ICP DAS PMC Data Server
Quick Start Guide

[Version 2.6.0]



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1 Overview

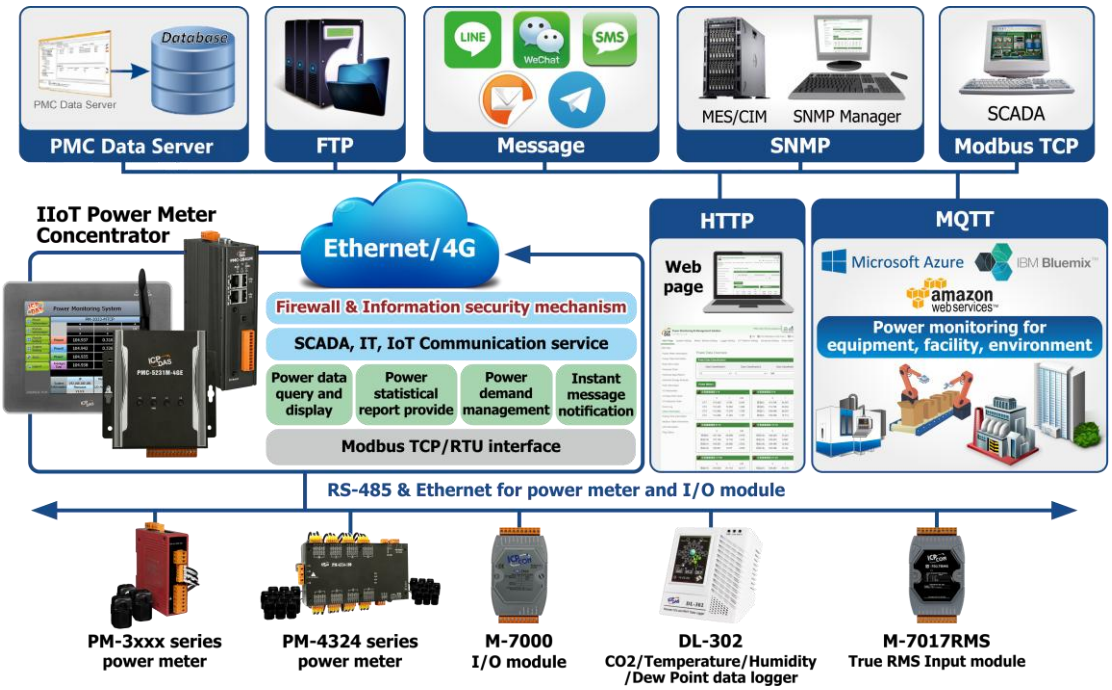
The PMC Data Server is a Database utility developed by ICP DAS. It is designed for connections to the ICP DAS PMC/PMD concentrators to read the historical power data measured by the power meters connected to PMC/PMD, and import the historical power data into the Database system for further statistics and analysis. The PMC/PMD power meter concentrators currently supported by PMC Data Server are as follows:

- The PMC-2841/523x/224x & PMD is used for connections to ICP DAS PM-2133/PM-3x33(-MTCP)/PM-311x(-MTCP)/PM-4324(-MTCP) power meters to measure and collect the power usage information of equipment through RS-485 (or Ethernet) interface.
- The PMC-2241M-iWSN allows flexible integration with ICP DAS iWSN wireless power meters via iWSN-200 data concentrator to measure and collect the power usage information of equipment by iWSN wireless power meter.

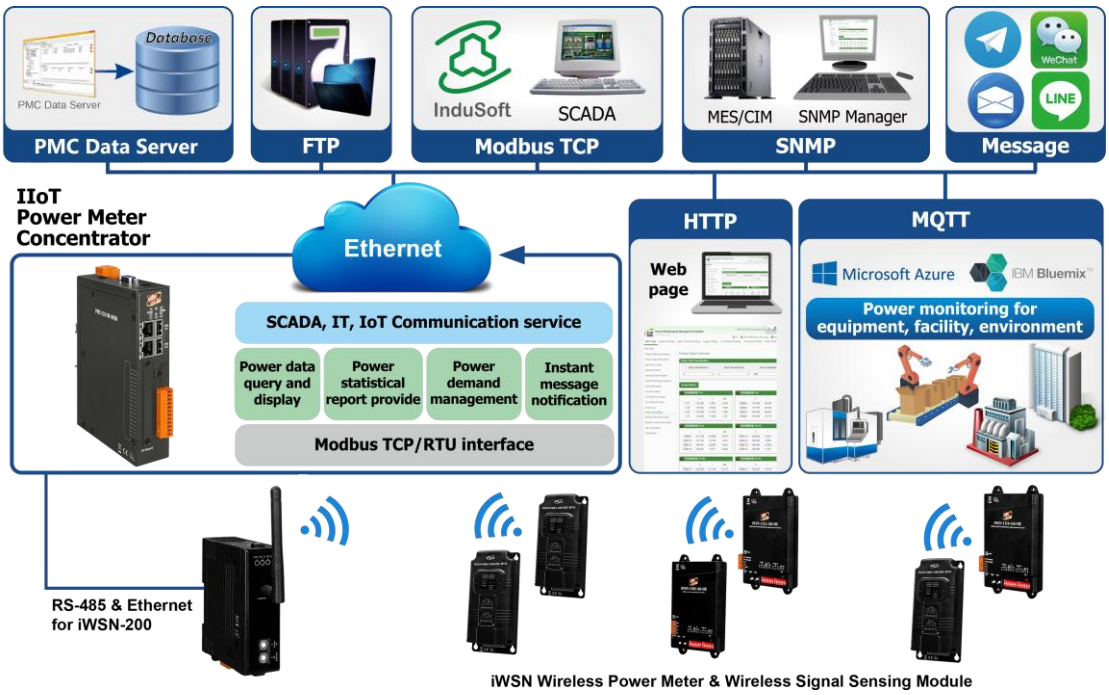
When PMC Data Server is connected to these PMC/PMD concentrators by Ethernet, the PMC/PMD concentrators will automatically send the historical power data log files at pre-defined scheduled time to the PMC Data Server through the FTP protocol, then PMC Data Server will receive these historical power data log files and import the content of these files into the Database system for further operations.
By using PMC Data Server to review the power usage information of equipment, during the whole process of system development, no programming is required; by a few settings of the connection parameters for Database; the user could quickly convert the historical power data of the devices into Database system.

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The following is the system architecture of the two types of PMC/PMD power meter concentrators supported by PMC Data Server:



PMC-2841/523x/224x & PMD series system architecture



PMC-2241M-iWSN series system architecture

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PMC Data Server Features:

- Connect to PMC/PMD concentrators through Ethernet interface to receive the historical power data log files (in CSV format) that are sent by PMC/PMD concentrators.
- Support Database import function to import the content of historical power data log files to the MS SQL, MS Access, MySQL(MariaDB) or Oracle Database system.

This document is intended to give a full-range instruction of PMC Data Server. For detailed operations and setting of PMC-2841/523x/224x & PMC-2241M-iWSN concentrator, please refer to the user manual of corresponding PMC/PMD concentrator.

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2 Before Installation

PMC Data Server can be installed on Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 10. Before the installation of PMC Data Server, please confirm the Microsoft .NET Framework 4.5.2 (or later version) has been installed on the target computer.

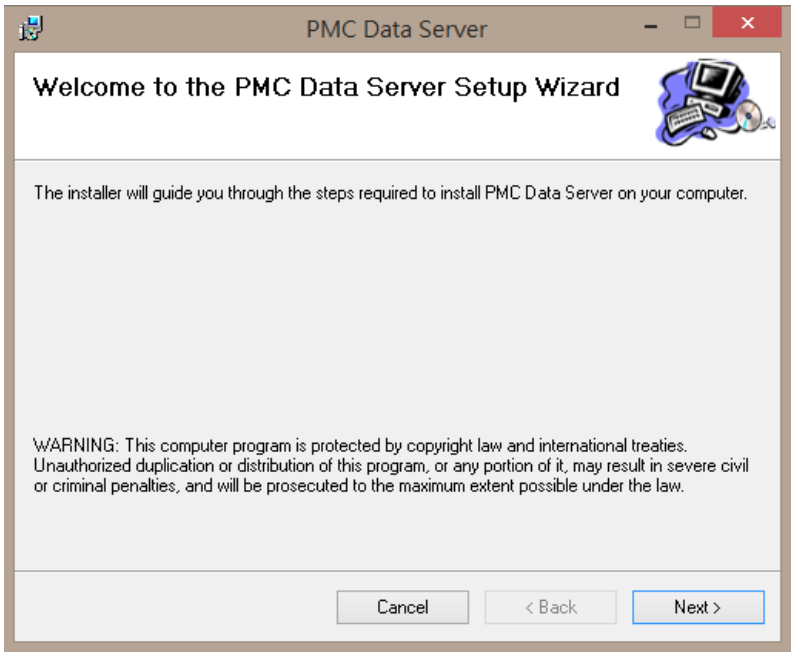
If the target computer does not install the framework package, please visit the link as below to download the file directly from Microsoft and install it.

- **Download Microsoft .Net Framework Version 4.5.2:**
  https://www.microsoft.com/en-us/download/details.aspx?id=42642

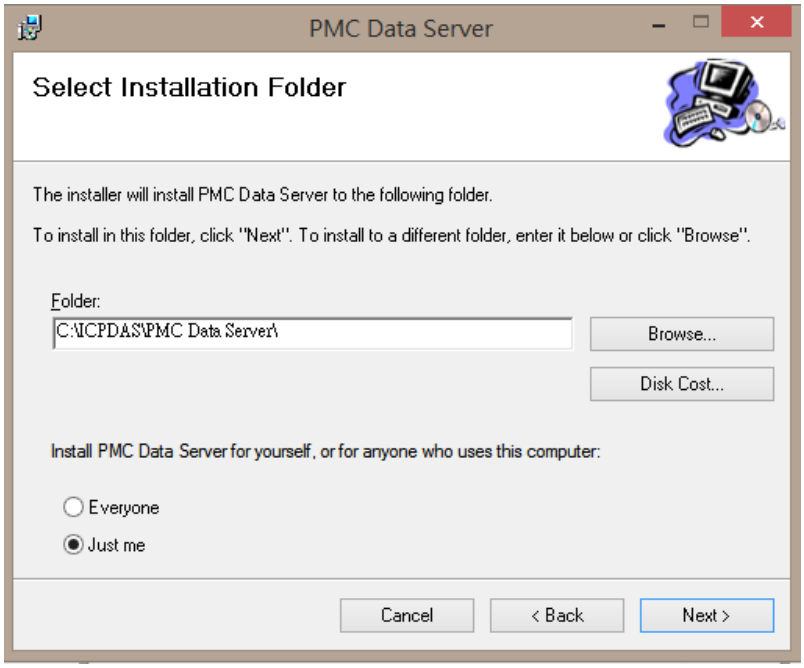
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3 Software Installation

Please contact ICP DAS service to obtain the latest version of PMC Data Server installation file (PMC Data Server_v2.x.x_Setup.msi). Double click on the installation file to start the installation, click【Next】to continue.

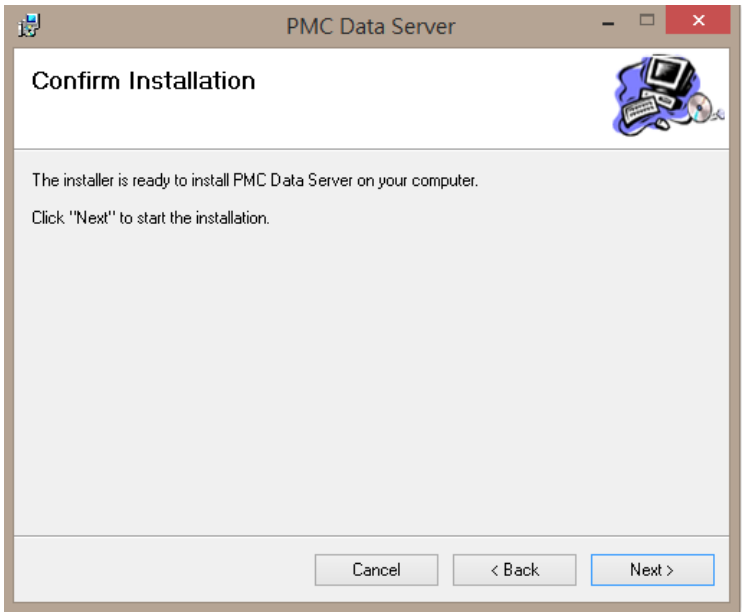


On 【Select Installation Folder】 window, input path or browse through file dialog box to select the destination folder, and then click【Next】to continue.

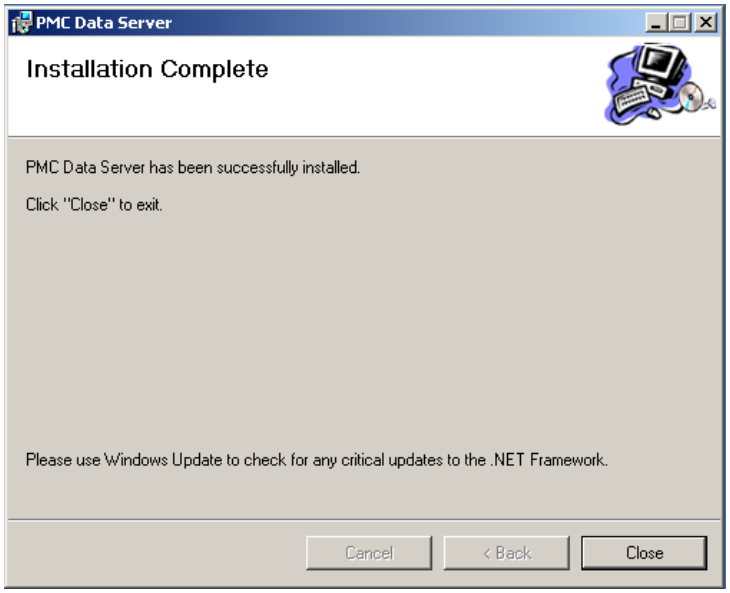


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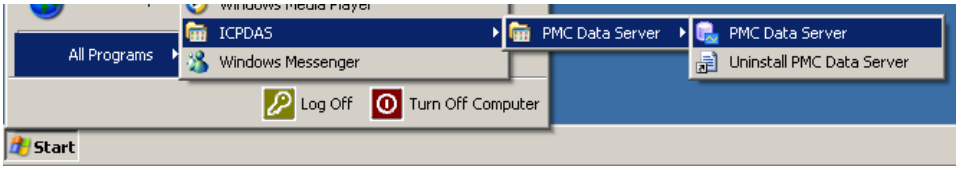
Click【Next】to start the installation.



When the installation process is completed, click【Close】to finish the installing process.



After the installation is completed, user will find PMC Data Server shortcut (icon) on the desktop and in the program menu: 【Start】→【All Programs】→【ICPDAS】→【PMC Data Server】. The icon is shown as .



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4 User Interface Introduction

PMC Data Server main window contains the following areas:

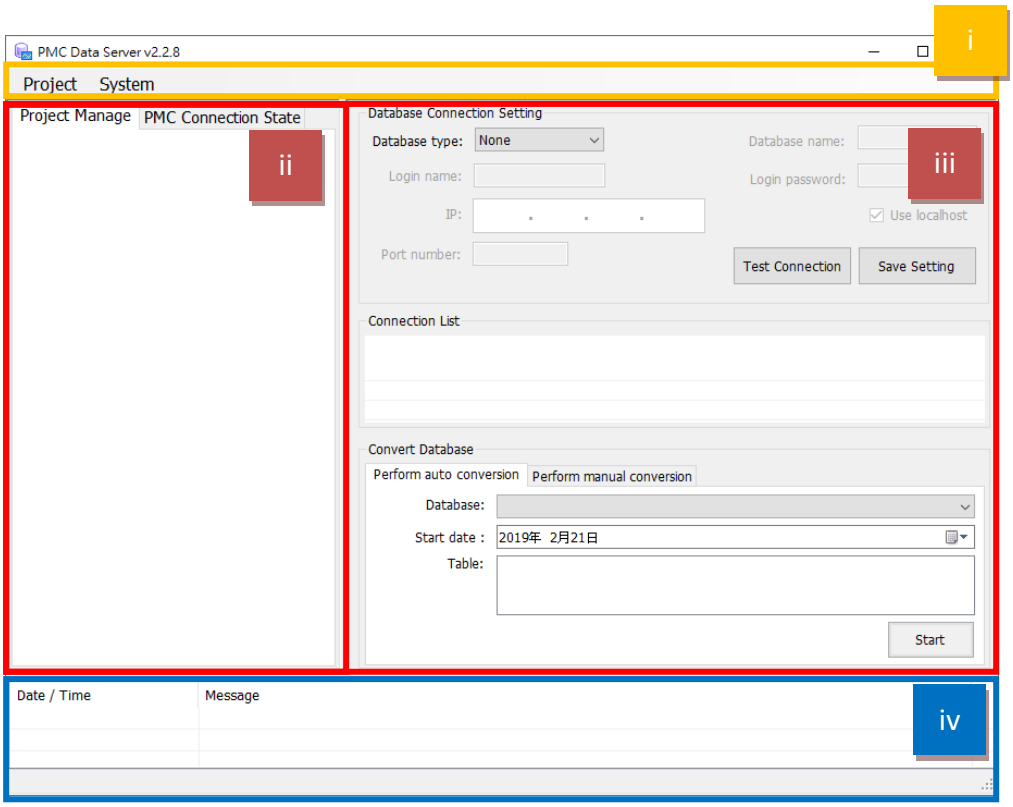
i. **System Function Area**：It contains the menu bar for user to select the function.

ii. **Function Operation Area**：

- Project Management: User can define the content of the data table and the related power meters which will be using to import the power data into the Database system. User also can review the setting here.
- PMC/PMD Connection State: The PMC/PMD connection state will be shown in this page.

iii. **Database Operation Area:** It provides the parameter setting for both the Database connection and Database importing functions.

iv. **System Message Area**：Display the system messages during the function execution.



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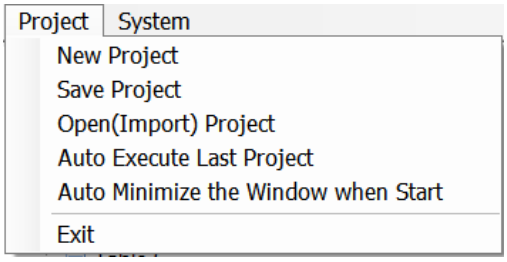
5 System Operating Procedure

PMC Data Server is connected to ICP DAS PMC/PMD concentrators via Ethernet interface. The historical power data log files generated by PMC/PMD concentrators will be automatically sent back to PMC Data Server via FTP protocol. After the PMC Data Server receives the files, the power data files will be processed and then the power data of the devices measured by power meters can be imported into the Database system.

The following section will introduce how to perform the functions of PMC Data Server.

5.1 Project Setting

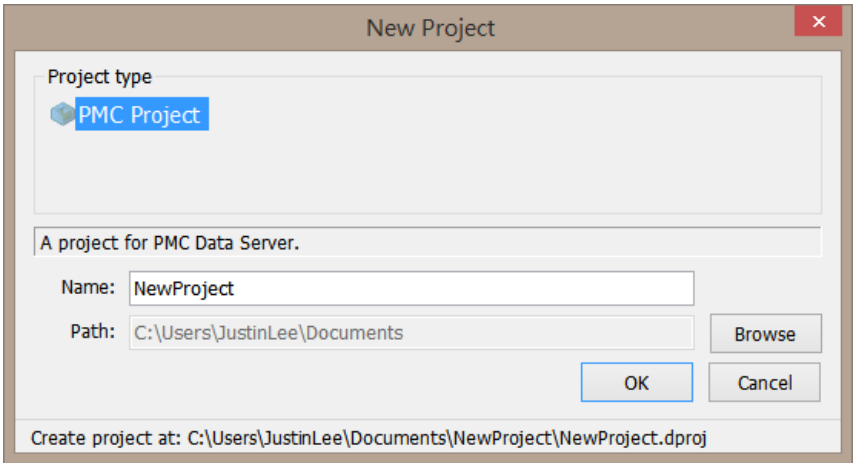
This section describes how to create, save and open (import) project in PMC Data Server. When check【Auto Execute Last Project】, the PMC Data Server will be launched and import last project setting automatically after the computer being rebooted.



5.1.1 Create New Project

On the【Project】function list, click【New Project】and the【New Project】window will appear. Enter the project Name in the text field; the corresponding storage path will be displayed at the bottom area of the window. After entering project name and project storage path, click “OK” button to create a new project.

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5.1.2 Save Project

On the【Project】function list, click【Save Project】to save current project settings so that the user can use the same PMC Data Server project next time.

5.1.3 Open(Import) Project

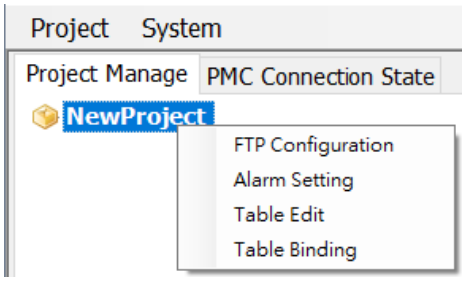
On the【Project】function list, click【Open(Import) Project】and the【Open】window will be shown. Browse through to select the desired project file (*.dproj) and click on【Open】. PMC Data Server will import the project settings.

5.1.4 Auto Execute Last Project

If user check the 【Auto Execute Last Project】, when user reboot the computer; The computer will automatically launch the PMC Data Server and import the last project setting. If the user has set last project to perform auto Database conversion function; PMC Data Server will also launch the Database auto conversion function for user to continue the original Database conversion operation. Please see chapter 5.6 for more detailed about how to perform auto Database conversion.

In addition, there will be a menu when user right-click on the project name with mouse. Each function in the menu will describe in section 5.3 , 5.4 and 5.5, respectively.

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5.2 System Setting

The user can view the version number of the utility and determine what language to be used in the system. After confirms the language setting, user can get to next step for project setting.

Please Note：

(1) The system need to be restarted when user changes the language setting. Please make sure the project setting and save it as requires before change the language setting.

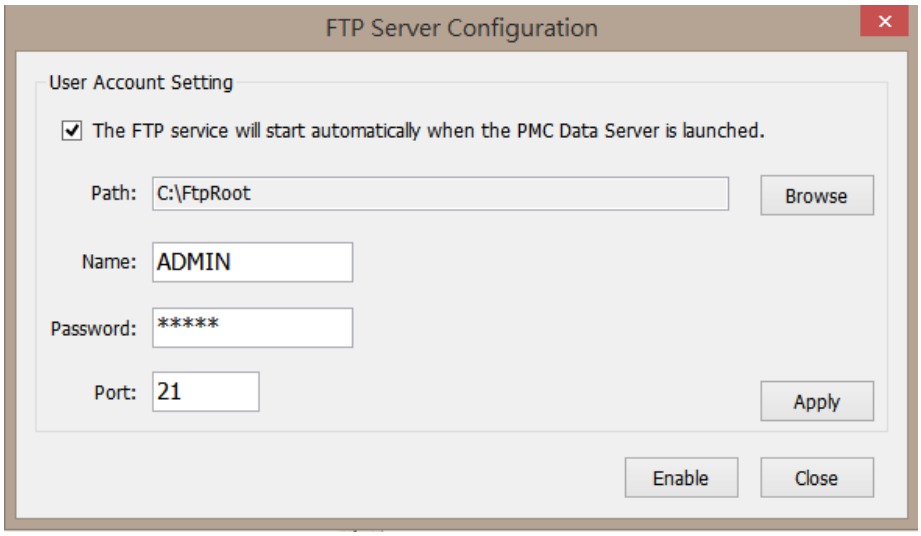
(2) In PMC Data Server, the default language of Database columns will be based on the system language setting of PMC Data Server. That is, if Chinese is selected as system language, the default language of Database columns will be in Chinese, and if English is selected as system language, the default language of Database columns will be in English. User can also see section 5.5.1 for more detailed about how to customizing the names of Database columns.

5.3 FTP Server Settings

PMCs send stored power data files to the PMC Data Server regularly through the FTP server. Therefore, it is required for user to setup the built-in FTP server of PMC Data Server for PMC/PMD to send back the power data logger file to the PMC Data Server. Following is the steps.

i. Mouse right-click on the project name and select 【FTP Configuration】.
   The configuration window will be shown as below.

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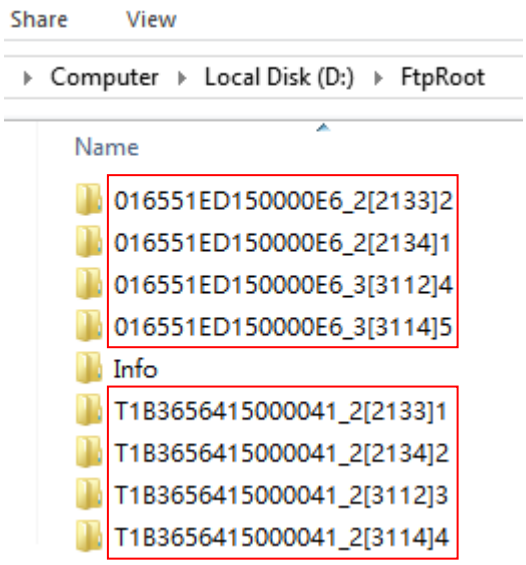


By default, the system will not launch FTP service automatically. If the user would like to launch the service, please first complete the following settings and click “Apply” button.

- Check or uncheck if the FTP service will start automatically when the PMC Data Server is launched.
- Path：Setup the download path for saving the received power data files that PMC/PMD send to the PMC Data Server.
- Name and Password：Set up the username and the password for the built-in FTP Server of the PMC Data Server. Please make sure the FTP settings on the PMC Web page is also the same as the FTP account settings on the PMC Data Server, so that the PMC/PMD can successfully login and send back power data files to the PMC Data Server.
- Port：Setup the port for the built-in FTP server of the PMC Data Server.

ii. After the FTP server setting is completed; implement the network connection of the front-end PMC/PMD and the PMC Data Server; click the “Enable” button; the PMC/PMD will start to transfer power data files to the specified FTP server download folder. The specified FTP server download folder will contain an “Info” subfolder and other subfolders for each power meters. The following figure is an example that shows the power data folder structure of the FTP server download path after the PMC/PMD sending back the power data files:

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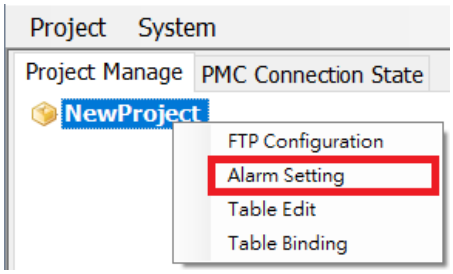
If user want to stop the FTP function or change the FTP setting, please mouse right-click on the project name and select【FTP Configuration】, then the configuration window will be shown. Click the “Stop” button to stop the FTP functions or change the FTP parameter setting.

5.4 Alarm Settings

The alarm sending function of PMC Data Server is divided into two parts. The first part is the notification of the change of power meter's setting. When the power meter's setting is changed (power meter be removed or power meter's name be modified), it will send an alarm Email set by the user. The second part is the notification of the change of the PMC/PMD connection status. This function will periodically check the current connection status between PMC/PMD and PMC Data Server according to the time period which user set. When the PMC/PMD connection status be changed (From "Online to Offline" or "Offline to Online"), PMC Data Server will send an alarm Email set by the user.

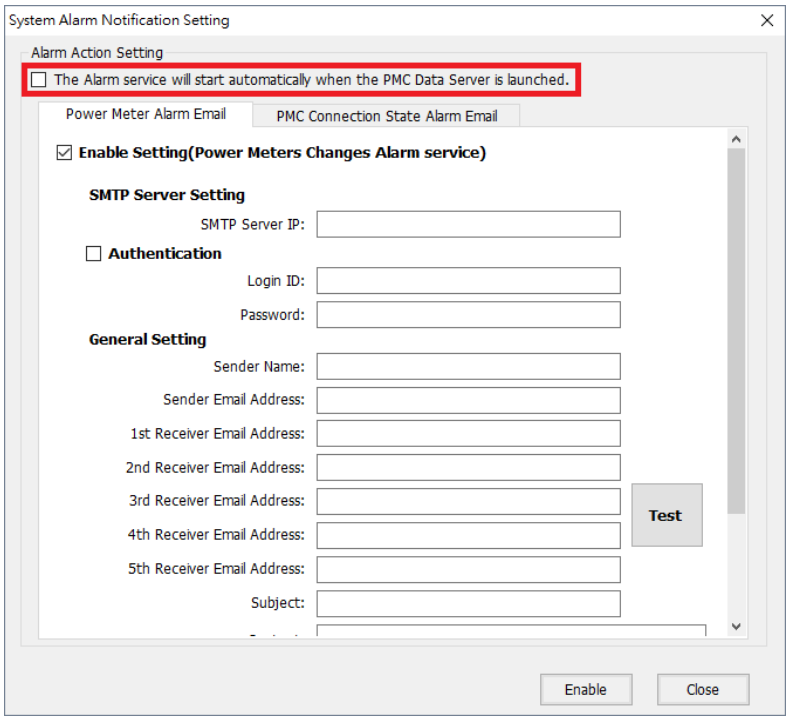
The following are the steps for alarm setting:

i Mouse right-click on the project name and select【Alarm Setting】.



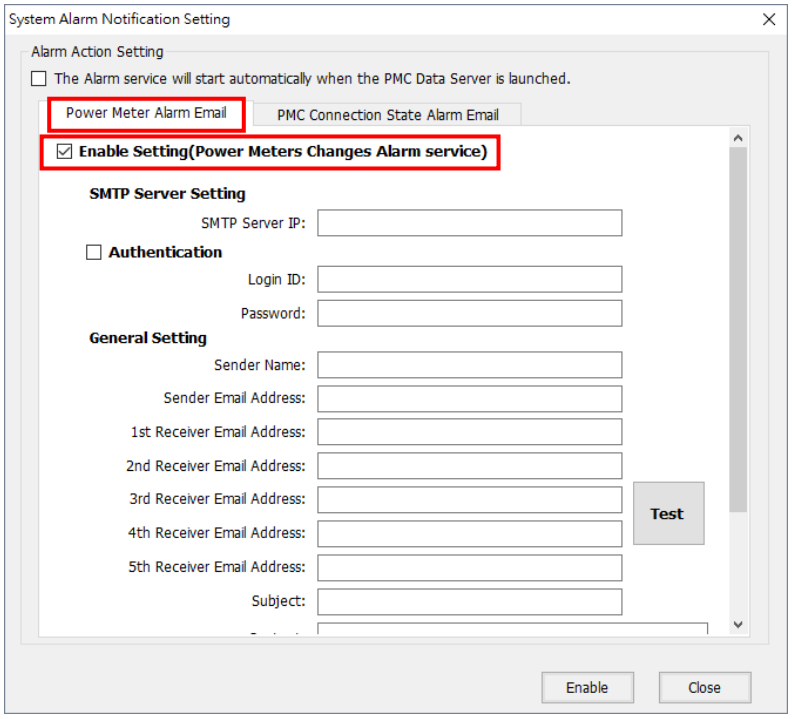
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ii By default, the PMC Data Server is disabled the alarm notification service. If user want the alarm notification service be launched automatically when he start the project next time, please remember to check the checkbox of "The Alarm service will start automatically when the PMC Data Server is launched."

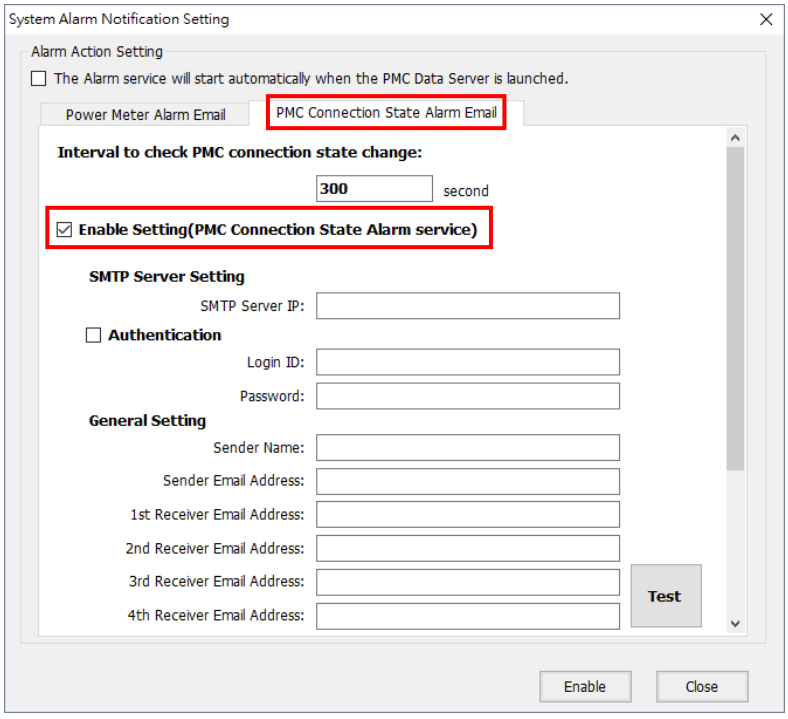


iii If user want to enable the notification service of “Power Meter Alarm Email”, please click the “Power Meters Alarm Email” tab, and check the checkbox of “Enable Setting(Power Meters Changes Alarm service)”, and refer to section 5.4.1 for more detailed information of the Power Meter Alarm Setting.

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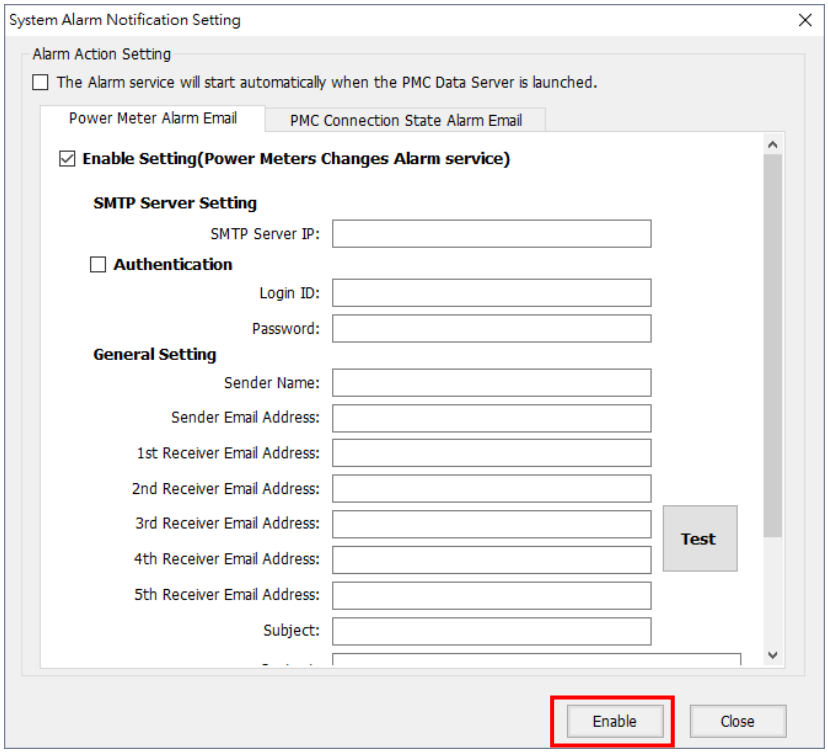


iv If user want to enable the notification service of “PMC/PMD Connection State Alarm Email”, please click the “PMC Connection State Alarm Email” tab, and check the checkbox of “Enable Setting(PMC Connection State Alarm service)”, and refer to section 5.4.2 for more detailed information of the PMC/PMD Connection State Alarm Setting.

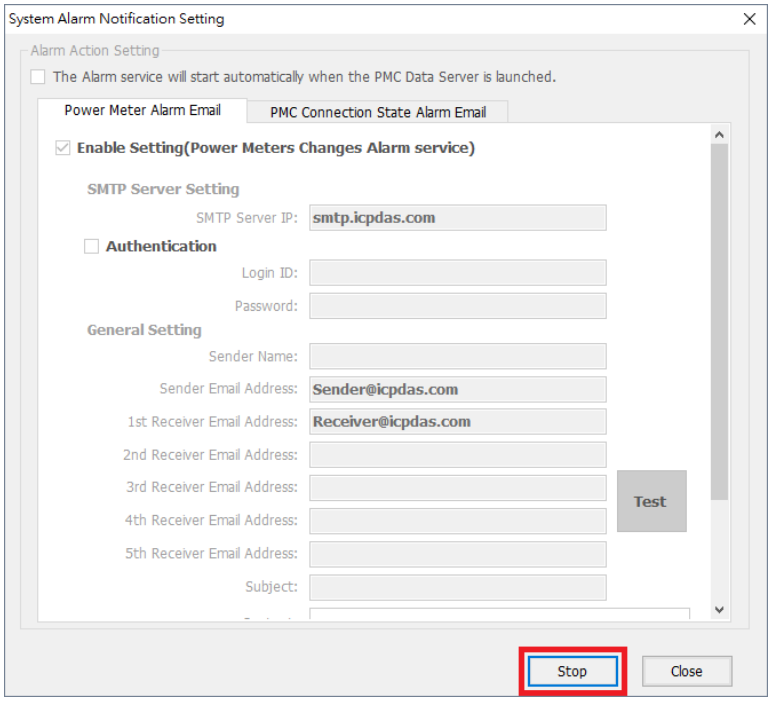


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v After complete step i~iv and have verified the Network setting of PMC/PMD and PMC Data Server, please click “Enable” button to save the setting and enable the alarm notification service,



vi If user want to disable the alarm notification service or modify the parameters setting of the service , please click the “Stop” button. The alarm notification service will be stopped immediately.

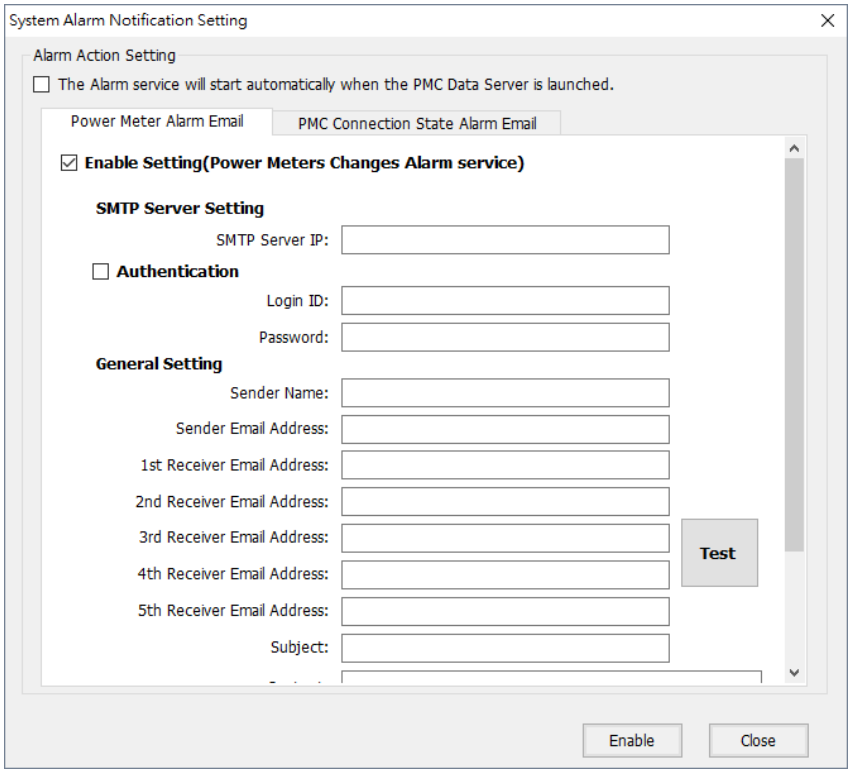


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5.4.1 Power Meter Alarm Setting

When the power meter's setting is changed (power meter be removed or power meter's name be modified), user can enable the alarm notification service to send an alarm Email to the related person for the follow-up processing. The following are the steps for the Power Meter alarm setting：

i. Click the “Power Meter Alarm Email” tab on【System Alarm Notification Setting】page, and get into the “Power Meter Alarm Setting” page.

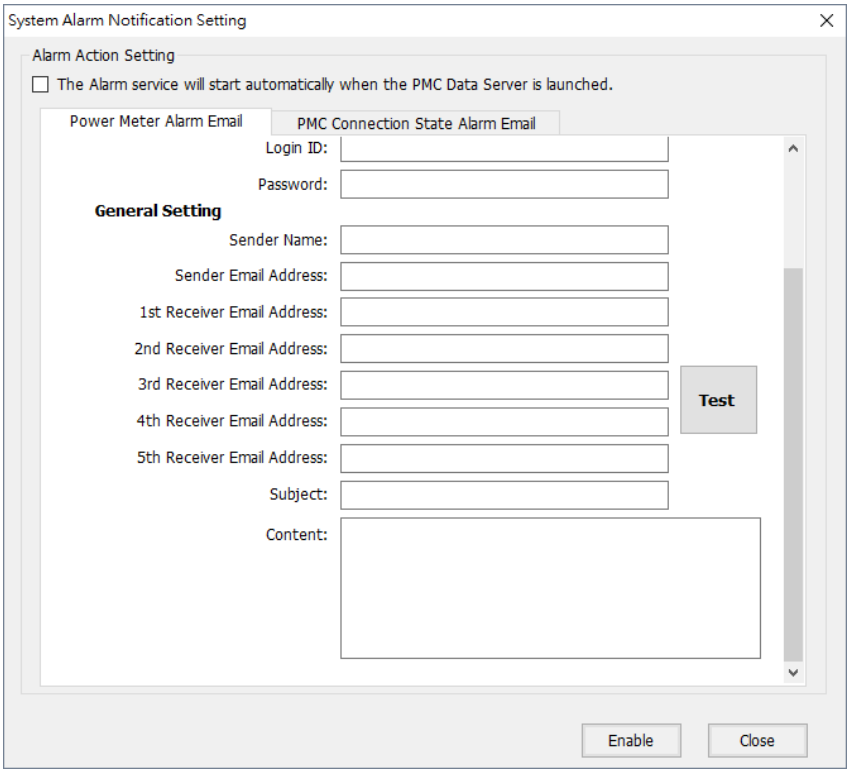


ii. If user want to enable the service, please check the checkbox of “Enable Setting(Power Meters Changes Alarm service)” first and complete the following settings.

- SMTP Server IP：In the “SMTP Server” field, enter the IP or the domain name of the SMTP server.
- ID and Password：If the SMTP server requires account and password validation, please select the “Authentication” checkbox and then enter the SMTP server login ID in the “Login ID” field, and enter the SMTP server password in the “Password” field.

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- Sender and Receiver's email address：Enter the sender's email address in the "Sender Email Address" field and enter at least one receiver's email address. To verify whether the email setting is correct or not, user can click the "Test" button, then the system will send a test Email to the receivers' email address for verification.
- Subject：Enter the email subject in the "Subject" field.
- Content：Enter the email content in the "Content" field.

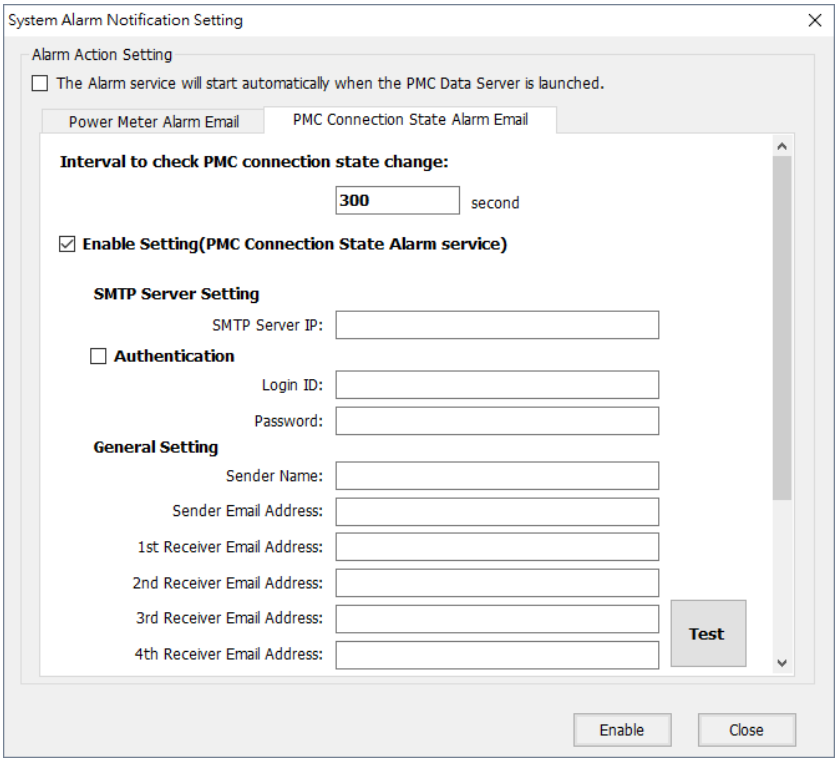


5.4.2 PMC/PMD Connection State Alarm Setting

User can set the time interval to periodically check the connection status between PMC/PMD and PMC Data Server. When the PMC/PMD connection status be changed (From "Online to Offline" or "Offline to Online"), PMC Data Server will send an alarm notification Email to the related person for the follow-up processing. The following are the steps for the PMC/PMD Connection State Alarm Setting：

i. Click the "PMC Connection State Alarm Email" tab on【System Alarm Notification Setting】page, and get into the "PMC/PMD Connection State Alarm Setting" page.

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ii. After complete the setting of "Interval to check the PMC connection state change", the PMC Data Server will periodically check the connection status between PMC/PMD and PMC Data Server according to the time period entered by user. If the PMC/PMD connection status is changed (From "Online to Offline" or "Offline to Online"), a pop-up warning window will be shown. If user enable the alarm notification Email sending function, then PMC Data Server will send an alarm Email to the related person for the follow-up processing.

Please Note：The default value of "Interval to check the PMC connection state change" is 300 seconds, and the minimum value is 60 seconds.

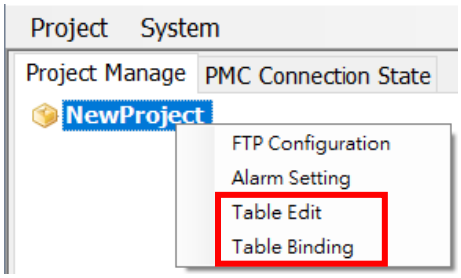
iii. If user want to enable the service, please check the checkbox of “Enable Setting(PMC Connection State Alarm service)” first and complete the settings. About the detail information of the setting, please refer to section 5.4.1 Power Meter Alarm Setting.

5.5 Data Table Editing and Binding

PMC Data Server takes the CT(or phase) of power meter as the basic unit.

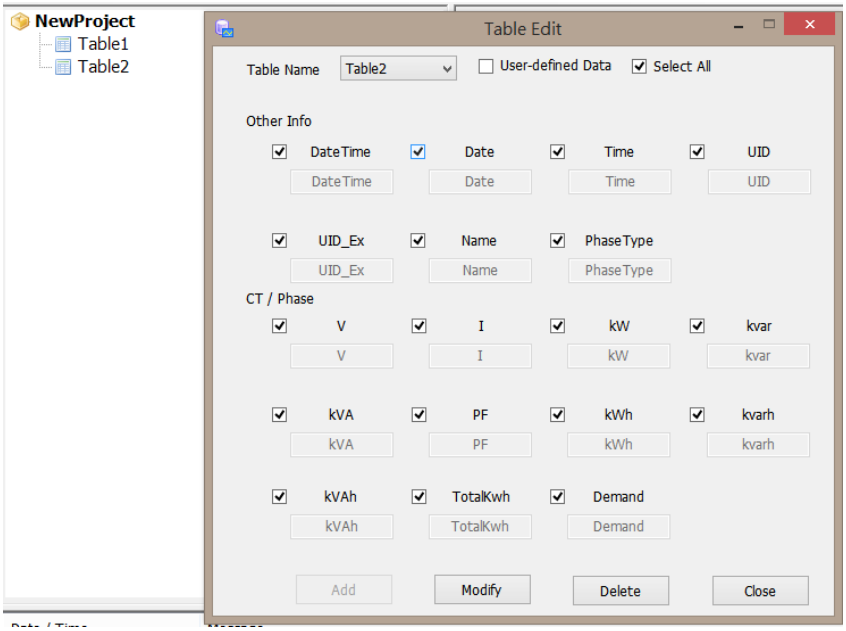
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After user complete the setting of CT(or phase) of the power meter as this section, the PMC Data Server will extract the content of the power data files sent back by the PMC for Database conversion. The detail description of the editing of the Data Table and the binding of Data Table and CT(or phase) of the power meter is as below.



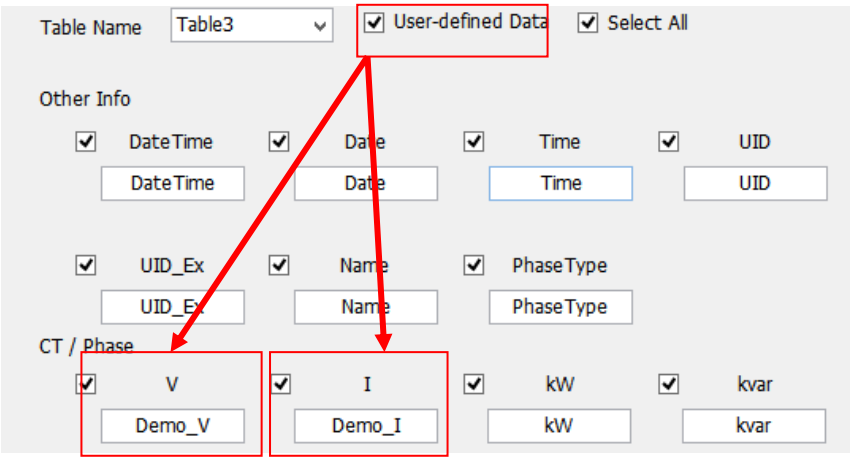
5.5.1 Data Table Editing

It is used to define which power data will be selected to import into the Database system, and also the definition of the Database Column. Mouse right-click on the project name and select【Table Edit】, then the Table Edit window will be shown as below. Input the name of the Data Table in the "Table Name" field, and select the data items which will be used in the Database import operation. After complete all setting, clicking "Add" button to add the Data Table in the system. User can modify the Data Table setting which already exists by clicking "Modify" button; Clicking "Delete" button will delete the Data Table which user define before.



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User can customize the content of the Database column for the data table as requires. For example, both "V" and "I" columns are the default Database column of the Data Table. They can be renamed as “Demo_V” and “Demo_I” as following, so the data from the CT (or phase) of the power meter will be converted into the Database with this new customized Database column.



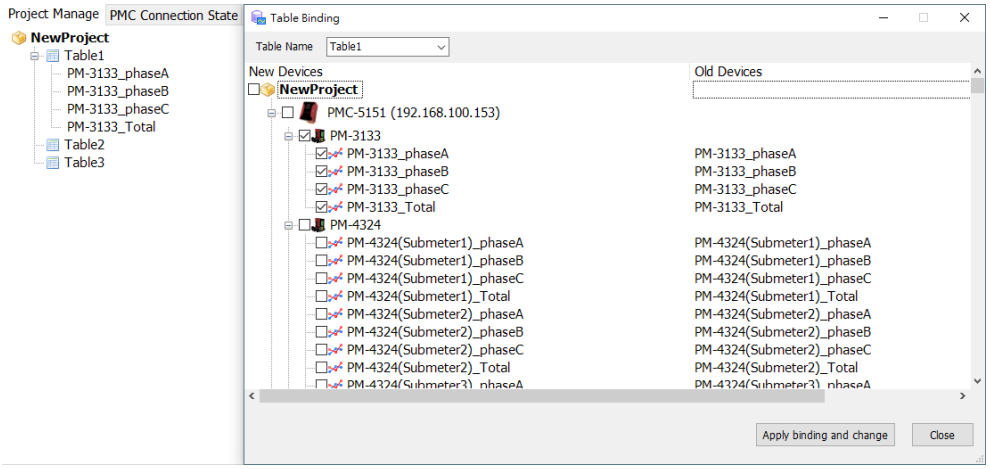
5.5.2 Data Table Binding

After complete the setting of “5.5.1 Data Table Editing”, now user have to setup the binding relation between the Data Table and its data source (The CT or phase of the power meter). Mouse right-click on the project name and select 【Table Binding】then a tree architecture list of the CT(or phase) of power meter of PMC will be shown as below. User can check or uncheck the checkboxes which is in the front of each CT(or phase) to add or remove the CT(or phase) from the binding list of the Data Table. Each CT(or phase) can be bound to multiple Data Tables. The CT(or phase) binding list is the data source of the Data Table. When PMC Data Server start the Database conversion operation, the system will perform the power data files processing according to the definition of the CT(or phase) which is added into the binding list or not. After complete the setting, the Database conversion function will be performed and store data into the Database system regularly.

If the user would like to remove the specified CT(or phase) from the binding list, just uncheck the checkboxes of the CT(or phase). Please remember to click “Apply binding and change” button after

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completing all setting.



Please note: When there are changes on Power Meters, tree architecture list of the CT(or phase) of power meter of PMC will be colored：Gray represents devices removed; Red represents nickname changed; Blue represents new devices.

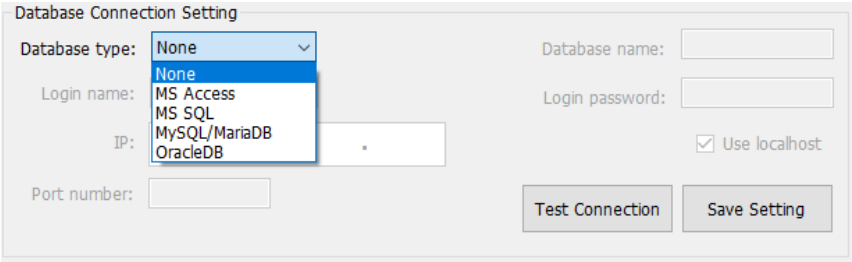
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5.6 Database Settings and Conversion

The Database convert function supports 4 types of Database: MS Access, MS SQL, MySQL(MariaDB) and OracleDB. The user could freely define the ways to connect to the Database. In addition, PMC Data Server also provides automatic Database conversion function to automatically convert the content of the historical power data log files into the specific Database system regularly.

5.6.1 Create Database Connection Setting

The user interface of the Database connection setting is shown as follow. Follow the steps below to set up it.



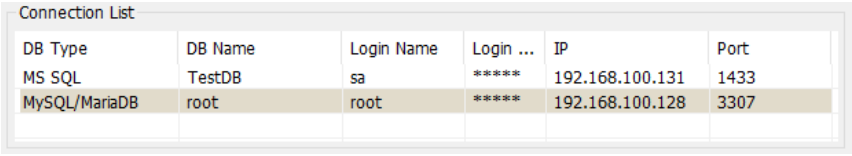
i. The Database convert function supports 4 types of Database. Select the Database type, the corresponding setting textboxes for the Database type will be shown for user to fill in.

ii. PMC Data Server provides connection testing function for MS SQL, MySQL(MariaDB) and Oracle Database. For MS Access connection setting, it doesn't require connection testing, the user only needs to make sure if the storage path is available or not.

5.6.2 Save Database Connection Setting

After complete the settings of "Database Connection Setting", the user could test the connection by clicking "Test Connection" button before the normal operation. User could also skip the test step and save the connection setting directly to the "Connection List" by clicking "Save Setting" button.

The Database connection settings list will be showed as below:

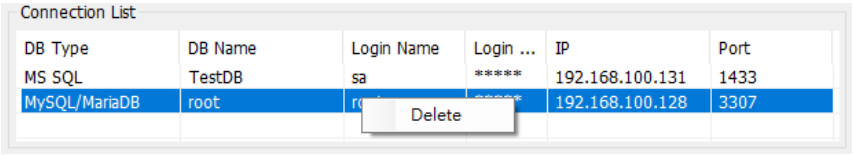


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5.6.3 Modify and Delete Database Connection Setting

Double click the database connection setting on the "Connection List", the PMC Data Server will bring out the saved setting and the setting information will be showed on the "Database Connection Setting" automatically. User can modify the setting to fit their requirements. After the modification is completed, click "Save Setting" button to save the settings back to the "Connection List".

In addition, user can also delete the previous saved database connection setting on the "Connection List" by mouse right-clicking on the selected database connection setting, and select "Delete".



5.6.4 Database Conversion

There are 2 ways to perform the database conversion function as "Auto Conversion" and "Manual Conversion". Before user performs the database convert function, please make sure if the Database connection setting to the database works properly.

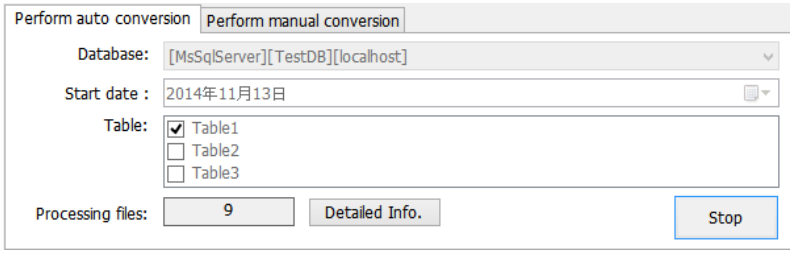
- Auto Conversion

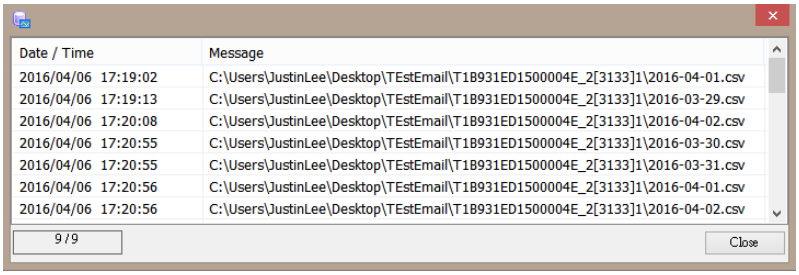
  Enable this function will let PMC Data Server automatically transferred the historical power data log files of PMC/PMD into the Database system based on the format setting of "5.5 Data Table Editing and Binding". The process to perform "Auto Conversion" function is as follows:

  In the "Perform auto conversion" tab, select a database connection from the "Database" drop down list; Select the start time for the operation and at least one Data table in the "Table" checkbox list. After completing the setting, click "Start" button to start database conversion function. When this function is executed, all operations on the user interface will be locked to prevent possible error and the number of the processing files will be shows on the user interface; "Start" button will become "Stop" button. When the user

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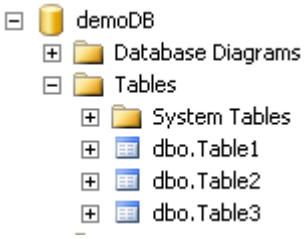
clicks “Detailed Info.” button, the detailed information of the power data files which have been imported to the database will be showed on the other dialog.





If the user would like to perform any operation immediately, the user can stop the convert function by clicking “Stop” button. The operations on the user interface will go back to normal again.

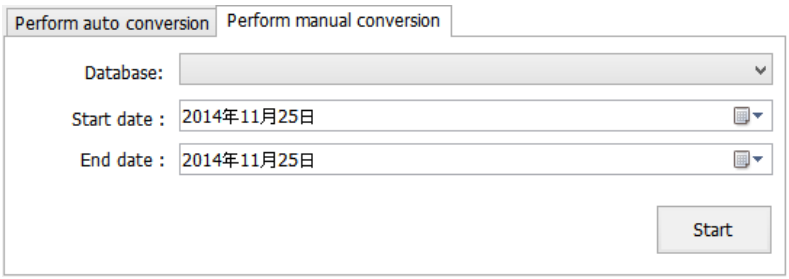
After the power data is converted and saved in the database, the database structure will be similar to that shown below:



- Manual Conversion

  In the “Perform manual conversion” tab, select a database connection from the “Database” drop down list, identify the start time and end time of the Database conversion operation and then click on “Start” button to perform the database conversion operation with the setting which user define manually.

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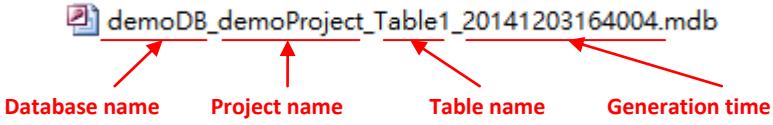


The status of the manual conversion operation will be displayed on the message list under the user interface.

If MS Access is selected as the destination database, the MS Access (*.mdb) file will be named as below.

"DatabaseName_ProjectName_TableName_GenerationTime .mdb".

Following is an example of MS Access file for reference:

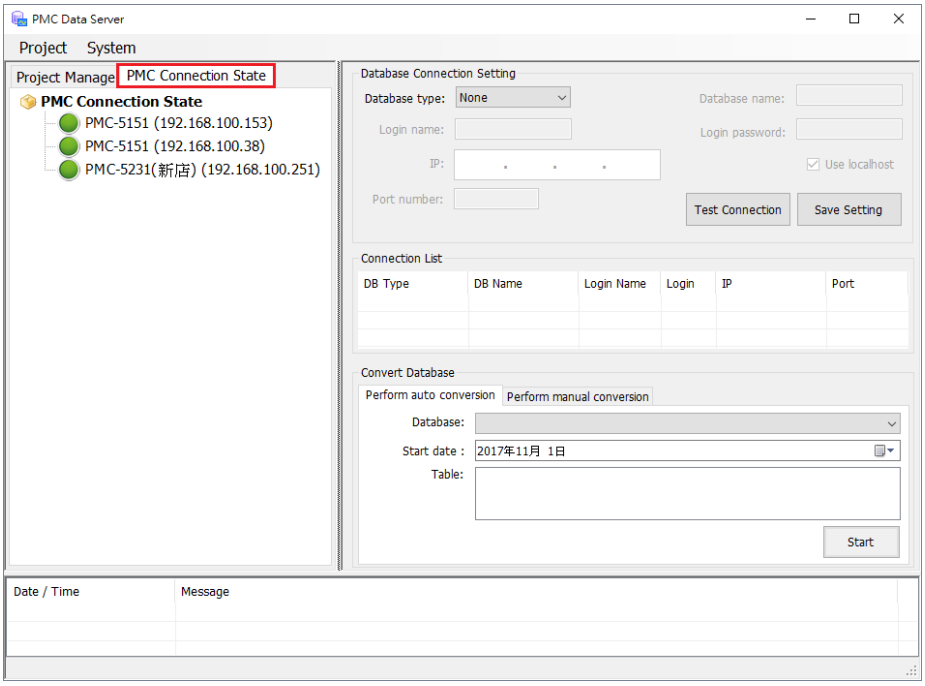


If MS SQL or MySQL(MariaDB) is selected as the destination database, all names of the tables in the database will be consistent as the setting in 5.5.1"Data Table Editing".

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5.7 PMC/PMD Connection State

When user opens the project, the PMC Data Server will periodically check the connection status between PMC Data Sever and the PMC/PMD concentrators which are included in the project. User can visit the "Function Operation Area" of PMC Data Server, and directly click the tab of "PMC Connection State" to review the connection status. If user enable the function of alarm notification Email sending, then PMC Data Server will send an alarm Email to the related person when it find the connection status is changed. About the setting of alarm notification Email sending, please refer to 5.4.2 PMC/PMD Connection State Alarm Setting for detail.

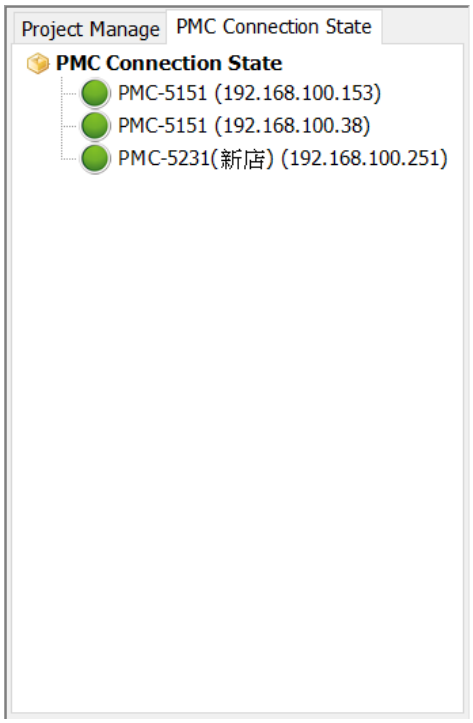


i Complete the setting of "FTP Server Settings" of PMC Data Server and "FTP Upload Setting" of PMC/PMD first. About the "FTP Server Settings" of PMC Data Server, please refer to 5.3 FTP Server Settings for detail. About "FTP Upload Setting" of PMC/PMD, please refer to 8.3 FTP Upload Setting of PMC/PMD User Manual.

ii After complete all setting, visit the "Function Operation Area" of PMC Data Server, click the tab of "PMC Connection State", then PMC Data Server will periodically check and display the connection status in the "Function Operation Area".

iii The page of PMC/PMD connection status is shown as below:

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PMC Data Server will periodically update the connection status with the PMC/PMD concentrators which are included in the project every 5 seconds. The Green light in front of the PMC/PMD node indicates that the PMC/PMD is in Online status, and the red light in front of the PMC/PMD node indicates that the PMC/PMD is in Offline status currently.

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