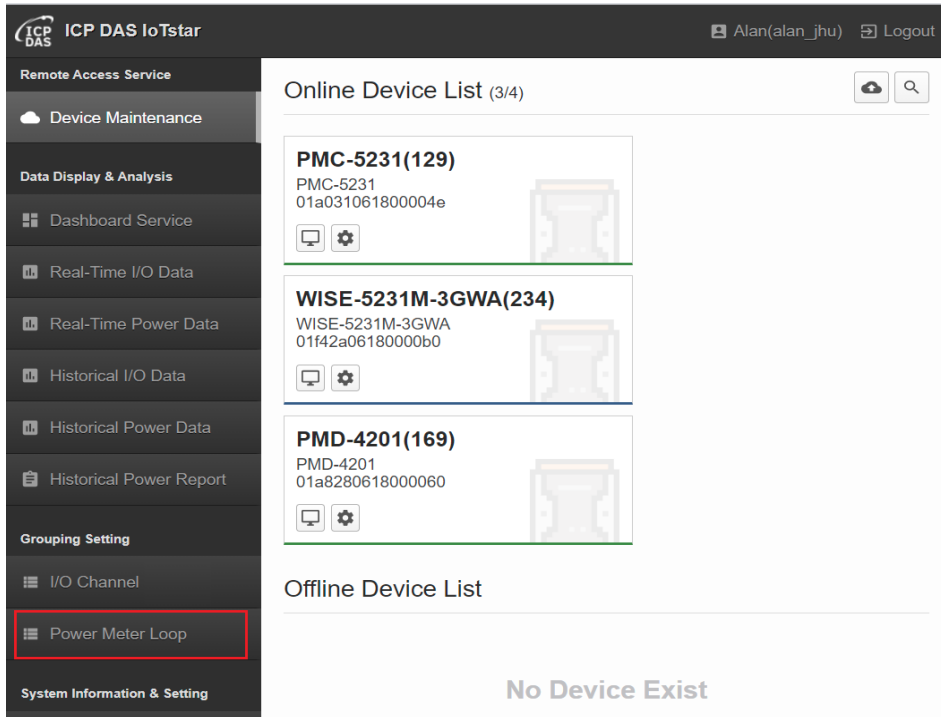


Figure 9-6 Grouping Setting for Power Meter Loop

Click the **Add New Group** button or **+ Add** button; enter the group name in the “Group Name” field, then click “OK” to create a new I/O Channel group.

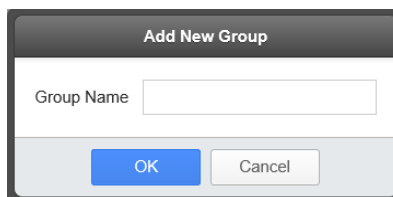
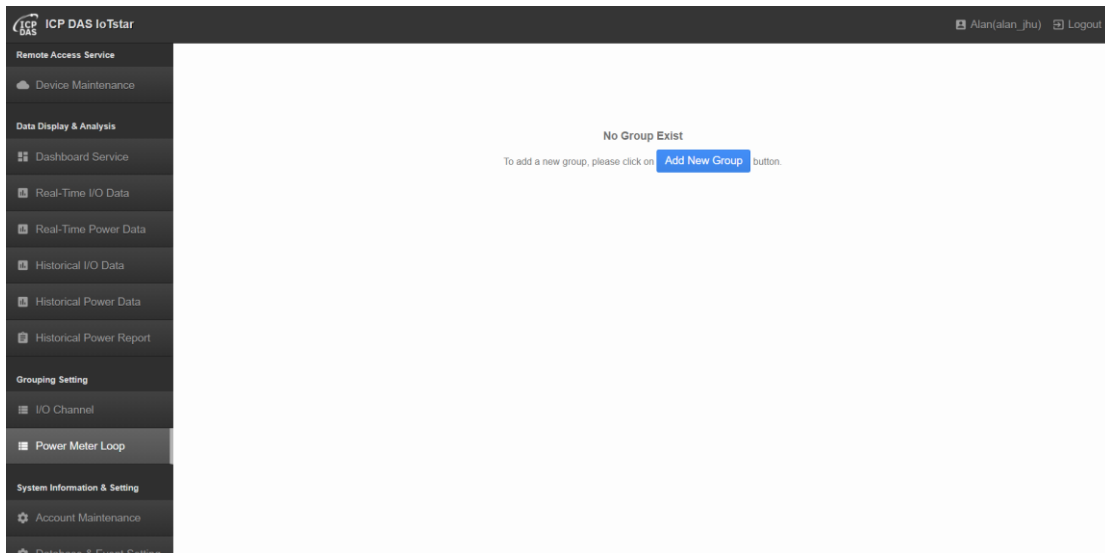



Figure 9-7 Create Power Meter Loop Group

After creating a new power meter group, please click the  button in the Data Review/System Setting section on the IoTstar Webpage; and specify the desired Loop of the power meter to add to the group. After completing the setting, click “OK” button to save the setting.

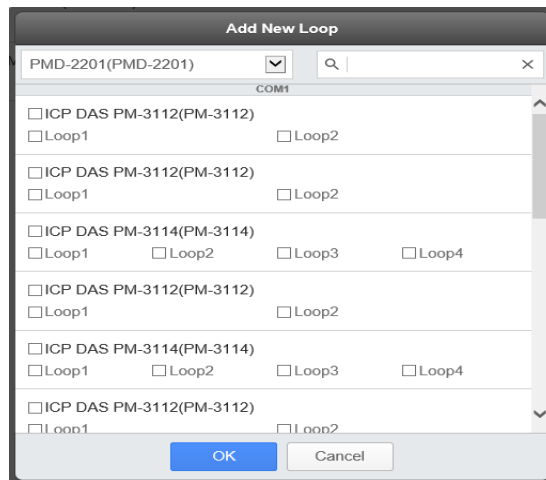
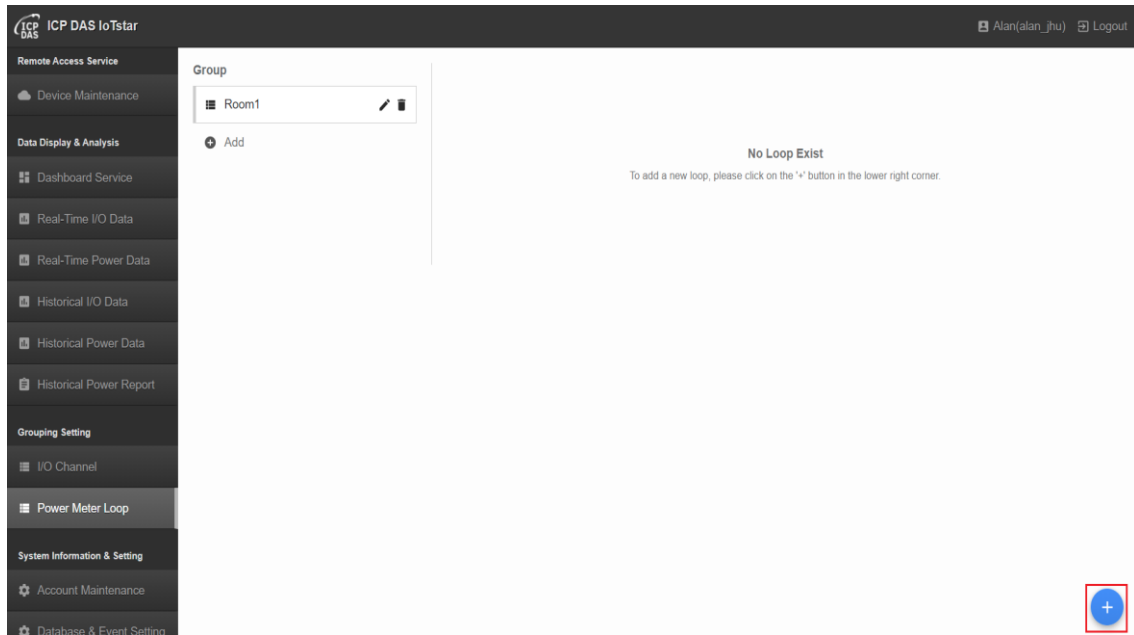




Figure 9-8 Add Loop into the Power Meter Loop Group

If required, the user can click the  button to edit the name of the power meter group. Or click the  button to delete the power meter group setting.

Click on a power meter group on the power meter group list, all Loops of the power meters that are included in the group will be displayed in the Data Review/System Setting section. If required, the user can also specify the Loop(s), and click the



button to remove the Loop(s) from the group. Click the



button to cancel the remove operation.

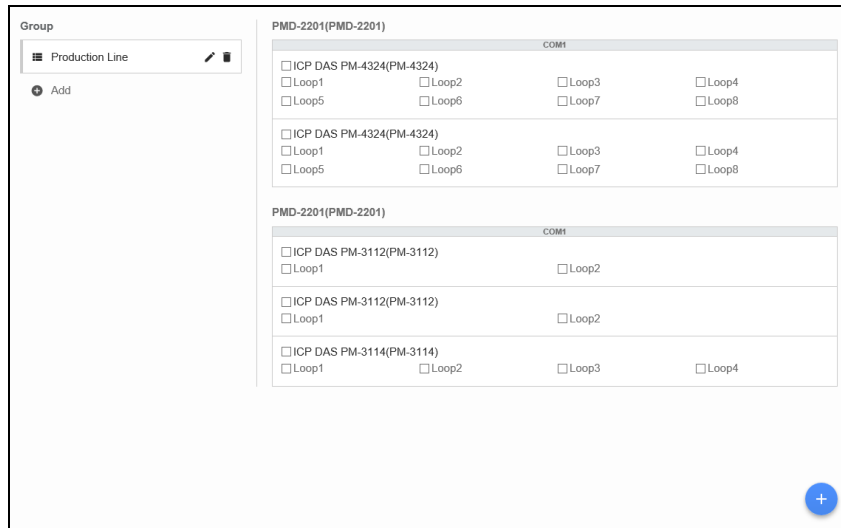


Figure 9-9 List of the Power Meter Loop Group

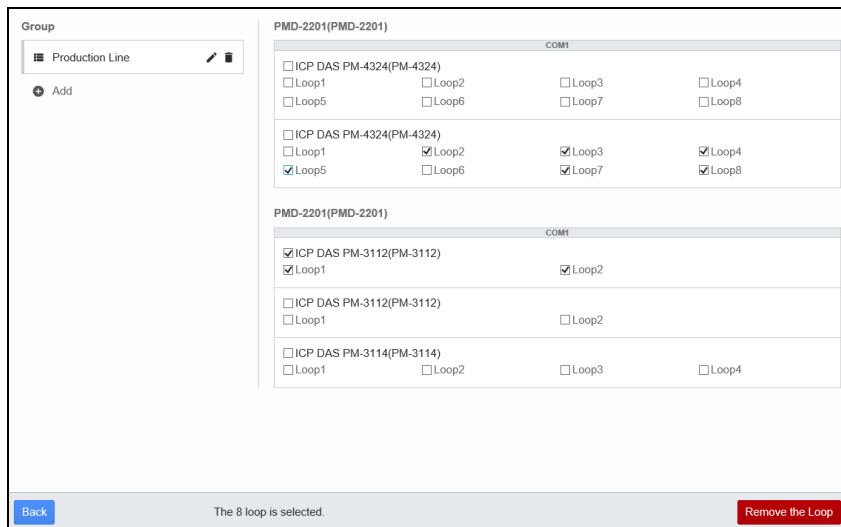


Figure 9-10 Remove Loop from the Power Meter Loop Group

10 System Information & Setting

System Setting is used for the system information display and parameters setting. It includes 4 options: “Account Maintenance”, “Database & Event Setting”, “Event List” and “Database Table List”. More detailed information for each option will be given in the following section.

10.1 Account Maintenance

Click on the “Account Maintenance” button in the “System Information & Setting” section on the “System Function” area of IoTstar Webpage; the Account Maintenance Setting page will be displayed as below:

ICP DAS ICP DAS IoTstar
Alan(alan_jhu) Logout

Remote Access Service

Device Maintenance

Data Display & Analysis

Dashboard Service

Real-Time I/O Data

Real-Time Power Data

Historical I/O Data

Historical Power Data

Historical Power Report

Grouping Setting

I/O Channel

Power Meter Loop

System Information & Setting

Account Maintenance

Database & Event Setting

Event List 647

Database Table List

Settings

Password

*Current Password:

*New Password:

*Retype New Password:

[Submit](#)

Information

*Nickname:

*Email:

Company:

Country / Region:

[Submit](#)

Device Share

Share the device to other account. However, the account shared the device is only authorized to inquire the I/O channel data or Power data that the device collected.

Username	Nickname	Action
No Sharing Account		

[Add](#)

Bot Service QR

The Bot Service feature lets you interact with your controller through the LINE app. The LINE accounts that allow interaction with your controller are listed below.

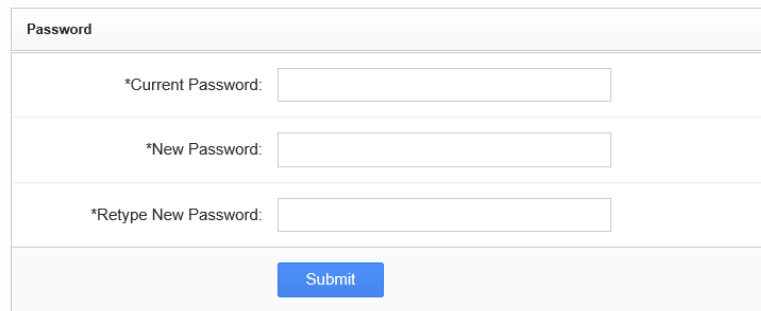
Status	ID	Nickname	Action
No LINE Account			

Figure 10-1 Account Maintenance Setting Page

The Account Maintenance Setting page includes 4 options: “Password modification”, “Information modification”, “Device Share” and “Bot Service”.

- Password modification

Password modification allows user to change the password that is required when login IoTstar. The Password modification setting steps are as follow:



Password	
*Current Password:	<input type="text"/>
*New Password:	<input type="text"/>
*Retype New Password:	<input type="text"/>
<input type="submit" value="Submit"/>	

Figure 10-2 Password Modification Page

- I. Enter current password in the “current password” field.
- II. In the “New password” and “Retype New password” fields, enter the new password.
- III. Click “Submit” button to save the new password setting.

After completing the password modification, the user can use the new password to login IoTstar next time.

- Information modification

Information modification allows to change the personal information of the current login account. After user entering the Information modification page, IoTstar will read and display personal information of the current login account. The Information modification setting steps are as follow:

Information	
*Nickname:	<input type="text" value="iotstar_demo"/>
*Email:	<input type="text" value="wayne_liu@icpdas.com"/>
Company:	<input type="text" value="ICPDAS"/>
Country / Region:	<input type="text" value="Taiwan"/> ▼
<input type="button" value="Submit"/>	

Figure 10-3 Information Modification Page

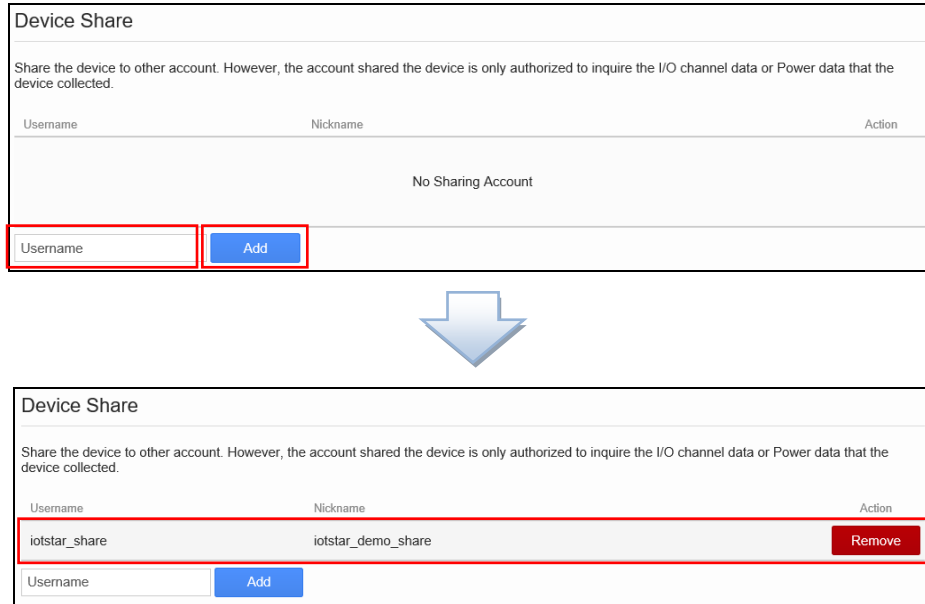
- I. Enter the new Nickname in the “Nickname” field.
- II. In the “Email” field, enter the new Email address of the user account. **Please Note: If the email address is changed, an email will be sent to the NEW email address with a link for verification, please click the link to complete the modification of the Email address.**
- III. Enter the new Company name in the “Company” field.
- IV. Select the new Country/Region in the “Country/Region” field.
- V. Click “Submit” button to save the new personal information setting.

● **Device Share**

“Device Share” allows the current login user account to share the I/O channel data or Power data of the WISE / PMC / PMD controllers that he has the authority for maintenance/monitoring to others IoTstar user account. The account shared is only authorized to inquire the I/O channel data or Power data that the controller collected.

Enter the Username of the account which you want to share information in the “Username” field; click the “Add” button to add the account shared, then all accounts

in the “Account Shared List” of the “Device Share” section are authorized to inquire the I/O channel data or Power data that the controller collected. Click the “Remove” button next to the account shared to stop the sharing.



- Bot Service

Bot Service allows users to interact with WISE / PMC / PMD controllers connected with IoTstar through the LINE App. For the function description, please refer to "ICP DAS IoTstar Bot Service User Manual".

10.2 Database & Event Setting

Click on the “Database & Event Setting” button in the “System Information & Setting” section on the “System Function” area of IoTstar Webpage; the Database & Event Setting page be displayed as below.

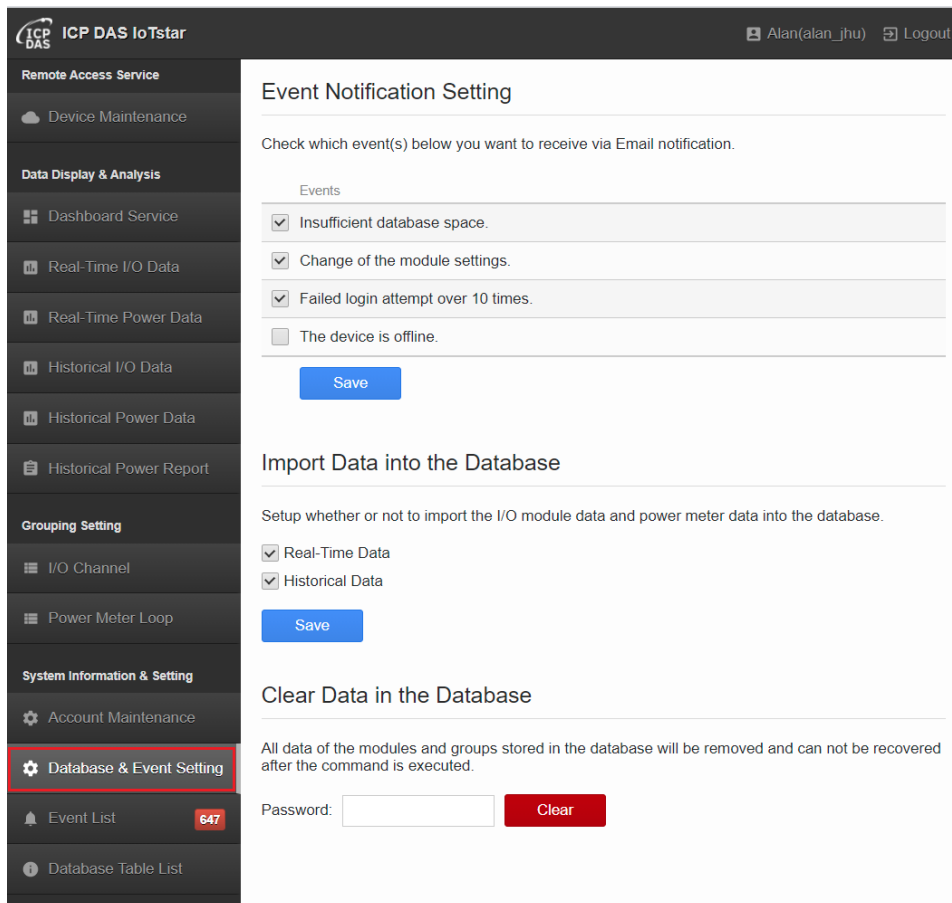


Figure 10-4 Database & Event Setting Page

The Database & Event Setting page includes 3 options: “Event Notification Setting”, “Import Data into the Database”, and “Clear Data in the Database”.

- **Event Notification Setting**

“Event Notification” Setting allows IoTstar to actively send the Event Notification Email to the user. Check the Event to receive the corresponding Notification Email, and then click “Save” button to save the setting.

Event Notification Setting

Check which event(s) below you want to receive via Email notification.

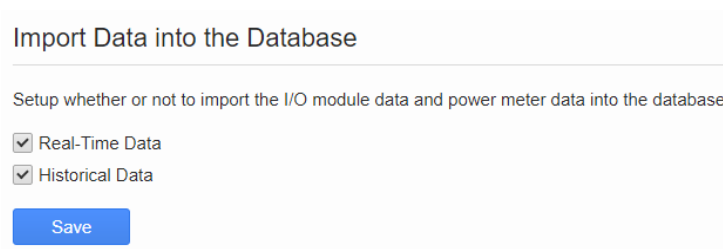
Events

<input checked="" type="checkbox"/>	Insufficient database space.
<input type="checkbox"/>	Change of the module settings.
<input type="checkbox"/>	Failed login attempt over 10 times.
<input type="checkbox"/>	The device is offline.

Currently IoTstar provide the Event notification options as follow:

- ◆ Insufficient database space: IoTstar provides the following Event Notification Email sending for the status of “insufficient database space”.
 - ✓ IoTstar will send a Notification Email to the user in advance when the usage of the database of the user account has reached 90% of the maximum size of database which be allocated to the user account.
 - ✓ When IoTstar wants to import I/O data into the user account's database, but the operation is failed. IoTstar will send a Notification Email to the user, and the error message will also be recorded in “Event List” section.
- ◆ Change of the module settings: If an I/O module or Power Meter connected to the WISE / PMC / PMD is removed, the IoTstar will actively send an Event Notification Email to the user.
- ◆ Failed login attempt over 10 times: If your IoTstar account has been encountered the failed login attempt over 10 times, IoTstar will actively send an Event Notification Email to the user.
- ◆ The device is offline: If a WISE / PMC / PMD controller connected to IoTstar is in offline status, then IoTstar will actively send an Event Notification Email to the user.
- Import Data into the Database

“Import Data into the Database” setting allows user to setup whether or not to import the historical data or real-time data (I/O Module or Power data) of the WISE / PMC / PMD controllers into the database. Check the “Real-Time data” or “Historical data”, and click the “Save” button to enable the function to import the I/O module data and power meter data into the database. Uncheck the “Real-Time data” and “Historical data”, and click the “Save” button to disable the function and IoTstar will stop to import the I/O module data and power meter data into the Database.



Import Data into the Database

Setup whether or not to import the I/O module data and power meter data into the database.

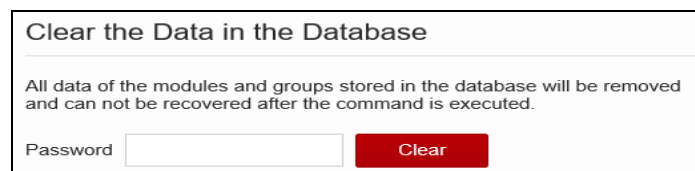
Real-Time Data

Historical Data

Save

- Clear the Data in the Database

“Clear the Data in the Database” setting will remove all I/O module data and power meter data of the WISE / PMC / PMD stored in the database. This operation cannot be recovered after the command is executed. If the user want to enable this function, please enter the password of the user account, then click the “Clear” button to clear all data in the database.



Clear the Data in the Database

All data of the modules and groups stored in the database will be removed and can not be recovered after the command is executed.

Password Clear

After executing the “Clear the Data in the Database” command, the content of the database will be cleared. If the controller is in online status and the “Import to the Database” function is enabled at that time, the IoTstar will still keep on receiving the new I/O module data and power meter data of the controller, and import them into the

Database. If the controller is in offline status, the IoTstar will stop the data import operation.

10.3 Event List

Click on the “Event List” button in the “System Information & Setting” section on the “System Function” area of IoTstar Webpage; the list of system event information will be displayed as below. In the Event List, the event with Red background color is serious event need to react immediately. The event with Yellow background color is warning event and the event with White background color is general event.

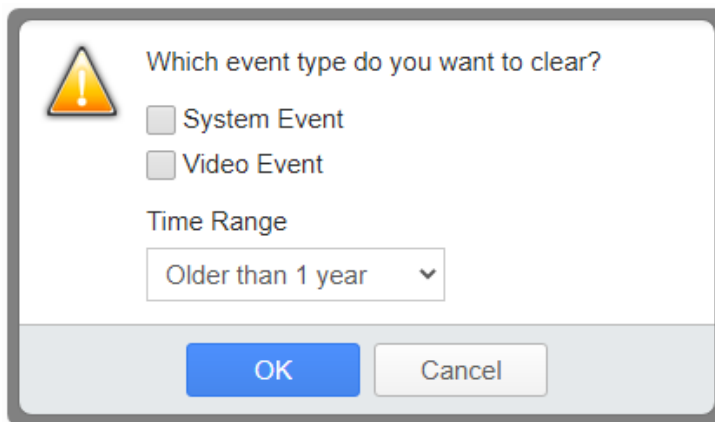
The screenshot displays the IoTstar web interface. On the left is a dark sidebar with a navigation menu. The 'Event List' option is highlighted with a red border and a red badge showing '626'. The main content area is titled 'Event List' and contains a table with two columns: 'Time' and 'Event'. The table lists various system events, including user logins, logouts, and device status changes (online/offline). At the bottom right of the table area, there are two buttons: 'Export' (blue) and 'Clear' (red). Below the table is a pagination control showing page numbers 1 through 5, an ellipsis, 37, and a next page arrow.

Time	Event
2021-02-18 11:16:42	The user login successfully from 192.168.100.27.
2021-02-18 11:12:52	The user login successfully from 192.168.100.181.
2021-02-18 11:12:42	The user logout successfully from 192.168.100.181.
2021-02-18 09:54:36	The user login successfully from 192.168.100.27.
2021-02-18 09:54:25	The user logout successfully from 192.168.100.27.
2021-02-18 09:10:16	The user login successfully from 192.168.100.27.
2021-02-18 09:10:11	The user logout successfully from 192.168.100.27.
2021-02-18 08:37:34	The user login successfully from 192.168.100.27.
2021-02-18 08:37:29	The user logout successfully from 192.168.100.27.
2021-02-18 08:30:04	The user login successfully from 192.168.100.27.
2021-02-18 08:29:58	The user logout successfully from 192.168.100.27.
2021-02-18 08:25:54	The user login successfully from 192.168.100.27.
2021-02-18 08:24:10	The device PMD-4201 S/N:01a8280618000060 is online.
2021-02-18 08:24:05	The device PMC-5231 S/N:01a031061800004e is online.
2021-02-18 08:23:58	The device WISE-5231M-3GWA S/N:01f42a06180000b0 is online.
2021-02-18 08:23:57	The device PMD-4201(PMD-4201(169)) S/N:01a8280618000060 is offline.
2021-02-18 08:23:57	The device WISE-5231M-3GWA(WISE-5231M-3GWA(234)) S/N:01f42a06180000b0 is offline.
2021-02-18 08:23:57	The device PMC-5231(PMC-5231(129)) S/N:01a031061800004e is offline.
2021-02-18 07:30:51	The device PMC-5231 S/N:01a031061800004e is online.
2021-02-18 07:30:48	The device PMD-4201 S/N:01a8280618000060 is online.

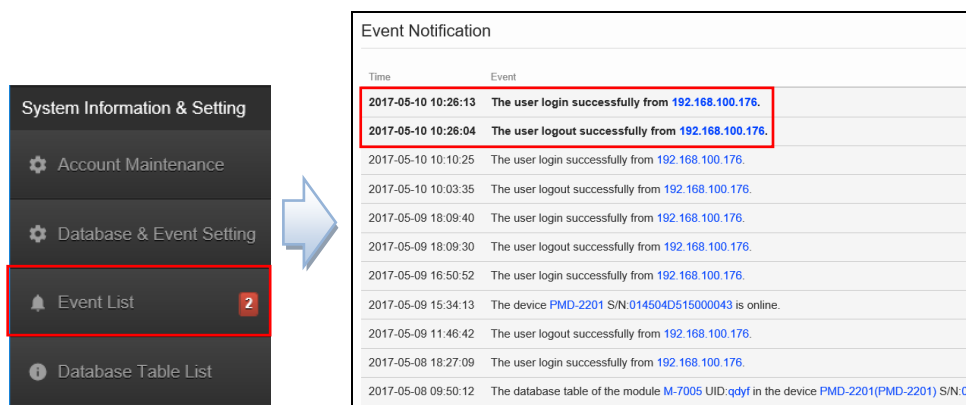
Figure 10-5 Event List Page

User can click the “Export” button on the right lower of “Event List” area to export the Event List logger file (*.CSV file format). User can also click the “Clear” button

to enter the Clear Event window, then select the event type, and assign the time range to delete the content of the “Event List” user specify.



In the “Event List” area, the unread event will be shown in Bold character. The total number of unread events will be shown on the Event List button as below.



10.4 Database Table List

Click on the “Database Table List” button in the “System Information & Setting” section on the “System Function” area of IoTstar Webpage; the list of I/O module and power meter connected to WISE / PMC / PMD, and their corresponding Database Table for the I/O module and power meter will be displayed. The “Database Table List” is as below:

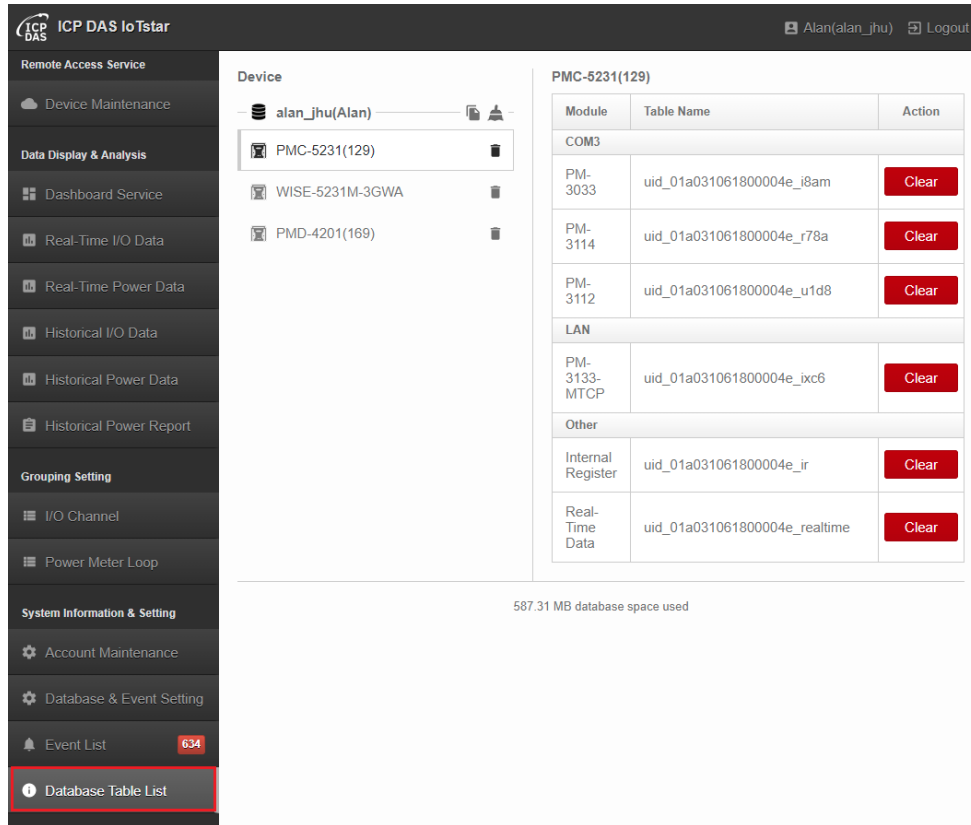



Figure 10-6 Database Table List Page


The “Database Table List” includes 2 options: “Device List” and “Module List”.



- **Device List**


The “Device List” section will list all WISE / PMC / PMD controllers that the user is authorized for maintenance/monitoring as well as the WISE / PMC / PMD controllers shared from other account. User can directly remove the WISE / PMC / PMD controllers (which he has the authority for maintenance/monitoring) by clicking the  button next to the controller's name. This action will remove all information of the removed controller.




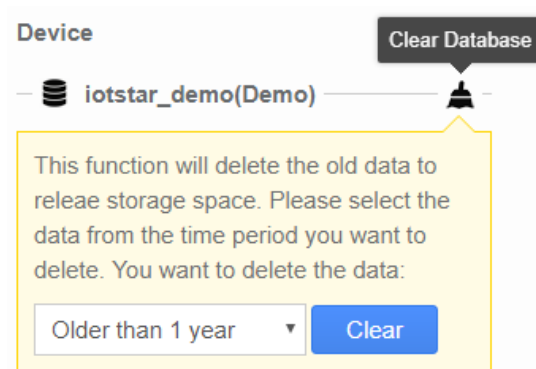
After removing the controller from the “Device List” successfully, the corresponding Database Table and data of the I/O module and power meter of the controller will all be removed. If the controller is in online status and “Import to the Database” function is enabled at that time, the IoTstar will create the new Database Table later, but will still keep on receiving the new I/O module data and power meter data of the controller, and import them into the Database. If the controller is in offline status, the IoTstar will not create the new Database Table, and stop the data import operation.

If the  icon is shown next to the device (controller's) name, it means some I/O module or power meter connected to the controller has been removed, the content of the corresponding Database Table for the removed module will not be updated continuously. User can click the controller's name to review the module list of the controller, and directly remove the Database Table of the module.

In addition, IoTstar also provides the “Clear Database” and “Copy Data Table” operations for the database. Users can click the “Copy Data Table”  button and “Clear Database”  button on the right side of the IoTstar user account for the corresponding operation.

➤ “Clear Database”  operation

After click the “Clear Database”  button and select the time range of the data to be removed from the database. IoTstar will then launch the data remove operation for all WISE / PMC / PMD controllers that the user account is authorized for maintenance. This function will help IoTstar to delete the old data from the database to release space; so that when new data is imported into the database, it will not fail due to insufficient database space.



Please Note:

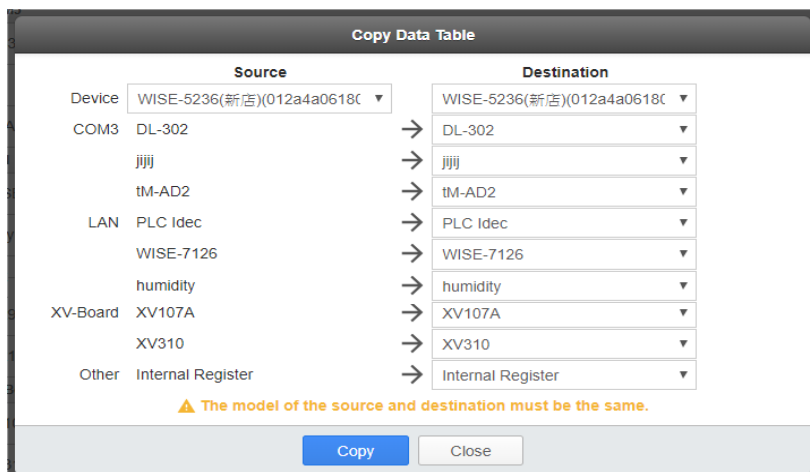
1. The “Clear Database” function will not remove the data of the WISE / PMC / PMD controllers shared from other user account.
2. The options of time range provided by the “Clear Database” function are “1 month ago”, “3 months ago”, “6 months ago”, “1 year ago”, “2 years ago” and “3 years ago”.

➤ “Copy Data Table”  operation

The Database Table the IoTstar create for the historical I/O data and power data is based on the unit of the I/O modules and power meters connected to WISE / PMC / PMD. So each I/O module and power meter connected to WISE / PMC / PMD has the corresponding Database Table. The name of the Database Table of the historical data is in the format of “uid_SerialNumber_ModuleUID”. The “SerialNumber” is a unique

number for each WISE / PMC / PMD controller. The “ModuleUID” is the information for I/O module (or power meter) connected to WISE / PMC / PMD. Therefore, if the system requires to replace the old controller with a new one, and the contents of the database table of the I/O module (or power meter) connected to the old controller need to be copied to the database table of the I/O module (or power meter) connected to the new controller, please click the “Copy Database” button, then the system will displays the “Copy Data Table” interface as below. After complete the settings of “Source data table” and “Destination data table” and clicking the “Copy” button, the system will copy the contents of the database table to ensure the integrity of the database table content of the I/O modules (or power meters) connected to the new controller.


Please Note: In the “Copy Data Table” interface, the model of the I/O module (or power meter) corresponding to the “Source data table” and the model of the I/O module (or power meter) corresponding to the “Destination data table” must be the same.




- Module List

Click on the name of the controller in the “Device List” section, the system will show

all modules connected to the controller and their corresponding Database Tables in the “Module List” section. It helps user to find the module's corresponding Database Table in an easy way. User can click the “Clear” button to clear the content of Database Table, or “Remove” button to remove the Database Table directly.

PMC-5231-3GWA		
Module	Table Name	Action
COM3		
M-7002 	uid_0123E90518000015_b4nc	Remove
PM-2133	uid_0123E90518000015_vxln	Clear
PM-3033	uid_0123E90518000015_nmbw	Clear
Other		
Internal Register	uid_0123E90518000015_ir	Clear

After clicking the “Clear” button in the “Action” field, the content of Database Table will be cleared directly. If the controller is in online status and “Import to the Database” function is enabled at that time, the IoTstar will still keep on receiving the new data of the module from controller, and import them into the Database Table. If the controller is in offline status, the IoTstar will stop the data import operation.

If the  icon is shown next to the module's name, it means the module has been removed from the controller, and the corresponding Database Table of the module will not be updated continuously. User can click the “Remove” button in the “Action” field to remove the Database Table and the content of the Database Table of the module.

Appendix I WISE Connection setting for IoTstar

Please follow the steps below to complete the WISE's setting for the Network connection with the IoTstar.

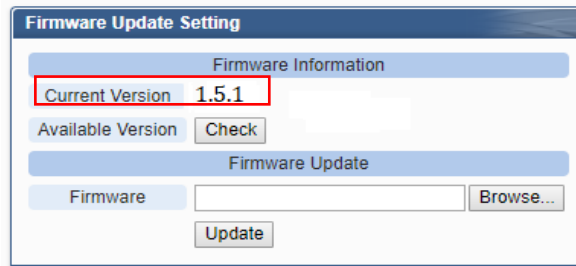
- I. Launch a Browser to open WISE's Web page. Login into the WISE and enter the System Setting Page.

The screenshot displays the 'System Setting Page' of the WISE-5231M-3GWA device. The page is organized into several sections:

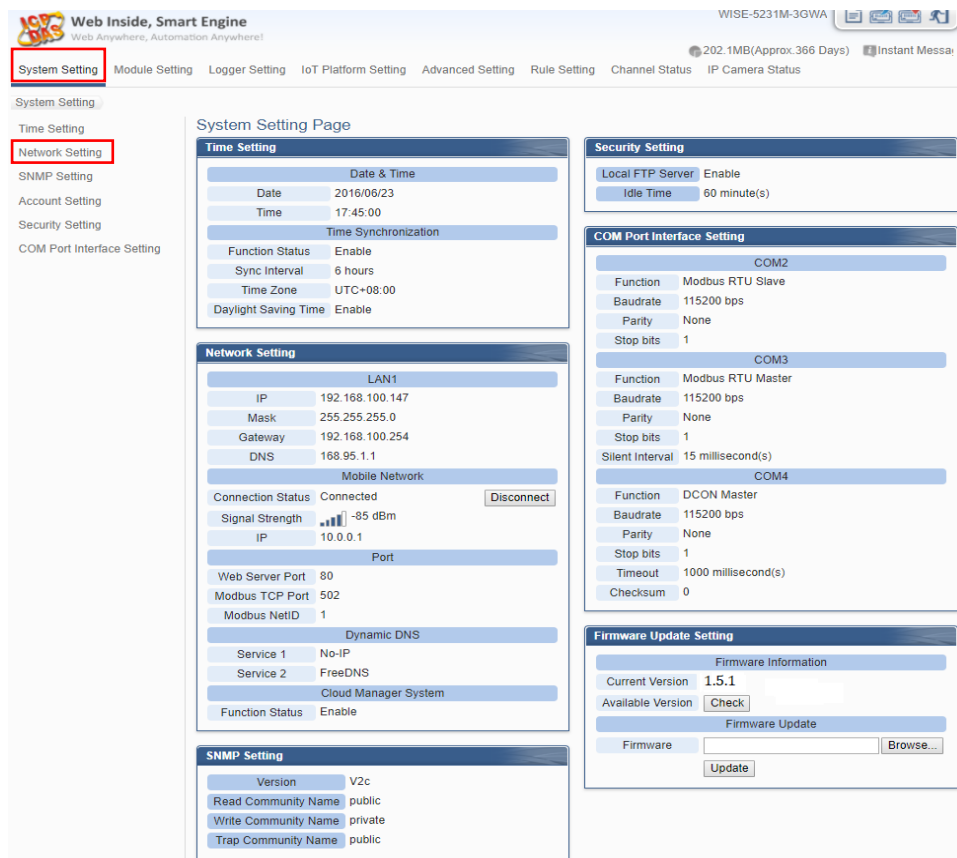
- Time Setting:** Includes Date & Time (Date: 2016/06/23, Time: 17:45:00) and Time Synchronization (Function Status: Enable, Sync Interval: 6 hours, Time Zone: UTC+08:00, Daylight Saving Time: Enable).
- Network Setting:** Includes LAN1 (IP: 192.168.100.147, Mask: 255.255.255.0, Gateway: 192.168.100.254, DNS: 168.95.1.1), Mobile Network (Connection Status: Connected, Signal Strength: -85 dBm, IP: 10.0.0.1), Port (Web Server Port: 80, Modbus TCP Port: 502, Modbus NetID: 1), Dynamic DNS (Service 1: No-IP, Service 2: FreeDNS), and Cloud Manager System (Function Status: Enable).
- SNMP Setting:** Includes Version (V2c), Read Community Name (public), Write Community Name (private), and Trap Community Name (public).
- Security Setting:** Includes Local FTP Server (Enable) and Idle Time (60 minute(s)).
- COM Port interface Setting:** Includes COM2 (Function: Modbus RTU Slave, Baudrate: 115200 bps, Parity: None, Stop bits: 1), COM3 (Function: Modbus RTU Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Silent Interval: 15 millisecond(s)), and COM4 (Function: DCON Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Timeout: 1000 millisecond(s), Checksum: 0).
- Firmware Update Setting:** Includes Firmware Information (Current Version: 1.3.0, Available Version: Check) and Firmware Update (Firmware: Browse..., Update).

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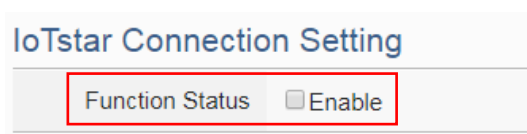
- II. Make sure the firmware version of the WISE is **V1.5.1 or later version**. If the WISE does not install with the right firmware version, please update the firmware before taking the next step.



III. Click the “System Setting” button on the System function toolbar; then click the “Network Setting” button on the Sub-function area to enter the Network Setting Page.



IV. Visit “IoTstar Connection Setting” section, and click “Enable” of the “Function Status” to enable the network connection to the ICP DAS IoTstar.



V. Select “User-defined IP address” and in the “Server Address” field, input the IP

address or Domain Name of the PC or Platform (with IoTstar installed). Enter the login username and password in the “Username” and “Password” fields. WISE will login to the IoTstar by the information provided.

Please Note : The “ ICP DAS Trial Service - Create Account” is currently disabled and the function is reserved. Please do not click on this option.

IoTstar Connection Setting	
Function Status	<input checked="" type="checkbox"/> Enable
*Server Address	<input type="radio"/> ICP DAS Trial Service - Create Account <input checked="" type="radio"/> Specify an address of server
*Username	<input type="text"/>
*Password	<input type="password"/>
Connection Status	Disable
<input type="button" value="Save"/>	

VI. After all settings are completed, click “Save” button to save the changes. This WISE will connect to the IoTstar immediately. The users can review the current connection status between WISE and IoTstar through the information displayed in the “Connection Status” field.

IoTstar Connection Setting	
Function Status	<input checked="" type="checkbox"/> Enable
*Server Address	<input type="radio"/> ICP DAS Trial Service - Create Account <input checked="" type="radio"/> 192.168.100.252
*Username	wayne1
*Password
Connection Status	Connected.
<input type="button" value="Save"/>	

VII. If the “Connection status” field shows the “Connected” message, it means the

connection between the WISE controller and IoTstar is in normal status. The authorized users now can login to the IoTstar (with the username and password set in “Step V”) to perform remote monitoring and maintenance of the WISE.

Appendix II Enable “Data Upload Operation” from WISE to IoTstar

IoTstar can receive the historical I/O data and real-time I/O data uploaded by WISE, and import these data into the database it created. In addition, IoTstar can also receive the snapshots or video files captured by iCAM cameras uploaded by WISE. Please refer to the following steps to complete the setting for the data upload and storage operations of WISE and IoTstar.

- Setting of WISE

- IoTstar Historical Data Sending Setting

I. Launch a Browser to open WISE's Web page. Login into the WISE and enter the System Setting Page.

The screenshot displays the 'System Setting Page' of the WISE web interface. The page is organized into several sections:

- Time Setting:** Includes 'Date & Time' (Date: 2016/06/23, Time: 17:45:00) and 'Time Synchronization' (Function Status: Enable, Sync Interval: 6 hours, Time Zone: UTC+08:00, Daylight Saving Time: Enable).
- Network Setting:** Includes 'LAN1' (IP: 192.168.100.147, Mask: 255.255.255.0, Gateway: 192.168.100.254, DNS: 168.95.1.1) and 'Mobile Network' (Connection Status: Connected, Signal Strength: -85 dBm, IP: 10.0.0.1).
- Security Setting:** Includes 'Local FTP Server' (Enable) and 'Idle Time' (60 minute(s)).
- COM Port Interface Setting:** Includes 'COM2' (Function: Modbus RTU Slave, Baudrate: 115200 bps, Parity: None, Stop bits: 1), 'COM3' (Function: Modbus RTU Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Silent Interval: 15 millisecond(s)), and 'COM4' (Function: DCON Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Timeout: 1000 millisecond(s), Checksum: 0).
- Firmware Update Setting:** Includes 'Firmware Information' (Current Version: 1.5.1) and 'Firmware Update' (Firmware: [input field], [Browse...], [Update]).

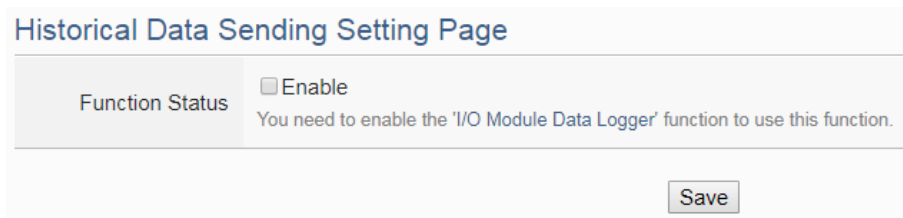
II. Refer to the instructions in Appendix I to confirm the connection between WISE


and IoTstar is in normal status.

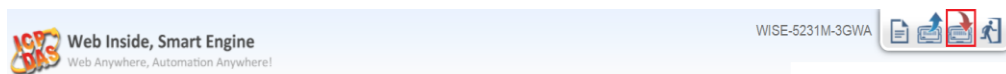
III. Click on “IoT Platform Setting” at the top of the WISE web page, and then click the “Historical Data Sending Setting” button under the “IoTstar Setting” section on the left to enter the “Historical Data Sending Setting” page.

IV. To enable the WISE's Historical I/O data upload operation; check “Enable” to enable the Historical I/O data files upload function.

Note: Please enable the WISE's Data Logger function first. About the setting of WISE's Data Logger function, please refer to the “7.1 I/O Module Data Logger Setting” section of WISE-523x/WISE-224x User Manual.



V. After all settings are completed, click “Save” button to save the setting, and then click the  “Save” button on the right upper of WISE Web page to save all parameter settings to WISE, then WISE will enable the corresponding mechanisms, and send I/O channel data to the IoTstar.



➤ Real-Time Data Sending Setting

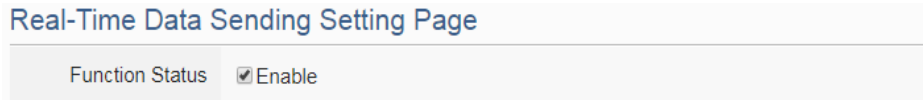
I. Launch a Browser to open WISE's Web page. Login into the WISE and enter the System Setting Page.

II. Refer to the instructions in Appendix I to confirm the connection between WISE and IoTstar is in normal status.

III. Click on “IoT Platform Setting” at the top of the WISE web page, and then click

the “Real-Time Data Sending Setting” button under the “IoTstar Setting” section on the left to enter the “Real-Time Data Sending Setting” page.

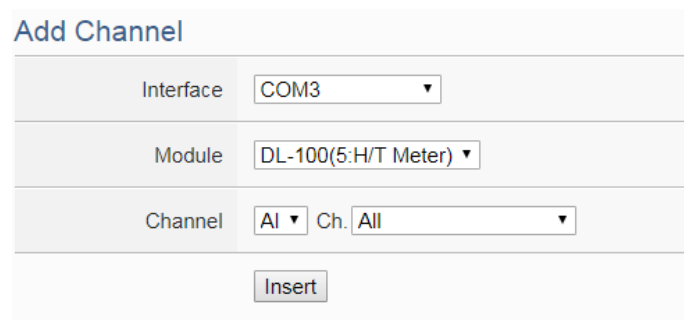
IV. In the “Function Status” field, check “Enable” to enable the Real-Time I/O data upload function.



Real-Time Data Sending Setting Page

Function Status	<input checked="" type="checkbox"/> Enable
-----------------	--

V. In the “Add Channel” section, select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add the I/O channel into the “Channel List” section. User can select “All” in “Channel” field to insert all I/O channels of the module at once.



Add Channel

Interface	COM3
Module	DL-100(5:H/T Meter)
Channel	AI Ch. All
<input type="button" value="Insert"/>	


VI. WISE will actively send the Real-Time I/O channel data which is located in the “Channel List” section to IoTstar. User can modify the database field name of the I/O channel data in the “*Name” field. To remove a pre-set I/O channel, please click the radio button in front of the pre-set I/O channel and then click “Remove” button.

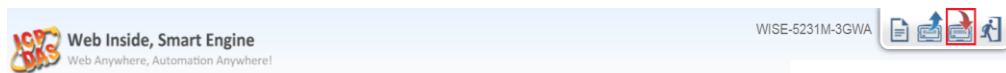
Please Note:

1. The name inputted in the “*Name” field must be a unique name.
2. The name set in the “*Name” field will be saved in the “Name” field of the Real-Time Database Table that WISE creates (Please refer to Appendix VI). These names can be used later for further query operations of the Database.

Channel List

Channel	*Name
<input type="radio"/> COM3 DL-100(5:H/T Meter) Humidity(RH)	COM3-N2-AI0
<input type="radio"/> COM3 DL-100(5:H/T Meter) Temperature(°C)(°C)	COM3-N2-AI1
<input checked="" type="radio"/> COM3 DL-100(5:H/T Meter) Temperature(°F)(°F)	COM3-N2-AI2

VII. After all settings are completed, click “Save” button to save the setting, and then click the  “Save” button on the right upper of WISE Web page to save all parameter settings to WISE, then WISE will enable the corresponding mechanisms, and send I/O channel data to the IoTstar.



➤ Video data Sending Setting

- I. Launch a Browser to open WISE's Web page. Login into the WISE and enter the System Setting Page.
- II. Refer to the instructions in Appendix I to confirm the connection between WISE and IoTstar is in normal status.
- III. Click on “IoT Platform Setting” at the top of the WISE web page, and then click the “Video Data Sending Setting” button under the “IoTstar Setting” section on the left to enter the “Video Data Sending Setting” page.
- IV. To select the data resource for image/video data sending, click on the radio button of the file source, and click the “Setting” button to enter the setting page.

Video Data Sending Setting Page

IP Camera Sandbox CGI Server

Source	Function Status	Content of Attached Message
<input checked="" type="radio"/> iCAM-721F (1.2.3.4:80)	Disable	
<input type="radio"/> iCAM-MR6322 (4.3.2.1:80)	Disable	
<input type="radio"/> iCAM-MR6322 (4.4.4.4:80)	Disable	
<input type="radio"/> iCAM-ZMR8422X (5.5.5.5:80)	Disable	

Setting

Save

V. Check the “Enable” function, and then the message setting interface will be shown as below. Enter the message content in the “Content of Attached Message” field. This message will be sent to IoTstar along with the image/video file and displayed on the IoTstar. Click the “OK” button to save the setting.

IP Camera iCAM-721F(1.2.3.4:80) Video Data Sending Setting

Function Status Enable

View Edit

*Content of Attached Message

Warning, a moving object is detected!

Interface: XV-Board
Module: XV308
Channel: DI Ch. 1

Insert

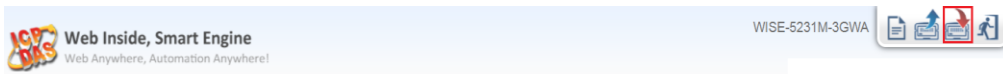
The image will be sent with this message.

Bot Service Forward to Bot Service

OK Cancel

VI. After all settings are completed, click “Save” button to save the setting, and then click the “Save” button on the right upper of WISE Web page to save all

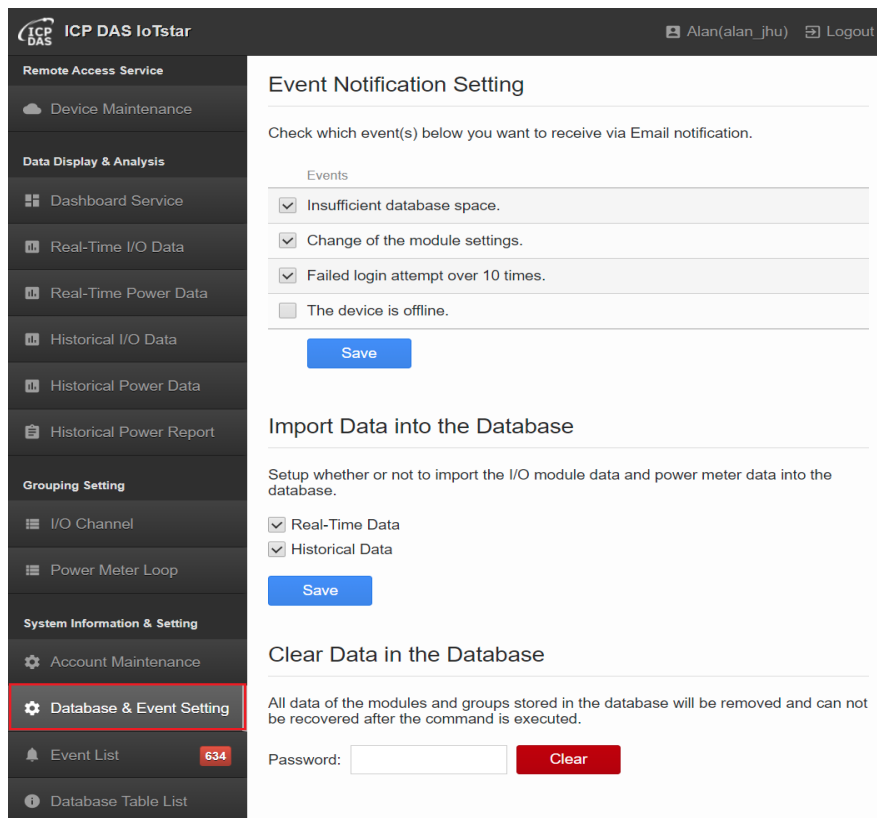
parameter settings to WISE, then WISE will enable the corresponding mechanisms, and send video data to the IoTstar.



- Setting of IoTstar

I. Launch a Browser to open IoTstar's Web page. Login into the IoTstar and enter the IoTstar home page.

II. Click on the “Database & Event Setting” button on the “System Information & Setting” section; the “Database & Event Setting” page will be displayed as below.



III. Check the “Real-Time data” or “Historical data”, and click the “Save” button to enable the functions to import the I/O data into the database.

Import Data into the Database

Setup whether or not to import the I/O module data and power meter data into the database.

Real-Time Data

Historical Data

IV. After the functions are enabled, the IoTstar will start to receive the Historical I/O data log files or Real-time I/O data that are uploaded from WISE, and will import them into the Database. Uncheck the “Real-Time data” or “Historical data”, and click the “Save” button will disable the functions and IoTstar will stop to import the I/O data into Database.

Appendix III PMC / PMD Connection setting for IoTstar

Please follow the steps below to complete the PMC / PMD's setting for the Network connection with the IoTstar.

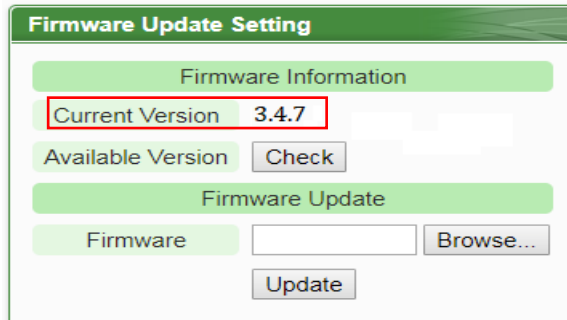
- I. Launch a Browser to open PMC / PMD's Web page. Login into the PMC / PMD and enter the System Setting Page.

The screenshot displays the 'System Setting Page' for a Power Monitoring & Management Solution. The page is organized into several sections:

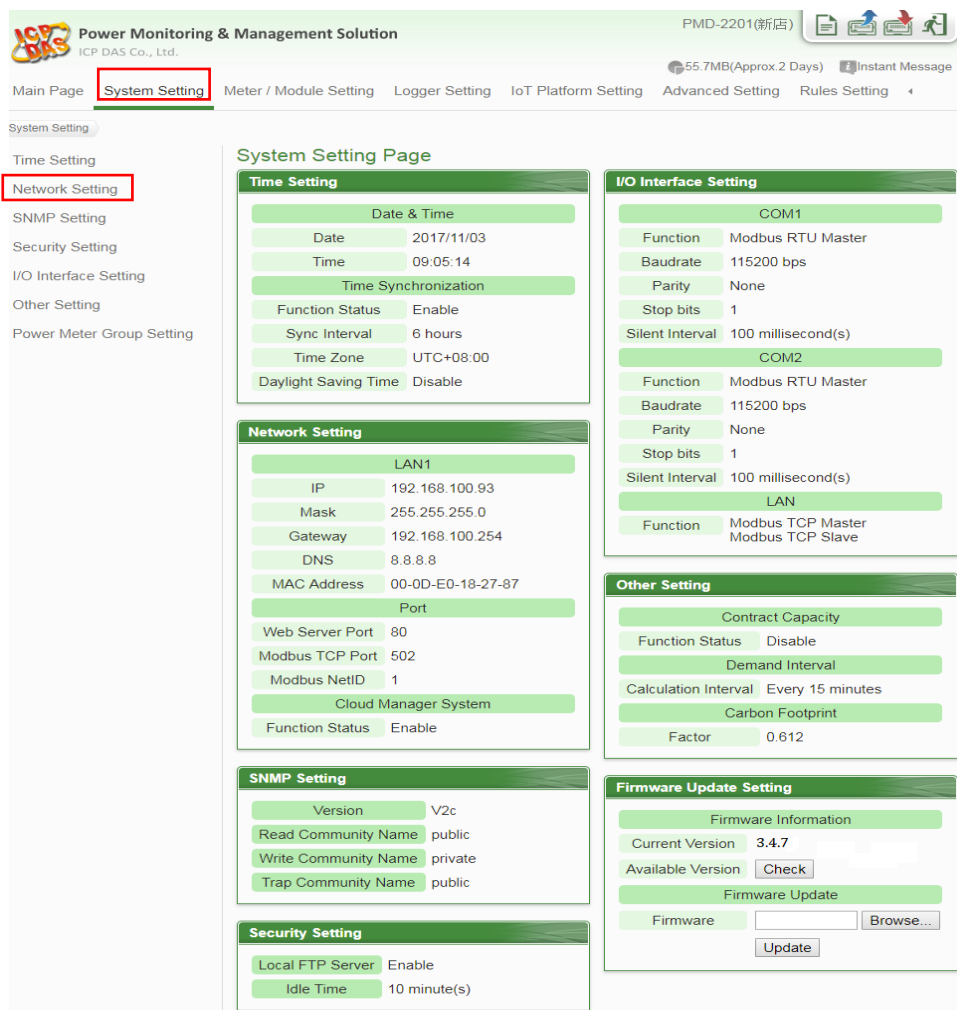
- Time Setting:** Includes 'Date & Time' (Date: 2017/11/03, Time: 09:05:14) and 'Time Synchronization' (Function Status: Enable, Sync Interval: 6 hours, Time Zone: UTC+08:00, Daylight Saving Time: Disable).
- Network Setting:** Includes 'LAN1' (IP: 192.168.100.93, Mask: 255.255.255.0, Gateway: 192.168.100.254, DNS: 8.8.8.8, MAC Address: 00-0D-E0-18-27-87), 'Port' (Web Server Port: 80, Modbus TCP Port: 502, Modbus NetID: 1), and 'Cloud Manager System' (Function Status: Enable).
- I/O Interface Setting:** Includes 'COM1' (Function: Modbus RTU Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Silent Interval: 100 millisecond(s)) and 'COM2' (Function: Modbus RTU Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Silent Interval: 100 millisecond(s)). It also includes 'LAN' (Function: Modbus TCP Master, Modbus TCP Slave).
- Other Setting:** Includes 'Contract Capacity' (Function Status: Disable), 'Demand Interval' (Calculation Interval: Every 15 minutes), and 'Carbon Footprint' (Factor: 0.612).
- SNMP Setting:** Includes 'Version' (V2c), 'Read Community Name' (public), 'Write Community Name' (private), and 'Trap Community Name' (public).
- Security Setting:** Includes 'Local FTP Server' (Enable) and 'Idle Time' (10 minute(s)).

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- II. Make sure the firmware version of the PMC / PMD is **V3.4.7 or later version**. If the PMC / PMD does not install with the right firmware version, please update the firmware before taking the next step.



III. Click the “System Setting” button on the System function toolbar; then click the “Network Setting” button on the Sub-function area to enter the Network Setting Page.



IV. Visit “IoTstar Connection Setting” section, and click “Enable” of the “Function Status” to enable the network connection to the ICP DAS IoTstar.

IoTstar Connection Setting

Function Status Enable

Save

V. Select “User-defined IP address” and in the “Server Address” field, input the IP address or Domain Name of the PC or Platform (with IoTstar installed). Enter the username and password of the account applied from the user's IoTstar in the “Username” and “Password” fields. PMC / PMD will login into the IoTstar by the information provided.

Please Note : The “ ICP DAS Trial Service - Create Account ” is currently disabled and the function is reserved. Please do not click on this option.

IoTstar Connection Setting

Function Status Enable

*Server Address ICP DAS Trial Service - Create Account
 Specify an address of server

*Username

*Password

Connection Status -

Save

VI. After all settings are completed, click “Save” button to save the changes. This PMC / PMD will connect to the IoTstar immediately. The users can review the current connection status between PMC / PMD and IoTstar through the information displayed in the “Connection Status” field.

IoTstar Connection Setting

Function Status	<input checked="" type="checkbox"/> Enable
*Server Address	<input type="radio"/> ICP DAS Trial Service - Create Account <input type="text" value="Specify an address of server"/>
*Username	<input type="text" value="alan_jhu"/>
*Password	<input type="password" value="*****"/>
Connection Status	Connected

VII. If the “Connection status” field shows the “Connected” message, it means the connection between the PMC / PMD and IoTstar is in normal status. The authorized users now can login into the IoTstar (with the username and password set in “Step V”) to perform remote monitoring and maintenance of the PMC / PMD.

Appendix IV Enable “Data Upload Operation” from PMC/PMD to IoTstar

IoTstar can receive the history power data (and I/O data) and real-time power data (and I/O data) uploaded by PMC / PMD, and import these data into the database it created. Please refer to the following steps to complete the setting for the power meter (and I/O module) data upload and database import operations of PMC / PMD and IoTstar.

- Setting of PMC / PMD
 - Historical Data Sending Setting
- I. Launch a Browser to open PMC / PMD's Web page. Login into the PMC / PMD and enter the System Setting Page.



The screenshot displays the 'System Setting Page' of the Power Monitoring & Management Solution. The page is organized into several sections:

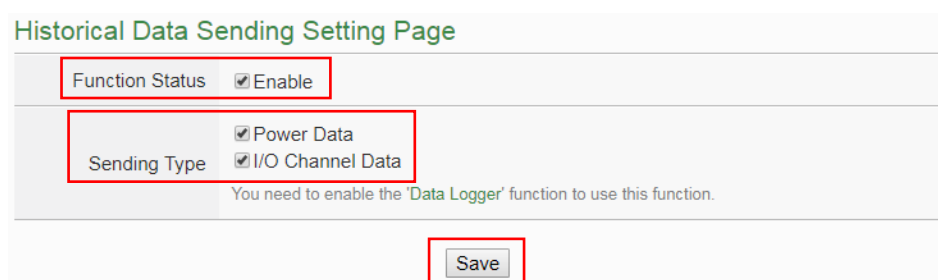
- Time Setting:** Includes Date & Time (Date: 2017/11/03, Time: 09:05:14) and Time Synchronization (Function Status: Enable, Sync Interval: 6 hours, Time Zone: UTC+08:00, Daylight Saving Time: Disable).
- Network Setting:** Includes LAN1 (IP: 192.168.100.93, Mask: 255.255.255.0, Gateway: 192.168.100.254, DNS: 8.8.8.8, MAC Address: 00-0D-E0-18-27-87) and Port (Web Server Port: 80, Modbus TCP Port: 502, Modbus NetID: 1).
- I/O Interface Setting:** Includes COM1 and COM2 (both Modbus RTU Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Silent Interval: 100 millisecond(s)) and LAN (Modbus TCP Master/Slave).
- Other Setting:** Includes Contract Capacity (Function Status: Disable), Demand Interval (Calculation Interval: Every 15 minutes), and Carbon Footprint (Factor: 0.612).
- SNMP Setting:** Includes Version (V2c), Read Community Name (public), Write Community Name (private), and Trap Community Name (public).
- Security Setting:** Includes Local FTP Server (Enable) and Idle Time (10 minute(s)).


II. Refer to the instructions in Appendix III to confirm the connection status between PMC / PMD and IoTstar is in normal status.

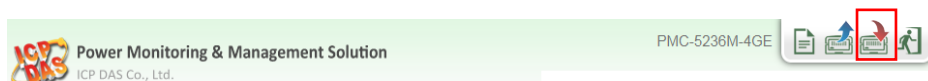
III. Click on “IoT Platform Setting” at the top of the PMC / PMD web page, and then click the “Historical Data Sending Setting” button under the “IoTstar Setting” section on the left to enter the “Historical Data Sending Setting” page.

IV. To enable the PMC / PMD's Historical data upload operation; check “Enable” to enable the data file upload function and select the type of data log file you would like to upload.

V. Please enable the PMC / PMD's Data Logger function first. About the setting of PMC / PMD's Data Logger function, please refer to the “8.1 Data Logger Setting” section of PMC-523x/PMC-224x/PMD User Manual.



VI. After all settings are completed, click “Save” button to save the setting, and then click the  “Save” button on the right upper of PMC / PMD Web page to save all parameter settings to PMC / PMD, then PMC / PMD will enable the corresponding mechanisms, and send I/O channel data to the IoTstar.



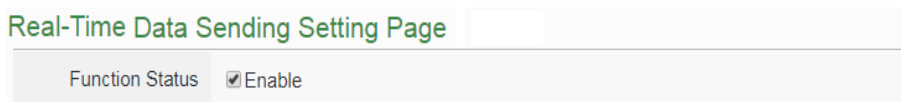
➤ Real-Time Data Sending Setting

I. Launch a Browser to open PMC / PMD's Web page. Login into the PMC / PMD and enter the System Setting Page.

II. Refer to the instructions in Appendix III to confirm the connection status between PMC / PMD and IoTstar is in normal status.

III. Click on “IoT Platform Setting” at the top of the PMC / PMD web page, and then click the “Real-Time Data Sending Setting” button under the “IoTstar Setting” section on the left to enter the “Real-Time Data Sending Setting” page.

IV. In the “Function Status” field, check “Enable” to enable the PMC / PMD's Real-Time power data and I/O data upload operation.



V. In the “Add Channel” section, select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add the power meter loop or I/O channel into the “Channel List” section. User can select “All” in “Channel” field to insert all power meter loops and I/O channels of the power meter or I/O module at once.




VI. PMC / PMD will actively send the Real-Time power data and I/O data which is located in the “Channel List” section to IoTstar. User can modify the database field name of the power data (or I/O channel data) in the “*Name” field. To remove a pre-set power meter loop or I/O channel, please click the radio button in front of the pre-set power meter loop or I/O channel and then click “Remove” button.

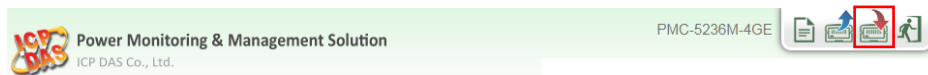
Please Note:

1. The name inputted in the “*Name” field must be a unique name..

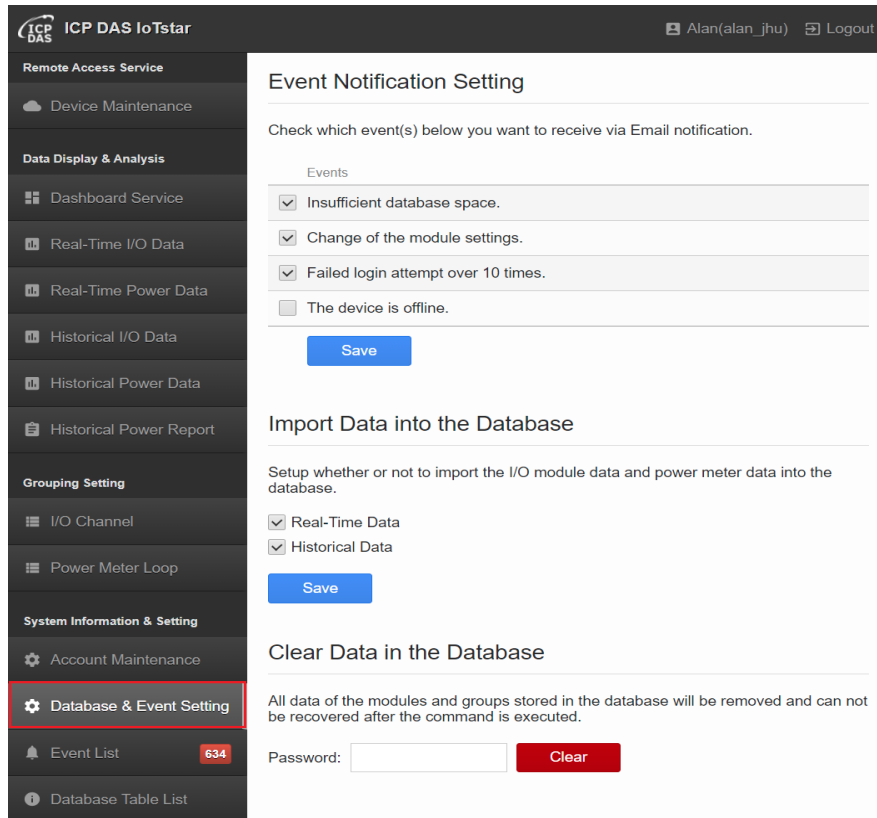
2. The name set in the “*Name” field will be saved in the “Name” field of the Real-Time Database Table that IoTstar creates for the PMC / PMD (Please refer to Appendix VI). These names can be used later for further query operations of the Database.

Channel	*Name
COM3 PM-3112(1) CT1 V	COM3-N1-CT1-V
COM3 PM-3112(1) CT1 V	COM3-N1-CT1-V
COM3 PM-3133(3) Phase A V	COM3-N3-PHASEA-V
COM3 PM-4324(4) Submeter1 CT1 V	COM3-N4-SUB1-CT1-V

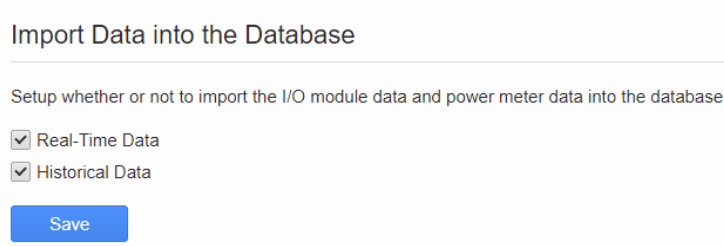
VII. After all settings are completed, click “Save” button to save the setting, and then click the  “Save” button on the right upper of PMC / PMD Web page to save all parameter settings to PMC / PMD, then PMC / PMD will enable the corresponding mechanisms, and send I/O channel data to the IoTstar.



- Setting of IoTstar
 - I. Launch a Browser to open IoTstar's Web page. Login into the IoTstar and enter the IoTstar home page.
 - II. Click on the “Database & Event Setting” button on the “System Information & Setting” section; the “Database & Event Setting” page will be displayed as below.



III. Check the “Real-Time data” or “Historical data”, and click the “Save” button to enable the functions to import the data into the database.



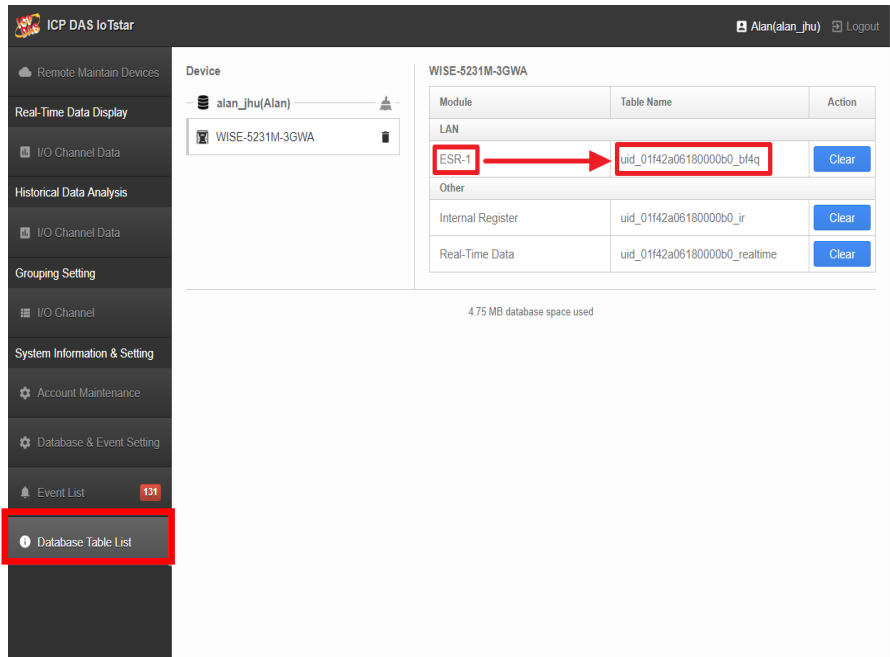
IV. After the functions are enabled, the IoTstar will start to receive the historical data or Real-time data that are uploaded from PMC / PMD, and will import them into the Database. Uncheck the “Real-Time data” or “Historical data”, and click the “Save” button will disable the functions and IoTstar will stop to import the data into Database.

Appendix V Database format for the Historical Data

After both the historical I/O data and power data upload function of WISE / PMC / PMD and the database import function of IoTstar are enabled, the IoTstar will start to receive the historical I/O data and power data log files uploaded by WISE / PMC / PMD and import the content of the data files into the Database. The frequency of the upload operation of the historical I/O data and power data log files from WISE / PMC / PMD to IoTstar is **per 5 minutes**. The user can disable the database import function to stop the database import operation of the historical data.

The Database Table the IoTstar create for the historical I/O data and power data is based on **the unit of the I/O modules and power meters connected to WISE / PMC / PMD**. So each I/O module and power meter connected to WISE / PMC / PMD has a corresponding Database Table. The format of the Database Table of the historical data is as follow:

- The format of historical I/O data in Database
 - To show the Database Table corresponding to the I/O module (or power meter) connected to WISE / PMC / PMD, please click on the “Database Table List” button on the “System Information & Setting” section of IoTstar Webpage; the list of I/O modules (or power meters) connected to WISE / PMC / PMD and the name of the corresponding Database Table of the I/O module (or power meters) will then be displayed. The name of the Database Table of the historical data is in the format of “uid_SerialNumber_ModuleUID”. The “SerialNumber” is a unique number for each WISE / PMC / PMD controller. The “ModuleUID” is a information for I/O module (or power meter) connected to WISE / PMC / PMD. Please refer to the following as an example:

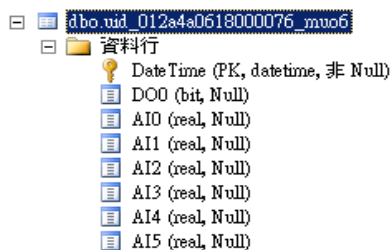


➤ The fields of the Database Table are arranged in the order of “DateTime (Data recording time), I/O Channel (listed by type: DI, DO, AI, AO)”. Please refer to the following as an example. The total number of the fields in the Database Table will be different depending on the type of I/O module. For the data type corresponding to the I/O module channel, please refer to the following:

✧ The data type of DIx (DI channel), DOx (DO channel), CIx (Discrete input) and COx (Coil output) is “bit”.

✧ The data type of AIx (AI channel), AOx (AO channel), RIx (Input Register), ROx (Holding Register) and IRx (Internal Register) is “real”.

✧ The data type of DICx (DI channel Counter) and DOCx (DO channel Counter) is “bigint”.

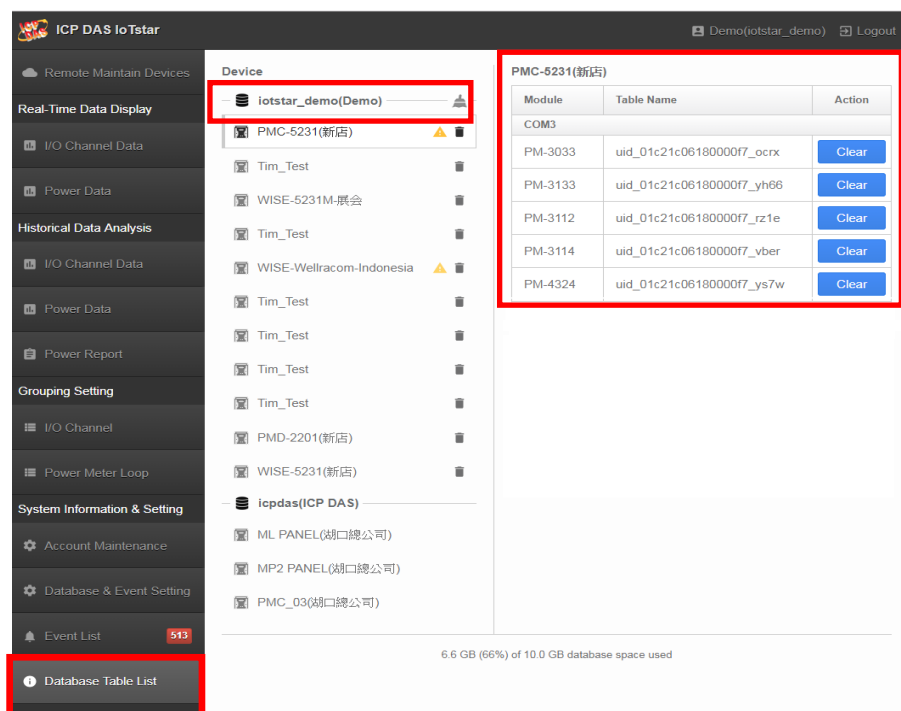


✧

Following is an example of the historical Database Table of the I/O module.

Date Time	DO0	A10	A11	A12	A13	A14	A15
2018-07-02 17:37:00.000	0	673	56.09	26.91	80.43	17.41	63.33
2018-07-02 17:38:00.000	0	674	55.99	26.92	80.45	17.39	63.3
2018-07-02 17:39:00.000	0	674	55.82	26.94	80.49	17.36	63.24
2018-07-02 17:40:00.000	0	671	55.61	26.93	80.47	17.29	63.12
2018-07-02 17:41:00.000	0	670	55.39	26.89	80.4	17.19	62.94
2018-07-02 17:42:00.000	0	669	55.24	26.85	80.33	17.11	62.79
2018-07-02 17:43:00.000	0	669	55.06	26.83	80.29	17.04	62.67
2018-07-02 17:45:00.000	0	667	54.85	26.73	80.11	16.89	62.4
2018-07-02 17:46:00.000	0	667	54.63	26.68	80.02	16.78	62.2
2018-07-02 17:47:00.000	0	667	54.73	26.64	79.95	16.77	62.18

- The format of historical power data in Database
 - To show the Database Table corresponding to the power meter connected to PMC / PMD, please click on the “Database Table List” button on the “System Information & Setting” section of IoTstar Webpage; the list of power meter connected to PMC / PMD and the name of the corresponding Database Table of the power meter will then be displayed. Please refer following as an example:



- The fields of the Database Table are arranged in the order of “DateTime (Data recording time), Loop, Phase, Power Data”. Please refer to the following as an

example. The total number of the fields in the Database Table will be different depending on the type of power meter.



Please Note:

1. The fields of “Power Data” in the Database Table include the items as V, I, KW, KVAR, KVA, PF, KWH, KVARH, KVAH, TotalKWH, Demand and DeltaTotalKWH. The data type is “real”.

2. The setting of “Loop” and “Phase” fields for the Single-Phase power meter are as below. The data type is “tinyint”.

Phase=1;

Loop=1(Loop1) / 2(Loop2) / 3(Loop3) or 4(Loop4);

3. The setting of “Loop” and “Phase” fields for the Three-Phase power meter are as below. The data type is “tinyint”.

Phase=1(Phase A) / 2(Phase B) / 3(Phase C) or 4(Total/Average);

Loop=1;

Following is an example of the Database Table of the Single-Phase power meter.

DateTime	Loop	Phase	V	I	KW	KVAR	KVA	PF	KWH	KVARH	KVAH	TotalsKWH	Demand	DeltaTotalsKWH
2018-07-02 17:37:00.000	1	1	108.2254	43.15078	4.305416	1.791282	4.669908	0.9220997	311.6591	112.2224	331.3458	75.38925	4.327881	0.07434082
2018-07-02 17:37:00.000	2	1	108.2254	31.65001	3.217044	1.149993	3.425507	0.9392473	236.3537	85.54285	251.4235	57.1683	3.287842	0.05705261
2018-07-02 17:37:00.000	3	1	107.6251	52.13065	5.278157	1.864834	5.611673	0.9409559	381.8143	138.2642	406.1833	92.3529	5.325317	0.0925293
2018-07-02 17:37:00.000	4	1	107.6251	22.46969	2.263612	0.841252	2.417825	0.9363443	162.362	58.79002	172.7234	39.2797	2.263367	0.03973389
2018-07-02 17:38:00.000	1	1	107.9024	42.79379	4.290934	1.688034	4.617733	0.92903	311.7335	112.252	331.4259	75.46359	4.328638	0.074646
2018-07-02 17:38:00.000	2	1	107.9024	32.64227	3.27278	1.274346	3.522168	0.9297242	236.4108	85.56282	251.4842	57.22535	3.287019	0.05783081
2018-07-02 17:38:00.000	3	1	108.3073	51.4741	5.241315	1.854267	5.574574	0.9404389	381.9068	138.2975	406.2819	92.44543	5.327451	0.09295654
2018-07-02 17:38:00.000	4	1	108.3073	23.33362	2.371359	0.8677974	2.527929	0.9380841	162.4017	58.80378	172.7656	39.31944	2.263388	0.03977966
2018-07-02 17:39:00.000	1	1	108.0131	42.39548	4.282682	1.603083	4.579183	0.935204	311.8081	112.2798	331.5057	75.53824	4.333101	0.06695557
2018-07-02 17:39:00.000	2	1	108.0131	32.85199	3.348092	1.150439	3.548589	0.9436507	236.4686	85.58226	251.5453	57.28318	3.291178	0.05015564

Following is an example of the Database Table of the Three-Phase power meter.

DateTime	Loop	Phase	V	I	KW	KVAR	KVA	PF	KWH	KVARH	KVAH	TotalsKWH	Demand	DeltaTotalsKWH
2018-07-02 17:37:00.000	1	1	106.2663	157.6436	16.13437	4.372093	16.75173	0.9629701	1144.354	412.2841	1216.714	276.8288	15.9083	0.2728271
2018-07-02 17:37:00.000	1	2	86.13081	120.2396	9.683695	3.619991	10.35655	0.9351036	694.2592	251.3808	738.557	167.9618	9.61144	0.1698608
2018-07-02 17:37:00.000	1	3	126.1374	199.9745	24.0762	7.366921	25.22384	0.9542505	1704.404	617.2196	1813.188	412.4152	23.70737	0.4162598
2018-07-02 17:37:00.000	1	4	106.1782	159.2859	48.24508	15.54225	50.73822	0.9507748	3434.082	1243.385	3652.561	830.832	47.69099	0.8320313
2018-07-02 17:38:00.000	1	1	106.0209	164.2822	16.23845	6.239208	17.41921	0.9317431	1144.627	412.3924	1217.008	277.1016	15.92025	0.2546387
2018-07-02 17:38:00.000	1	2	85.46117	121.3305	9.779465	3.392461	10.36892	0.9433134	694.429	251.4404	738.7374	168.1316	9.640043	0.1536865
2018-07-02 17:38:00.000	1	3	126.4842	205.1121	24.44427	8.375932	25.94365	0.9424259	1704.821	617.3588	1813.629	412.8315	23.78387	0.3780518
2018-07-02 17:38:00.000	1	4	105.9887	163.575	48.84912	17.66418	52.01149	0.9391608	3434.914	1243.69	3653.448	831.664	47.79996	0.7612305
2018-07-02 17:39:00.000	1	1	106.0027	160.9817	16.0403	5.756826	17.0668	0.9405341	1144.881	412.486	1217.28	277.3562	15.91699	0.2674561
2018-07-02 17:39:00.000	1	2	85.89303	120.3002	9.595291	3.772508	10.3352	0.9275854	694.5827	251.4997	738.9024	168.2853	9.622314	0.15979

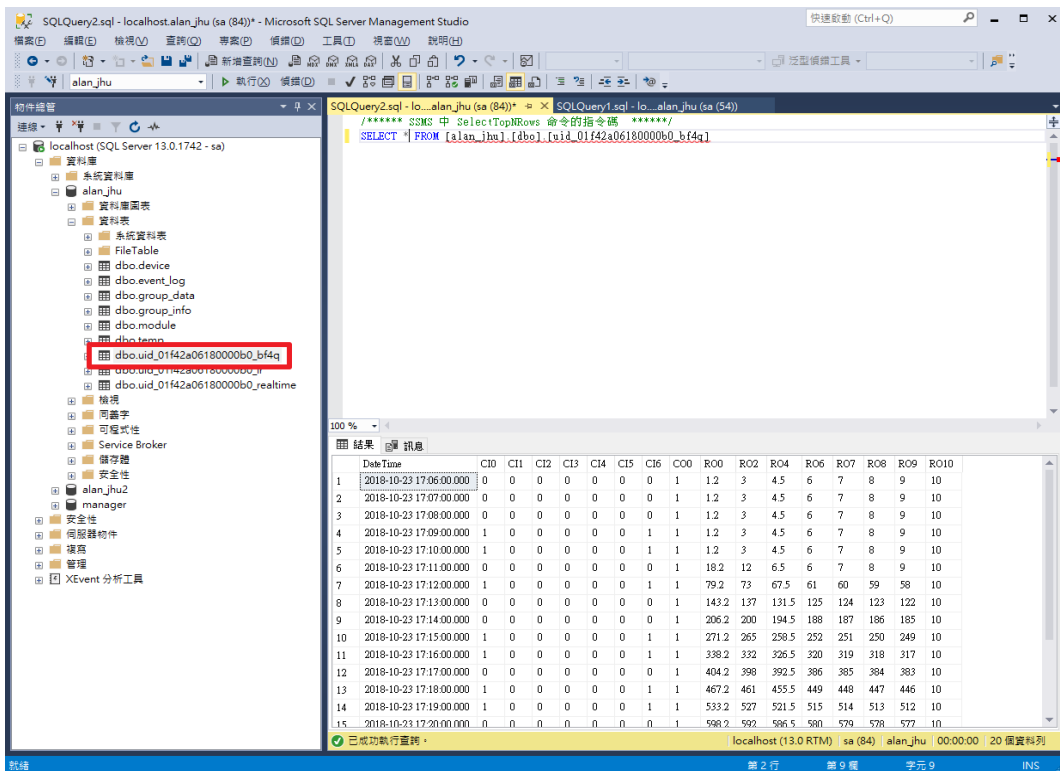
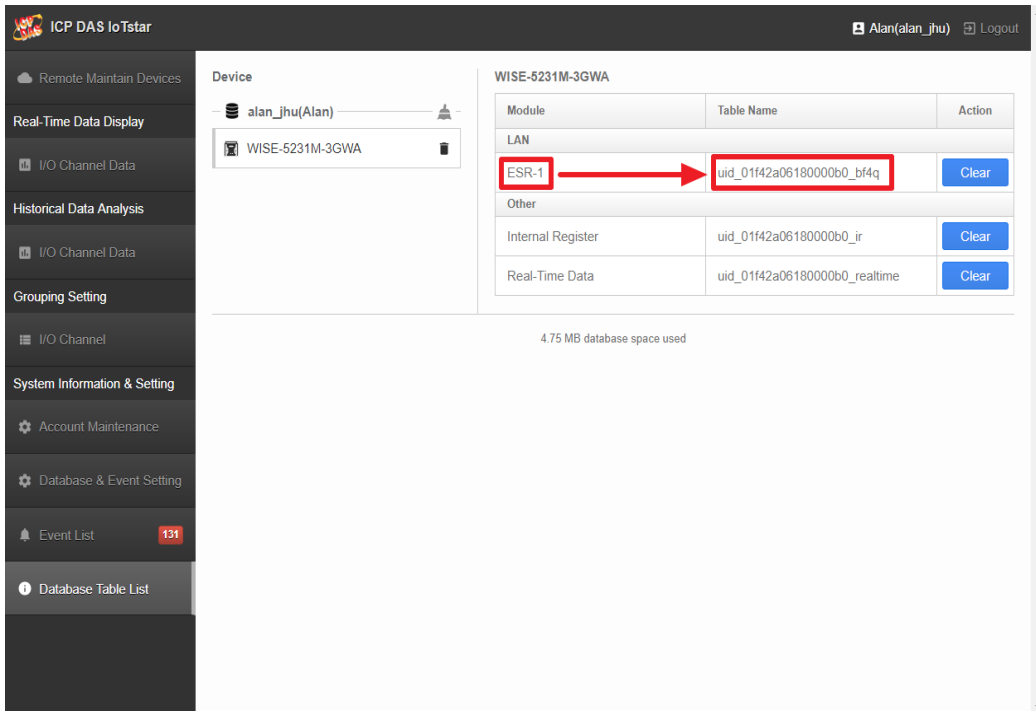
- Work with SQL command

User now can use the SQL command to get the historical I/O data (or power data) from the Database Table. Following is an example for the data retrieve from the historical Database Table.

In this case, the WISE controller login into IoTstar with the account “alan_jhu”; user can use Microsoft SQL Server Management Studio to open the corresponding Database of the “alan_jhu” account; find the “uid_01f42a06180000b0_bf4q” Database Table (“uid_01f42a06180000b0_bf4q” is the name of the Database Table of the ESR-1 module; the user can find it in the “Database Table List” page of IoTstar), then use the SQL command to query the historical I/O channel data from the Database Table.

SELECT * FROM [alan_jhu].[dbo].[uid_01f42a06180000b0_bf4q]

(The above is used to query all historical I/O channel data from the Database Table of ESR-1.)



User can query the historical I/O data for a period of time from the Database Table. It only need to add a WHERE condition to the SELECT command as below.

`SELECT * FROM [alan_jhu].[dbo].[uid_01f42a06180000b0_bf4q] WHERE`

DateTime >= '2018-10-23 17:10:00' AND DateTime < '2018-10-23 17:15:00'

(The above is used to query the historical I/O channel data during the time period of

“2018-10-23 17:10:00 ~ 2018-10-23 17:15:00” from the Database Table of ESR-1.)

The screenshot shows the Microsoft SQL Server Management Studio interface. The left pane displays the server hierarchy for 'localhost (SQL Server 13.0.1742 - sa)'. The central pane shows a SQL query: `SELECT * FROM [alan_jhu].[dbo].[uid_01f42a06180000b0_bf4q] WHERE DateTime >= '2018-10-23 17:10:00' AND DateTime < '2018-10-23 17:15:00'`. The bottom pane displays the query results in a table format. The first row of data is highlighted with a red box.

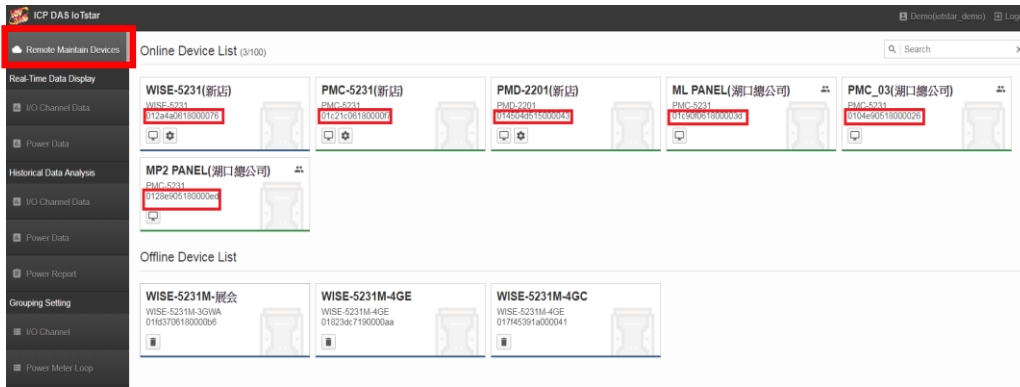
DateTime	CI0	CI1	CI2	CI3	CI4	CI5	CI6	CO0	RO0	RO2	RO4	RO6	RO7	RO8	RO9	RO10
2018-10-23 17:10:00.000	0	0	0	0	0	1	1	1.2	3	4.5	6	7	8	9	10	
2018-10-23 17:11:00.000	0	0	0	0	0	0	1	18.2	12	6.5	6	7	8	9	10	
2018-10-23 17:12:00.000	0	0	0	0	0	1	1	79.2	73	67.5	61	60	59	58	10	
2018-10-23 17:13:00.000	0	0	0	0	0	0	1	143.2	137	131.5	125	124	123	122	10	
2018-10-23 17:14:00.000	0	0	0	0	0	0	1	206.2	200	194.5	188	187	186	185	10	

Appendix VI Database format for the Real-Time Data

After both the real-time I/O data and power data upload function of WISE / PMC / PMD and the database import function of IoTstar are enabled, the IoTstar will start to receive the real-time I/O data and power data uploaded by WISE / PMC / PMD and import them into the Database. For the real-time I/O data and power data, the database will only keep the latest values of the corresponding channel. The user can disable the database import function to stop the database import operation.

The Real-Time Database Table the IoTstar create is based on **the unit of WISE / PMC / PMD controller**. So each WISE / PMC / PMD has a corresponding Database Table for the storage of real-time I/O channel data and power data. Based on the setting of “Appendix II” and “Appendix IV”, IoTstar will receive the real-time data of the selected I/O channel or Power meter loop/phase from WISE / PMC / PMD, and import them into the Database. The total amount of I/O channels and Power meter loop/phase to be included in each WISE / PMC / PMD's Real-Time Database Table can be **up to 1000**. The format of the Real-Time Database Table is as follow:

- The format of Real-Time Data in Database
 - Each WISE / PMC / PMD controller has a corresponding Database Table for the storage of the real-time I/O data and power data. The name of this Database Table is in the format of “uid_**SerialNumber**_realtime”. The “**SerialNumber**” is a unique number for each WISE / PMC / PMD controller. User can find the “**SerialNumber**” of the corresponding WISE / PMC / PMD controller through the “Remote Maintain Devices” page of IoTstar as below:



➤ There are 7 fields in the Real-Time Database Table as below. The I/O channels (or Power meter loop/phase) included in the Database Table are based on the channels listed on the “Channel List” section of the WISE / PMC / PMD's “IoT Platform Setting -> IoTstar Setting -> Real-Time Data Sending Setting” page which user define previously (please refer to “Appendix II” and ”Appendix IV”). It is arranged from top to bottom, and can store up to 1000 I/O channels (or Power meter loop/phase) data.

Name	Data type	Description
Name	varchar	The setting of “Name” field in the “Channel List” section of the WISE / PMC / PMD's “IoTstar Real-Time Data Sending Setting” page which user define previously for the I/O module channel (or meter power loop/phase).
Value	real	The real-time value of the I/O channel (or meter power loop/phase). “NULL” mean the I/O module (or power meter) which the I/O channel (or meter power loop/phase) belongs is in offline status with controller.
DateTime	datetime	The time information of the real-time value of

		the I/O channel (or meter power loop/phase) be logged.
ModuleUID	varchar	It is the information of the I/O module (or power meter) which the I/O channel (or meter power loop/phase) belongs. User can obtain the corresponding name of the historical I/O module (or power meter) Database table through the combination of “uid_SerialNumber_ModuleUID” . (The “SerialNumber” is a unique number for each WISE / PMC / PMD controller).
Channel	varchar	The column name of the I/ O channel (or meter power loop/phase) in the historical I/O module (or power meter) Database table.
Loop	tinyint	If this data is the power data, it mean the loop information of the power meter which the power data belongs. If this data is the I/O channel data, it will show “NULL”.
Phase	tinyint	If this data is the power data, it mean the phase information of the power meter which the power data belongs. ● Three Phase Power Meter: 1 -> A; 2 ->B; 3->C; 4 ->Total/Average ● Single Phase Power Meter:1

		If this data is the I/O channel data, it will show “NULL”.
--	--	--

Following is an example of the Real-Time Database Table with I/O channel data.

	Name	Value	Date Time	ModuleUID	Channel	Loop	Phase
1	COM3-N1-AIO	127.995	2019-12-10 18:12:35.000	wrwt	AIO	NULL	NULL
2	COM3-N2-AO0	0.5	2019-12-10 18:12:35.000	kysh	AO0	NULL	NULL
3	COM3-N2-AO1	0	2019-12-10 18:12:35.000	kysh	AO1	NULL	NULL
4	COM3-N3-DO0	0	2019-12-10 18:12:35.000	æhk	DO0	NULL	NULL
5	COM4-N1-DIC0	0	2019-12-10 18:12:35.000	bo7n	DIC0	NULL	NULL
6	COM4-N3-DIO	0	2019-12-10 18:12:35.000	sag9	DIO	NULL	NULL
7	COM4-N6-RI32	NULL	2019-12-10 18:12:35.000	ex8s	RI32	NULL	NULL
8	IR1	0	2019-12-10 18:12:35.000	ir	IR1	NULL	NULL
9	XV-DIC0	0	2019-12-10 18:12:35.000	lkz2	DIC0	NULL	NULL

Following is an example of the Real-Time Database Table with Power Data.

	Name	Value	Date Time	ModuleUID	Channel	Loop	Phase
1	COM3-N1-SUB8-TOTAL-KWH	1423.265	2019-12-03 14:36:38.000	g92h	KWH	8	4
2	COM3-N2-PHASEA-V	108.027	2019-12-03 14:36:38.000	p82r	V	1	1
3	COM3-N2-PHASEB-V	106.176	2019-12-03 14:36:38.000	p82r	V	1	2
4	COM3-N2-PHASEC-V	113.47	2019-12-03 14:36:38.000	p82r	V	1	3
5	COM3-N2-TOTAL-KWH	3056.991	2019-12-03 14:36:38.000	p82r	KWH	1	4
6	COM3-N3-CT2-I	12.768	2019-12-03 14:36:38.000	f3u5	I	2	1

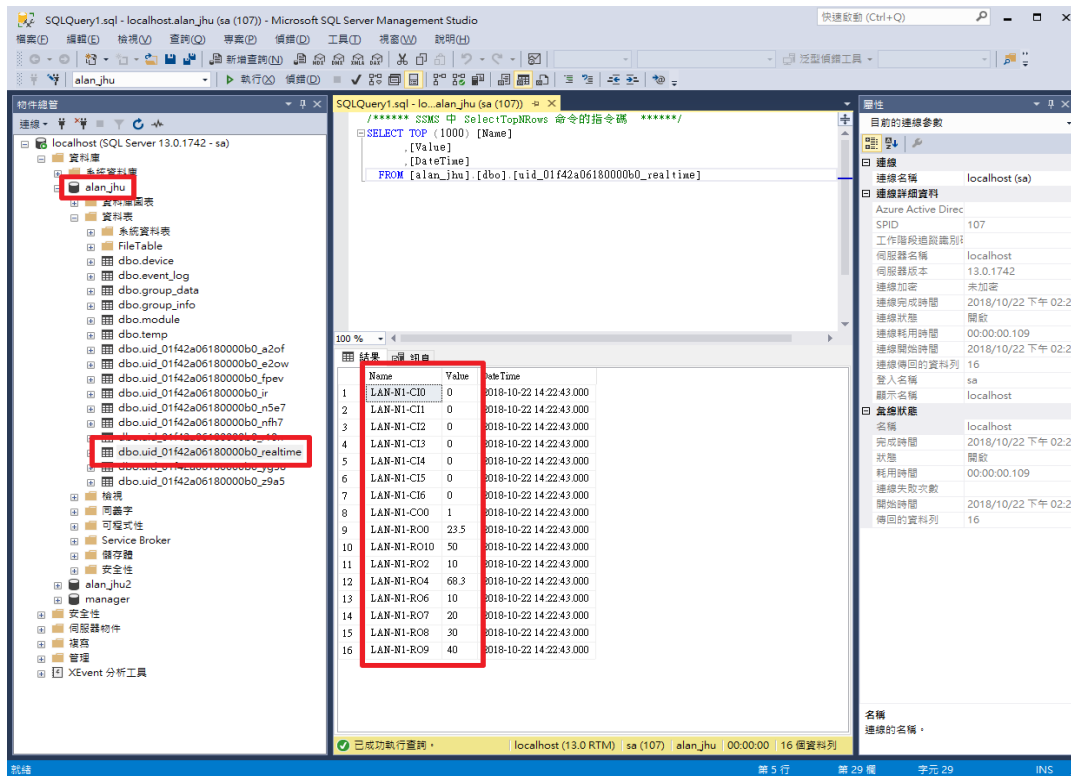
- Work with SQL command to get real-time I/O data and power data

User now can use the SQL command to get the data from the Real-Time Database Table. Following is an example to get real-time I/O data and power data from the Real-Time Database Table.

In this case, the WISE controller login into the IoTstar with the account “alan_jhu”; user can use Microsoft SQL Server Management Studio to open the corresponding Database of the “alan_jhu” account, find the “uid_01f42a06180000b0_realtime” Database Table for the real-time I/O channel data of the WISE controller (“01f42a06180000b0” is the Serial Number of the WISE), then use the SQL command

as below to query all real-time I/O channel data from the Database Table.

```
SELECT TOP (1000) [Name], [Value], [DateTime] FROM  
[alan_jhu].[dbo].[uid_01f42a06180000b0_realtime]
```



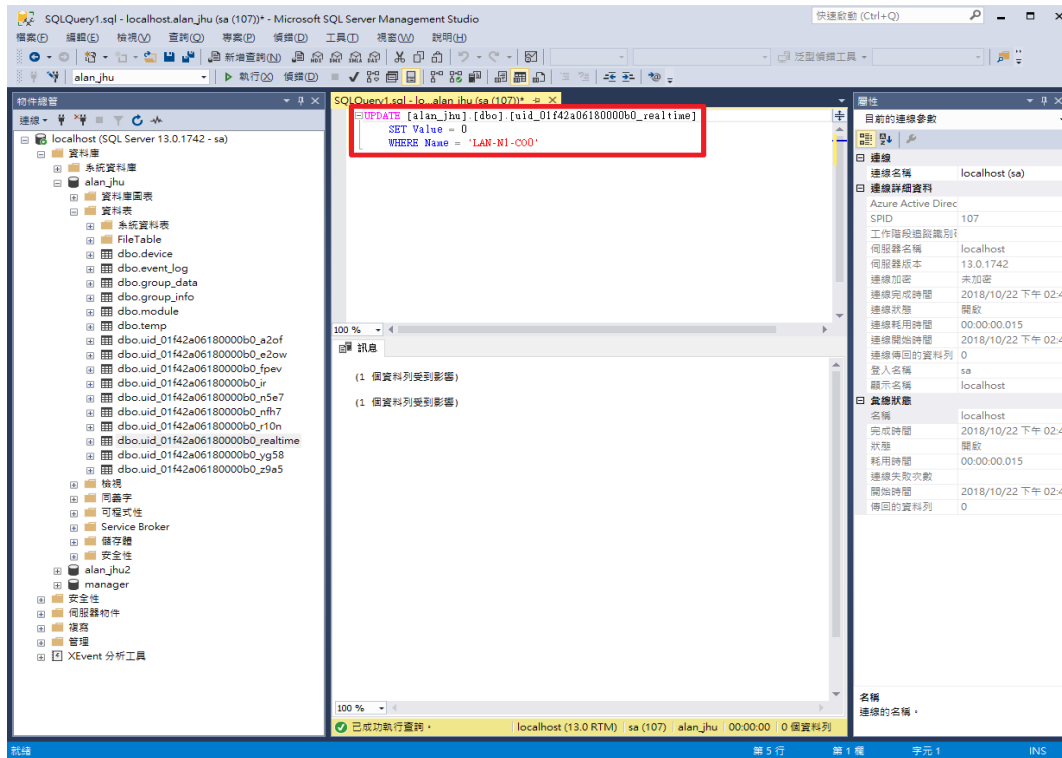
- Work with SQL command to assign the value of the I/O module's DO/AO Channel

User also can use the SQL command to assign the value of I/O module's DO/AO channel by the Real-Time Database Table. Please refer to the following as an example:

In this case, user use Microsoft SQL Server Management Studio to open the Database that is corresponding to the “alan_jhu” account, find the “uid_01f42a06180000b0_realtime” Database Table for the real-time I/O channel data of the WISE controller (“01f42a06180000b0” is the Serial Number of the WISE), search the DO channel named as “LAN-N1-C00”, then use the SQL command as

below to set the value of the “LAN-N1-COO” channel to OFF.

```
UPDATE [alan_jhu].[dbo].[uid_01f42a06180000b0_realtime] SET Value = 0  
WHERE Name = 'LAN-N1-COO'
```



Appendix VII Database format for the Status of WISE/PMC/ PMD Controller

Users can query the status of the WISE / PMC / PMD controller through the Database Table created by IoTstar, then the back-end management system can get the information for the displaying of status. The format of the Database Table of the WISE / PMC / PMD controller's status is as follow:

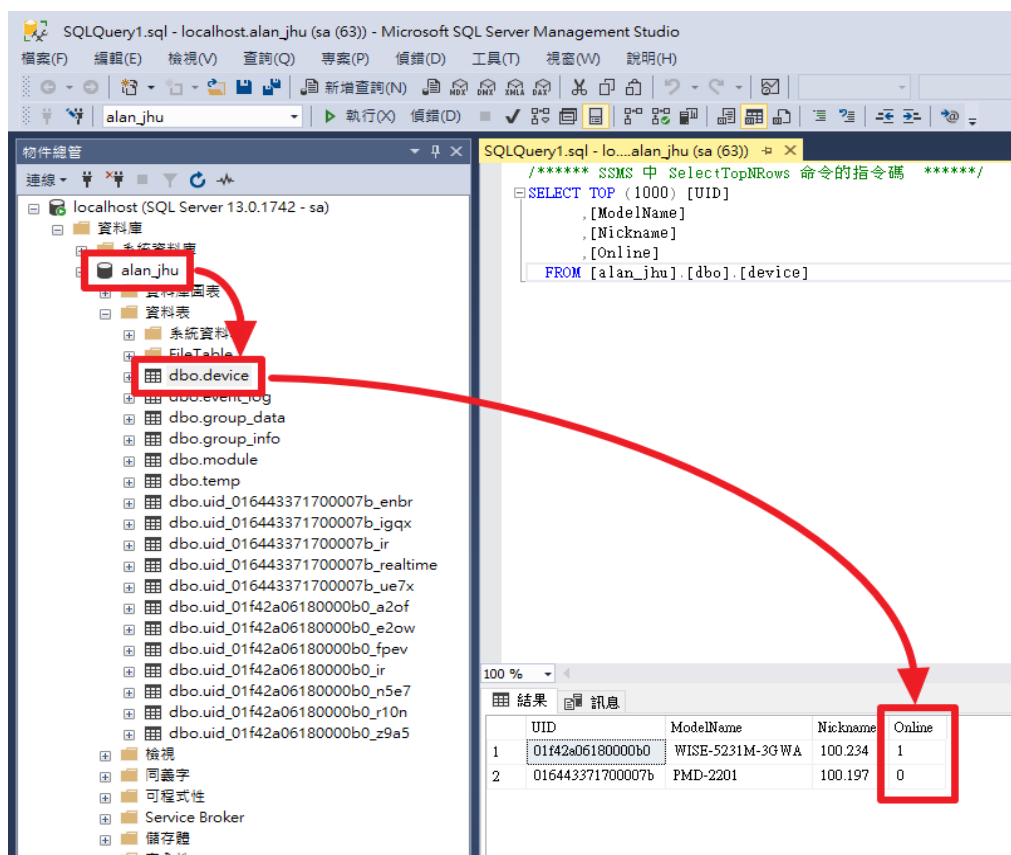
Results		Messages			
	UID	ModelName	Nickname	Online	Signal
1	01f42a06180000b0	WISE-5231M-3GWA	100.234	0	-113

Name	Data type	Description
UID	varchar	It is the “Serial Number” of the WISE / PMC / PMD controller. User can find the WISE / PMC / PMD controller with the corresponding “Serial Number” through the “Remote Maintain Devices” page of IoTstar.
ModelName	varchar	It is the Model name of the controller.
NickName	nvarchar	It is the Nickname of the controller.
Online	bit	It indicates the connection status between the WISE / PMC / PMD controller and IoTstar. The data type is “bit” (“0” -> Offline; “1” -> Online;).
Signal	int	If the WISE / PMC / PMD controller supports the Mobile Network. This field will be used to indicates the Mobile Signal strength of the WISE / PMC / PMD controller. The unit is dBm. This value is updated once every 30 seconds.

In this case, the WISE / PMC / PMD controllers login into the IoTstar with the account “alan_jhu”; user can use Microsoft SQL Server Management Studio to open the corresponding Database of the “alan_jhu” account, find the “**device**” Database Table. This Database Table contains the fields to record the related information of the WISE / PMC / PMD controllers which login into the IoTstar with the “alan_jhu” account.

Now user can use the SQL command as below to query the connection status of all controllers from the Database Table.

```
SELECT TOP (1000) [UID], [ModelName], [NickName], [Online] FROM [alan_jhu].[dbo].[device]
```



Appendix VIII Database format for the Status of the I/O Module(Power Meter)

Users can query the status of the I/O modules (and Power meters) which WISE / PMC / PMD connect through the Database Table created by IoTstar, then the back-end management system can get the information for the displaying of status. The format of the Database Table of the I/O module's status (and Power meters) is as follow:

UID	DeviceUID	Interface	Number	Manufacturer	ModelName	Nickname	Type	Removed	Loop	Phase	Channel	Online
1	e001	01f42a06180000b0	COM3	1	I-7018Z		0	0	NULL	NULL	A10,A11,...	1
2	kysh	01f42a06180000b0	COM3	2	I-7024R		0	0	NULL	NULL	D10,D11,...	1
3	eehk	01f42a06180000b0	COM3	3	I-7012FD		0	0	NULL	NULL	D10,DIC...	0
4	bo7n	01f42a06180000b0	COM4	1	M-7055		0	0	NULL	NULL	D10,D11,...	1

Name	Data type	Description
UID	varchar	It is the “Serial Number” of the I/O module (or Power meter). This value is assigned by IoTstar.
DeviceUID	varchar	It is the “Serial Number” of the WISE / PMC / PMD controller which the I/O module (or Power meter) connect.
Interface	varchar	It is the interface of the WISE / PMC / PMD controller which is used to connect with the I/O module (or Power meter).
Number	tinyint	It is the number of the I/O module (or Power meter).
Manufacturer	varchar	If the module is a Power meter, this field indicates the manufacturer of the meter.
ModelName	varchar	It is the Model name of the I/O module (or Power meter).
Nickname	nvarchar	It is the Nickname of the I/O module (or Power

		meter).
Type	tinyint	It indicates the type of the module. “0” is for I/O module, “1” is for Power meter and “2” is for Internal Register.
Removed	bit	It indicates the I/O module (or Power meter) has been removed from the WISE / PMC / PMD controller, or not. (“0” indicates the module has not been removed; “1” indicates the module has been removed.)
Loop	tinyint	If the module is a Power meter, this field indicates the number of Loop.
Phase	tinyint	If the module is a Power meter, this field indicates the Phase of the Power meter. (“1” is for Single Phase; “3” is for Three Phase;)
Channel	varchar	If the module is an I/O module, all the I/O channel types the module support will be displayed in the field.
Online	bit	It indicates the connection status between the I/O module (or Power meter) and the WISE/PMC/ PMD controller (“0” -> Offline; “1” -> Online;). This value is updated once every 30 seconds.

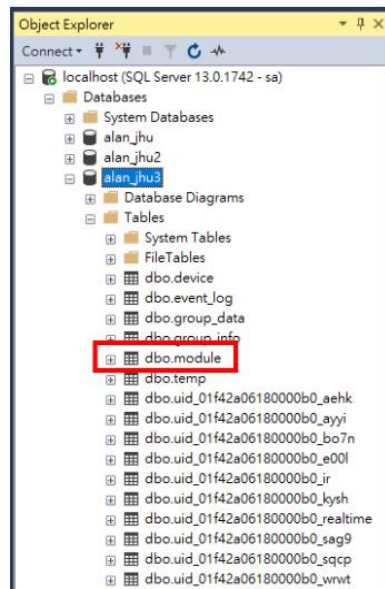
In this case, the WISE / PMC / PMD controllers login into the IoTstar with the account “alan_jhu3”; user can use Microsoft SQL Server Management Studio to open the corresponding Database of the “alan_jhu3” account and find the “**module**”

Database Table. This Database Table contains the fields to record the related information

This Database Table contains the fields to record the related information of the I/O modules (or Power meters) connect with the WISE / PMC / PMD controllers which login into the IoTstar with the “alan_jhu” account.

Now user can use the SQL command as below to query the connection status between the I/O modules and WISE / PMC / PMD controllers.

```
SELECT [UID],[ModelName],[Nickname],[Online] FROM [alan_jhu3].[dbo].[module]
```



UID	DeviceUID	Interface	Number	Manufacturer	ModelName	Nickname	Type	Removed	Loop	Phase	Channel	Online
wrwt	01f42a06180000b0	COM3	1		I-7018Z		0	0	NULL	NULL	A10,A11,...	1
kysh	01f42a06180000b0	COM3	2		I-7024R		0	0	NULL	NULL	D10,D11,...	1
aehk	01f42a06180000b0	COM3	3		I-7012FD		0	0	NULL	NULL	D10,D1C...	0
bo7n	01f42a06180000b0	COM4	1		M-7055		0	0	NULL	NULL	D10,D11,...	1
sqcp	01f42a06180000b0	COM4	2		M-7051		0	0	NULL	NULL	D10,D11,...	1
sag9	01f42a06180000b0	COM4	3		M-7055		0	0	NULL	NULL	D10,D11,...	1
ayyi	01f42a06180000b0	COM4	4		M-7022		0	0	NULL	NULL	A00,A01	1
e00l	01f42a06180000b0	COM4	5		IR-712A		0	0	NULL	NULL	NULL	1
ir	01f42a06180000b0	IR	0				2	0	NULL	NULL	IR5,IR6,I...	NULL