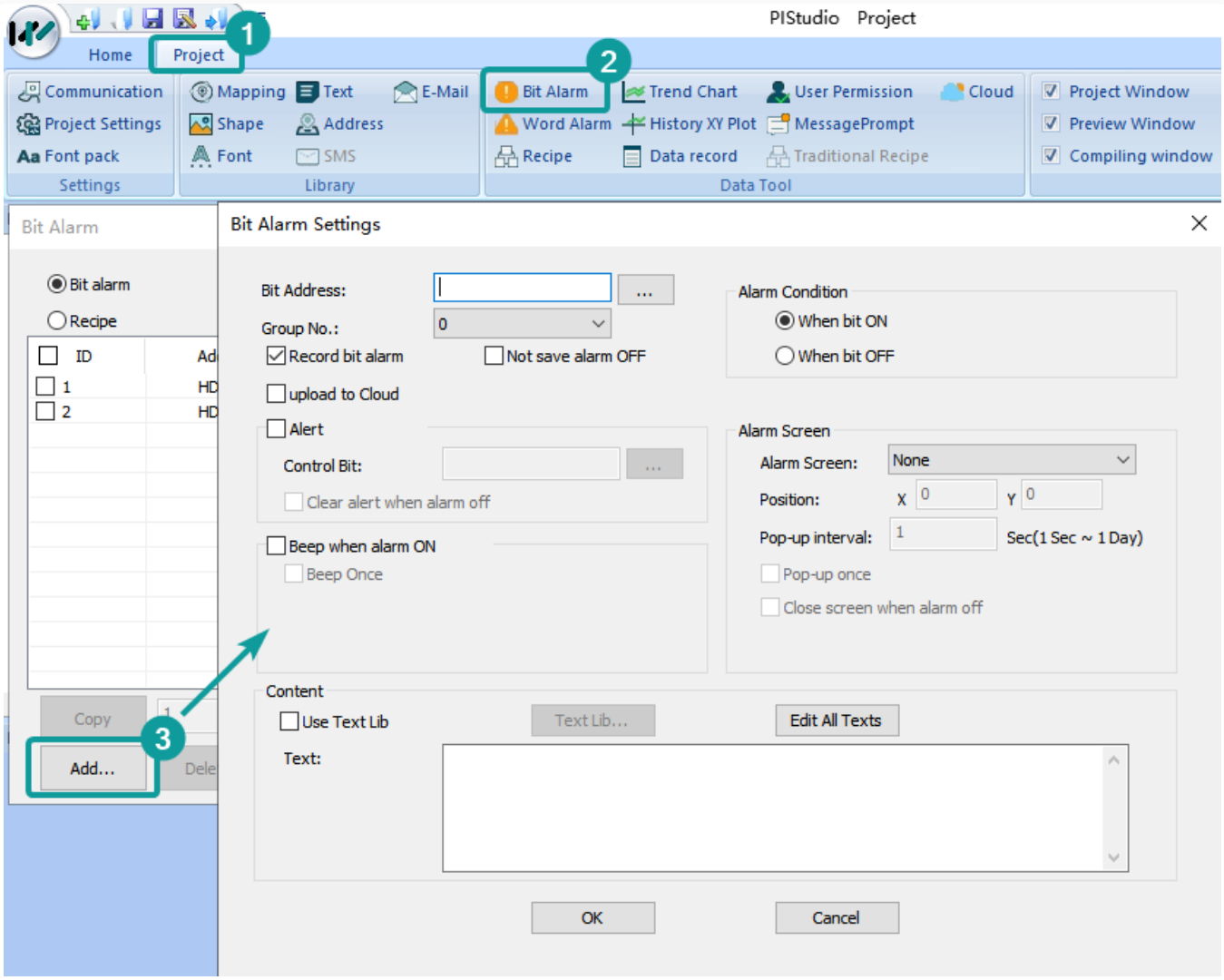
06 Data Tool

This chapter provides information about basic functions and configuration in PIStudio.

Alarm

Bit alarm

Click "Project"→"Bit Alarm", it is displayed as the following figure.



Group No.: Group number of Bit alarm. The name is unique and cannot be duplicated.

Bit Address: Bit address of alarm monitoring

- **Record bit alarm by default:** Whether to record the alarm history data of bit alarm, if checked, it will be saved in the designated storage location.
- **Not save alarm OFF:** If checked, after the alarm is dismissed, the corresponding alarm records will be deleted from the log file.

Upload to Cloud: The data upload by "bit alarm" is stored in the Cloud and it is alarm data. (Only ig series and 8000/9000 series with -R after system upgrade are supported)

✎**Note:**

- After enable the Cloud and check the box of Upload to Cloud, the communication port settings of the address in the imported Bit Alarm record configuration must be the same as the communication port settings of the current project, otherwise it cannot be used normally.

- The number of Alarm records upload to Cloud shall not exceed the limit value, or the sum of the imported alarm records and the number of existing alarm records shall not exceed the limit value. the specific limitation as following table:

Series	Number of Alarm upload to Cloud
8000-R	200
9000-R	200
3000ig	20
8000ig	200

Alarm Condition: It sets alarm trigger condition, there are two types: alarm when ON and alarm when OFF.

Alert: It is used to mark whether the alarm has occurred. if an alarm occurs, the address of "control bit" will be written to 1. If "clear alert when alarm OFF" is checked, the address of "control bit" will be written to 0.

Beep when alarm ON: The beep works when the alarm is triggered. If "beep once" is checked, bit address alarm only beep once and stop.

Content: It is used for setting alarm content (command).

Alarm Screen: Pop-up alarm screen (it need to be sub-screen);

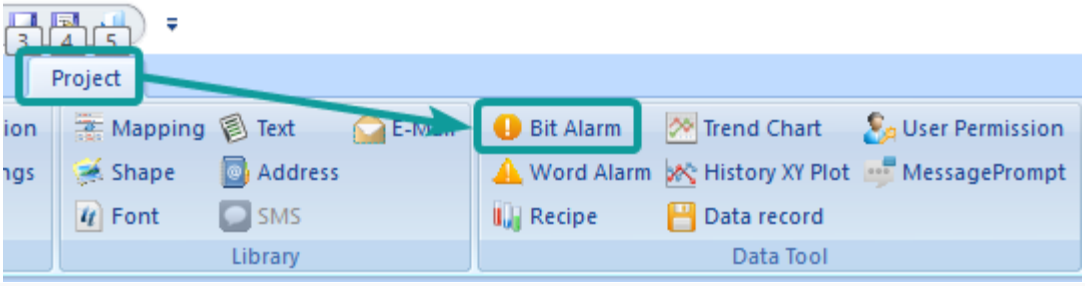
- **Position:** The location of the screen alarm display.
- **Pop-up Interval:** The time of reopen the alarm screen when alarm screen closed.
- **Pop-up once:** Pop up alarm screen once, and the screen would not pop up again
- **Close window when alarm off:** Automatically close the alarm screen when alarm off.

✎Note:

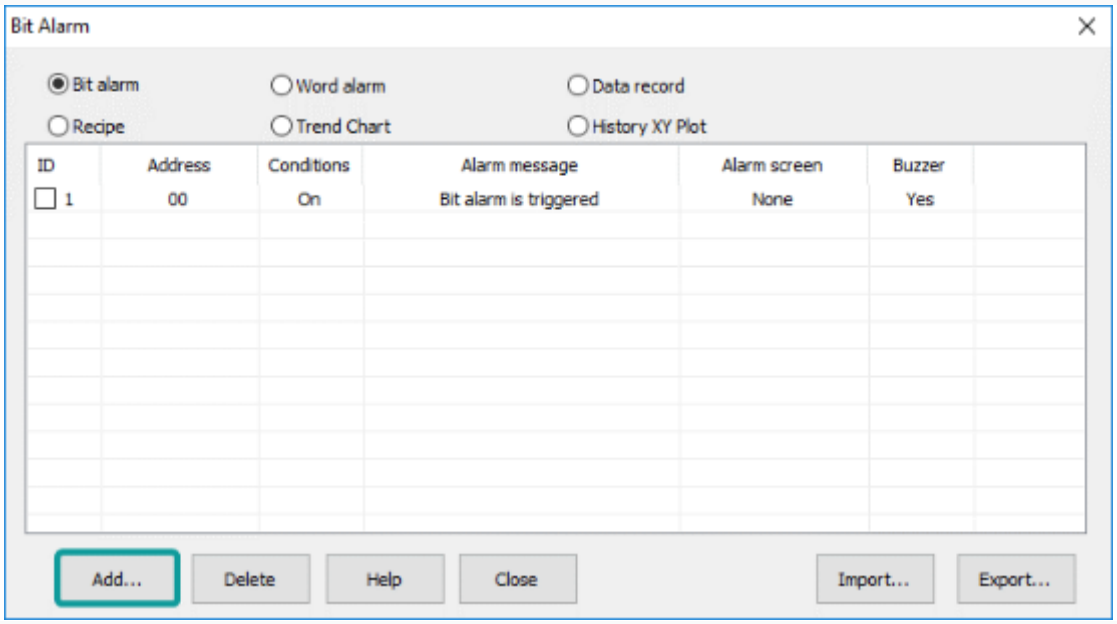
- If the "cloud" function is enabled and "upload to cloud" is checked, the communication port of the address in the configuration of the imported bit alarm record must be the same as that of the current project; otherwise, it cannot be used normally.
- The number of alarm configuration points reported to the cloud cannot exceed 20, or the sum of imported alarm records and the current alarm records cannot exceed 20. If it exceeds, please reconfigure.

Operating Procedures of Adding One Alarm

- Click "Project"→"Bit Alarm" as below shows.



- Click "Add" button to open "Bit Alarm" setting window.

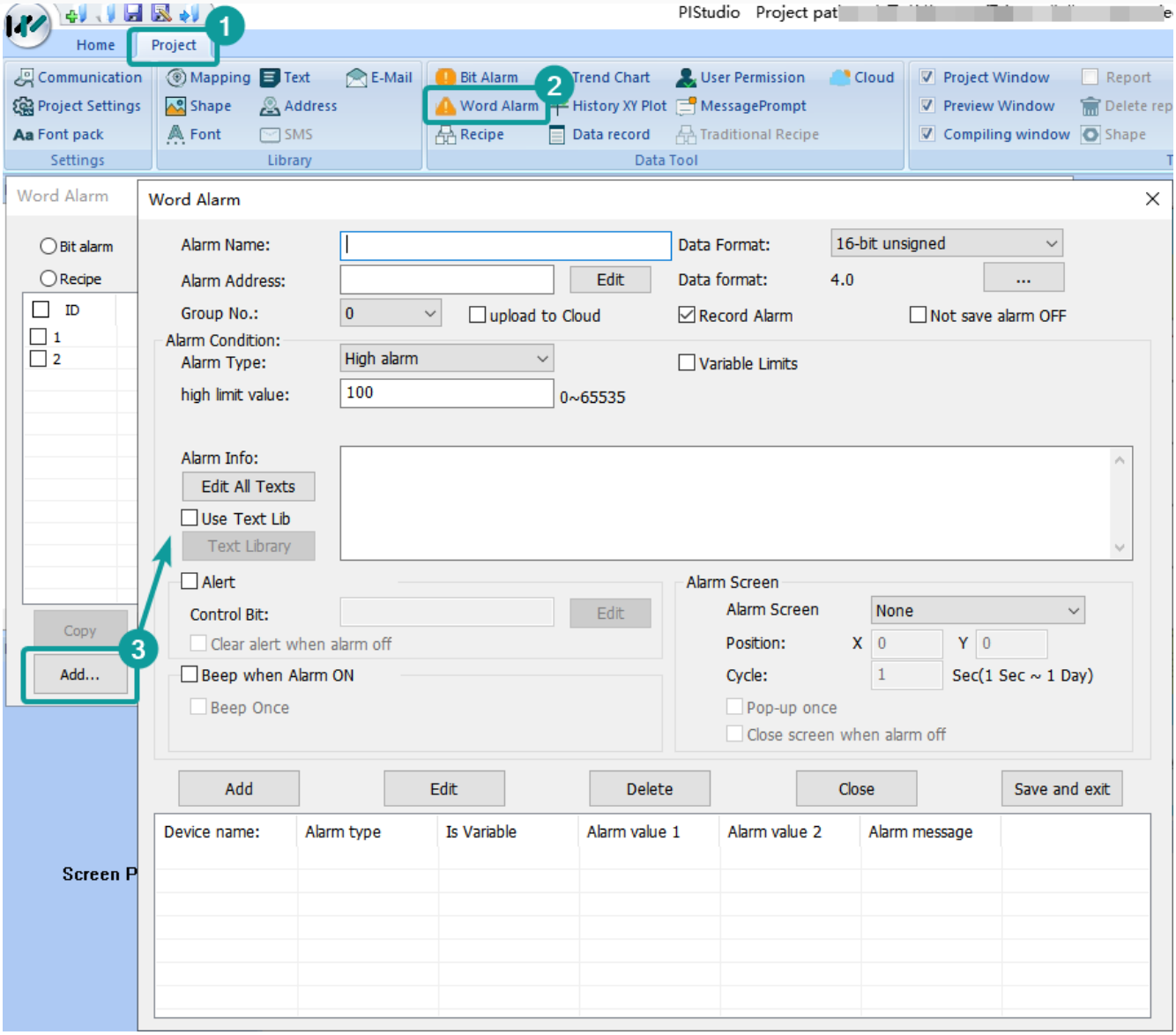


- Set "Bit Address".
- Set "Alarm Condition".
- Set "Content".
- Other settings can be set according to the actual situation".
- Click "OK" button to complete settings.

Word alarm

Word alarm is to monitor the word address of a device. If the data meets the set conditions, an alarm will be generated.

Click "Project"→"Word alarm", it is displayed as the following figure.



Alarm Name: You can set alarm name for it. Alarm Name can only consist of (0~9), (a~z), (A~Z), ('_'), (' ') and other non-English characters.

Alarm Address: It is used for setting word address for word alarm, such as HDW0.

Data Format: 16-bit unsigned decimal, 16-bit signed decimal, 16-bit BCD, 32-bit unsigned decimal, 32-bit signed decimal, 32-bit BCD, 32-bit float.

Group No.: Group number of word alarm. The name is unique and cannot be duplicated.

Upload to Cloud: The data upload by "word alarm" is stored in the Cloud and it is alarm data. (Only ig series and 8000/9000 series with -R after system upgrade are supported)

✎**Note:**

- If the "cloud" function is enabled and "upload to cloud" is checked, the communication port of the address in the configuration of the imported word alarm record must be the same as that of the current project; otherwise, it cannot be used normally.

- The number of alarm configuration points reported to the cloud cannot exceed 20, or the sum of imported alarm records and the current alarm records cannot exceed 20. If it exceeds, please reconfigure.

Series	Number of Alarm upload to Cloud
8000-R	200
9000-R	200
3000ig	20
8000ig	200

Record alarm: Whether to record the alarm history data of word alarm, if checked, it will be saved in the designated storage location.

Not save alarm OFF: If checked, after the alarm is dismissed, the corresponding alarm records will be deleted from the log file.

Alarm Condition: Alarm is triggered when designated address meets the alarm condition, it provides four conditions;

1. **High alarm:** Alarm is triggered when it reaches high limit. It can be a constant or a variable
2. **Low alarm:** Alarm is triggered when it reaches low limit. It can be a constant or a variable
3. **Range alarm:** Alarm is triggered when it exceeds the range. It can be a constant or a variable
4. **Equivalent alarm:** Alarm is triggered when the value equals to the given data. It can be a constant or a variable

Alarm Info: It is used for setting alarm content (command);

Alert: It is used to mark whether the alarm has occurred. if an alarm occurs, the address of "control bit" will be written to 1. If "clear alert when alarm OFF" is checked, the address of "control bit" will be written to 0.

Alarm Screen: Pop-up alarm screen (it need to be sub-screen);

1. **Position:** The location of the screen alarm display.
2. **Pop-up Interval:** The time of reopen the alarm screen when alarm screen closed.
3. **Pop-up once:** Pop up alarm screen once.
4. **Close window when alarm off:** Automatically close the alarm screen when alarm off.

Beep when alarm ON: beep works when the alarm is triggered, in the default mode, the beep works until the alarm is released.

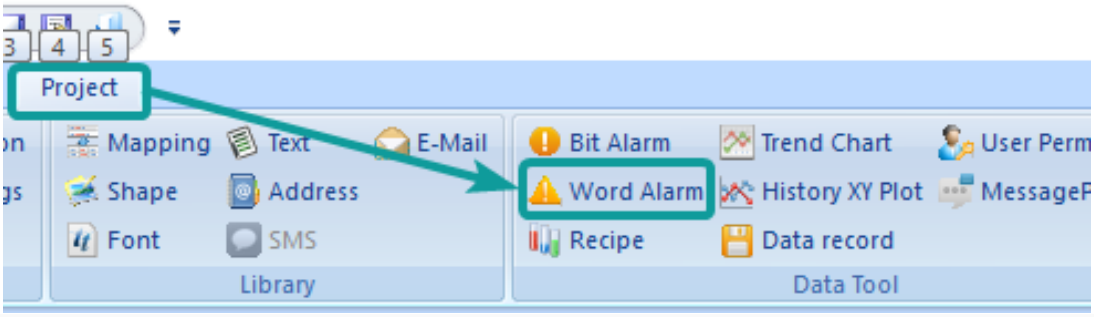
Beep once: Beep works once, when alarm is triggered.

Alarm List

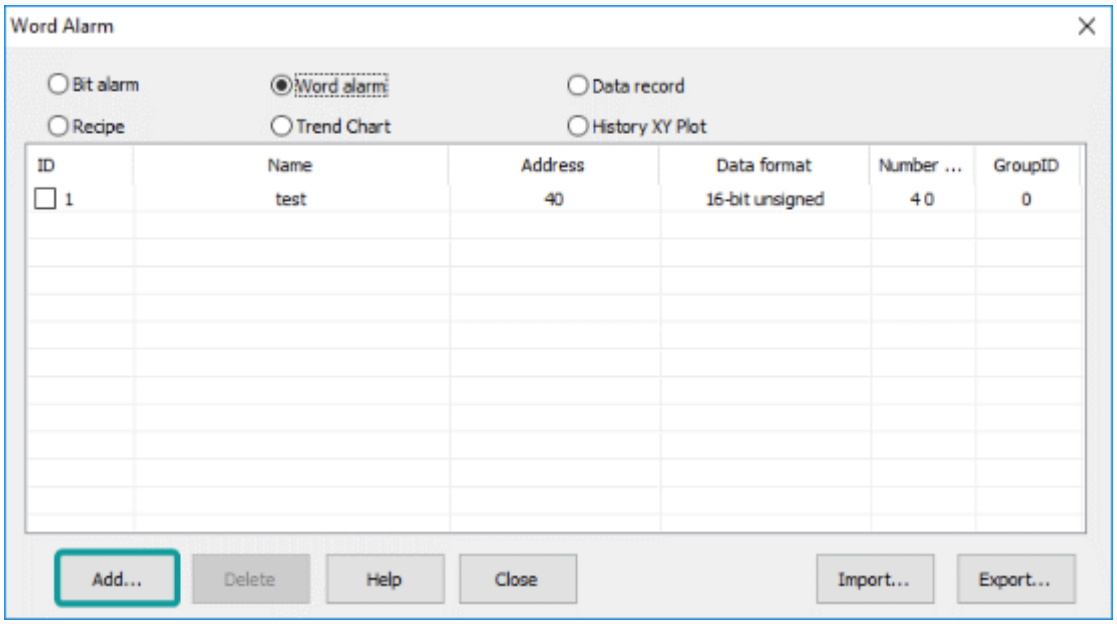
It displays all the word alarm lists; it will show the alarm information;

Operating Procedures of Adding One Alarm

- Click "Project"→ "Word Alarm" as below shows.



- Click "AddClick" button to open "Word Alarm" setting window.



- Set Basic information of word alarm.
- Set "Content".
- Other settings can be set according to the actual situation.
- Click "OK" button to complete settings.

HMI Alarm Demo Download Link

https://drive.google.com/open?id=1Llq03CMISM_1mMIfU308hxFbs4rGdQGP

Recipe

Traditional recipe is composed of multiple groups of information with the same structure and different data. Due to the similarity of these information, you could edit them into a set of recipes to facilitate the transfer of data between HMI and PLC.

Data operation

1. **Read:** Read a group of data from the recipe file and assign the group of data to the set address.
2. **Write:** Read a group of data from the set address and assign the group of data to the corresponding recipe file.

PI Series HMI has Recipe function, Recipe function keeps data in the HMI, used to download the data from HMI to designated device addresses, or upload the data from device addresses to HMI.

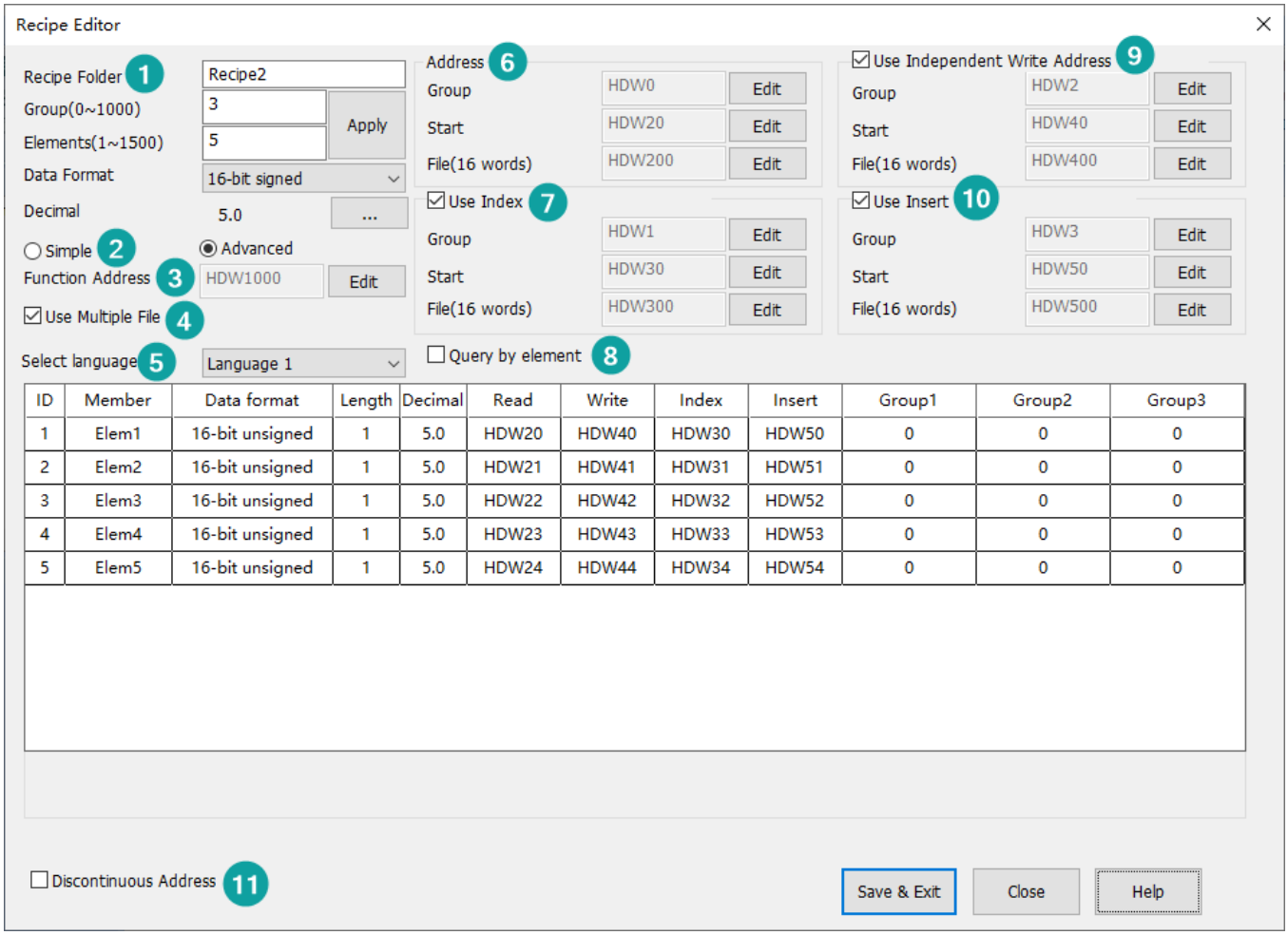
The maximum number of group in recipe is 1000, and the maximum number of member in each group is 1500.

Recipe could store the data in USB flash disk and SD card and view the recipe data by object "Recipe display". It has two mode: simple mode and advanced mode.

1. **Simple:** Only support the data operation of one recipe file, including read and write.
2. **Advanced:** Support the data operation of multiple recipe files, including read, write, insert and index. View and select recipe file by object "File list".

Recipe function settings will be display in "Recipe display" object.

Description



Basic

- **Recipe Folder:** Give Recipe folder name (It can be used, when setting Recipe display object);

    - ✎**Note:** Recipe Folder name can only consist of (0~9), (a~z), (A~Z), ('_'), (' ') and other non-English characters;
- **Group:** Set the recipe group number, the number of elements, the data format. The data format has 8 modes: 16-bit signed decimal, 16-bit unsigned decimal, 16-bit BCD, 32-bit signed decimal, 32-bit unsigned decimal, 16-bit BCD, 32-bit floating point number, 64-bit (double-precision) floating-point number, string, and the choice of data integer and decimal places.
- **Elements:** It sets members' initial number of each group;
- **Data Format:** There are some formats can be supported in Recipe, like 16-bit BCD, 16-bit signed, 16-bit unsigned, 32-bit BCD, 32-bit signed, 32-bit unsigned, 32-bit floating and string. If each member requires different formats, please set it one by one in form;
- **Decimal:** It sets integer and scale digits;

Mode Selection: Select Simple or Advanced mode. Recipe file is divided into simple mode and advanced mode. Only in advanced mode can exist multiple recipe files used at the same time. (used wiht file list onject), Simple mode can only support a recipe file; Aadvanced mode can insert group information and reordered.

Function address: all operations are done through function addresses, different operating value is as follows:

- = 0: no operation;
- = 1: trigger read data;
- = 2: new trigger or update (If there is group number, it updates.)
- = 4: insert (only valid in advanced mode)
- = 8: delete (Delete according to the writing group number. If write and read address are consistent, refer to the reading group number);
- = 16: delete and sorted ((Delete according to the writing group number. If write and read address are consistent, refer to the reading group number)
- = 64: import CSV recipe file.

Use Multiple File

Check it to use more than one recipe file in HMI, but this option only valid in [Advanced mode];

Select language

The text in HMI can be in 8 languages, user can set language in here;

Address

1. **Group:** This address is for selecting group number;
2. **Start:** This is starting address is for reading and writing in recipe, PIStudio will automatically assigns addresses for each members;
3. **File(16 words):** This address only available when enable the Use Multiple File. This setting address is for input the recipe file's filename.

Use Index

If the value from Group address is changed, Read address will display the new data according to new group number immediately. Relatively, if the data of write address is changed, the corresponding group from table is also changed.

Query by Element

Enable it for querying group by specify element, select a primary key from all the elements, except the group number. This element value from all groups must be unique if want to set as primary key;

✎**Note:** When this option is enabled, Group address will be invalid.

Use Independent Write Address

To separate Recipe read address and write address.

Use Insert

It inserts data into the specified group, if the specified group already exists, it would not cover the original data, while it will move the original group next one after it.

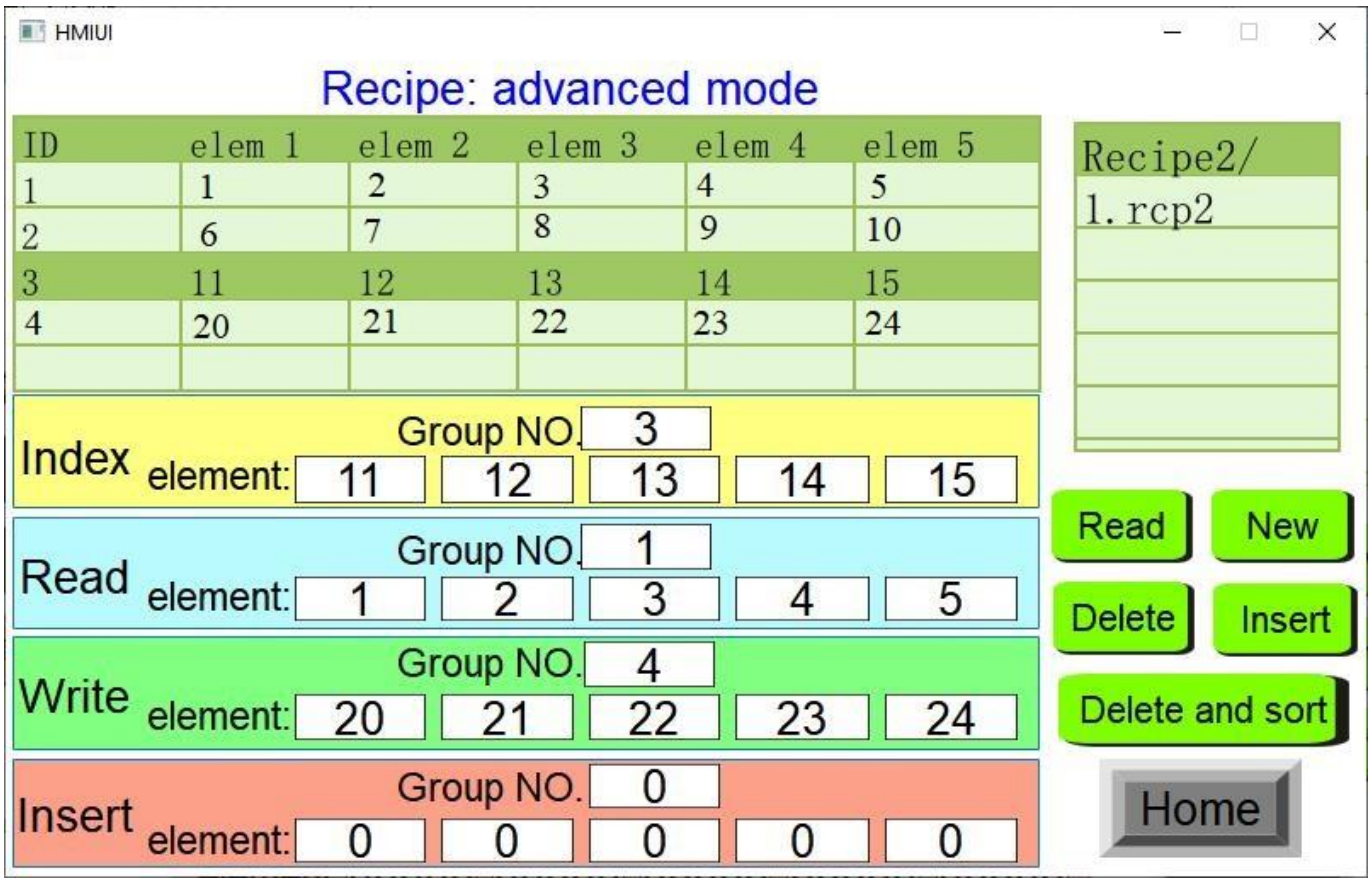
Discontinuous Address

Whether enable the non-consecutive recipe operation addresses or not. If disabled, the recipe address will recover as the continuous addresses.

✎**Note:** This function only supported in HMI+, i series, ie series, ig series.

description of Adcanced mode

According to the recipe configuration information in Figure 2 above. The function address is HDW70, and each function configuration corresponds to the group number address, recipe element address and recipe file name address. The recipe information configured in figure 2 can be displayed in the table in figure 3 with the "Record Display" object.

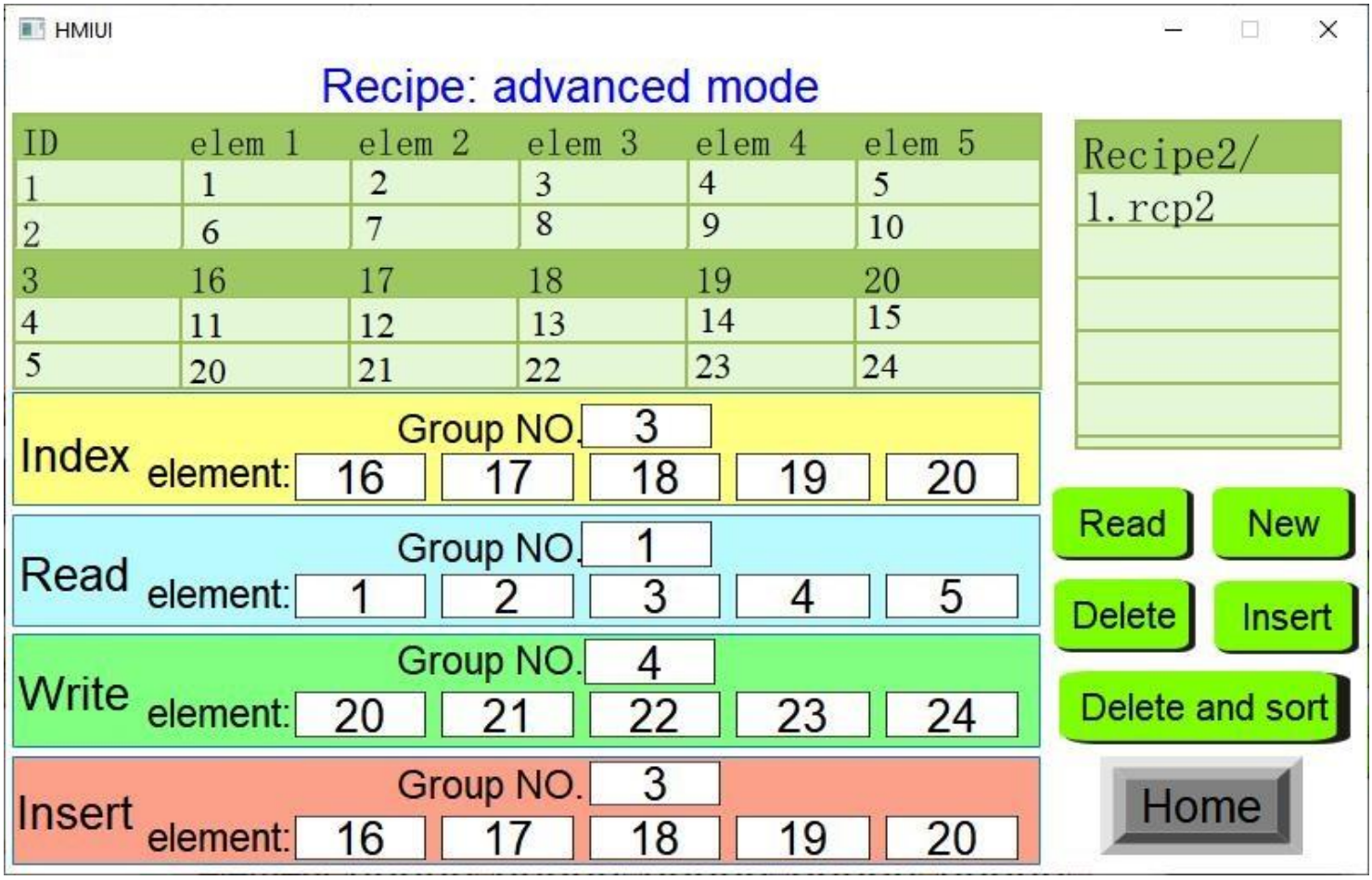


Read recipe: Input 1 to the file name, when the group number addresses HDW100=1 and HDW70=1 (read), the element data of the first group (ID=1) is written to the recipe address from the recipe file. As shown in Figure 3 above: HDW105=1, HHDW106=2, HDW107=3, HDW108=4, HDW109=5.

Write recipe: Input 1 to the file name, when the group number addresses HDW101=4 and HDW70=2 (write), the data will be read from the recipe address and written to the corresponding group of the recipe file. As shown in figure 3 above: HDW110=20, HHDW111=21, HDW112=22, HDW113=23, HDW114=24. Write the data of this set to the

elements of ID=4 in the recipe table (if there is no data of Group 4 in the recipe file, a new set of data will be added; If there is data of Group 4 in the original recipe, the original data will be overwritten and the latest data will be displayed in the recipe file).

Index recipe: When the file name is input 1, when the group number address HDW102=3, the data of ID=3 (Group 3) in the recipe file will be directly displayed in the component address of the index, that is, HDW115=11, HHDW116=12, HDW117=13, HDW118=14 and HDW119=15. If the data of the index component address is modified, the modified data will be automatically filled into the table of the recipe file, that is, the data of the recipe file will be automatically updated after the data is modified.



Insert recipe: Input 1 to the file name, when the group number addresses HDW103=3 and HDW70=4 (insert), the data of the 3rd group will be inserted, but the data of the third group already exists in the original recipe file (see Figure 3 above), then the original data will be moved down by one group, that is, the original 3rd group will become the 4th group, and so on, and HDW120=16, HHDW121=17, HDW122=18, HDW123=19 and HDW124=20 will be written into the new 3rd group of the recipe file at the same time. The results are shown in Figure 4 above.

When the group number address HDW101=2 (**The delete function only works on the group number of the write function**), HDW70=8 (delete), the data in the recipe file with ID=2 (Group 2) will be deleted.

When the group number address HDW101=5 (**The delete function only works on the group number of the write function**), HDW70=16 (delete and sort), the data of ID=5 (Group 5) in the recipe file will be deleted, and the original ID=6 (Group 6) data will be reordered to become the new Group 5 data, the original ID=7 (Group 7) data will be reordered to become the new Group 6 data, and so on.

Recipe Demo Download Link: Download

Calling CSV recipe file

Overview

The recipe files used by the regular series HMI are in CSV format, and the recipe files used by the current series HMI are in database format. In order to be compatible with CSV format recipe files on the current series of HMI, please follow the instruction when using it.

Operations

Create the recipe as it is configured. The default recipe file name is “1. rcp2”, which is placed in folder 123, as shown in the following figure.

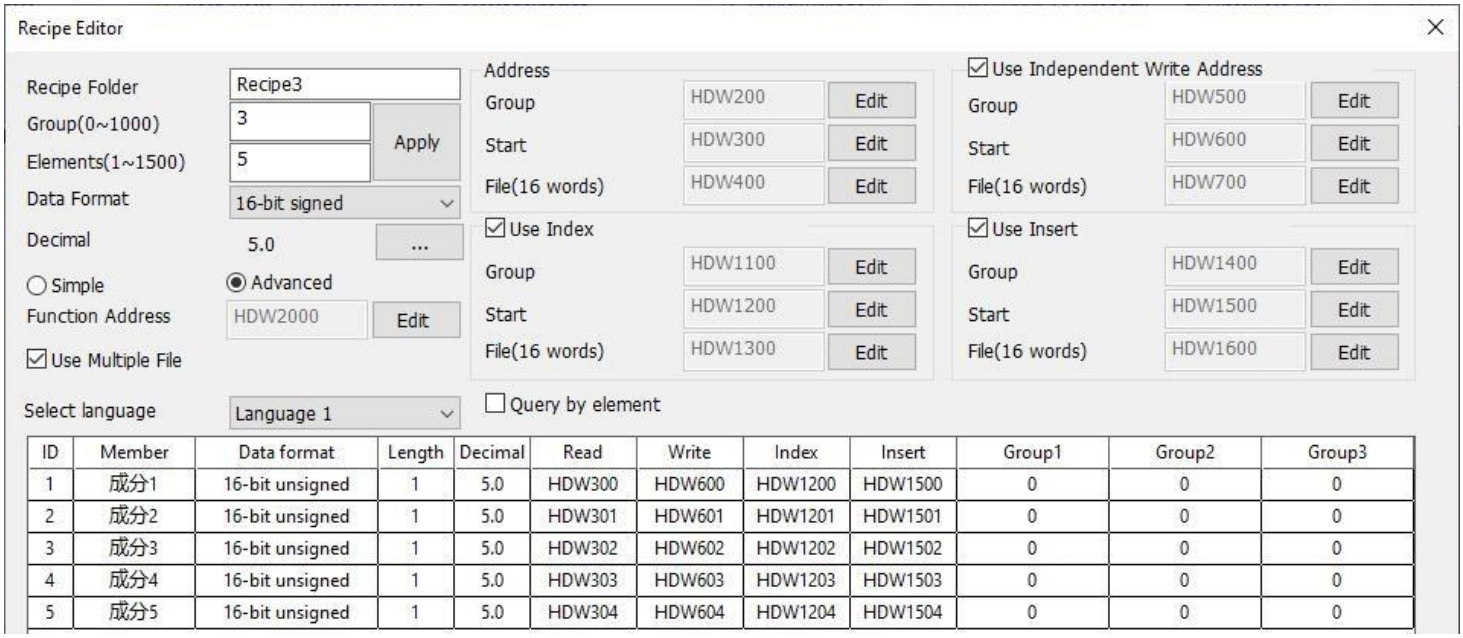
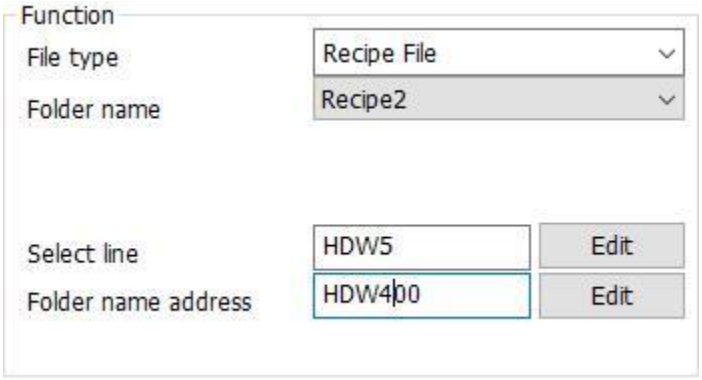


Figure 1

2. Place a "Recipe Record Display" object and a "File List" object on the project screen for viewing the recipe files in the folder 123, and the address configuration in the object should be consistent with the above configuration.



By configuring the address in the table and combining the recipe function, the CSV recipe files of regular series are imported.

Address range	Object type	Address function
HSW1050 to 1065	Text input object	Enter the CSV recipe file name to import
HSW1066	Numerical input object	Import CSV file type: • = 0: Custom CSV file (all data in the file is valid) • = 1: Normal recipe file for regular series HMI (the data in line 1 of the file is invalid) • = 2: Special recipe file for regular series HMI (the data in line 1 and 2 and column 1 of the file are invalid)
HSW1067	Numerical input object	Where the CSV file is saved: • = 0: In the CsvFile directory of U disk • = 1: In the CsvFile directory of the SD card **The path for offline simulation is: C:\ HMIEmulation\ CustomFileDir\ CsvFile**
HSW242	Numerical input object	Returns the results of the csv import: • = 37: CSV file imported successfully • = 38: CSV file import failed

Select CSV recipe file (take U disk as an example):

Using the file list object, select the recipe file in the U disk by path, and configure the recipe file name address directly to the special address HSW1050 in the above table, which can directly detect the CSV file in the U disk; Select the recipe file in the file list, and write the selected recipe file name into the recipe file name: In HSW1050 to 1065.

Use the special address of the above table to configure the path of the CSV file: HSW106, configure recipe file name: HSW1050 to1065

Use HSW1066 address to select the corresponding CSV recipe file type.

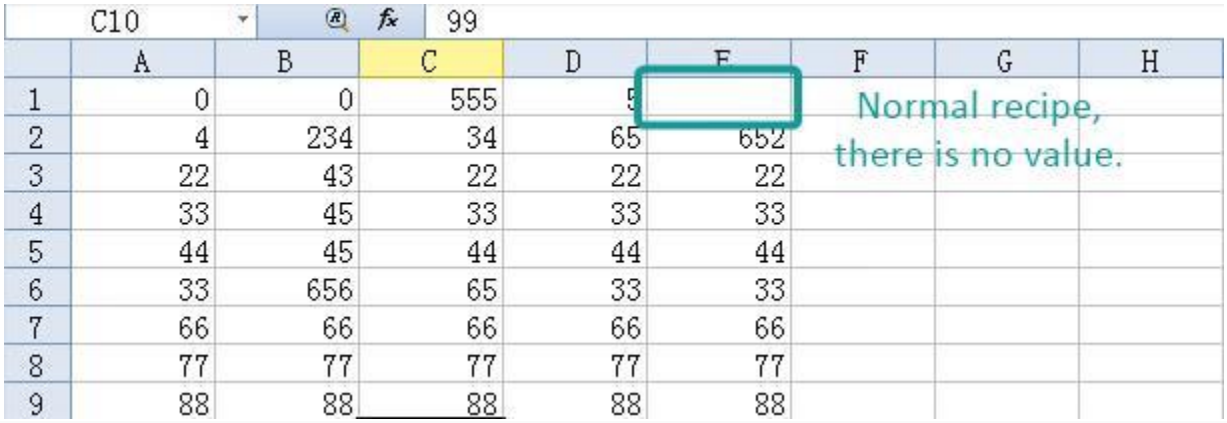
- HSW1066 = 0: Import a user-defined CSV recipe file (all data in the custom CSV file must be valid);

A1 fx 6000

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	6000	45	45	2200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
2	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
3	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
4	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
5	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
6	6000	45	45	2200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
7	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
8	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
9	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
10	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
11	6000	45	45	2200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
12	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
13	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
14	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
15	6000	45	45	1200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese
16	6000	45	45	2200	500	1	1.23E+09	70_kasa	1月1日	ahmet	mehmet	SOL DIKEY	Mentese

- HSW1066=1: Import the normal recipe file of regular series HMI (the data in line 1 of the file is invalid);

The data in line 1 of the normal recipe file is used to define the format of the recipe and will not be imported into the recipe table as recipe information, **but you must ensure that the data in line 1 representing the elements and number of groups is correct, otherwise the CSV recipe file will fail to be imported.**



	A	B	C	D	E	F	G	H
1	0	0	555	5				
2	4	234	34	65	652			
3	22	43	22	22	22			
4	33	45	33	33	33			
5	44	45	44	44	44			
6	33	656	65	33	33			
7	66	66	66	66	66			
8	77	77	77	77	77			
9	88	88	88	88	88			

- HSW1066=2: Import the special recipe file of regular series HMI (the data in line 1, 2 and column 1 of the file are invalid);

In the special recipe file, line 1 is used to define the format of the recipe, line 2 is used to define the element name of the recipe, and column 1 is used to define the group name of the recipe, so lines 1, 2 and column 1 of the special recipe will not be imported into the recipe table as recipe information. **During use, ensure that the data such as the number of groups and elements representing the recipe format in the first line are correct, otherwise the import of the CSV recipe file will fail.**

	A	B	C	D	E	F
1	0	0	367	4	1	
2		red	white	yellow	blue	
3	recipe 1	2	5	6	99	
4	recipe 2	1	2	3	4	
5	recipe 3	4	45	54	23	
6	recipe 4	6	7	78	87	
7	recipe 5	267	98	76	95	
8	recipe 6	4	64	35	656	
9	recipe 7	4	454	335	564	
10	recipe 8	8	3	43	65	
11	recipe 9	89	657	24	65	
12	recipe 10	6	767	6565	653	

Perform import

After configuring the saving path of CSV recipe file, the name of recipe file and the type of recipe according to the above steps, the method of transferring CSV file to DB file is as follows:

- Configure the DB recipe file name by text input object: HDW500 = 3 (recipe file configured in Figure 1),
- Set the recipe function address to: HDW1000 = 64 (the function address configured in Figure 1),
- Transform the CSV recipe file in U disk into DB recipe file with file name “3.rcp2”.

DB recipe file for storing CSV data:

Simple mode: When the recipe file is set to simple mode, the file of CSV data is saved as the DB recipe file of 1. rcp2 by default.

Advanced mode: When the recipe is enabled in advanced mode (multi-file recipe), the imported CSV file data is saved to the file recorded at the recipe file address HDW500 (the address configured in Figure 1).

Import results:

- HSW242 = 37: Import succeeded;
- HSW242 = 38: Import failed.

Precautions:

- Ensure that the data format of each element in the CSV file is the same as the recipe data format set in the software (DB), and ensure that the elements of each row in the valid data area is the same as the elements set in the software (DB);
- When the elements of a line in CSV file is more than the elements set in the software (DB), it will prompt the import failure;
- When the CSV file imported into the regular series HMI is a recipe file, the data representing the recipe format (elements, number of groups, whether it is a special recipe) in line 1 must be correct, otherwise the import of CSV file will fail.

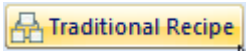
Traditional recipe

Traditional recipe is composed of multiple groups of information with the same structure and different data. Due to the similarity of these information, you could edit them into a set of recipes to facilitate the transfer of data between HMI and PLC.

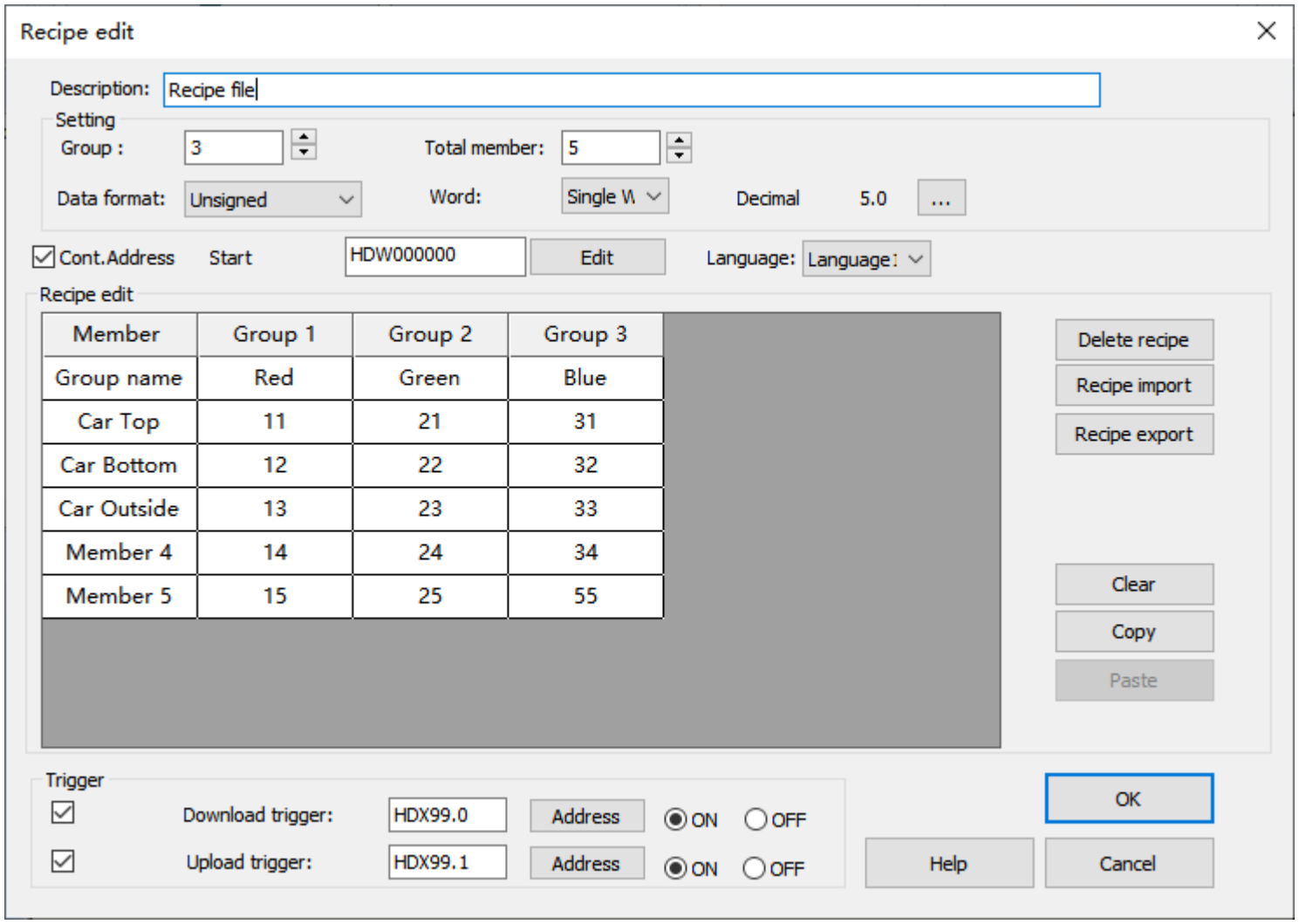
Traditional recipe function is valid only when the LEVI project is converted to the PI project, and the original project uses the traditional recipe.

✎**Note**: Currently, only HMI+, i series, ie series, and ig series support the traditional recipe.

Simple recipe mode

Click the "Traditional Recipe" 

in the "Data tool" bar in the upper side of the software, and the following interface will pop up:



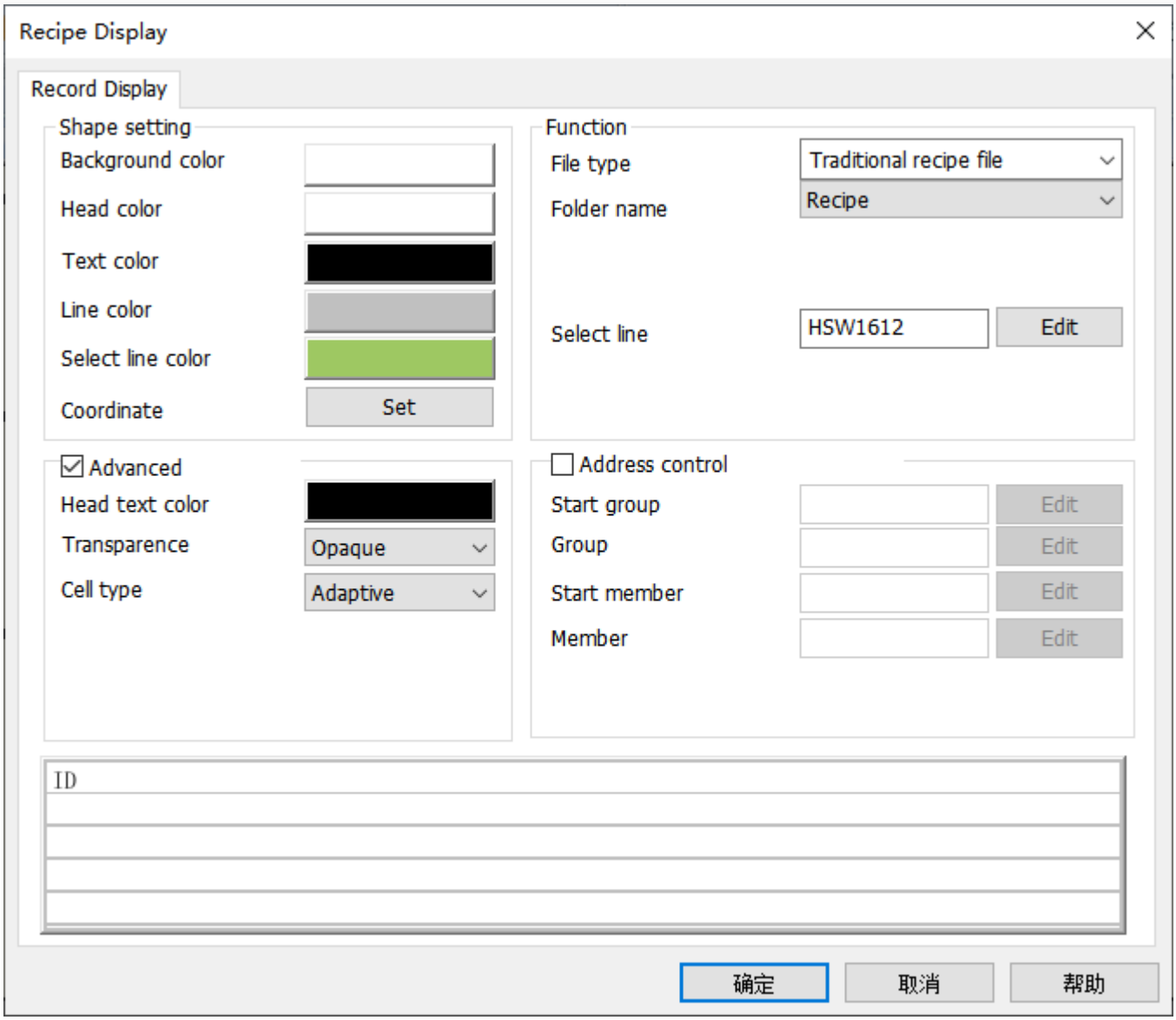
✎**Note**:

- The recipe folder name can only consist of (0~9), (a~z), (A~Z), ('_'), (').
- The element name of the recipe cannot include following 5 special characters: " **,** " , " **|** " , " **<** " , " **>** " , " **&** " .

Recipe display

Select the file type "Traditional recipe file" in object "Recipe Display", and it is recommended to fill in the traditional recipe group number HSW1612 to the address of select line.

✎**Note**: The Recipe Display can display up to 50 groups of 100 elements by default, which can be to display out of range by enabled "Address Control". After the "Address Control" is enabled, the display group number can be reached to 100. If want to display more than 100, please adjust the "Start Group" from "Address Control" to index the display group, as following shown:



Recipe transmission address

The special addresses used in the Recipe are shown in the following table:

Address	Description	Function
HSW1611	Traditional Recipe transfer operation.	=1: Recipe download. =2: Recipe upload.
HSW1612	Traditional Recipe group number.	Traditional Recipe group number.
HSW242	Recipe operation result prompt: Upload: Data is written to recipe file from address. Download: Data is written to the address from recipe file.	=1: Recipe download, start. =2: Recipe download, execution error. =6: Recipe download, successful. =7: Recipe upload, start. =8: Recipe upload, execution error. =11: Recipe group name does not exist. =12: Recipe upload, successful.

Recipe index

The recipe index address RPW is mainly used for editing traditional recipes, and it is more convenient to modify the data and display of recipes. Only need to modify and display the data of the recipe file through "Numeric Input/Display" Object and "Word Switch".

The recipe index area (RPW)'s instruction as follows:

1. RPW**####, a total of six digits, the first two ** represent the Recipe group number, #### represents the element order number. For example, RPW010000 indicates the 1st element of the Recipe group No.1, and RPW110002 indicates the 3rd element of the Recipe group No.11.
2. If the indexed group number or element number does not exist, the value of RPW defaults to zero. For example, RPW110011 represents the 12th element of the Recipe group No.11. If it does not exist, the value returned by accessing RPW110011 is zero. The value written in RPW110011 will not be saved to the recipe file.

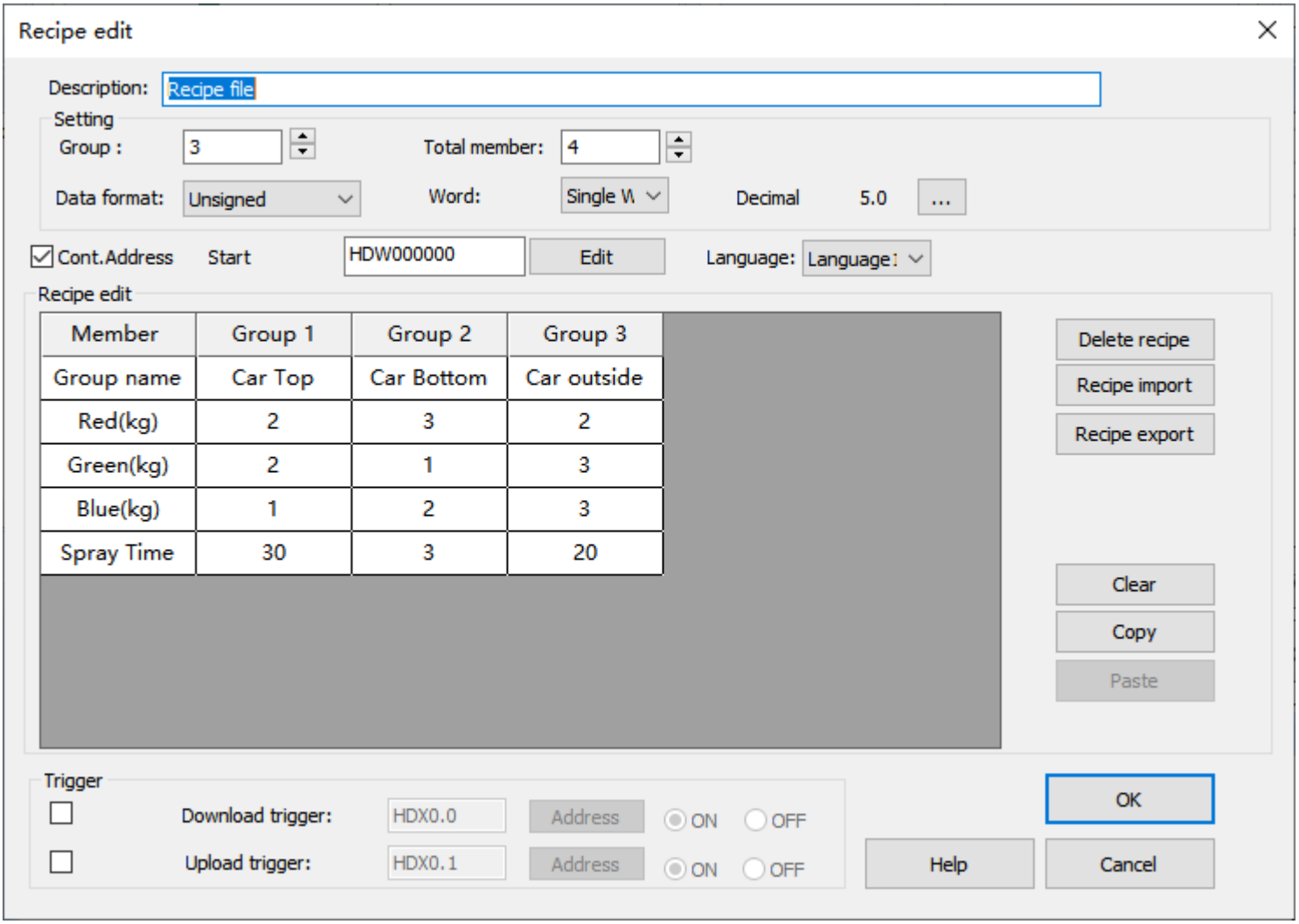
- ✎**Note**: As long as RPW**#### exists, any object "writes" to HPW**#### will be saved to the recipe file.

3. The RPW register only supports word address access.
4. It can be known from the coding method of RPW**#### that the range of RPW is from RPW000000-RPW990450, wherein the range of group number is 0-100, and the range of element is 0-450.

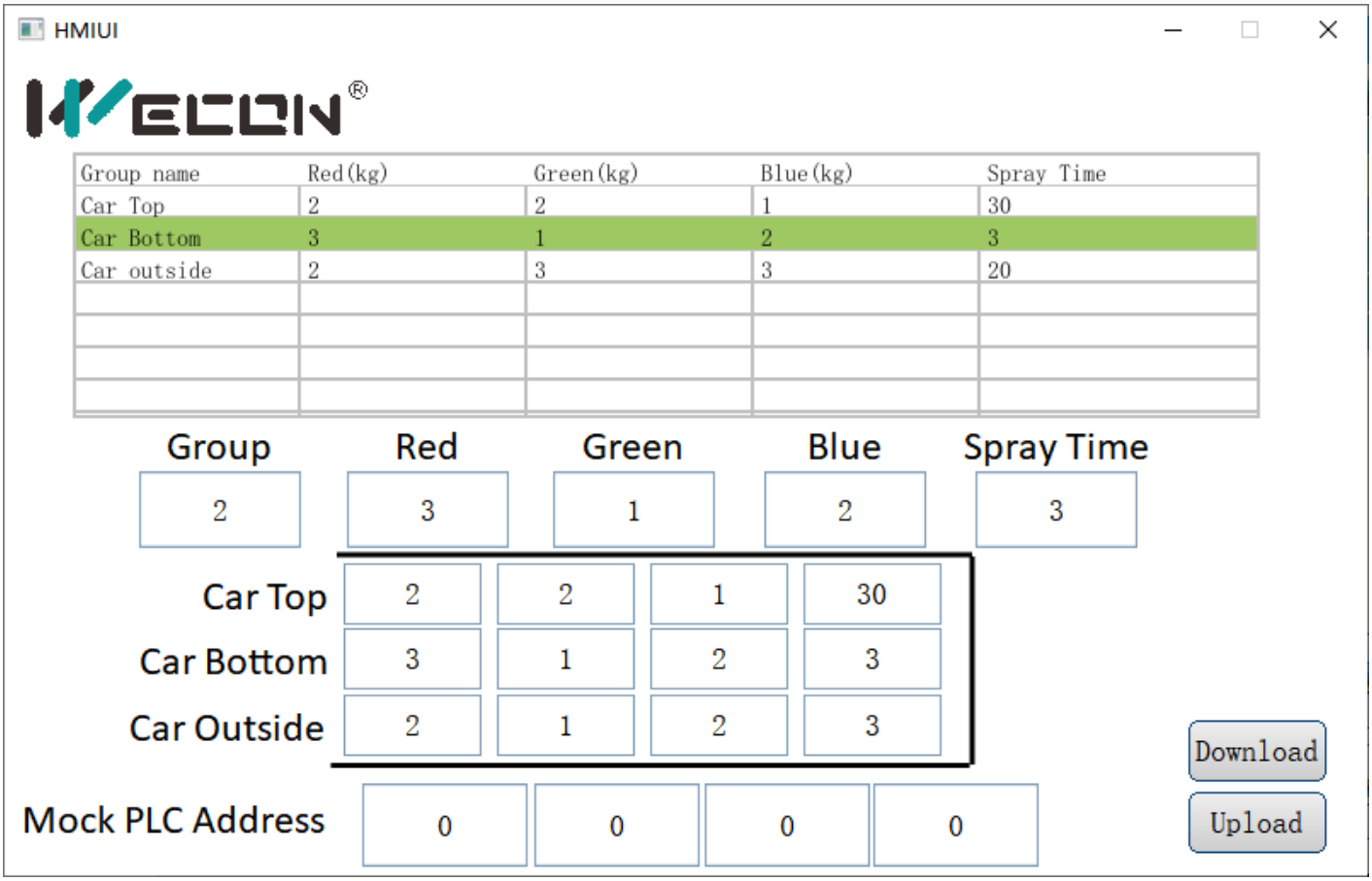
Recipe example

The recipe index makes the modification and display of recipe data more convenient. Only need to modify and display the data of the recipe file through "Numeric Input/Display" Object and "Word Switch".

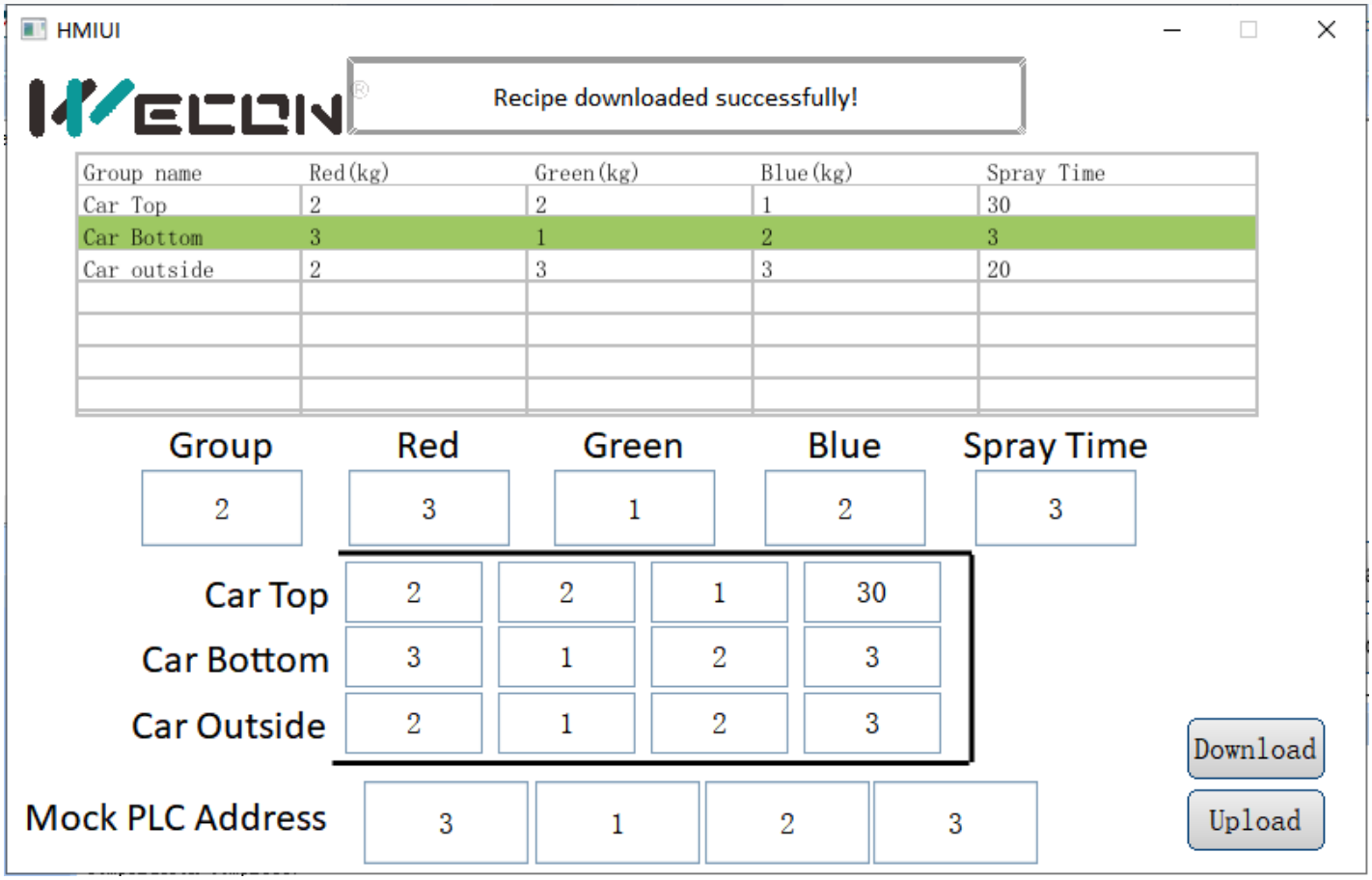
Edit the recipe configuration, create three groups of recipes, 4 elements for per group: Red, green, blue, spraying time, as following shown:



RPW 0~3 can display the data of group for the selected line. RPW10000~10003, RPW20000~20003, RPW30000~30003 each address can display the single element. Directly modify the content of the RPW address and then modify the recipe data, as following shown:



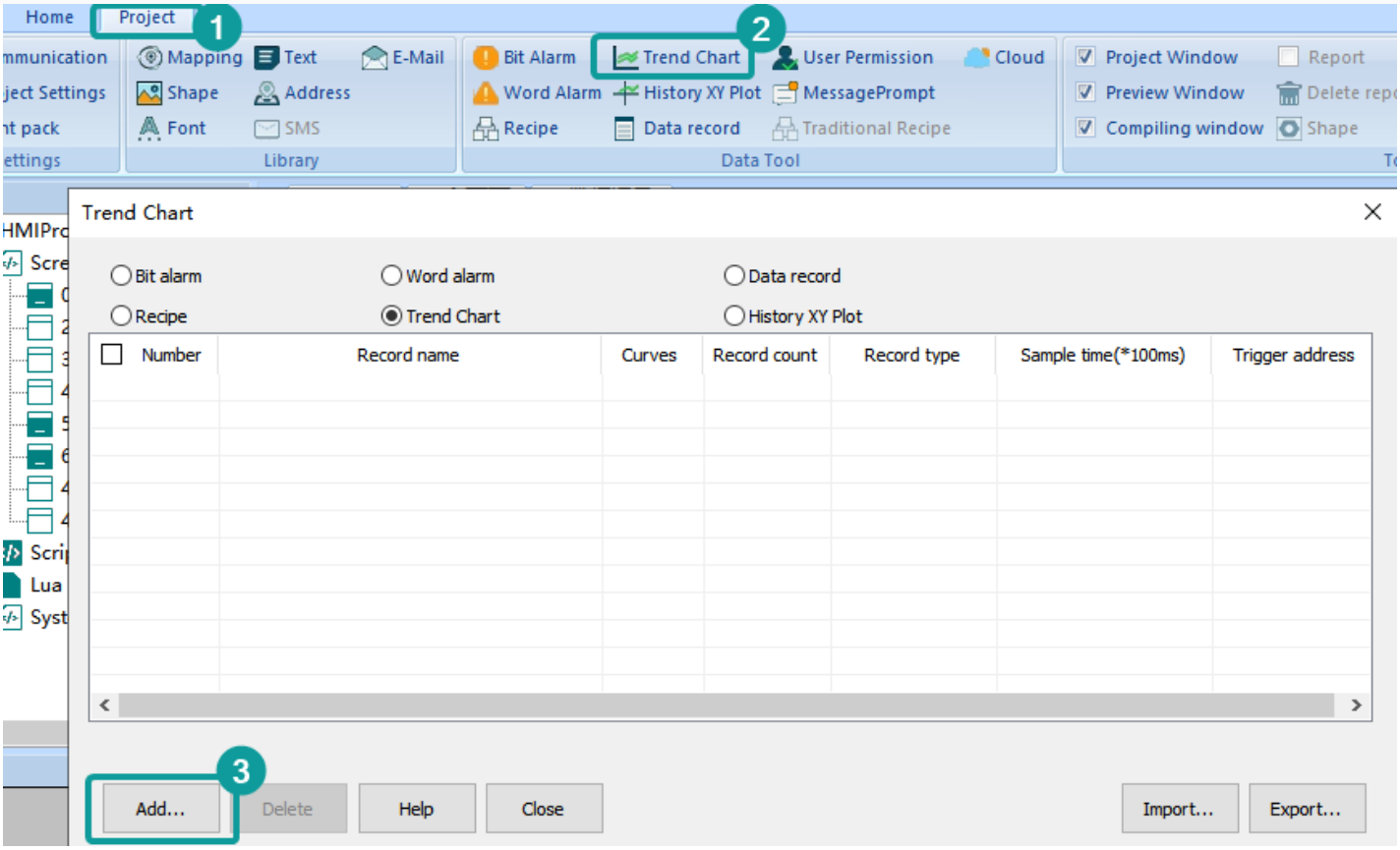
After selecting the 2nd group, trigger the download button to download the whole group data to the corresponding element address (For this case, the data will write into HDW0~3), or trigger the upload button to upload the content of the element address to the specified recipe group.



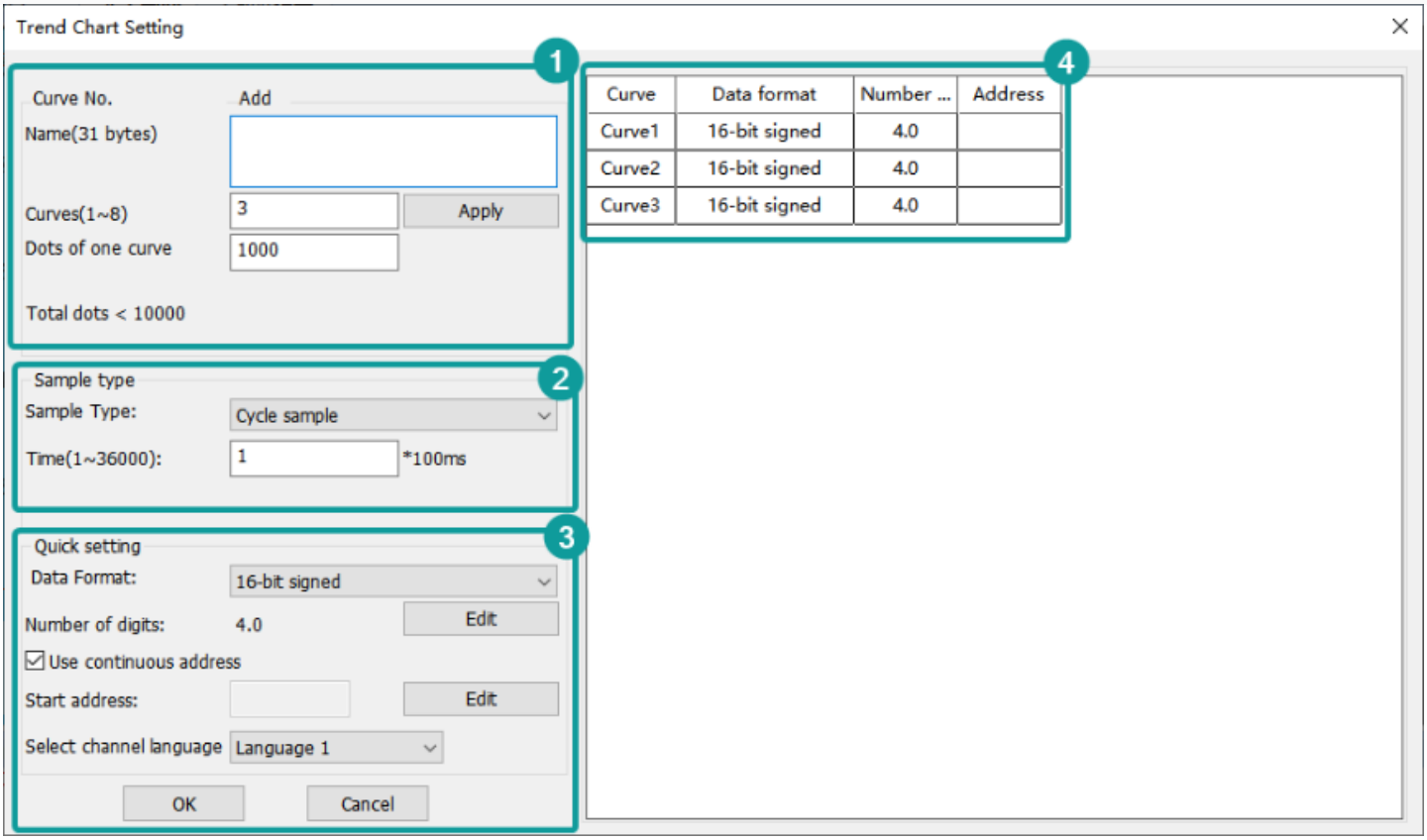
Trend chart

Trend chart function is used for displaying the real-time data in HMI as curve graph, which X axis represent as time, Y axis represent as data.

Click "Project" → "Trend chart", it will pop up the following screen. Click "Add" to creat new curve record.


Home
Project
1
Mapping
Text
E-Mail
Shape
Address
Font
SMS
Library
Bit Alarm
Trend Chart
2
User Permission
Cloud
Word Alarm
History XY Plot
MessagePrompt
Recipe
Data record
Traditional Recipe
Data Tool
Project Window
Report
Preview Window
Compiling window
Shape
Trend Chart
Bit alarm
Word alarm
Data record
Recipe
Trend Chart
History XY Plot
Number
Record name
Curves
Record count
Record type
Sample time(*100ms)
Trigger address
3
Add...
Delete
Help
Close
Import...
Export...

Settings



(1) Basic settings

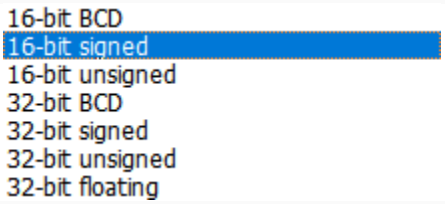
1. **Curve NO.:** It is for setting curve number,
2. **Curve Name:** It is for setting curve name. The length limitation is 31 bytes.
3. **Curve (1~8):** It is for setting the number of curves. The default is 3.
4. **Dots of one curve:** It is for setting dots number of each curve. The default is 1000, but the maximum dots are 10,000 for all the curves.

(2) Sample Type

1. **Sample method:** There are two types, one is Cycle sample, the other is Trigger cycle sample. If you select Trigger cycle same mode, the trigger sample address is required to edit.
2. **Sample unit:** 100ms.

(3) Quick Setting

1. **Data format:** It is for setting all the curves, select the data format for all curves, and setting the reading addresses for curves. There are as follows.



2. **Sample address:** Fill in the start address that read the device data. If the sampl address is consecutive, check "use continuous address". For example, set HDW0 as start address, curve number is 3, then the HDW0 is for Curve 1, HDW1 is for Curve2, HDW2 is for Curve 3.

(4) Curve Table: The sample address you have set would display on it. Click the corresponding box to modify the content.

✎**Note:** Curve names can only consist of Chinese characters, (0~9), (a~z), (A~Z), ('_') (' '), and other non-English characters.

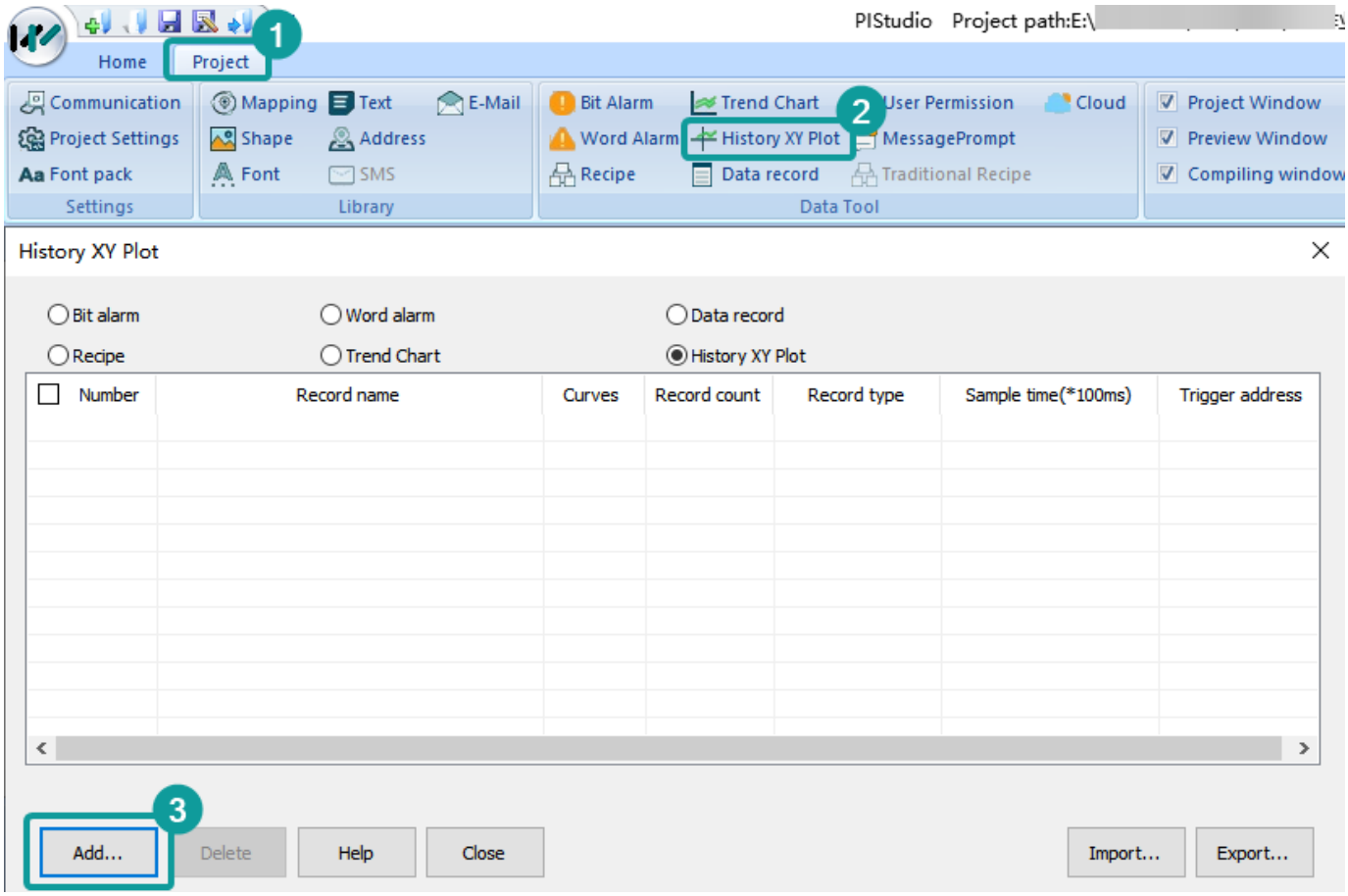
Trend Chart Demo Download Link

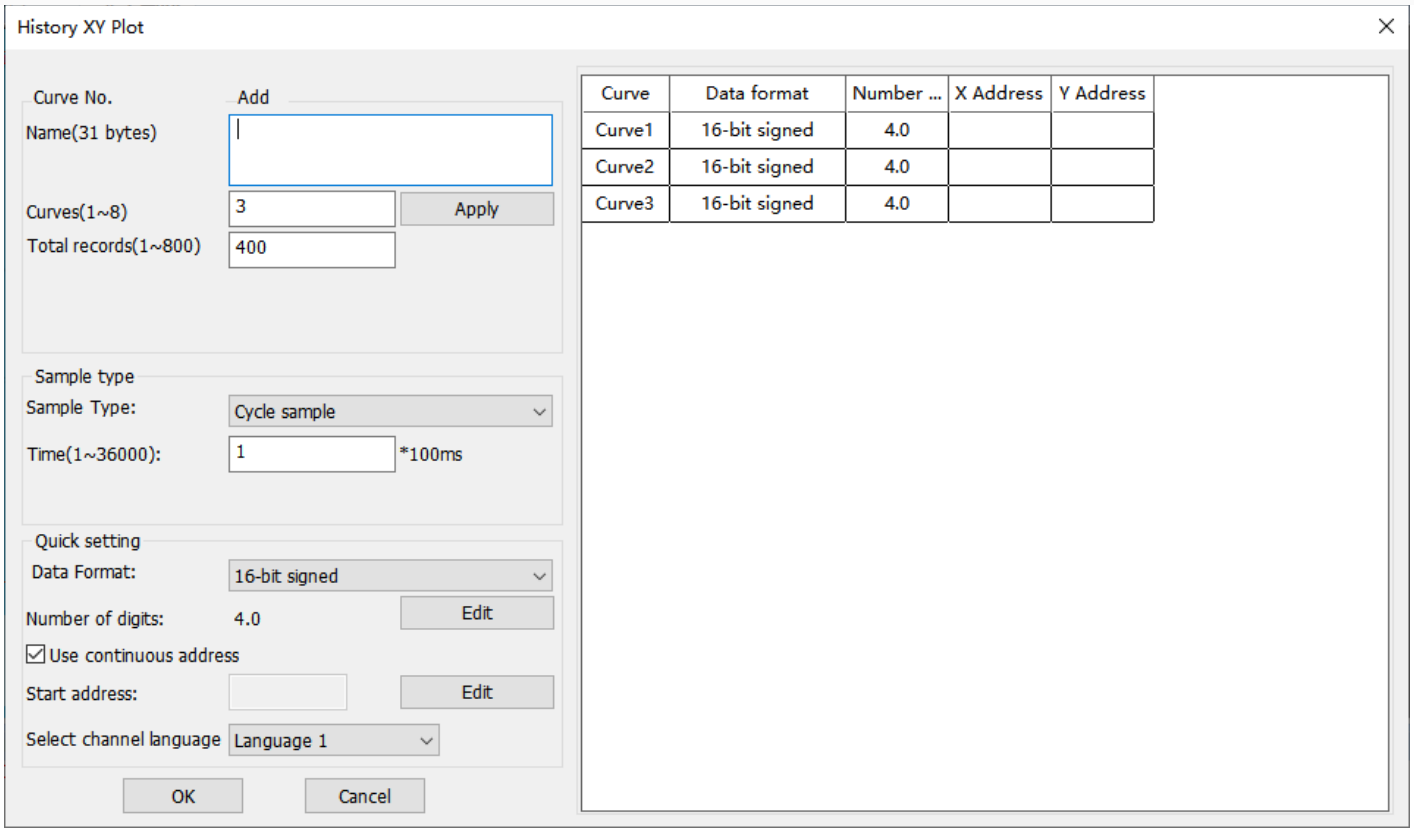
https://drive.google.com/open?id=1smnaAvSxOWC0WQK4_uvqHXWn4vUZxGJC

History XY plot

Different from TrendChart, uses need to set history XY curve items in project. Please click "Project"-> "History XY Plot" to open the setting screen.

Recipe function settings will be display in "History XY Plot" object.





(1) Basic settings

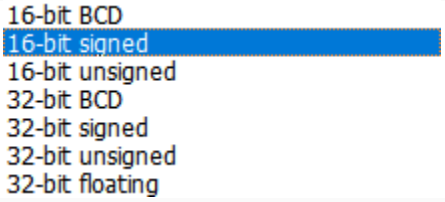
1. **Curve NO.:** It is for setting curve number,
2. **Curve Name:** It is for setting curve name. The length limitation is 31 bytes.
3. **Curve (1~8):** It is for setting the number of curves. The default is 3.
4. **Dots of one curve:** It is for setting dots number of each curve. The default is 1000, but the maximum dots are 10,000 for all the curves.

(2) Sample Type

1. **Sample method:** There are two types, one is Cycle sample, the other is Trigger cycle sample. If you select Trigger cycle same mode, the trigger sample address is required to edit.
2. **Sample unit:** 100ms.

(3) Quick Setting

1. **Data format:** It is for setting all the curves, select the data format for all curves, and setting the reading addresses for curves. There are as follows.



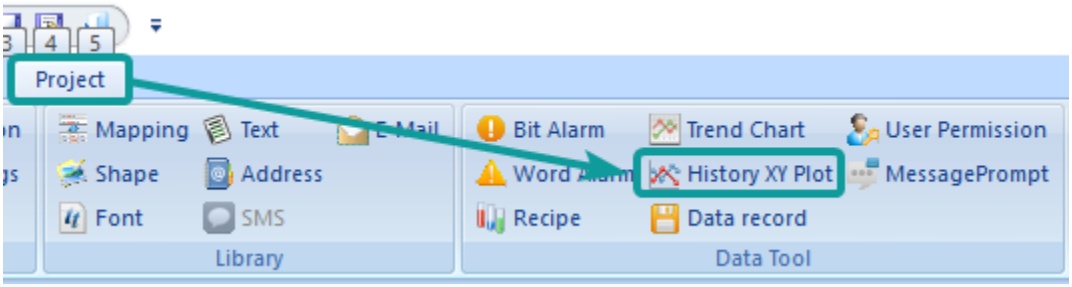
2. **Sample address:** Fill in the start address that read the device data. If the sample address is consecutive, check "use continuous address". For example, set HDW0 as start address, curve number is 3, then the HDW0 is for Curve 1, HDW1 is for Curve2, HDW2 is for Curve 3.

(4) Curve Table: The sample address you have set would display on it. Click the corresponding box to modify the content.

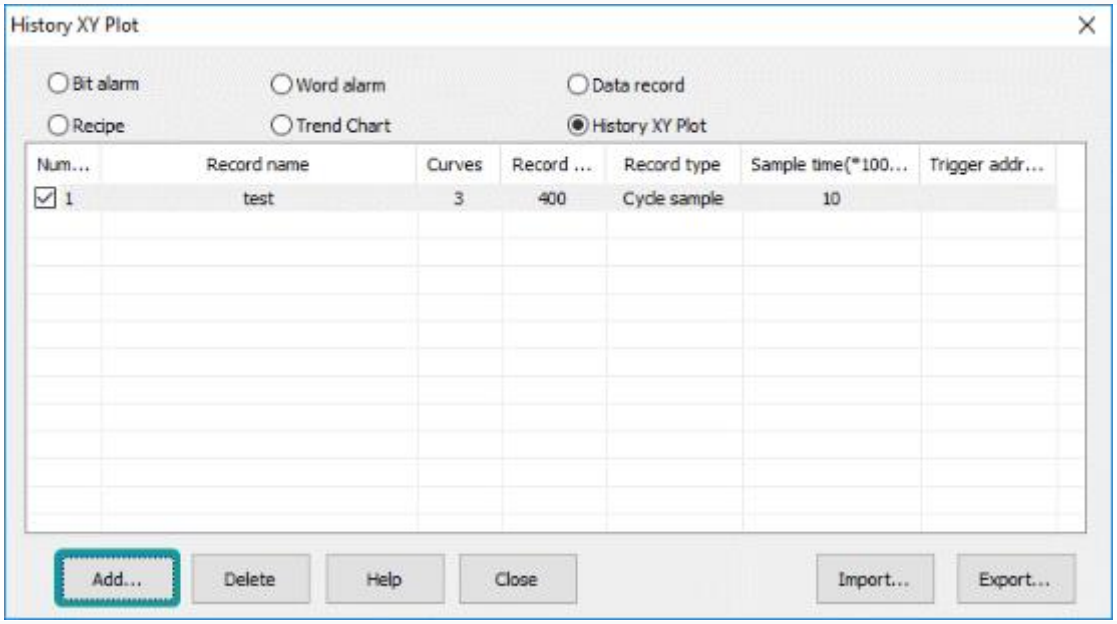
✎**Note:** Curve names can only consist of Chinese characters, (0~9), (a~z), (A~Z), ('_') (' '), and other non-English characters.

Operating Procedure

- Click "Project" → "History XY Plot" to open the function selecting windows.



- Click "Add" button to open "History XY Plot" setting windows.



- Setting the function of History XY Plot.
- Click "OK" to save the setting.

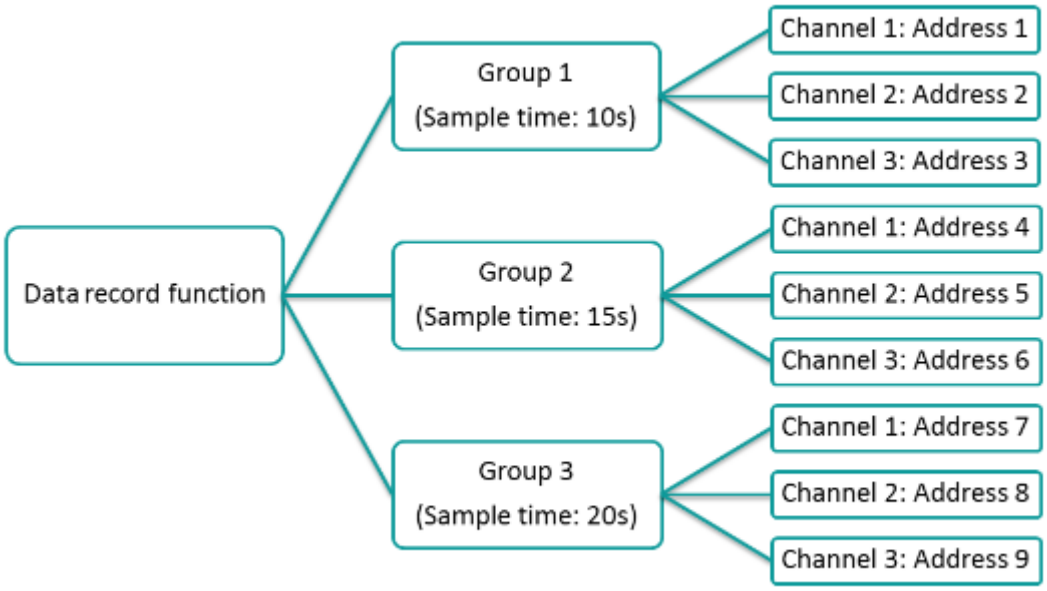
Download Link

https://drive.google.com/open?id=1t4_HuRmIJJ-B5ryA2kVMadD9FywKhZ4r

Data record

The data record function is organized according to the structure below. In a project, there can be multiple record groups, each record group containing multiple channels. Different groups have different sampling times.

The topology is shown in the following figure.



The data record stored in SD card is also organized according to the above figure.

The sample time and save time is consistent in the same record group. There are multiple channels in the group, When the sampling time is up, every channel would collect data to PLC register according to its own address.

Sampling interval: The interval between two consecutive samples was recorded.

As long as the project uses the data record function and supports the large-capacity storage module, the system will sample data according to the set sampling interval and save data according to the set saving interval.

For the file storage of data, see the file size configuration during data record configuration.

✎**Note:**

After enable the Cloud and check the box of Upload to Cloud, the communication port settings of the address in the imported Data record configuration must be the same as the communication port settings of the current project, otherwise it cannot be used normally.

The number of Data records upload to Cloud shall not exceed the limit value, or the sum of the imported Data records and the number of existing alarm records shall not exceed the limit value. the specific limitation as following table:

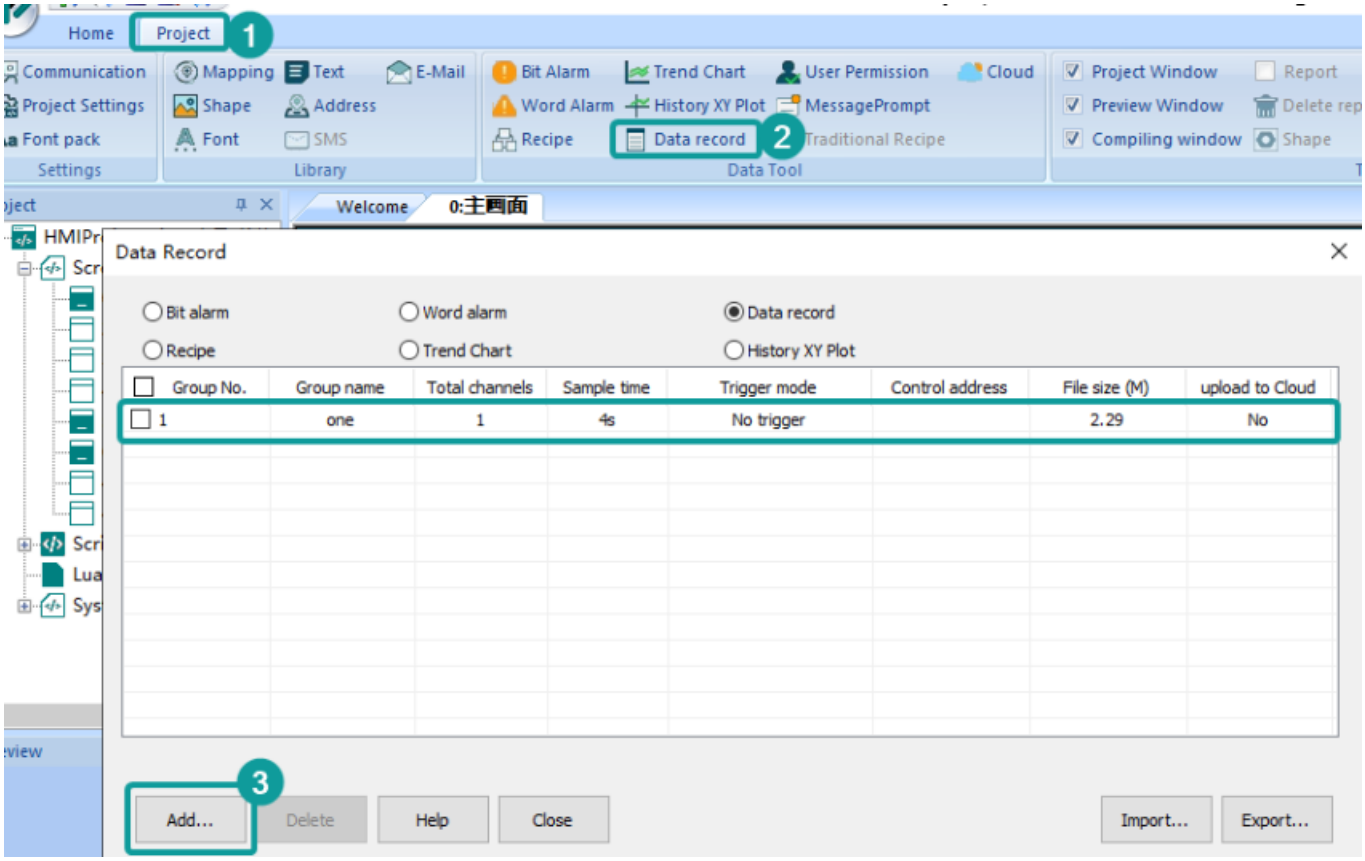
Series	Number of Data Record upload to Cloud
8000-R	100

9000-R	100
3000ig	50
8000ig	100

The record group name can only be composed of Chinese characters, (0~9), (a~z), (A~Z), ('_'), (') and other non-English characters.

Channel name cannot incloud following symbols: : " , ", " | ", " < ", " > ", " & ".

Settings



Operating Procedures

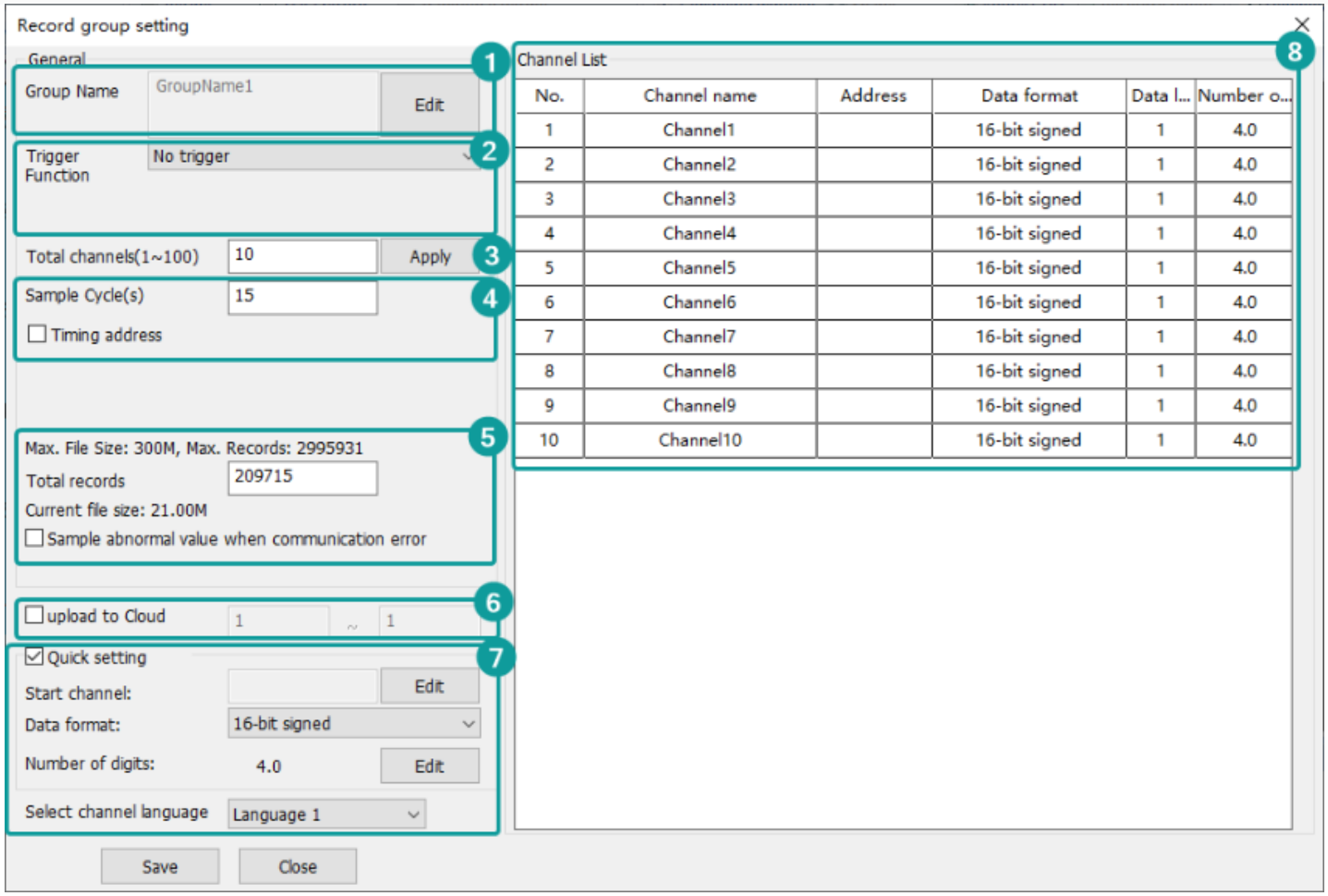
1. Click "Project"->"Data record" as below shows.
2. Click "Add" button to open "Data record" setting window.
3. Enter group name, the default is "GroupName0"
4. Select "Trigger function" mode, such as "No trigger".
5. Set "Total channels", such as 3.
6. Click "Apply" button.
7. Set Sample cycle, such as 15.
8. Set "Start channel" in "Quick settings", such as 4 0.

9. Check group information in "Channel list" as below.
10. Click "Save" button to complete settings.

The figure above display the group of current project. The data record file would stored in "DataLogFile" folder, and the data of every group would have a data file. The file suffix is in "db" format.

✎Note:

- For HMI series 8000 and above, the size of a single file cannot exceed 300M and the total file capacity cannot exceed 1000M.
- For HMI series 3000, the size of a single file cannot exceed 4M and the total file capacity cannot exceed 10M.
- If the total amount exceeds the range, an alarm will be given during project compilation.



(1) Group name: Set group name, and he name should be unique.

(2) Trigger function: There are four modes to trigger record.

1. **No trigger:** Data will be recorded in every sample time.
2. **Trigger to record by sample cycle:** Data will be recorded in every same time, when trigger control bit set ON.
3. **Trigger to record once and reset:** Data will be recorded when trigger control bit set ON, and the bit will be reset automatically.
4. **Trigger to record once:** Data will be recorded when trigger control bit set ON, and the bit need to be reset manually.

5. **Trigger address:** It is only valid when the trigger condition is selected. The monitoring cycle for trigger sampling address is 1s.

(3) Total channels (1~100): Set the numbers of channels. Click "apply" to view the channel lists on the right record channel.

(4) Sampling cycle: If you check "collect control address", the sampling interval is the value of the address. The unit is second. For example, Sample cycle=15s. It means that records data one time every 15s.

Timing address: It sets address to change sample time when HMI is running;

(5) Total records: It sets data record number in one data record file. If the data file size is beyond the current file size. The old data will be deleted, and the new data will replace the old data. Please remember to back up the old data record file.

Abnormal value: It sets a value, when communication fails, data record will record this value;

(6) Upload to Cloud: The data uploaded by Data Record is stored in the Cloud(Only ig series). The maximum number of record is 20.

(7) Quick Settings

1. **Start Channel:** It sets the continuous addresses for channels.
2. **Data Format:** It sets the same data format for channels.
3. **Number of Digits:** It sets the digits' number for channels.
4. **Language Settings**: The text in HMI can be in 8 languages, user can set language in here.

(8) Channel List: Besides quick settings, user can set channel name, address, data format, and so on one by one according to real situation.

✎**Note:**

- After enabling the Cloud function and checking the upload to the Cloud, the communication port settings of the address in the imported Data record configuration must be the same as the communication settings of the current project, otherwise it cannot be used normally.
- The range of upload to the Cloud from Data record configuration must not exceed 50, or the total number of imported Data records and the number of currently existing Data records must not exceed 50. If it exceeds, it will prompt you to reconfigure, should reduce the number.
- The channel name can only be composed of English characters, (0~9), (a~z), (A~Z), ('_'), ('').
- The channel name does not include these 5 special characters: ", ', "| "," <", "> "," & ".
- The data would be overwritten automatically if the capacity exceed the maximum capacity. For 8000/9000 series, the size of single file cannot exceed 300MB, and total capacity of data records cannot exceed 1000MB. For 3000/3000i/3000ie series, the size of single file cannot exceed 4MB, and total capacity of data records cannot exceed 10MB. If the total amount exceeds the range , an error will be prompted when the project is compiled.

You could click here to jump to object "Data Record Display"

User permission

Introduction

1. User permission is one of expansion function in PI Series HMI; it provides multi-level of permission for control HMI operations.

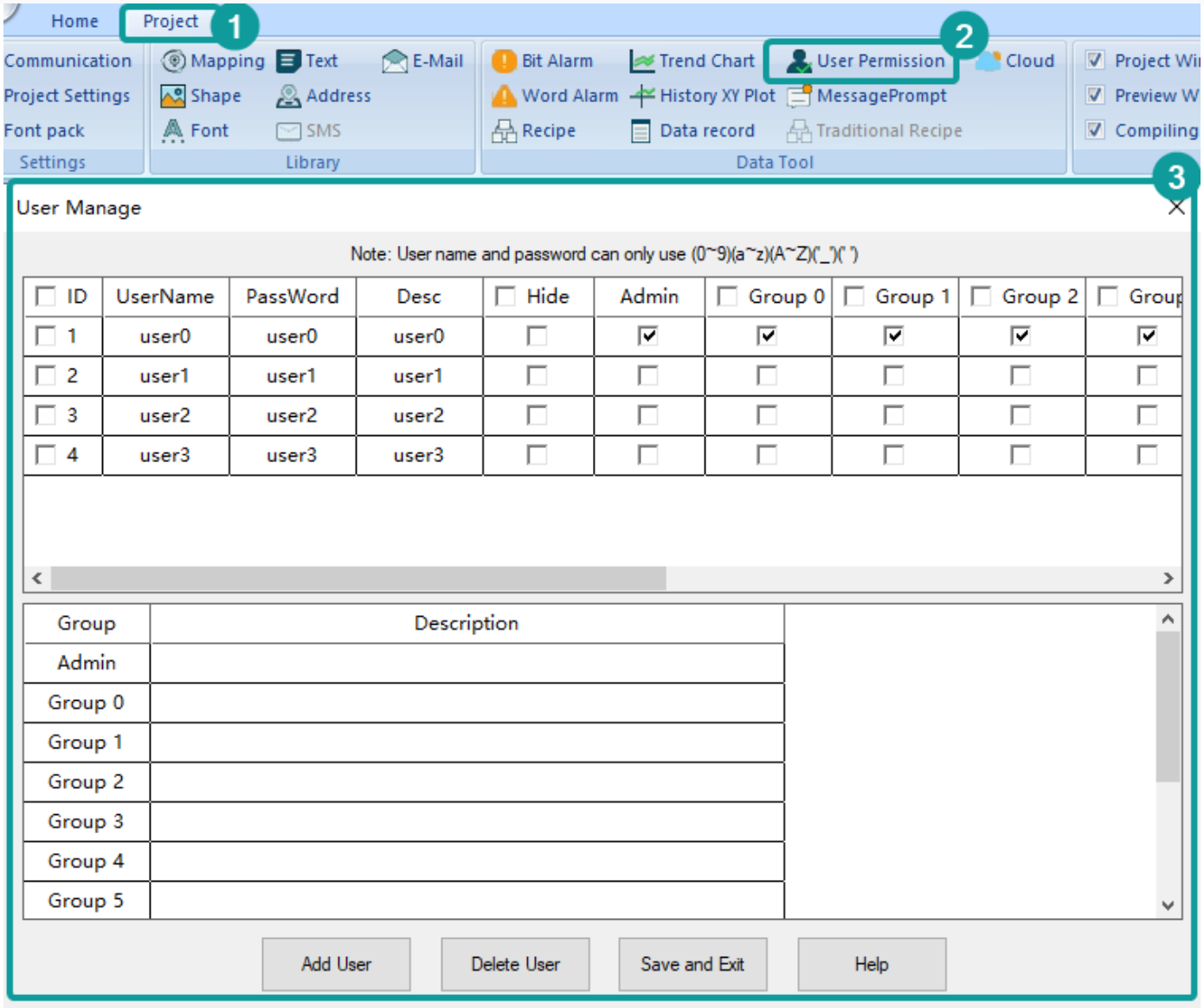
2. User need to set the user and group during designing project. Different groups have different permission levels for accessing. Each user should be added into the specified group; it is possible to add the same user into different groups.
3. Operating record: it records user operations information, the records files are saved in HMI flash; its path is [\\flash\\UserOperationLogs.db].
4. When it is on simulator mode, the files are saved in C disk, its path is [C:\\WECON\UserMgrFile\UserOperationLogs.db].

✎ **Note:**

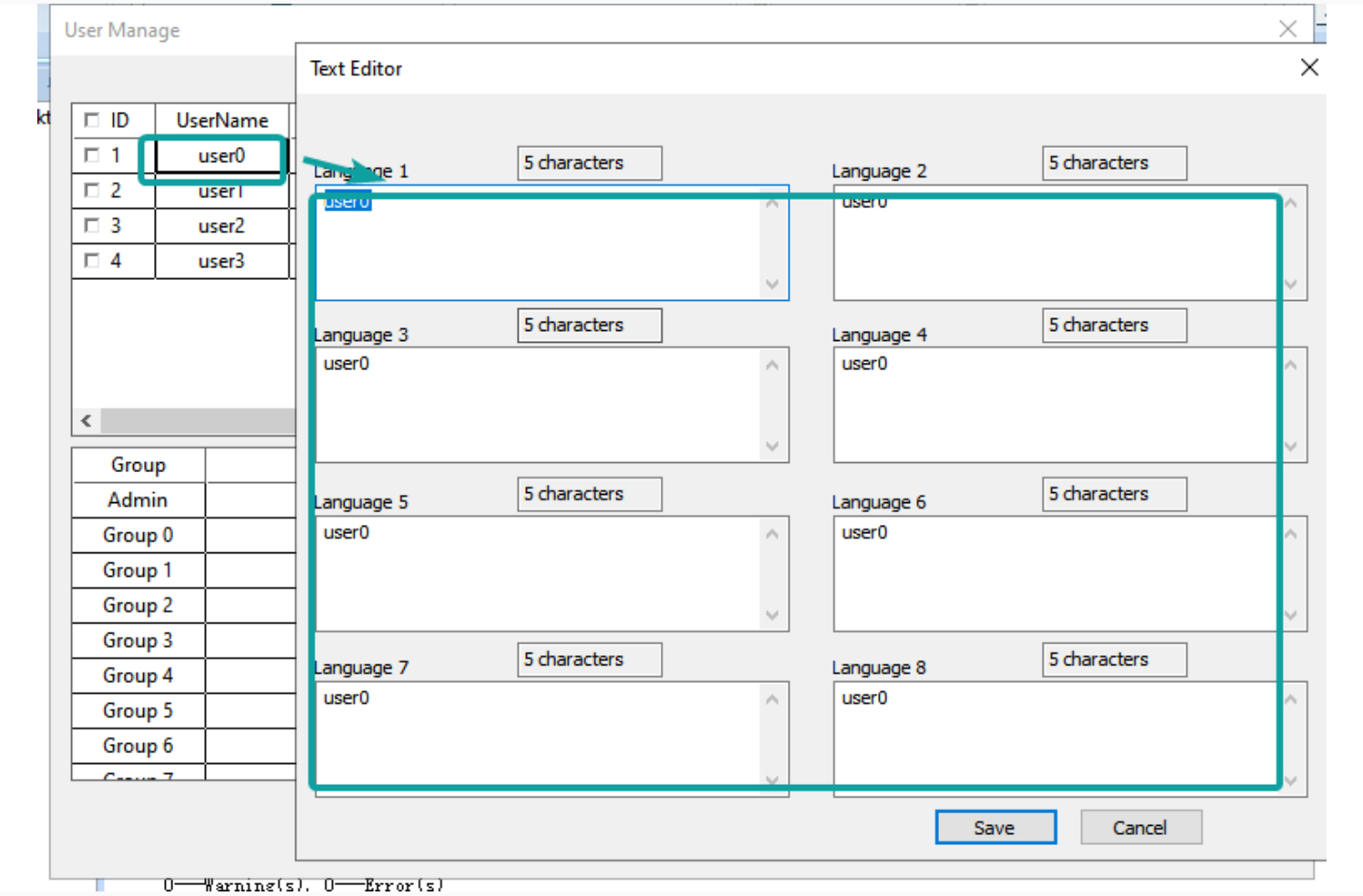
- The user name and password must be unique.
- The multi language function of User permission only supported on HMI system version V2.0 or above

Settings

Open PIStudio software, then operate as the following figure.



Click on the cell from UserName and Desc, which can support the multi language.

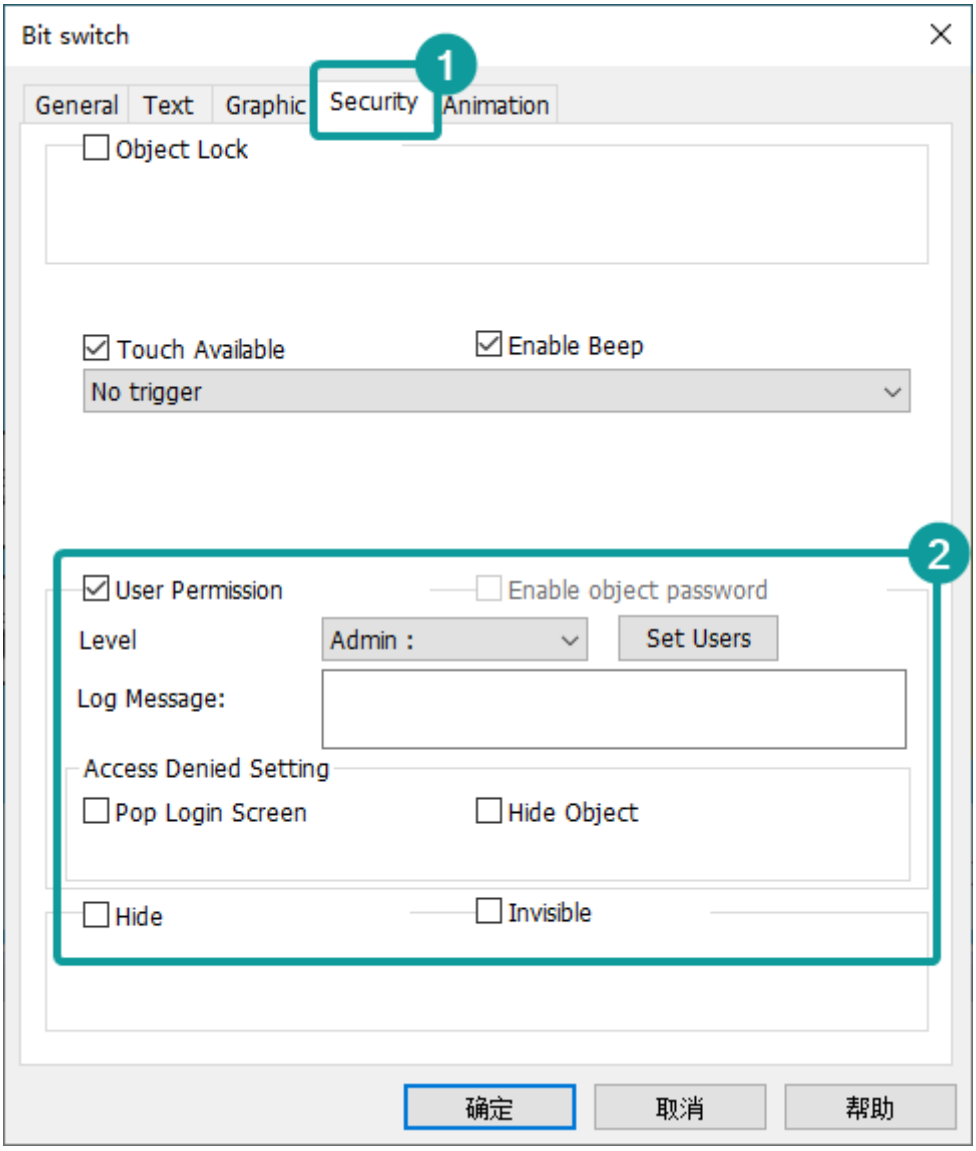


1. Click "User Permission" in "Data Tool" toolbar.
2. Edit user name, click "User0" cell under "UserName", and then enter the user name, one project allows maximum 20 users.
3. Edit password, click "User0" cell under "PassWord", and then enter the user name.
4. Edit description, click "User0" cell under "Desc", and then enter, description is not necessary。
5. Check the groups for each user, there are 11 groups beside admin.
6. Editing groups' description, but it is not necessary.
7. Click "Save and Exit" button to complete all settings.

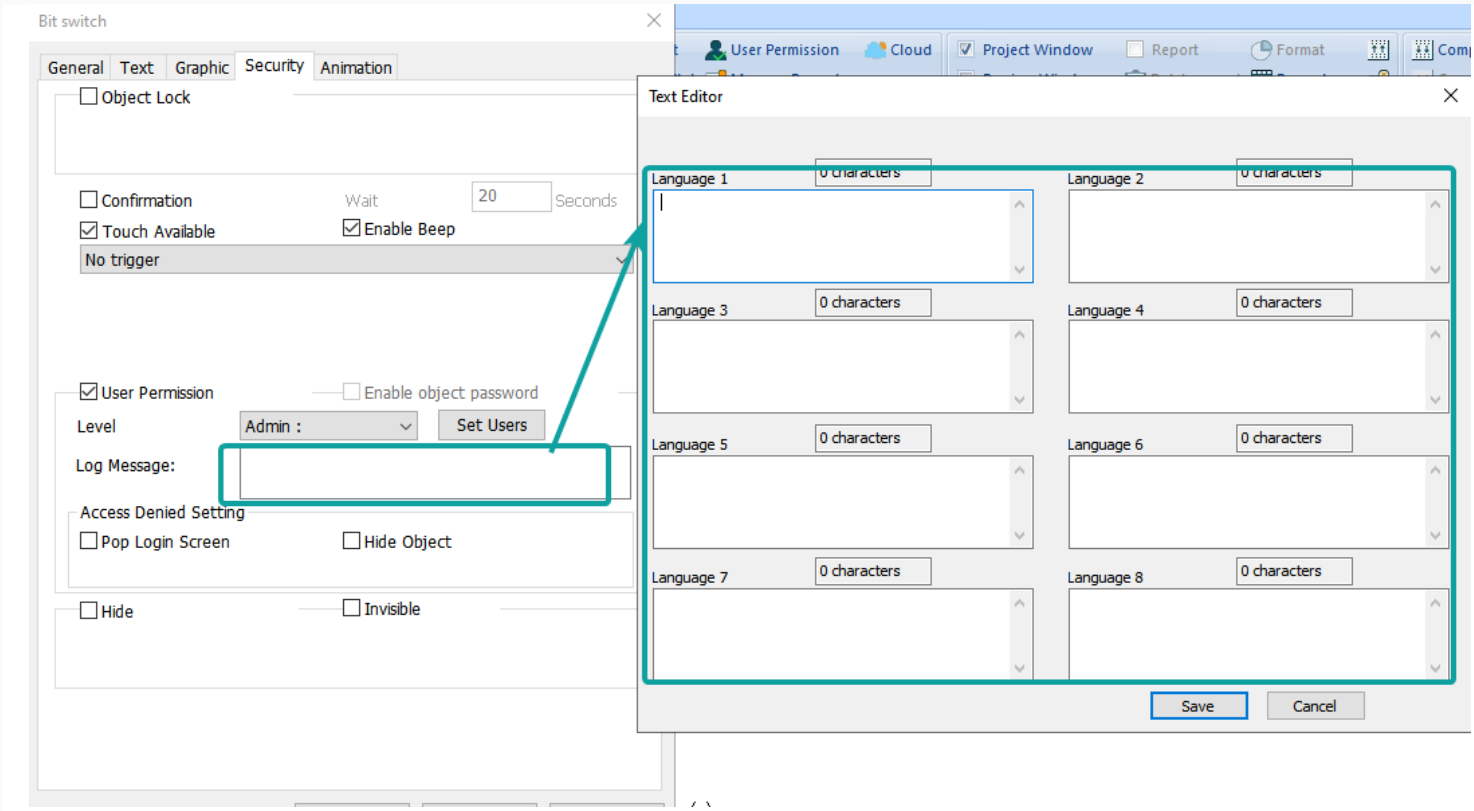
✎Note:

- Only a maximum of one administrator permission is allowed in a profile with one user permission. If you want to use "Funtion address" to modify the user permission, you must log in the administrator account to operate.
- When the configured file does not have the administrator account, a new user can be added through "Funtion address" and set as the administrator.
- If you select hidden fucntion when configuring user account, the account would display as "******" in the list. You only need to enter the password of the corresponding hidden user to log in.
- Adding new UserName and Desc on the HMI by special addresses in the current language of the HMI, other languages will also configure the user names and user descriptions to the current language by default, i.e. switching to other languages, the new user names and user descriptions will not change with the language.

Object permission configuration



User operation logs support multi languages configuration. Click on the Log Message, the text editor of multi language will be pop up:



Operation Procedure of Object Permission

1. Open the object setting windows;
2. Select "Security" windows;
3. Check the "User Permission";
4. Select "Level" to set permission level;
5. Enter "Log Message", it is for operation records, if it was empty, the operation for this object would be not be recorded;
6. Select the "Access Denied Setting" mode;

Log information description

A combination of Chinese characters, numbers, and uppercase and lowercase letters can be entered, and the number does not exceed 63.

The format of insert variable:{variable address, data format}. e.g., {HDW100,UW2.1}.

The data format are as follows.

Letter	Meaning
B	Binary
O	Octonary

U	Unsigned decimal
H	Hexadecimal
b	BCD
F	32-bit float
S	Signed decimal
C	Character
W	Single word
D	Double word

Examples.

- Unsigned decimal, BCD, 32-bit float and Signed decimal are as follows.

{HDW100,UW2.1}: Indicates the variable address is HDW100. The data format are: unsigned decimal, single word, two integer bits, one decimal place.

- Binary, Octonary and Hexadecimal are as follows.

{HDW100,HD8}: Indicates the variable address is HDW100. The data format are: hexadecimal, double word, eight integer bits.

- Character is as follows.

{HDW100,C32}: Indicates the variable address is HDW100. The data format are: 32 characters.

When a record is generated, the contents of this variable are replaced by the value of your corresponding address.

Function address

A user must first log in before performing an operation, and after the login is successful, the user can perform the required operation, and log out after completing the operation, making the operation permission invalid. User login, log out, modification of user password during operation and user management and other functions need to be configured.

HMI allows managing user accounts on screen. Including adding, deleting and editing the user account. HMI provide built-in screen for [Sign in] and [change password] (screen No. 1006 and 1007).

Functions and addresses are as follows.

Function	Address	Object type	Address function
Sign in	HUW1158~1335	Drop down list	User name
	HUW1002	Character input object	Password
	HUW1000	Word Switch (Input 1)	OK (sign in)
Change password	HUW1158~1335	Drop down list	User name
	HUW1002	Character input object	Old password
	HUW1006	Character input object	New password
	HUW1010	Character input object	Confirm password
	HUW1000	Word Switch (Input 2)	OK(change password)
Sign out	HUW1000	Word Switch (Input 3)	Sign out
New user ***1**	HUW1014	Character input object	User name
	HUW1006	Character input object	password
	HUW1010	Character input object	Confirm password
	HUW1000	Word Switch (Input 4)	OK(add new user)
	HUW1336~1345	Character input object	User description

	HUX1347.0	Bit switch	=1: User hidden =0: Visible (Defaults)
	HUW1000	Word Switch (Input 8)	Save(add Hide features)
Delete user ***2**	HUW1158~1335	Drop down list	User name
	HUW1000	Word Switch (Input 5)	OK (delete user)
Delete Profile	HUW1000	Word Switch (Input 9)	OK(delete)
Export Profile	HUW1000	Word Switch (Input 10)	OK(export)
Import profile	HUW1000	Word Switch (Input 11)	OK(import)
Export log file	HUW1000	Word Switch (Input 12)	OK(export)
Delete log file	HUW1000	Word Switch (Input 13)	OK (delete)
Current user name	HUW1349	Character object	32 Word
System state information	HUW1030	Character input object	System state information
Permission settings	HUW1014	Character input object	User name
	HUW1348	Bit switch	Set the user group: HUX1348.0 = 1 administrator; HUX1348.1 = 1 group 0 permission; HUX1348.2 = 1 group 1 permission; (Total group 0 - group 10)
	HUW1000	Word Switch (Input 6)	Add user rights (set according to HUW1348)
User login mode setting	HUW1382	Word Switch/Numeric input object	0: Select a user name from the drop-down list

			1: Use character input object (address HUW1014) to log in with a user name

When the user performs a function operation, the operation result is displayed in the HUW1001.

Value (HUW1001)	Meaning
1	Insufficient permissions.
2	Username does not exist.
3	Username already exists.
4	Wrong username or password.
5	Login successfully.
6	Passwords are inconsistent in twice time.
7	Password changed successfully.
8	User added successfully.
9	User deleted successfully.
10	Maximum number of users exceeded.
11	Admin user already exists.
12	User permission modified successfully.
13	File imported successfully.

14	File imported failed.
15	File exported successfully.
16	File exported failed.
17	Logout successfully.
18	Profile deleted successfully.
19	Log file deleted successfully.
20	Hide settings modified successfully.
21	Hide settings modified failed.
22	Password already occupied, please reset. (For both username and password, it can not repetition)

✎**Note:**

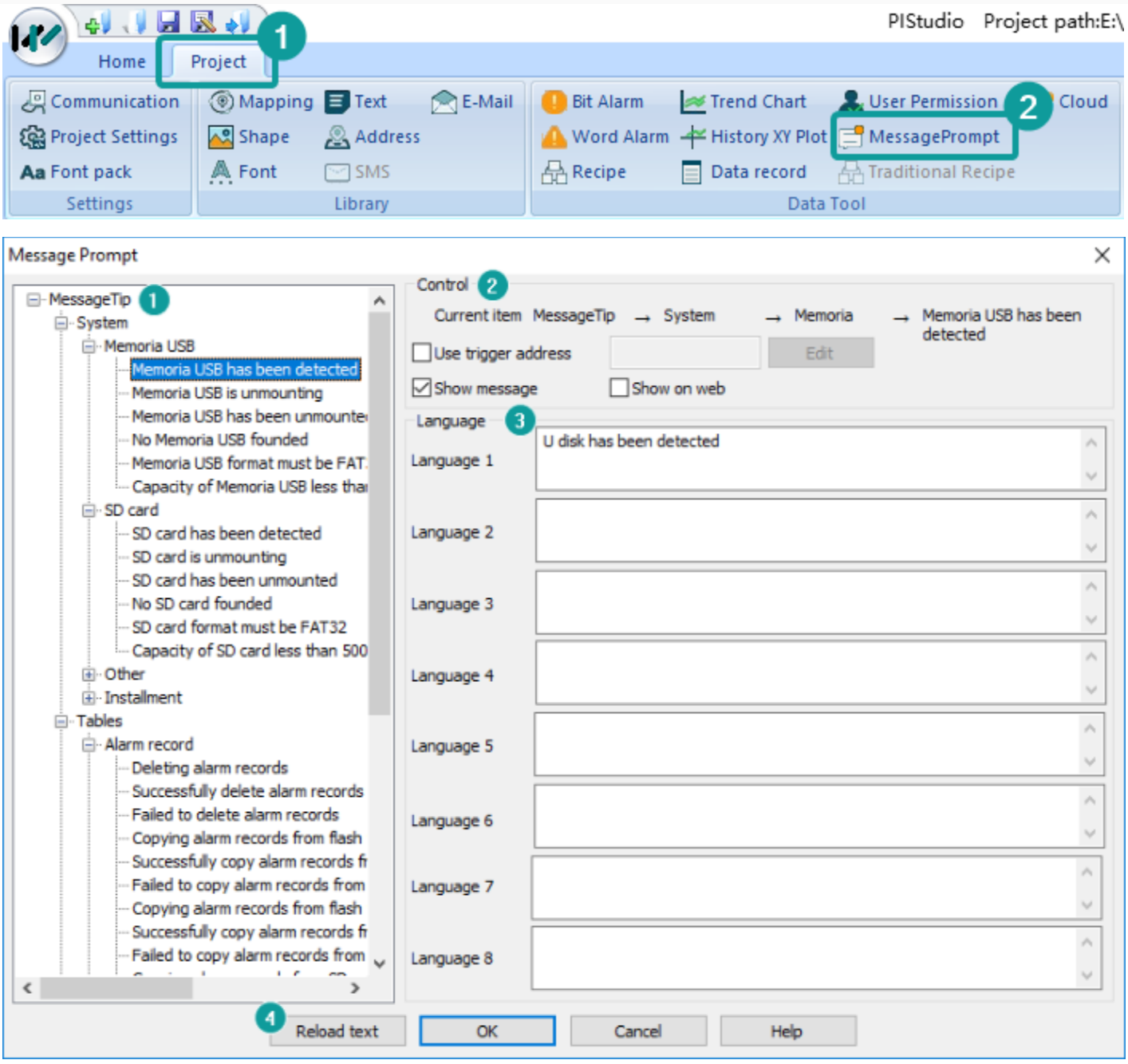
- *1: If there is an admin user account, then the new user can no longer add one more admin, that is, one project can only have one administrator account.
- *1: When adding new user, the password could not be duplicated with other users.
- *2: When deleting user, it is forbidden to delete the admin user.

User Permission Demo Download

https://drive.google.com/open?id=1qOiEDvo_1H1YqpoLDpS77dGaAFm8nrGq

Message prompt

A message box is a window used to show some prompts or warnings to users. For example, the application process a task in the process of pop-up message box, suggesting that "U disk has been detected", then the customer can carry out data dump function.



(1) Message

It includes system classes (u disk, SD card, and others), chart classes (alarm, data record, recipe, file list), curve classes (Trend Chart, historical XY trend Plot).

(2) Control

1. **Current item:** It shows selected message information.
2. **Use trigger address:** When the message is triggered, the trigger address would be set ON.

For Example:

Trigger address is 011, during inserting a USB flash disk into HMI, and 011 would be set ON, once HMI recognizes USB flash disk, and display message.

1. **Show message:** Check it to display message when HMI is running. It is checked by default.
2. **Show on web:** Check it to display message when remote access HMI screen, it is unchecked by default.

(3) Message Content

Each message has default content, but you could set different content according to the actual situation. And the same message could be displayed in 8 languages.

(4) Reload Text: It means discard changes.

For Example

User deletes default content or modifies default content, but he wants to give up modification back to original, just click "Reload text".

✎**Note:**

- If you do not want this prompt during the running of HMI, please uncheck "Show message".
- "Reload text" function would be invalid after clicking "save".
- These 5 special characters are not supported in the header Multi language settings: ",", "|", "<", ">", "&".

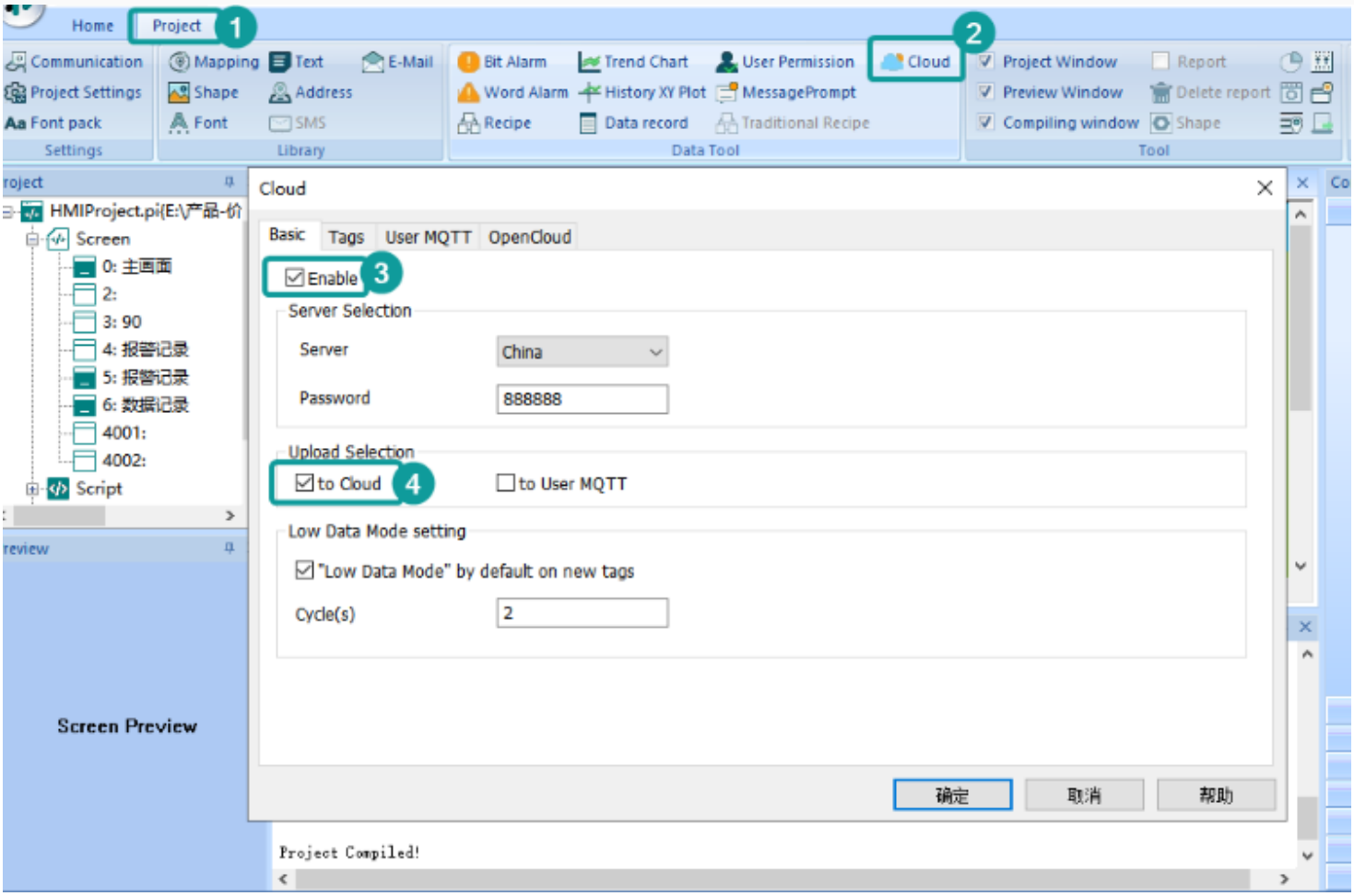
Cloud

Introduction

Cloud function is available for following models: the ig series and 8000/9000 series with -R after system upgrade

You may configure the basic settings of Cloud functions, tags, and User MQTT according to your needs. (If the device supports the Cloud function, you can use the function and configure the tags after checking the box to enable it, or upload the data to the 3rd party server.)

Click "Project"-"  Cloud" in the upper left corner of the software, as shown in the following figure.



(1) Enable

If the HMI supports the Cloud function, check it to enable the Cloud function, and it will collect the real-time data from HMI upload to the Cloud. The number of data collection is limited, and the specific parameters are as follows:

Series	Monitoring Tags	Alarm Record	Data Record	OpenCloud Data
8000-R	300	200	100	1000
9000-R	300	200	100	1000
3000ig	100	20	50	500
8000ig	300	200	100	1000

For example:

- In 3000ig's Cloud, the monitoring tags upload to the Cloud in real time is limited to 100.
- For 3000ig's Alarm, the Alarm records of word alarms and bit alarms upload to Cloud is limited to 20. (See "Alarm" for details).
- For 3000ig's Data record, the Data records upload to Cloud is limited to 50. (For details, please refer to "Data Record").

(2) Server Selection

Server: China, ASEAN, and Europe.

Password:

1. If the HMI is not bound, this access password will be updated and downloaded into the HMI screen simultaneously.
2. If the HMI is bound, this access password in the project cannot effectively change the binding password of the device, and it can only be changed through V-NET.

(3) Upload Selection:

To upload the data collected by HMI to the cloud or a to the third-party server, only one upload method can be selected.

1. **to Cloud**: All the configured tags, data records, and alarm records would be pushed to V-NET.
2. **to User MQTT**: All the configured tags, data records, and alarm records would be pushed to to the third-party server, and the relevant Lua function calls please refer to "Cloud interface".

After the "to User MQTT" is checked. The tags, data records, and alarms cannot be viewed on V-NET, but the device can be bound to V-NET and remote monitoring the device screen normally.

4) Low Data Mode setting

1. When you check the "low Data Mod" by default on new tags, the newly added tags will be enabled in Low Data Mode by default.
2. The longer the refresh interval, the slower the data upload, and the more traffic data will be saved. This function is only used for the control of tags.