

Chapter 23 Recipe

This chapter describes the Recipe function that the DOPSoft software provides, the memory address it occupies and the method to set the recipe. A recipe is comprised of a number of parameters. In industrial application, different products match their own parameters and the user can make the products correspond to different recipe parameters by changing the type of the products. The user can also set and maintain the recipe parameters. The established recipe form can be uploaded from HMI to PLC, or vice versa. The Recipe function enables the user to store a large number of numeric parameters in the HMI memory area. For example, the baking time varies for different types of bread, and these time variables can be controlled by the HMI Recipe function to reduce the load of the controller. The register of the controller, thus, can be conserved for more flexible applications.

- ◆ Classification of recipe setup elements:

Recipe Setup	Recipe
	32 bits Recipe
	Enhance Recipe

Table 23-1-1 Classification of Recipe Setup Elements

- ◆ Common Properties of recipe setup elements:

Recipe Setup	Address	Length	Group	Retained Area	Data Format	Integer Place	Fractional Place	Read Length
Recipe	◎	◎	◎	◎				
32 bits recipe	◎	◎	◎	◎	◎	◎	◎	
Enhance Recipe	◎	◎	◎	◎	◎	◎	◎	◎

Table 23-1-2 Common Properties of Recipe Setup Elements

23-1 16 bits Recipe

The [Enable Recipe] must be checked to create 16 bits recipe data. The dedicated registers for the 16 bits recipe are RCP and RCPNO.

RCP	Recipe Register
RCPNO	Recipe number register

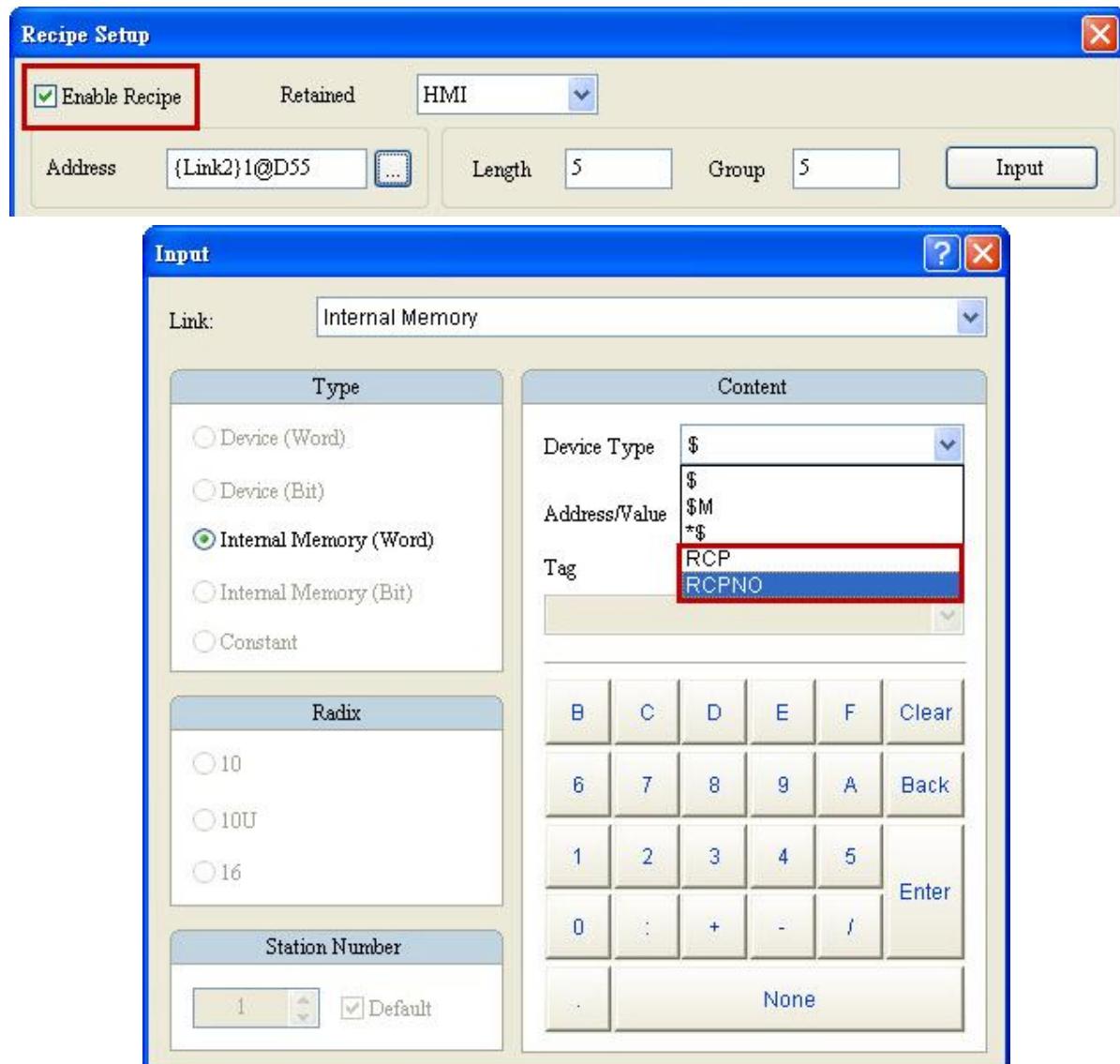


Figure 23-1-1 16 bits Recipe Register

For the 16 bits Recipe, the size of each recipe register is 16 bits (16 bits = 1 word). Assuming that the Length is L and the Group is G, the actual recipe counts are $L \times G =$ words.

Recipe Size : L^*G		Length(L)		
		W1	W2	W3
Group(G)	1	9	18	27
	2	8	16	24
	3	44	55	66

Figure 23-1-2 16 bits Recipe Register Size

■ Recipe Number Register (RCPNO)

RCPNO is used to specify the group for the 16 bits Recipe. Read/write of the recipe means to read/write a group of recipes according to the group assignment in the recipe number register. When the first group of recipes is selected, RCPNO = 1; when the fourth group of recipes is selected, RCPNO = 4.

NOTE:

The recipe number register does not provide the non-volatile function, and the data in the register cannot be maintained when HMI is powered off.

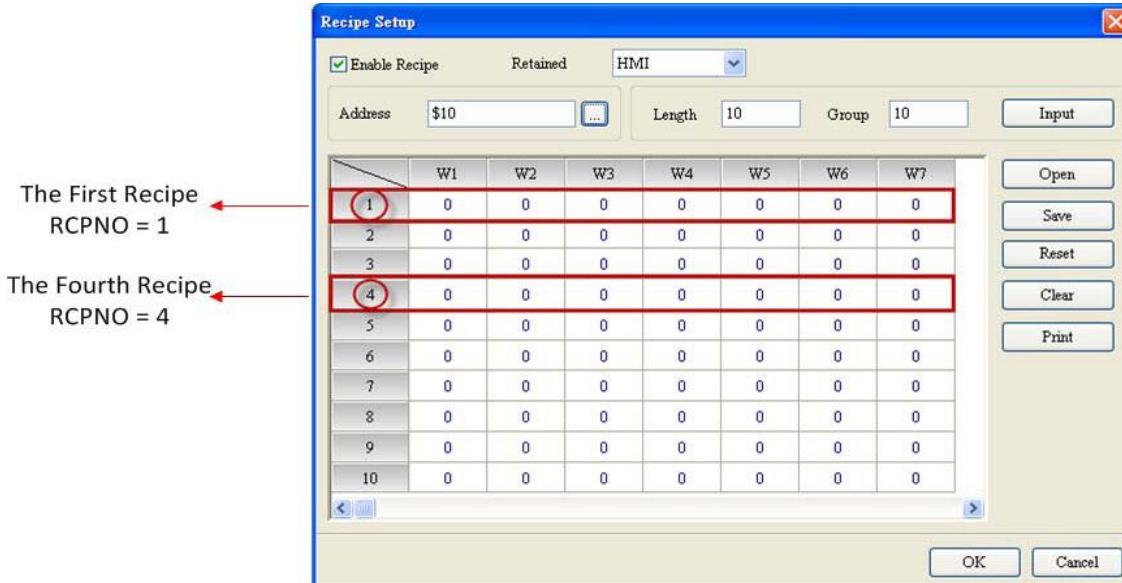


Figure 23-1-3 Recipe Number Editing Screen

■ Recipe Register (RCP)

A recipe buffer is provided in HMI and configured in the utmost front of the register. This buffer is used to store the recipe of the group that the user selected. The length of the buffer is equal to the length of the selected recipe, indicating that the recipe buffer occupies a number of registers equal to L. The number of the registers that a recipe form occupies is $L^*(G+1)$, where $G+1$ stands for the additional register for the buffer. With the recipe buffer, the user only needs to switch between the groups to check the currently specified recipe parameter. When the selected recipe group (RCPNO) is 1, the recipe value of Group 1 will be displayed in the recipe buffer (i.e. RCPNO = 1 in the figure below).

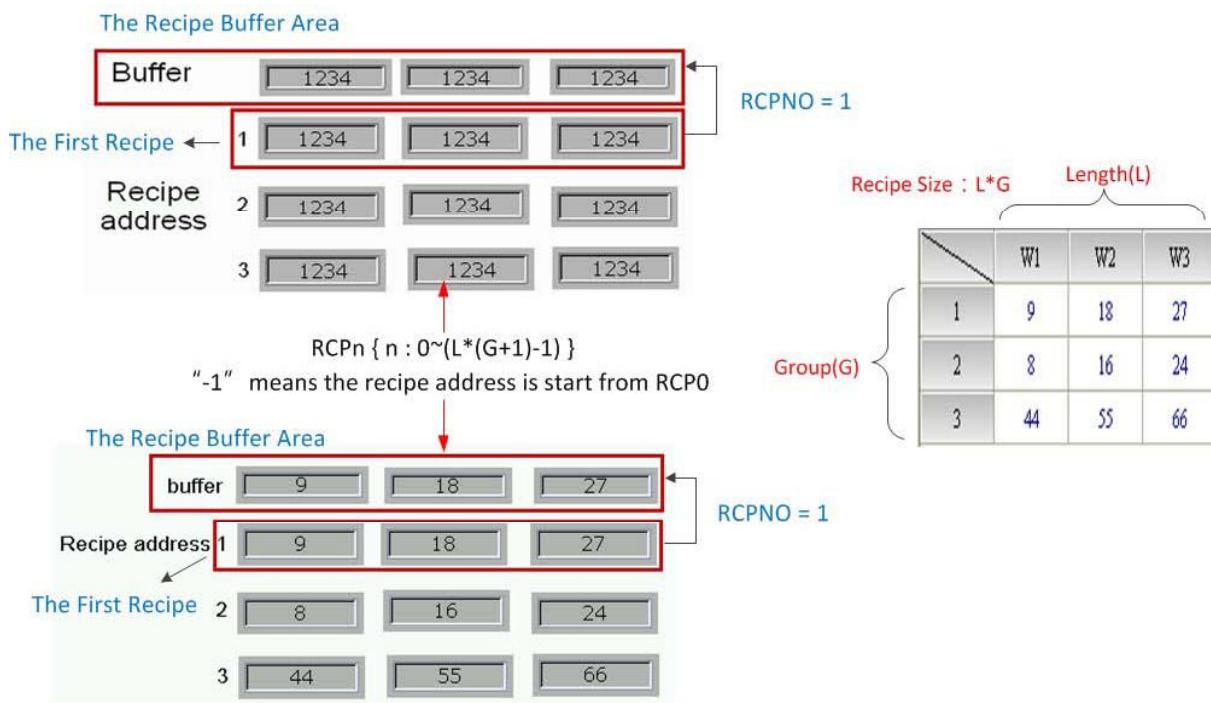


Figure 23-1-4 16 bits Recipe Buffer Configuration

Address accessing range of recipe register:

Accessing Type	Device Type	Accessing Range
Word	RCPn	RCP0~RCP65535
Bit	RCPn	RCP0.0~RCP65535.15
Note: n = Word (0-65535)		

Table 23-1-3 Recipe Register

The address accessing range provided by RCP is limited according to the recipe size that users created. Assume the recipe size is length 3*group 3, then RCP address is range from RCP0 to RCP11. When creating address of RCP12, a warning message will pop up. Please see the figure below.

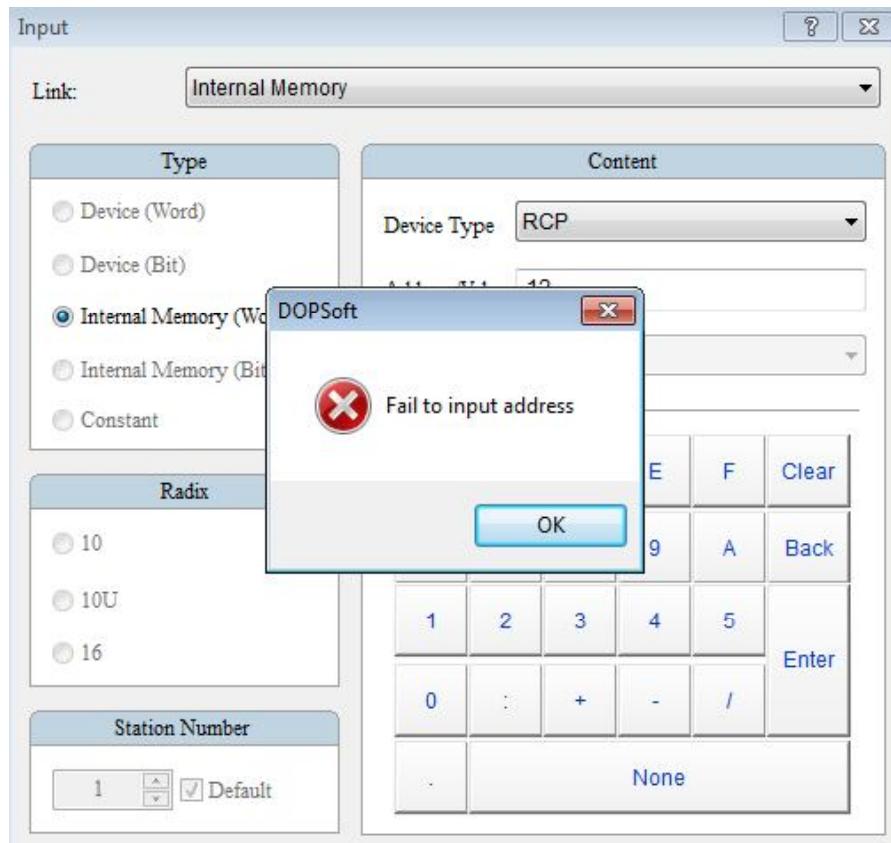


Figure 23-1-5 Recipe Register Configuration

■ 16 bits Recipe Size Limit

If the retained area is set to USB Disk or SD Card, the editable size of a 16 bits Recipe is $(L \times G) = 4194304$. The user can enter [View] → [Memory List] to check the 16 bits Recipe size and capacity.

HMI Memory	
Item	Cost-Bytes
Curve	0 (0K)
Image	204 (0K)
Text	12716 (12K)
Background Image	0 (0K)
Total Used	12920 (12K)
Available	39689296 (38759K)
Free	39676376 (38746K)
Screen Saver	Pass
Sub Screen	Pass
2 - Screen_2	0.39 % Used
Macro	0 (0K)
Curve	0 (0K)
Image	20 (0K)
Text	0 (0K)
Background Image	0 (0K)
Total Used	20 (0K)
Available	39689296 (38759K)
Free	39689276 (38759K)
Screen Saver	Pass
Sub Screen	Pass
External Storage	
Alarm	0 (0K)
History	0 (0K)
Recipe16	0 (0K)
Recipe 32	0 (0K)
Total Used	0 (0K)

Figure 23-1-6 16 bits Recipe External Storage

If the retained area is set to HMI, the editable size of a 16 bits Recipe is $(L \times G) = 65536$ words, or 64K. Hence, when the currently edited 16 bits Recipes are larger than 64K, a warning message will appear on the Recipe Setup window to remind the user that the recipe size has exceeded the allowable limit.

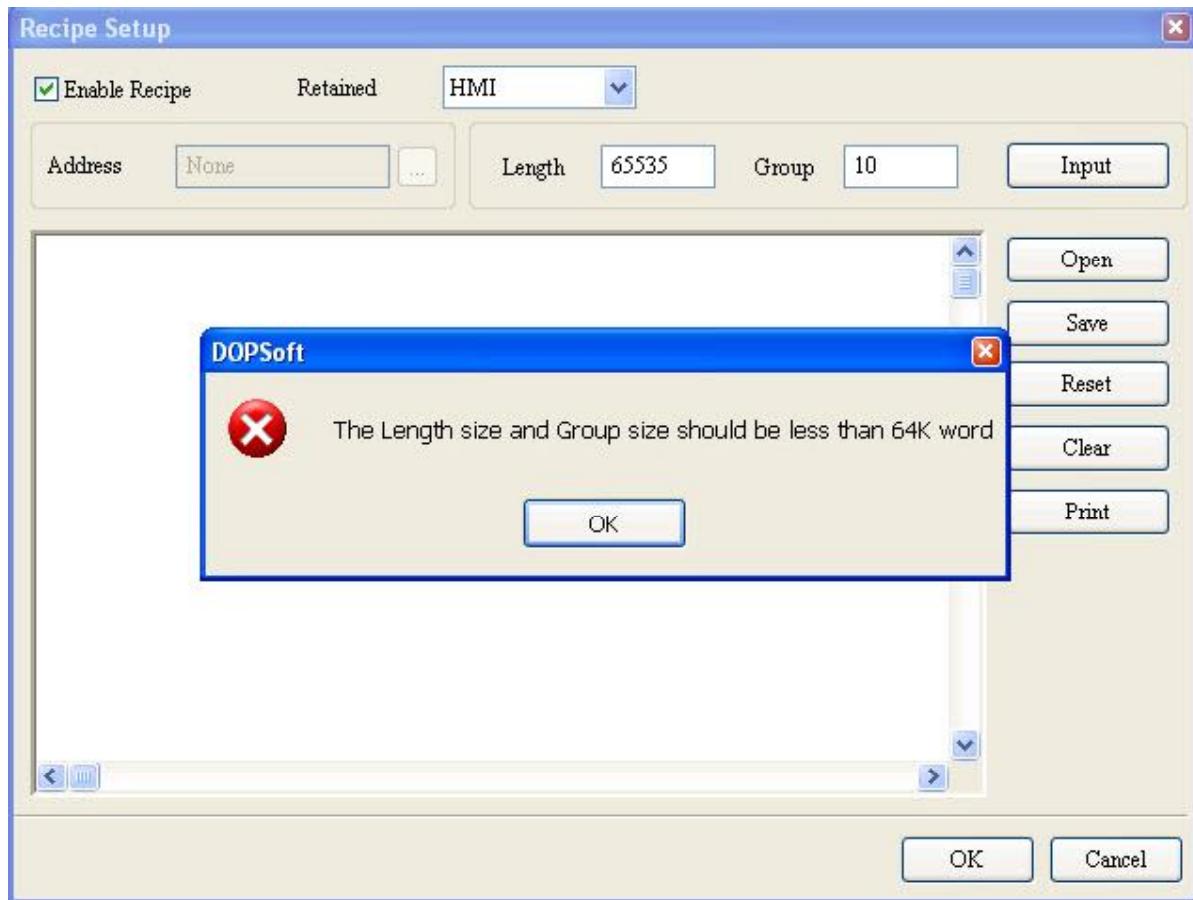


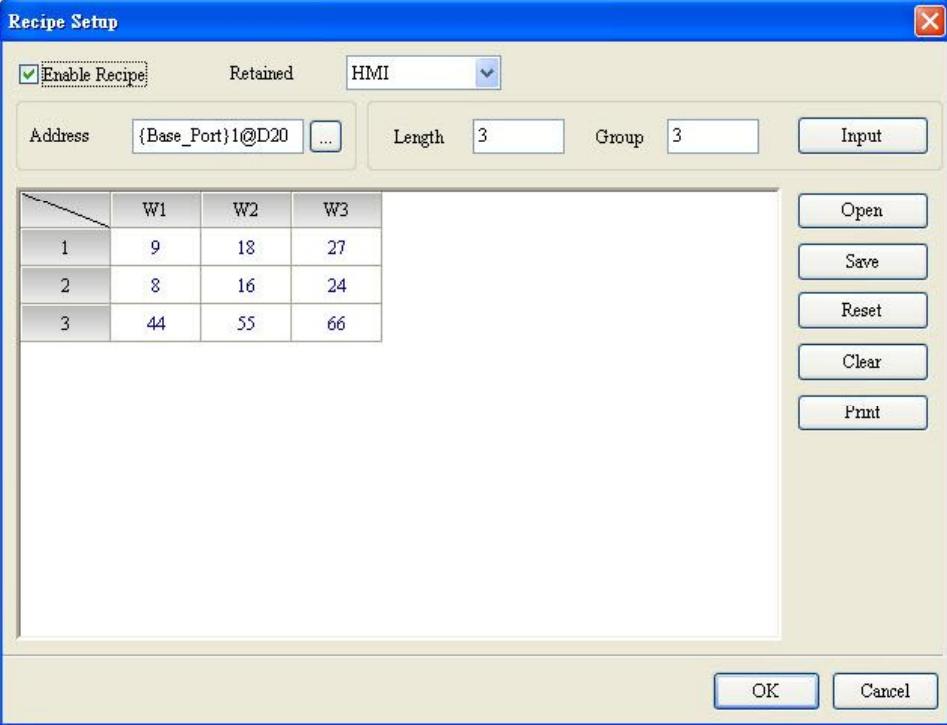
Figure 23-1-7 16 bits Recipe Internal Storage

Enter [Options] → [Recipe] to create 16 bits Recipe data. By setting the recipe, the user can write a large number of batch data to PLC using the recipe control flag in the control area, or read the data from PLC to HMI. The recipe can be used for control applications in the industry. It is very helpful in processing a large number of data.



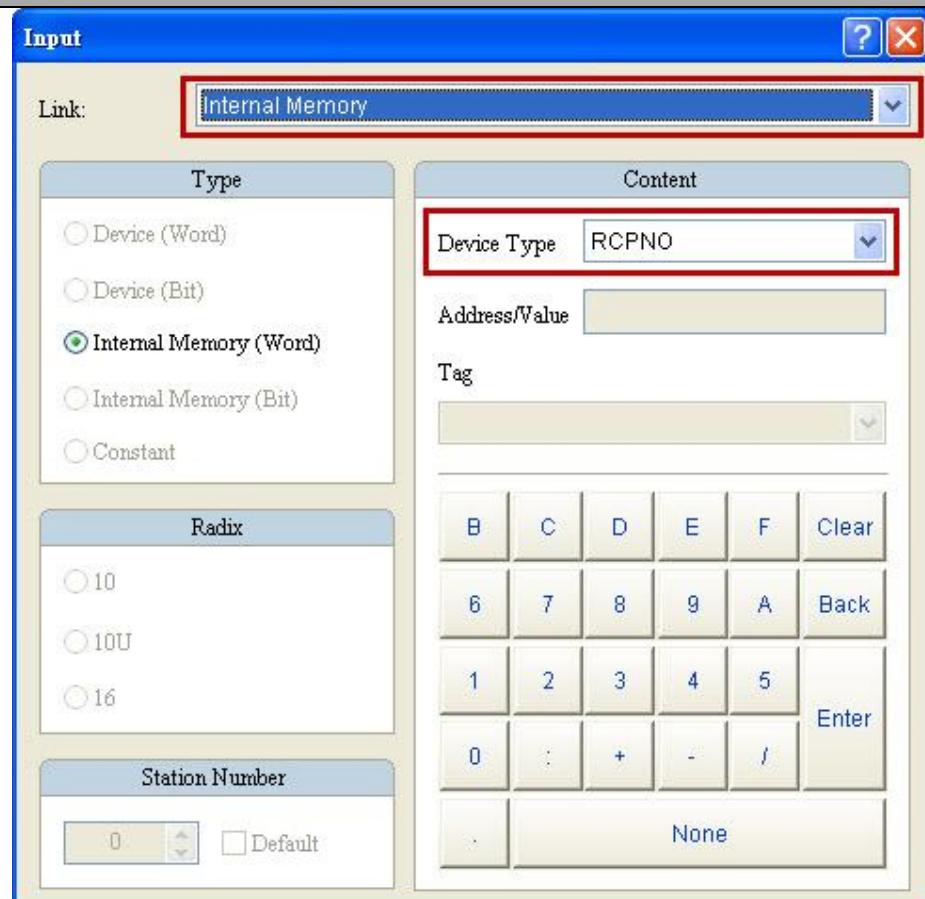
Figure 23-1-8 16 bits Recipe

Refer to the 16 bits Recipe example in Table 23-1-4

<h3 style="text-align: center;">16 bits Recipe Example</h3> <p style="text-align: center;">Table 23-1-4 16 bits Recipe Example</p>	
<p>Set 16 bits Recipe</p> <ul style="list-style-type: none"> ➤ Step 1: Enter [Options] → [Recipe] . <ul style="list-style-type: none"> ● Set the Address to D20. ● Set the Retained Area to HMI. ● Set both Length and Group of the recipe to 3. ● Click [Configure] and a form is generated with the Length and Group values set up previously. Complete the form with the values to be displayed and click [OK] to leave the Recipe Setup window. 	
<p>Create Numeric Element</p> <ul style="list-style-type: none"> ➤ Create a numeric element. Set the Write Address to Internal Memory and select RCPNO as the element type. This element is used for selection of the recipe group. 	

16 bits Recipe Example

Table 23-1-4 16 bits Recipe Example



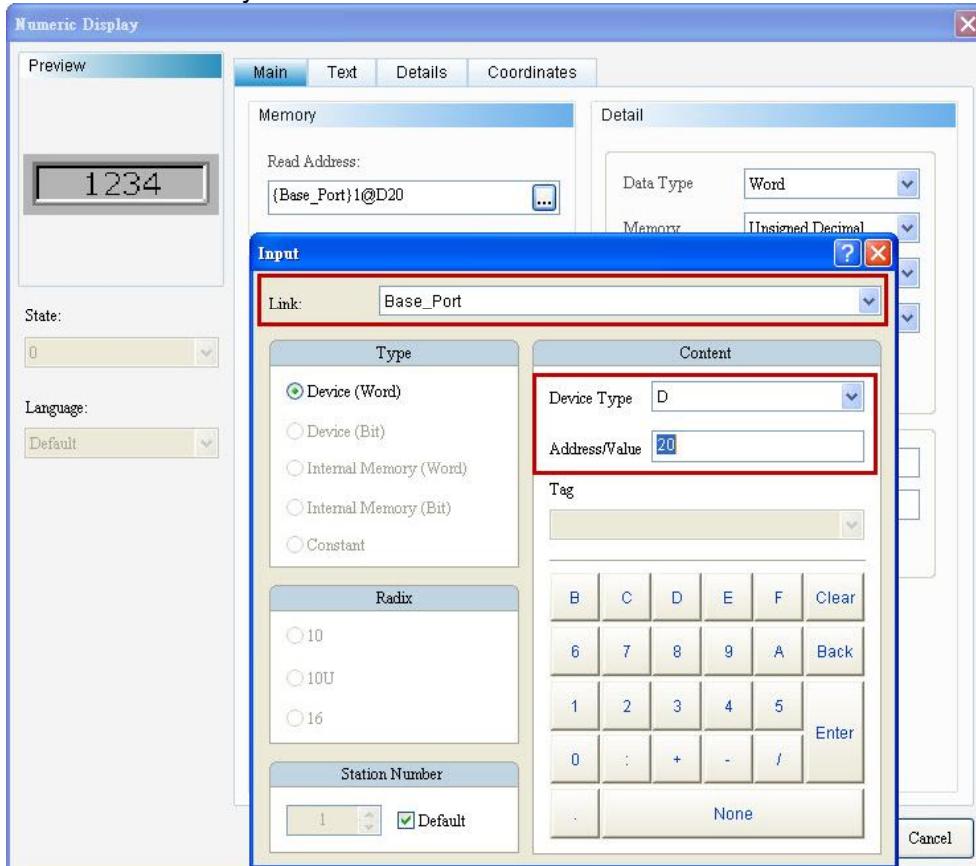
- The following is displayed when the creation is completed.

RCPNO W:RCPNO_{### # #}

16 bits Recipe Example

Table 23-1-4 16 bits Recipe Example

- Step 1: Use the configured recipe size ($L^*G = 3 \times 3$) and put it in the formula $L * (G+1)$ to gain the actually configured RCPs = RCP0~RCP11.
- Step 2: Create 12 numeric display elements and set the Read Address to Internal Memory RCP0 and so on.



- The following is displayed when the creation is completed.

Buffer

R:RCP0 R:RCP1 R:RCP2

1 R:RCP3 R:RCP4 R:RCP5

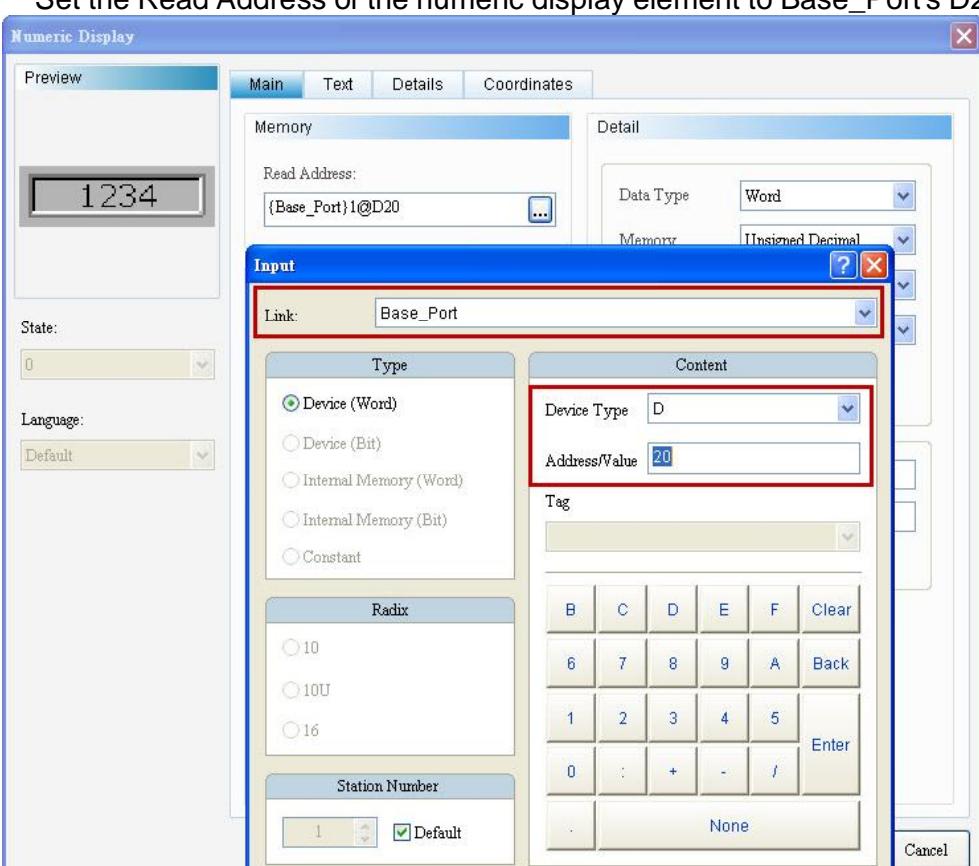
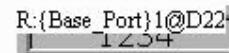
Recipe address

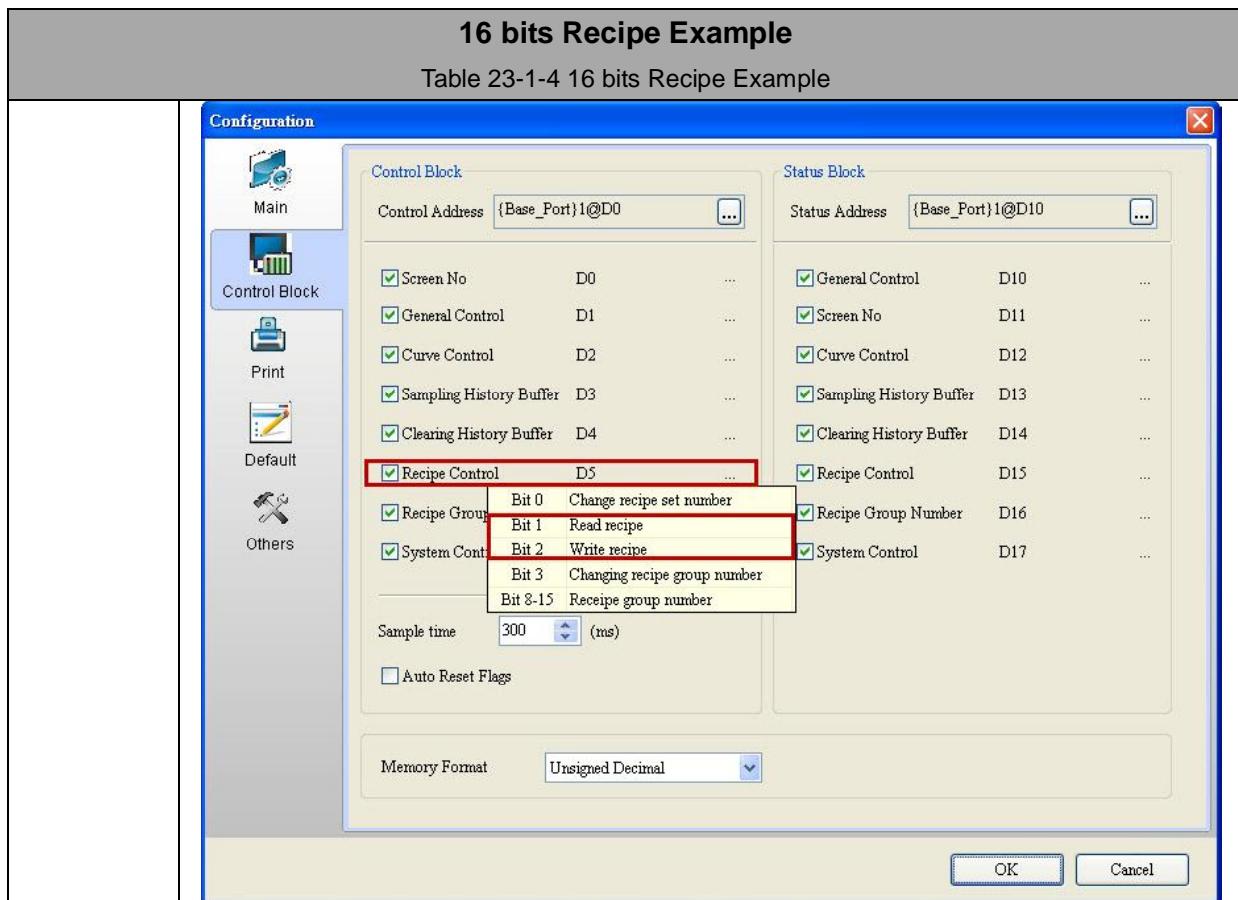
2 R:RCP6 R:RCP7 R:RCP8

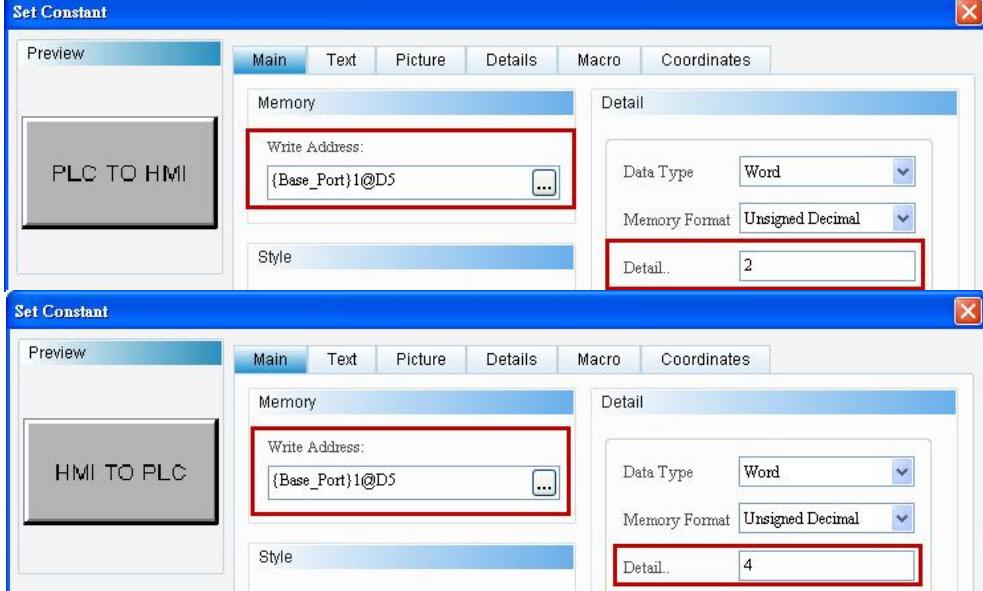
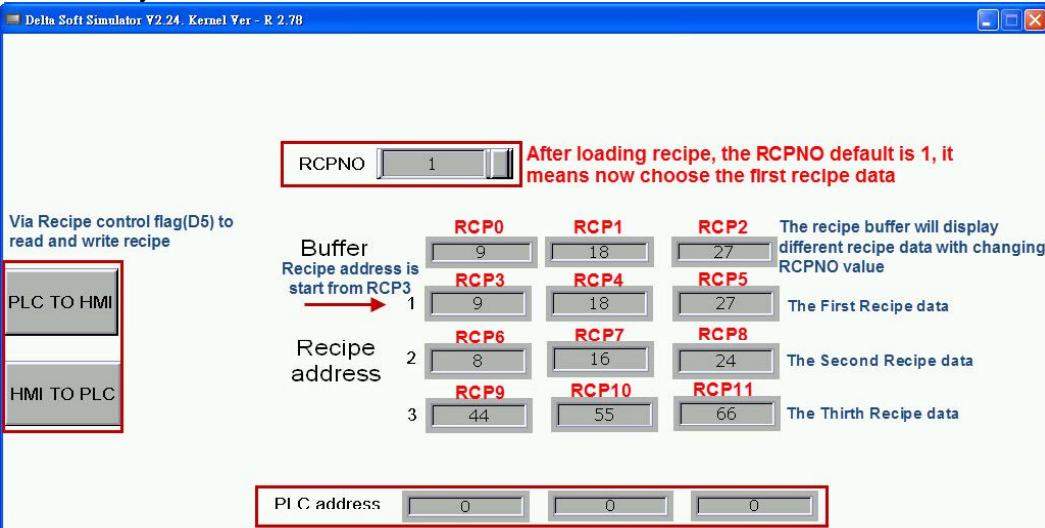
3 R:RCP9 R:RCP10 R:RCP11

NOTE:

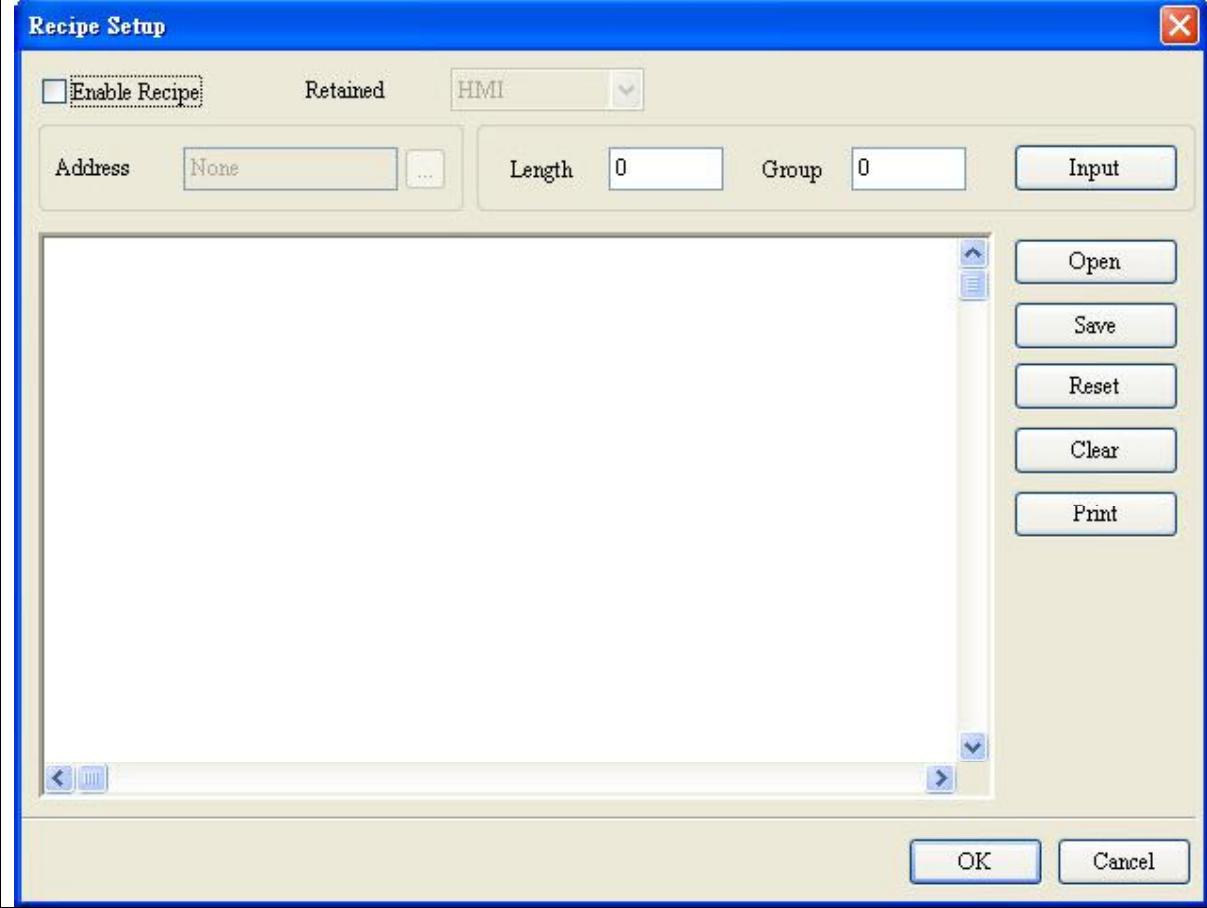
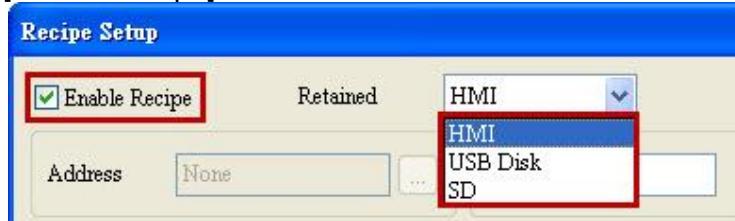
The RCP0~RCP2 created are the recipe buffers and the actual recipe data RCPs are RCP3~RCP11. For more information, refer to Figure 23-1-4 16 bits Recipe Buffer Configuration.

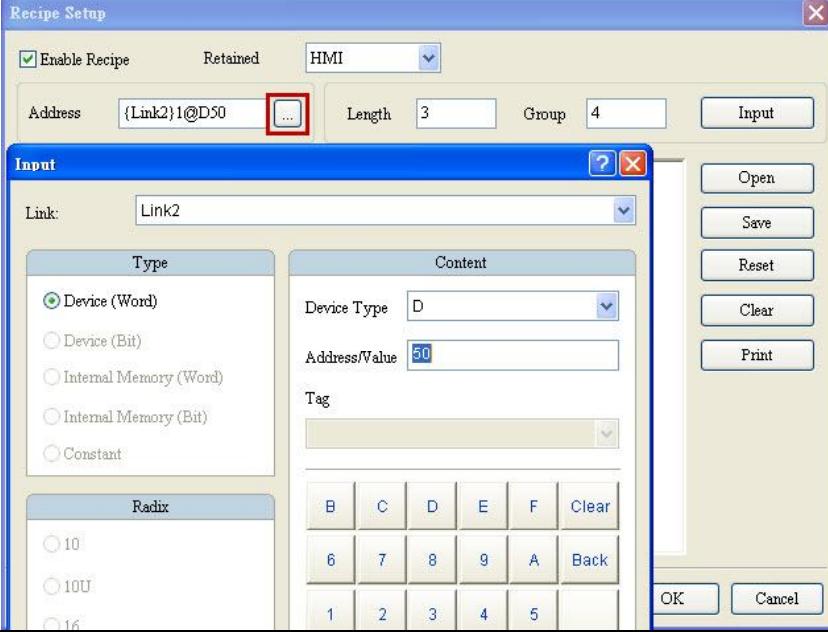
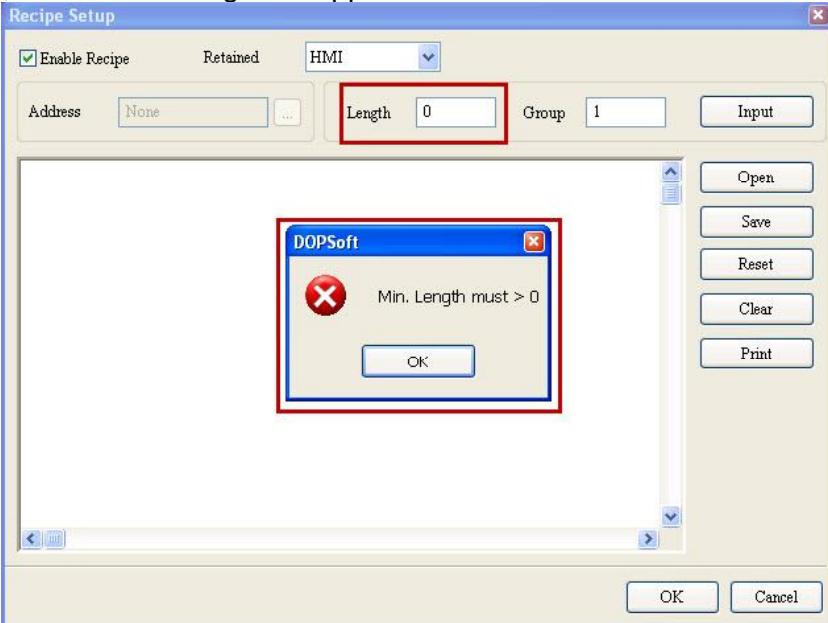
<h3 style="text-align: center;">16 bits Recipe Example</h3> <p style="text-align: center;">Table 23-1-4 16 bits Recipe Example</p>	
<p>Create Numeric Display Element</p> <ul style="list-style-type: none"> ➤ Create 3 numeric display elements D20, D21 and D23 to show the change of the data when the user reads or writes PLC recipes. ➤ Set the Read Address of the numeric display element to Base_Port's D20. 	<ul style="list-style-type: none"> ➤ The following displays when the creation is completed. <p style="margin-top: 10px;"> PLC address R:{Base_Port}1@D20-  R:{Base_Port}1@D21-  R:{Base_Port}1@D22-  </p>
<p>Set Recipe Control Flag in Control Block</p> <ul style="list-style-type: none"> ➤ Enter [Options] → [Configuration....] → [Control Block] and check the [Recipe Control] flag. Set the Control Address in the Control Block to define that Recipe Control address. After the setting is completed, click [OK] to leave the Configuration Window. 	



16 bits Recipe Example	
Table 23-1-4 16 bits Recipe Example	
Create Permanent Numeric Button Element	<p>➤ Create 2 permanent numeric buttons. Set the Write Address to D5 and the Setting to 2 and 4, respectively, corresponding to Bit 1 and Bit 2 of the Recipe Control flag D5. This setup is used for read and write of the recipe.</p> 
Execution Results	<p>➤ After creation of all elements, perform the compilation and download the screen data and recipe to HMI.</p>  <p>Select a recipe group. The recipe data will be displayed in the created RCP0~RCP11 with reference to the selected recipe group. The RCP0~RCP2 created are the recipe buffers and the RCPs for the first group of recipe data are actually RCP3~RCP11.</p> 

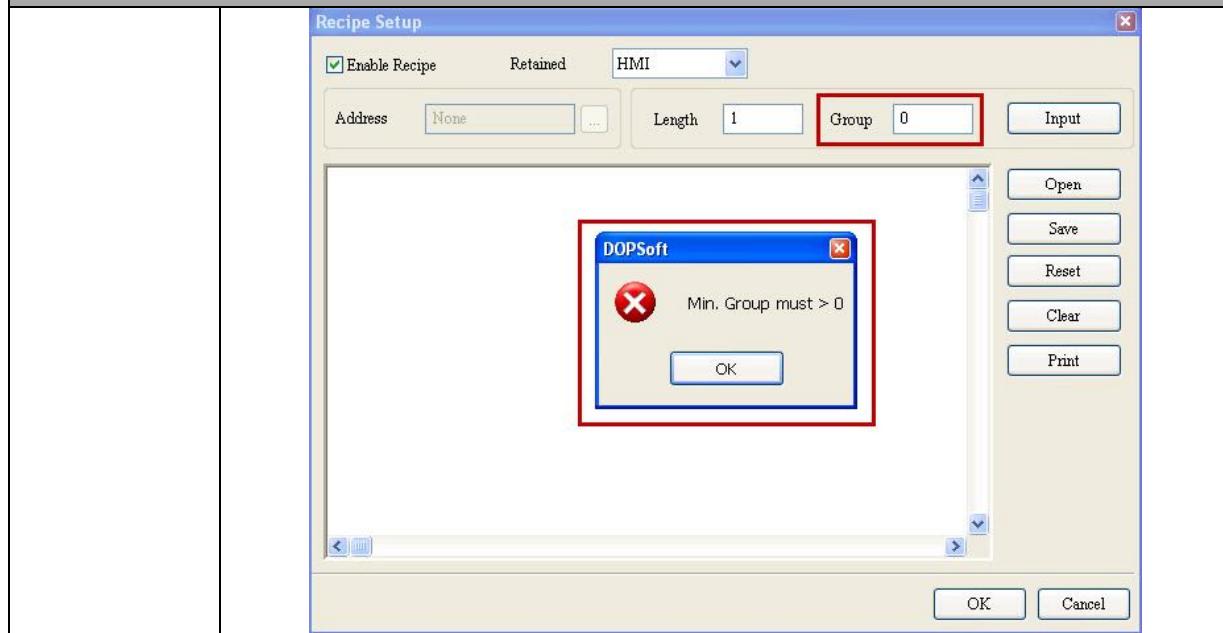
16 bits Recipe Example	
Table 23-1-4 16 bits Recipe Example	
	<p>Activate the Recipe Write button and the recipe data of the selected group will be written to PLC. Activate the Recipe Read button and the recipe data that were written to the PLC will be read back to HMI with reference to the selected recipe group. The recipe data will be changed to match the content of the selected group.</p> <div style="border: 1px solid black; padding: 10px;"> <p>Recipe Read</p> <p>Step 1 RCPNO 1</p> <p>PLC TO HMI</p> <p>HMI TO PLC</p> <p>Step 2</p> <p>Buffer 9 18 27</p> <p>Recipe address 1 9 18 27 2 8 16 24 3 44 55 66</p> <p>PLC address 9 18 27</p> <p>Write Recipe data to PLC</p> </div>
	<p>Recipe Write</p> <p>Step 1 RCPNO 2</p> <p>PLC TO HMI</p> <p>HMI TO PLC</p> <p>Step 2</p> <p>Buffer 9 18 27</p> <p>Recipe address 1 9 18 27 2 9 18 27 3 44 55 66</p> <p>PLC address 9 18 27</p> <p>Read PLC recipe data to HMI</p>

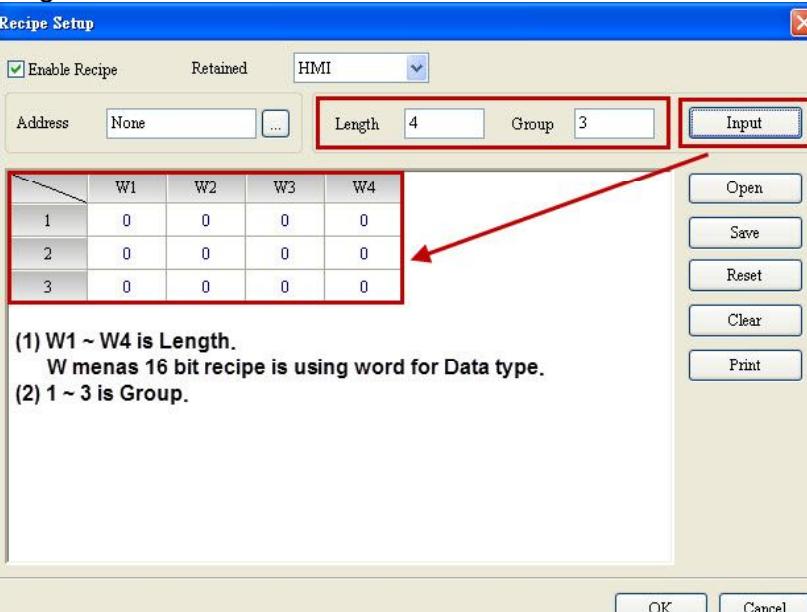
Recipe Setup Property Description Table 23-1-5 Recipe Setup Property Description	
	
Retained Area	<ul style="list-style-type: none"> ➤ The [Enable Recipe] must be checked to set the retained area.  <ul style="list-style-type: none"> ➤ The retained area can be HMI, USB Disk or SD Card. ➤ When HMI is selected as the retained area, the data will be recorded in HMI SRAM in case of power-off.
Address	<ul style="list-style-type: none"> ➤ Selects the address of internal memory or controller register. ➤ Selects link name or element type. Please refer to 5-1 Button for details.

<h3 style="text-align: center;">Recipe Setup Property Description</h3> <p style="text-align: center;">Table 23-1-5 Recipe Setup Property Description</p>	
	
Length/Group	<ul style="list-style-type: none"> ➤ The Length and Group represent the length and group size that the user entered. With these values set up, the user can click [Configure] to create the form. ➤ The Length and Group cannot be set to 0. If any of the values is set to 0, an error message will appear to warn the user. 

Recipe Setup Property Description

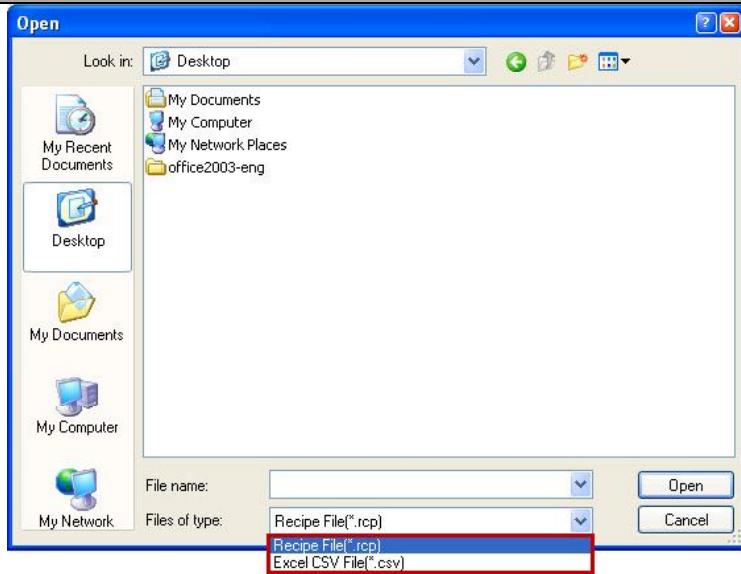
Table 23-1-5 Recipe Setup Property Description



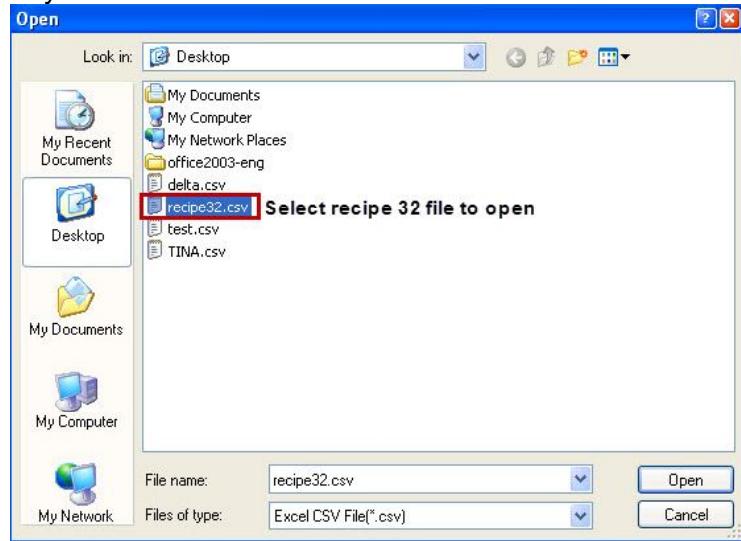
Recipe Setup Property Description	
	Table 23-1-5 Recipe Setup Property Description
Configure	<ul style="list-style-type: none"> ➤ After the Length and Group are set, click the [Configure] button to generate a form in the blank area with L*G as its size. For example, with 4 and 3 as the settings for the Length and Group, respectively, the size of the form is 4 x 3. <p>NOTE: Due to the limit of HMI memory, the size of the recipe should not be greater than 64K (L*G not greater than 65536). Otherwise, the following warning message will appear:</p>  <ul style="list-style-type: none"> ➤ The user can complete the form with recipe data after the configuration. 
Open	<ul style="list-style-type: none"> ➤ The [Open] function provides CSV and RCP file formats for the user to import the recipe.

Recipe Setup Property Description

Table 23-1-5 Recipe Setup Property Description



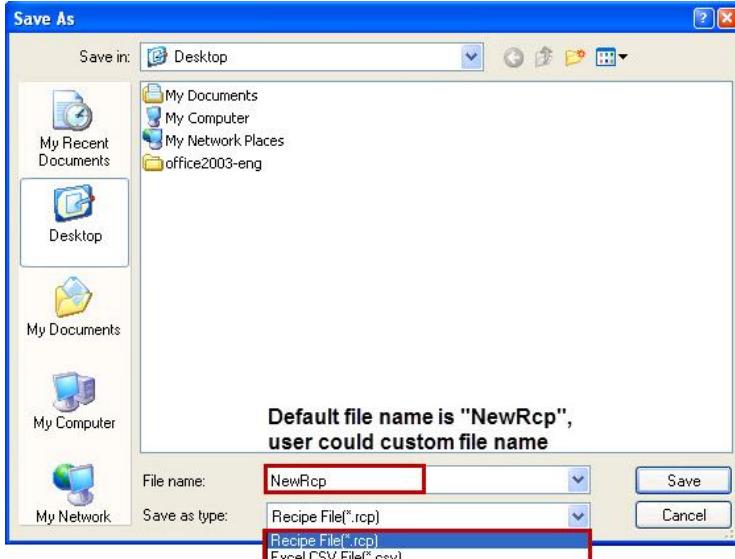
- The opened and imported recipe file only provides the content of the recipe data. The address of the recipe does not support loading the address that was set up previously. If a 32-bit RCP or CSV recipe file is opened as a 16 bits Recipe, the data loaded will not be displayed normally.



Recipe Setup Property Description

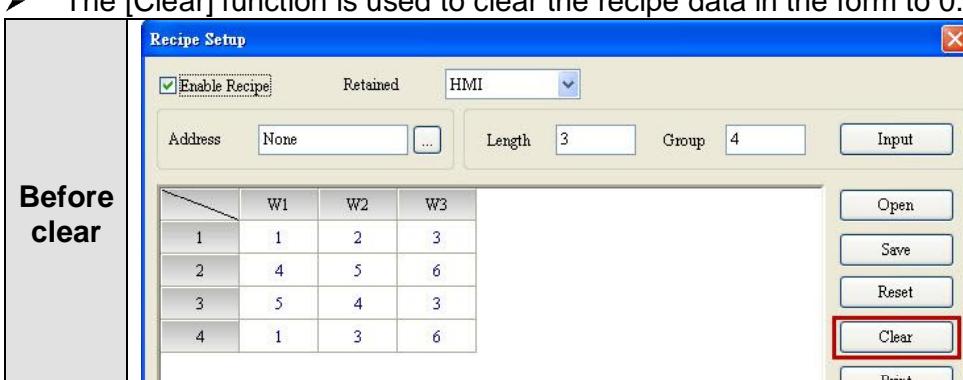
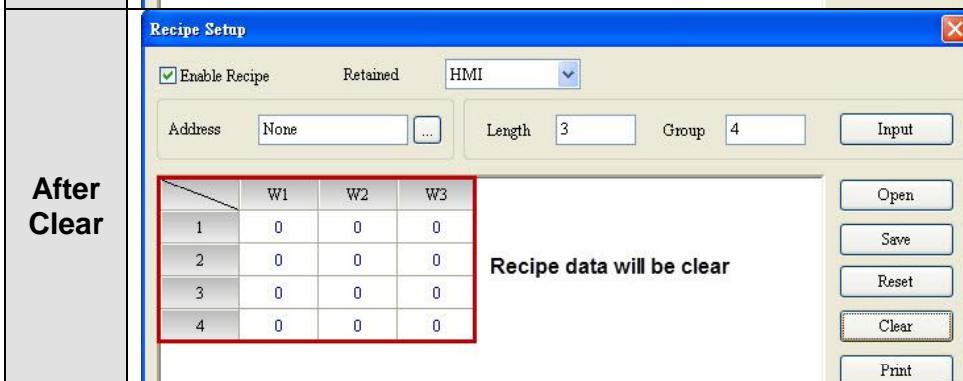
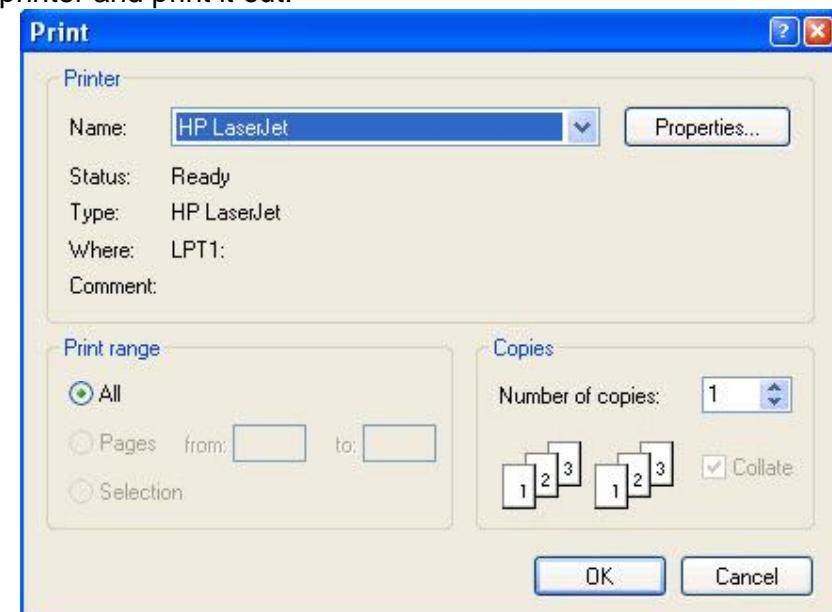
Table 23-1-5 Recipe Setup Property Description



Recipe Setup Property Description																					
Table 23-1-5 Recipe Setup Property Description																					
Save	<ul style="list-style-type: none"> ➤ The [Save] function enables the user to save the current 16 bits Recipe. Like the Open function, the Save function supports CSV and RCP file formats. 																				
Reset	<ul style="list-style-type: none"> ➤ The recipe data that the user saved does not support the recipe address set up by the Save function. ➤ The [Reset] function is used to empty the configured form. The user needs to enter the length and group values after the reset for the next configuration of the form. <thead> <tr> <th></th> <th style="text-align: center;">W1</th> <th style="text-align: center;">W2</th> <th style="text-align: center;">W3</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> </tbody>		W1	W2	W3	1	0	0	0	2	0	0	0	3	0	0	0	4	0	0	0
	W1	W2	W3																		
1	0	0	0																		
2	0	0	0																		
3	0	0	0																		
4	0	0	0																		

" data-bbox="260 520 860 700"/>

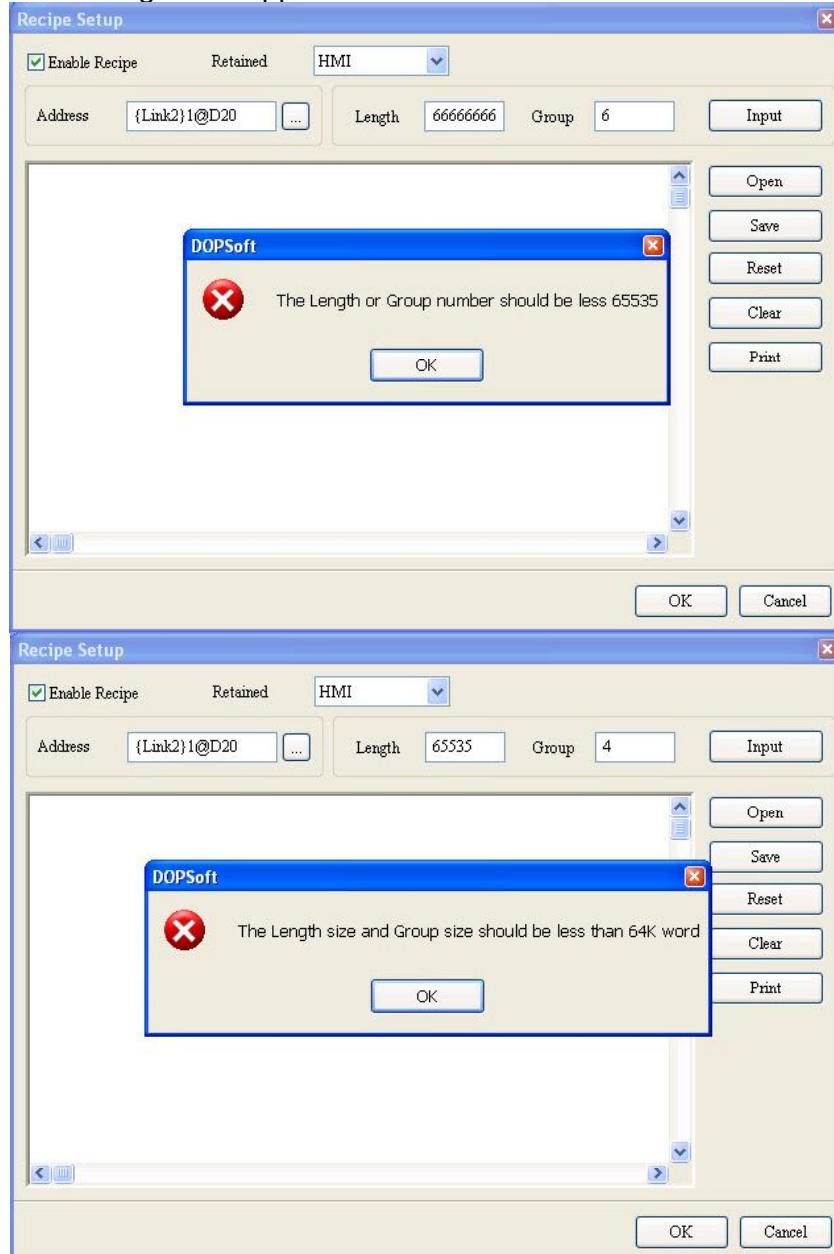
Recipe Setup Property Description	
Table 23-1-5 Recipe Setup Property Description	
	<p>The screenshot shows the 'Recipe Setup' dialog box. On the left, a vertical column labeled 'After Reset' is visible. The main area of the dialog box contains a yellow starburst-shaped warning message that reads 'The recipe data will be reset'. The dialog box includes fields for 'Enable Recipe' (checked), 'Retained' (set to 'HMI'), 'Address' (set to 'None'), 'Length' (set to '0'), and 'Group' (set to '0'). On the right side, there are buttons for 'Input', 'Open', 'Save', 'Reset', 'Clear', and 'Print'.</p>

<h3 style="text-align: center;">Recipe Setup Property Description</h3> <p style="text-align: center;">Table 23-1-5 Recipe Setup Property Description</p>		
	<p>➤ The [Clear] function is used to clear the recipe data in the form to 0.</p>  <p>Before clear</p>	
Clear	 <p>After Clear</p> <p>Recipe data will be clear</p>	
Print	<p>➤ The [Print] function is used to output the current recipe data to the printer and print it out.</p> 	
OK	<p>➤ After the 16 bits Recipe properties are set up, click [OK] to save the changes and leave the Recipe Setup window.</p> <p>➤ When the [OK] button is pressed, the length and group values that the user entered will be checked again for their change or excess.</p>	

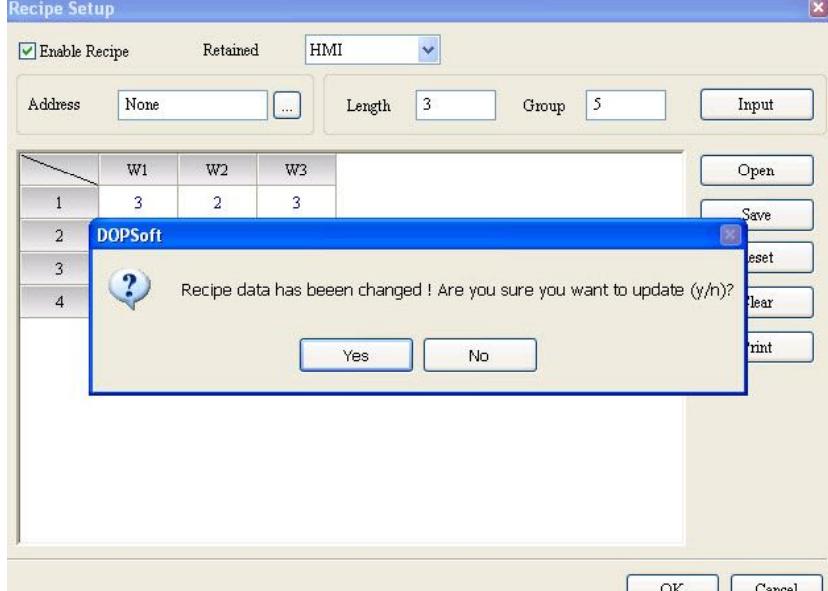
Recipe Setup Property Description

Table 23-1-5 Recipe Setup Property Description

- If the length or group size exceeds the allowable limit, the following two messages will appear:



- If the length or group size is inconsistent with the configured form, the data will also be checked when the OK button is pressed for their change and the following message will appear:

Recipe Setup Property Description	
Table 23-1-5 Recipe Setup Property Description	
	 A screenshot of a Windows application window titled "Recipe Setup". Inside the window, there are several input fields and buttons. A modal dialog box titled "DOPSoft" is displayed in the center, containing a question mark icon and the message "Recipe data has been changed! Are you sure you want to update (y/n)?". Below the message are two buttons: "Yes" and "No". At the bottom right of the main window are buttons for "OK" and "Cancel".
Cancel	➤ Click [Cancel] to leave the Recipe Setup window without saving any change of the data. It has the same effect as pressing the X mark at the upper right corner of the window.

23-2 32 bits recipe

The 32 bits recipe supports the data type Double Word. The data format supports Signed Decimal, Unsigned Decimal and Floating. The size of each register is 32 bits (2 Words or 1 Double Word, DW).

Unlike the 16 bits Recipe, the 32 bits recipe provides an additional recipe grouping option. When performing recipe read or recipe write, the user must specify both recipe number and recipe group to read or write a group of recipes.

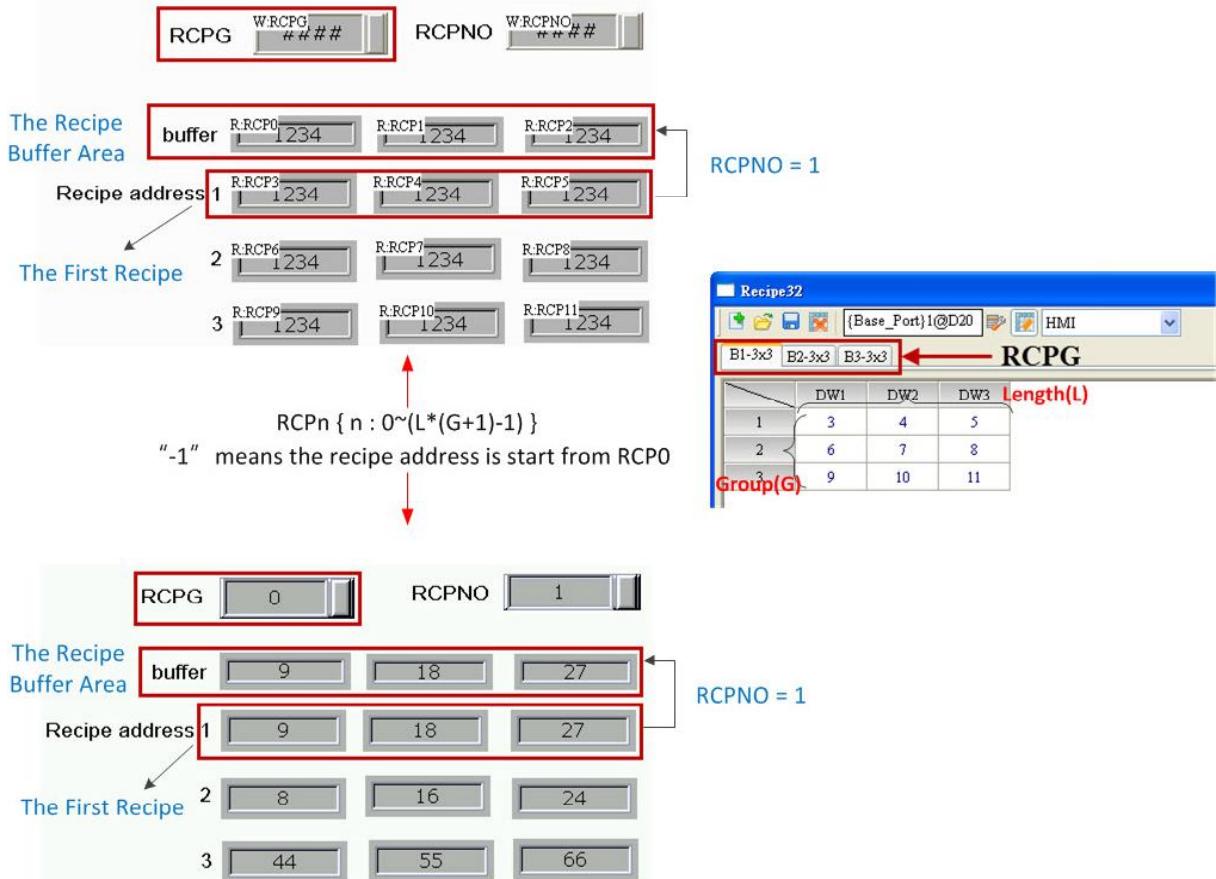


Figure 23-2-1 32 bits recipe Buffer Configuration

32 bits recipe has its own registers, which are RCP, RCPNO and RCPG.

RCP	Recipe register
RCPNO	Recipe number register
RCPG	Recipe group register

RCP and RCPNO are shared with 16 bits recipe, which already mentioned before. The following introduces features of RCPG.

■ Recipe group register (RCPG)

The recipe group register is used to specify the 32 bits recipe group register. Up to 235 groups of 32 bits recipe data can be created.

The RCPG 0 is assigned to 16 bits Recipe. RCPG 1~235 (RCPG 1~255) must be used to call 32 bits recipe data.

For a 32 bits recipe, when the first group of recipes in the first grouping is selected, RCPG = 1 and RCPNO = 1; when the fourth group of recipes in the third grouping is selected, RCPG = 3 and RCPNO = 4.

NOTE:

The recipe group register does not provide the non-volatile function, and the data in the register cannot be maintained when HMI is powered off.

B1-8x10 B2-4x3 B3-5x9								
RCPG = 1								
DW1	DW2	DW3	DW4	DW5	DW6	DW7	DW8	RCPNO = 1
1	3	4	5	0	0	0	0	
2	6	7	8	0	0	0	0	
3	9	10	11	0	0	0	0	
4	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	

	DW1	DW2	DW3	DW4	DWS
1	5	5	5	0	0
2	7	7	7	0	0
3	8	8	8	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0

Figure 23-2-2 32 bits recipe number Editing Screen

■ Recipe number register (RCPNO)

RCPNO is used to specify the group for the 32 bits recipe. Read/write of the recipe means to read/write a group of recipes according to the group assignment in the recipe number register. When the first group of recipes is selected, RCPNO = 1; when the fourth group of recipes is selected, RCPNO = 4.

NOTE:

The recipe number register does not provide the non-volatile function, and the data in the register cannot be maintained when HMI is powered off.

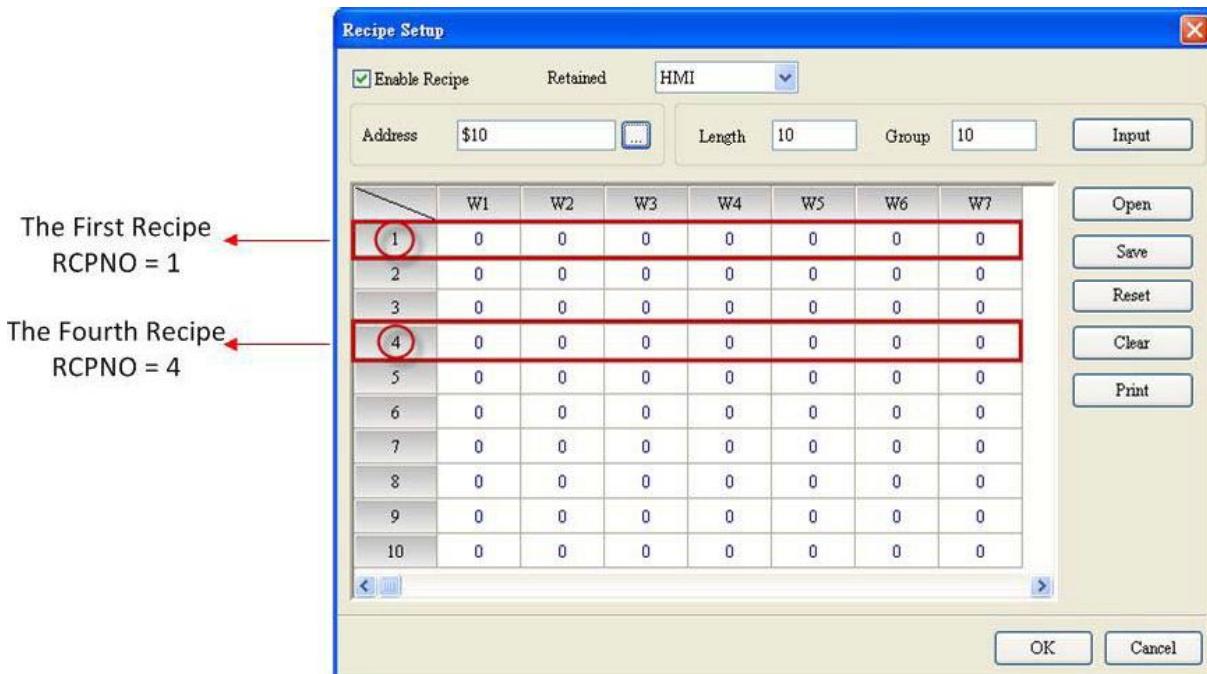


Figure 23-2-3 Recipe Number Editing Screen

■ 32 bits Recipe Size Limit

If the retained area is set to USB Disk or SD Card, the size of a 32 bits recipe file must not be greater than 50MB.

Unlike the 16 bits Recipe, the editable size of a 32 bits recipe is dependent on the HMI flash memory specifications of different models when the retained area is set to HMI.

The user can enter [View] → [Memory List] to check the editable 32 bits recipe size and capacity. (Figure 23-2-4)



The screenshot shows two instances of the 'HMI Memory' dialog box. The top instance displays the 'ROM' section, which includes a summary table and a detailed view for 'Controller', 'Printer', 'Screen Data', and 'Recipe 32'. The bottom instance displays the 'External Storage' section, which includes a summary table and a detailed view for 'Alarm', 'History', 'Recipe16', and 'Recipe 32'. Both sections show memory usage in bytes.

Item	Cost-Bytes
ROM	0.05 % Used
Total Used	45056 (44K)
Available	85983232 (83968K)
Free	85938176 (83924K)
Detail	
Controller	32768 (32K)
Printer	0 (0K)
Screen Data	8192 (8K)
Recipe 32	4096 (4K)
Non-Volatile Area	0.00 % Used
SDRAM	0.43 % Used
External Storage	

Item	Cost-Bytes
Curve	0 (0K)
Image	388 (0K)
Text	11184 (10K)
Background Image	0 (0K)
Total Used	11572 (11K)
Available	39687616 (38757K)
Free	39676044 (38746K)
Screen Saver	Pass
Sub Screen	Pass
2 - Screen_2	0.40 % Used
Macro	0 (0K)
Curve	0 (0K)
Image	20 (0K)
Text	0 (0K)
Background Image	0 (0K)
Total Used	20 (0K)
Available	39687616 (38757K)
Free	39687596 (38757K)
Screen Saver	Pass
Sub Screen	Pass
External Storage	
Alarm	0 (0K)
History	0 (0K)
Recipe16	0 (0K)
Recipe 32	0 (0K)
Total Used	0 (0K)

Figure 23-2-4 32 bits recipe Memory List

Refer to the 32 bits recipe example in Table 23-2-1.

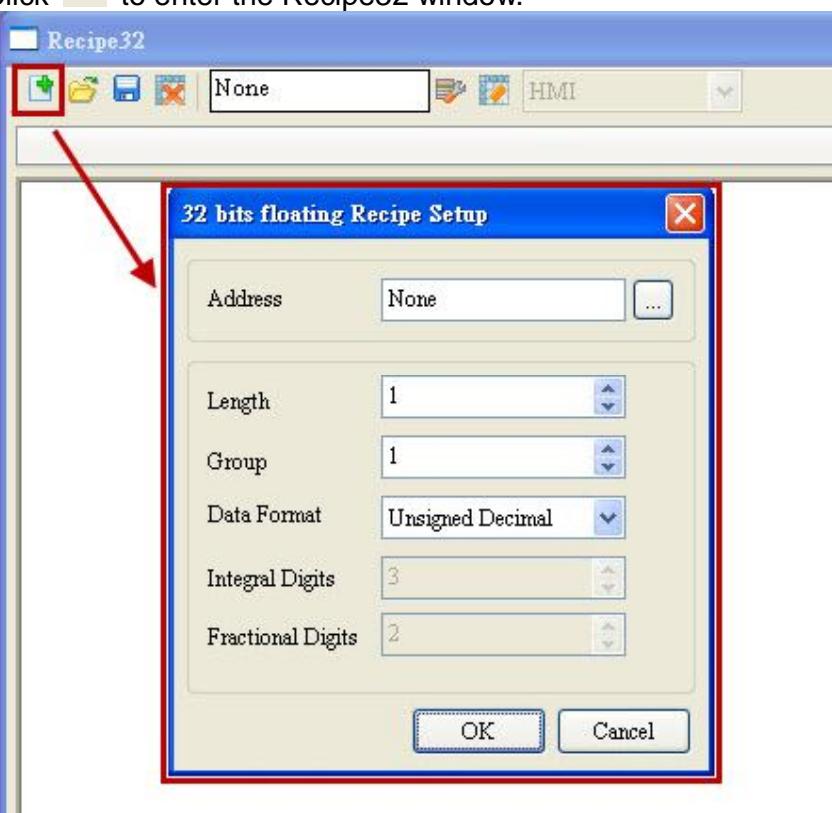
32 bits Recipe Example

Table 23-2-1 32 bits recipe Example

➤ Step 1: Enter [Options] → [32 bits recipe].

- Click  to enter the Recipe32 window.

Set 32 bits recipe

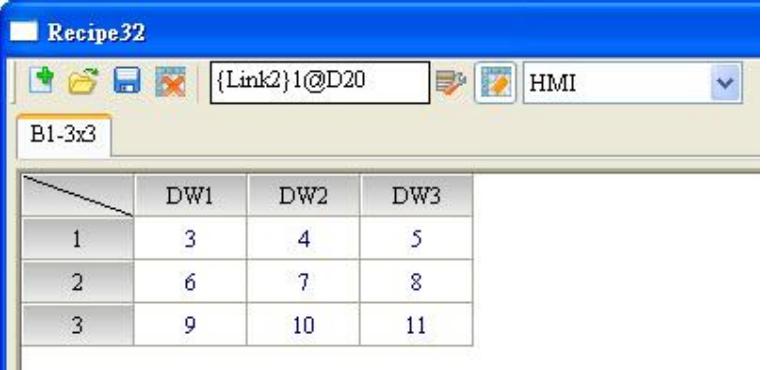


32 bits floating Recipe Setup

Address	None
Length	1
Group	1
Data Format	Unsigned Decimal
Integral Digits	3
Fractional Digits	2

OK Cancel

- Set the Address to D20.
- Set both Length and Group to 3 for the first group of recipe. Both values should not be set to 0.
- Set the Data Format to Unsigned Decimal.



	DW1	DW2	DW3
1	3	4	5
2	6	7	8
3	9	10	11

➤ Step 2: Set the Retained Area to HMI.

32 bits Recipe Example

Table 23-2-1 32 bits recipe Example



- Step 3: Activate the 32 bits recipe function.



- Step 4: Repeat Step 1 to set both Length and Group to 3. The recipe data are shown below:

The screenshot shows the Recipe32 software window displaying a 3x3 grid of data. The grid has columns labeled DW1, DW2, and DW3. The rows are numbered 1, 2, and 3. The data values are as follows:

	DW1	DW2	DW3
1	5	6	7
2	8	9	10
3	11	23	34

- Step 5: Repeat Step 1 to set both Length and Group to 3. The recipe data are shown below:

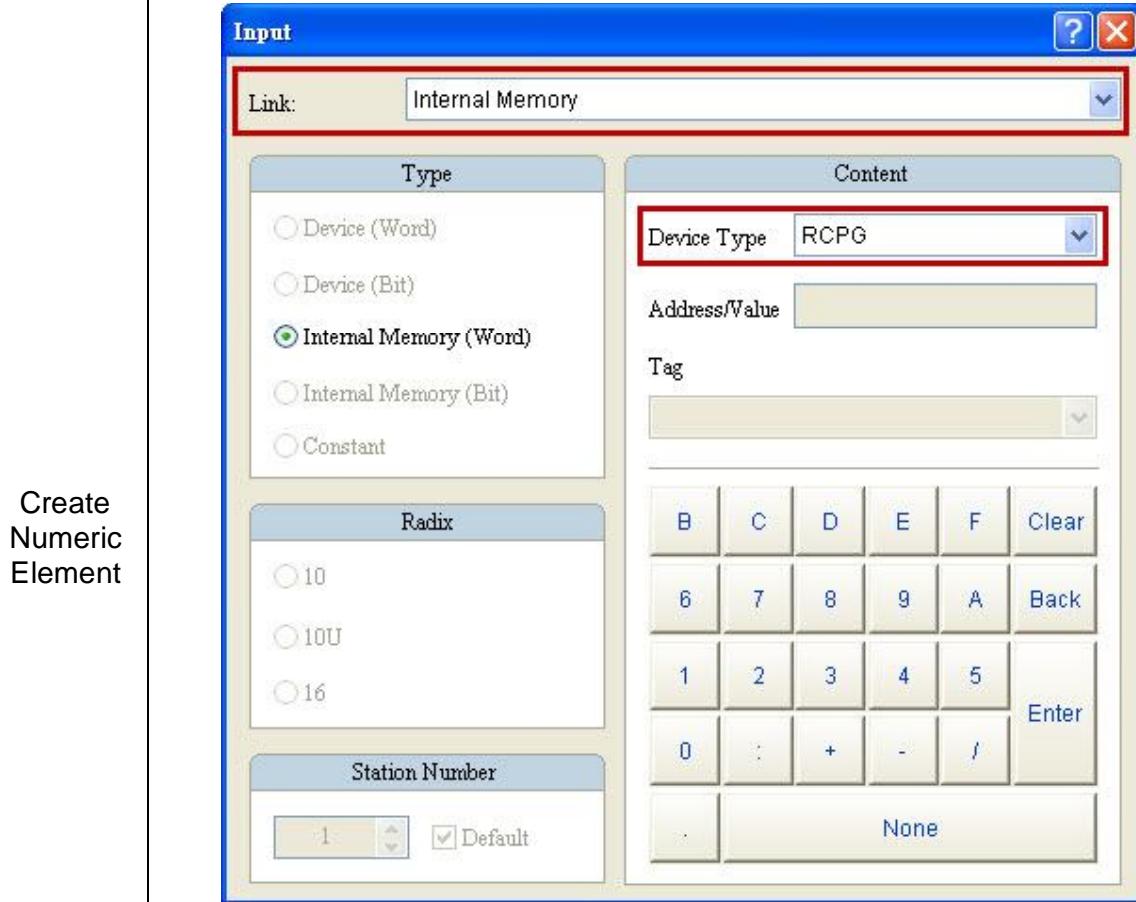
The screenshot shows the Recipe32 software window displaying a 3x3 grid of data. The grid has columns labeled DW1, DW2, and DW3. The rows are numbered 1, 2, and 3. The data values are as follows:

	DW1	DW2	DW3
1	5	5	5
2	7	7	7
3	8	8	8

32 bits Recipe Example

Table 23-2-1 32 bits recipe Example

- Create a numeric element. Set the Write Address to Internal Memory and select RCPG as the element type. This element is used for selection of the recipe grouping.



Create Numeric Element

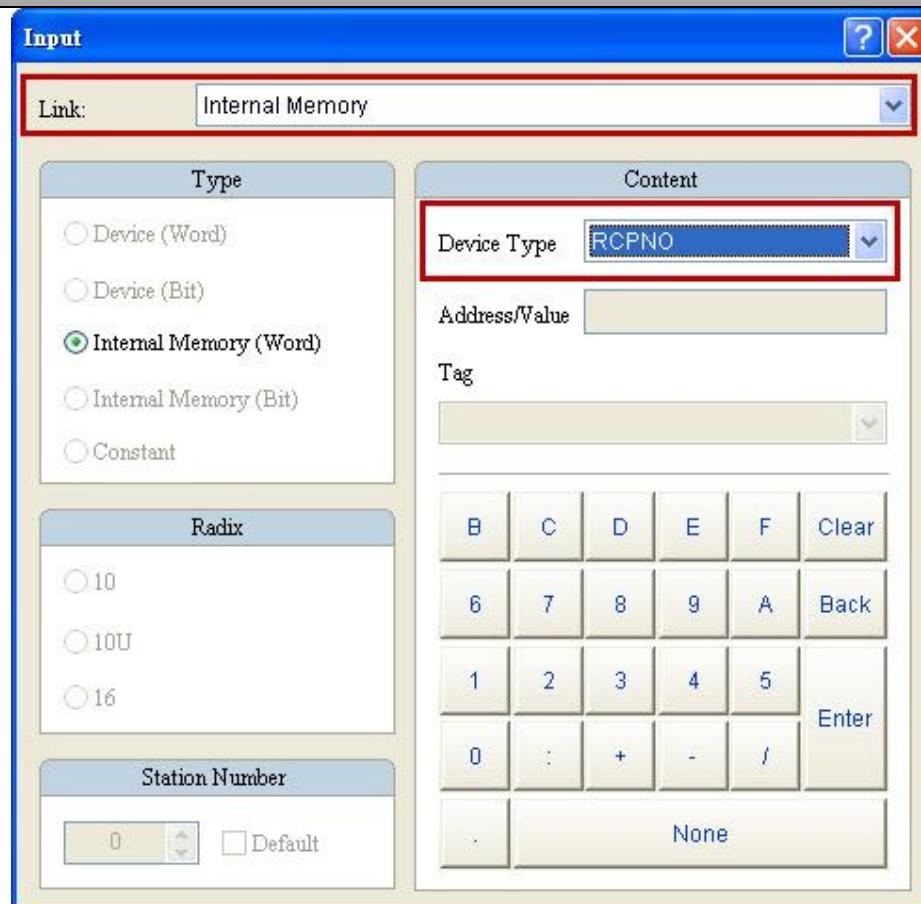
- The following is displayed when the creation is completed.



- Create a numeric element. Set the Write Address to Internal Memory and select RCPNO as the Element Type. This element is used for selection of the recipe number.

32 bits Recipe Example

Table 23-2-1 32 bits recipe Example



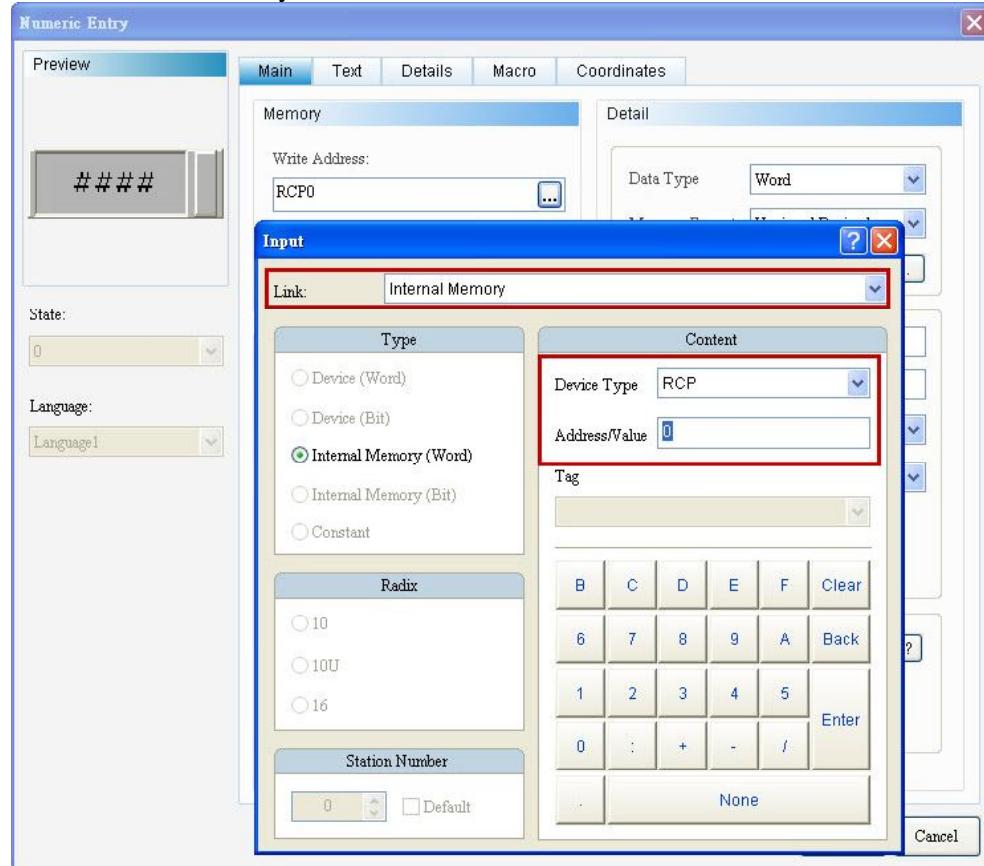
- The following is displayed when the creation is completed.

W:RCPNO
 RCPNO #####

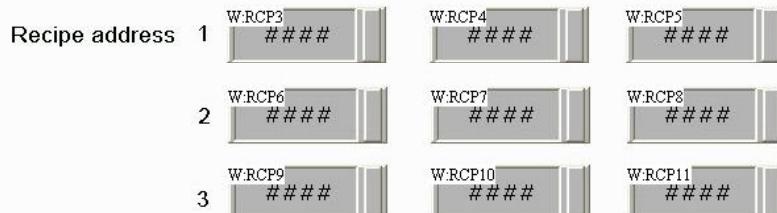
32 bits Recipe Example

Table 23-2-1 32 bits recipe Example

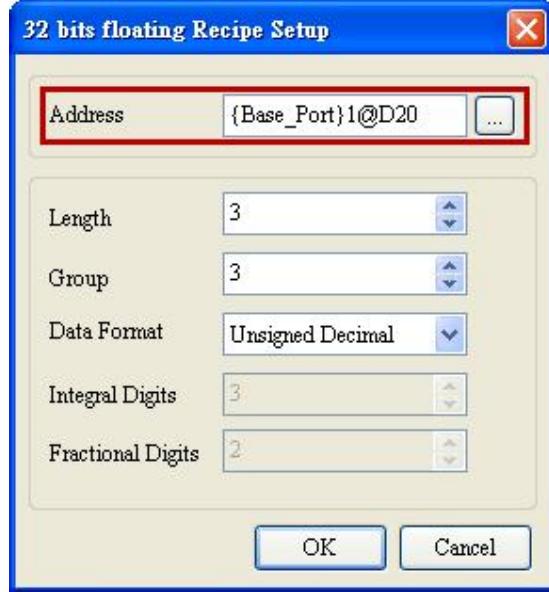
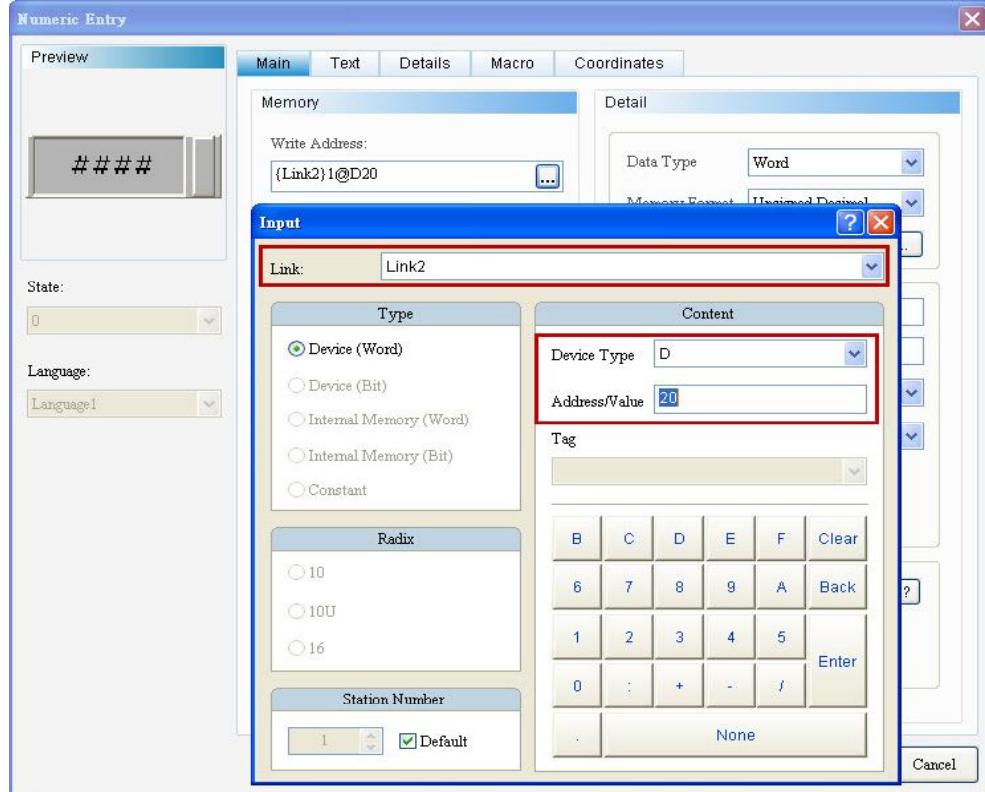
- Step 1: Before the numeric display element is created to display the 32-bit recipe register, the user can use the recipe register formula $[(L^*(G+1)-1)]$ to gain the number that n in RCPn represents. Put the size of the recipe ($L^*G = 3 \times 3$) in the formula to gain $RCPn = RCP0 \sim RCP11$.
- Step 2: Create 12 numeric display elements and set the Read Address to Internal Memory RCP0 and so on.

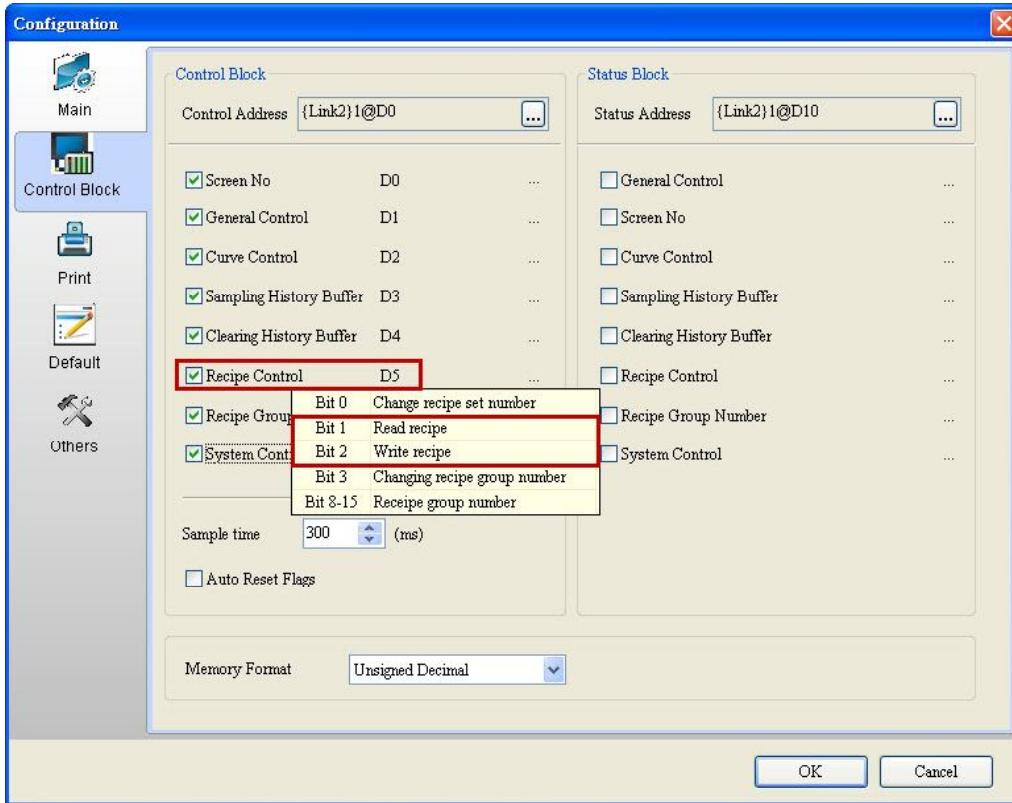
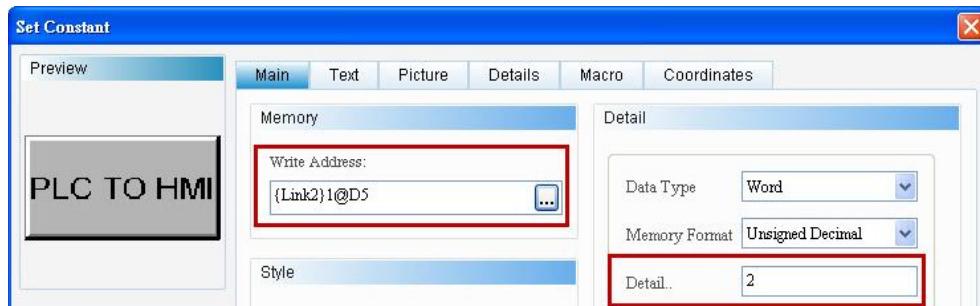


- The following is displayed when the creation is completed.

**NOTE:**

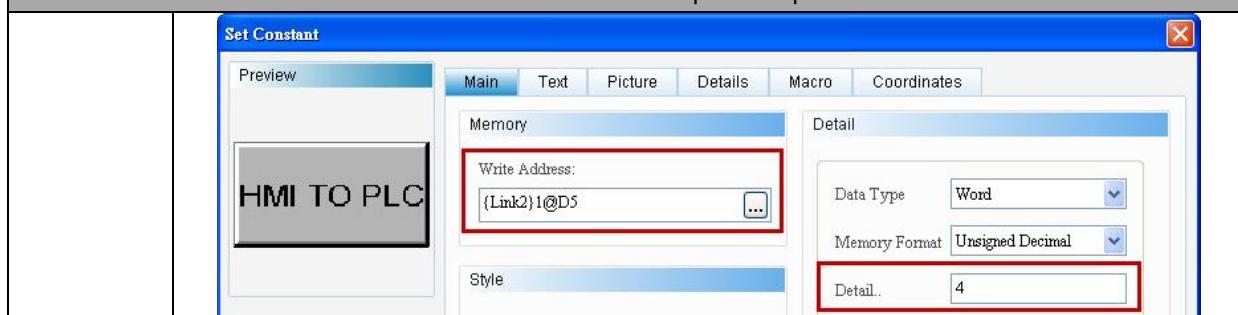
The RCP0~RCP2 created are the recipe buffers and the actual recipe data RCPs are RCP3~RCP11. For more information, refer to Figure 23-1-1-4 16 bits Recipe Buffer Configuration.

32 bits Recipe Example	
Create Numeric Display Element	Table 23-2-1 32 bits recipe Example
	<ul style="list-style-type: none"> ➤ Create 3 numeric display elements with reference to the address set up on the 32 Bits Recipe Setup window. The purpose of the creation is to show the change of the data when the user reads or writes PLC recipes. Since the 32 bits recipe uses the Double Word format, the recipe address entered must increase by 2 from D20 to D23 and D24. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> ➤ Set the Read Address of the numeric display element to Base_Port D20. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> ➤ The following is displayed when the creation is completed.

<h3 style="text-align: center;">32 bits Recipe Example</h3> <p style="text-align: center;">Table 23-2-1 32 bits recipe Example</p>											
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center; padding: 5px;"> PLC address </td><td style="width: 33%; text-align: center; padding: 5px;"> W:{Link2}1@D20 ##### </td><td style="width: 33%; text-align: center; padding: 5px;"> W:{Link2}1@D22 ##### </td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td style="text-align: right; padding: 5px;"> W:{Link2}1@D24 ##### </td></tr> </table>		PLC address	W:{Link2}1@D20 #####	W:{Link2}1@D22 #####						W:{Link2}1@D24 #####
PLC address	W:{Link2}1@D20 #####	W:{Link2}1@D22 #####									
		W:{Link2}1@D24 #####									
Set Recipe Control Flag in Control Block	<ul style="list-style-type: none"> ➤ Enter [Options] → [Configuration....] → [Control Block] and check the [Recipe Control] flag. Set the Control Address in the Control Block to define that Recipe Control address. After the setting is completed, click [OK] to leave the Configuration Window. 										
Create Permanent Numeric Button Element	<ul style="list-style-type: none"> ➤ Create 2 permanent numeric buttons. Set the Write Address to D5 and the Setting to 2 and 4, respectively, corresponding to Bit 1 and Bit 2 of the Recipe Control flag D5. This setup is used for read and write of the recipe. 										

32 bits Recipe Example

Table 23-2-1 32 bits recipe Example



32 bits Recipe Example

Table 23-2-1 32 bits recipe Example

- After creation of all elements, perform the compilation and download the screen data and recipe to HMI.



The recipe grouping is set to 0 by default after the download, indicating that the data displayed is 16 bits Recipe data. The user must change the setting of the recipe grouping to 1 to display 32 bits recipe data.

Execution Results

RCPG = 0 means use 16 bit recipe data

RCPG	0	RCPNO	1
Buffer	9	18	27

Recipe address 1	9	18	27
2	8	16	24
3	44	55	66

16 bit recipe data

PLC address	0	0	0
-------------	---	---	---

Recipe Setup

Enable Recipe Retained HMI

Address: (Link2) 1@D20

	W1	W2	W3
1	9	18	27
2	8	16	24
3	44	55	66

PLC TO HMI

HMI TO PLC

RCPG = 1 means use 32 bit recipe data

RCPG	1	RCPNO	1
Buffer	3	4	5

Recipe address 1	3	4	5
2	6	7	8
3	9	10	11

32 bit recipe data

PLC address	0	0	0
-------------	---	---	---

PLC TO HMI

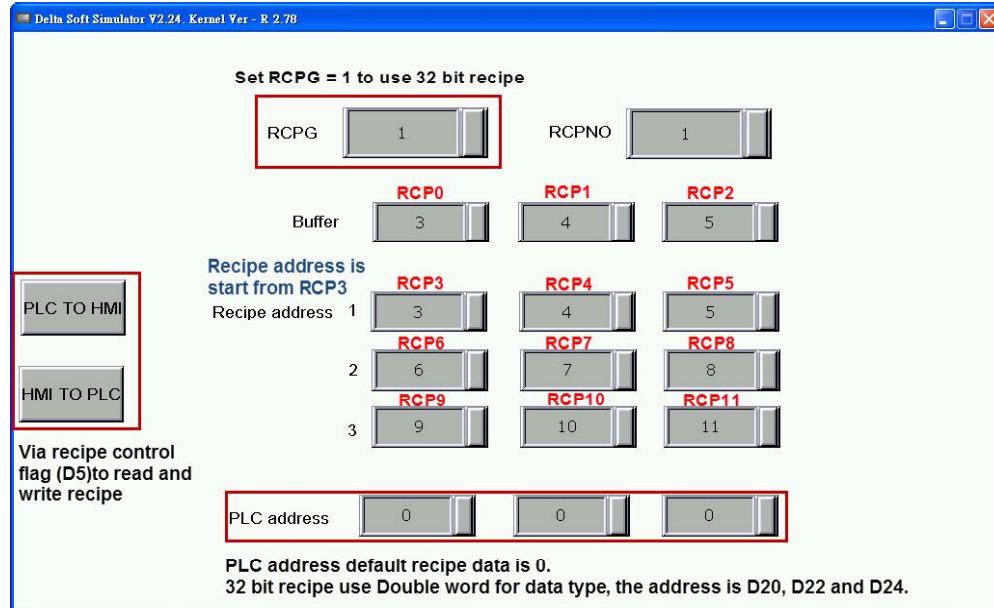
HMI TO PLC

The recipe data will be displayed in the created RCP0~RCP11 with reference to the selected recipe grouping. The RCP0~RCP2 created are the recipe

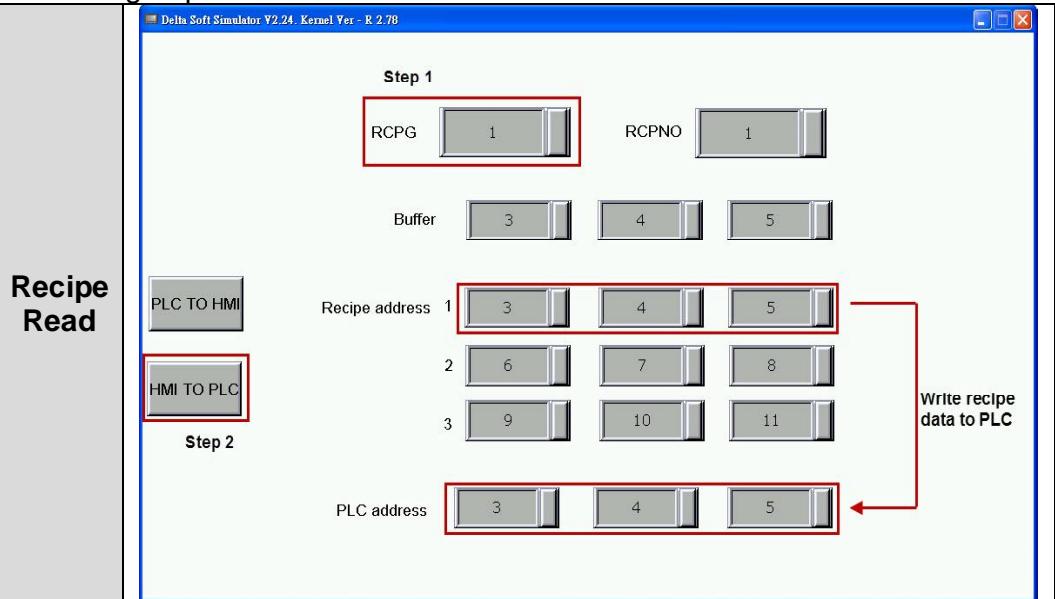
32 bits Recipe Example

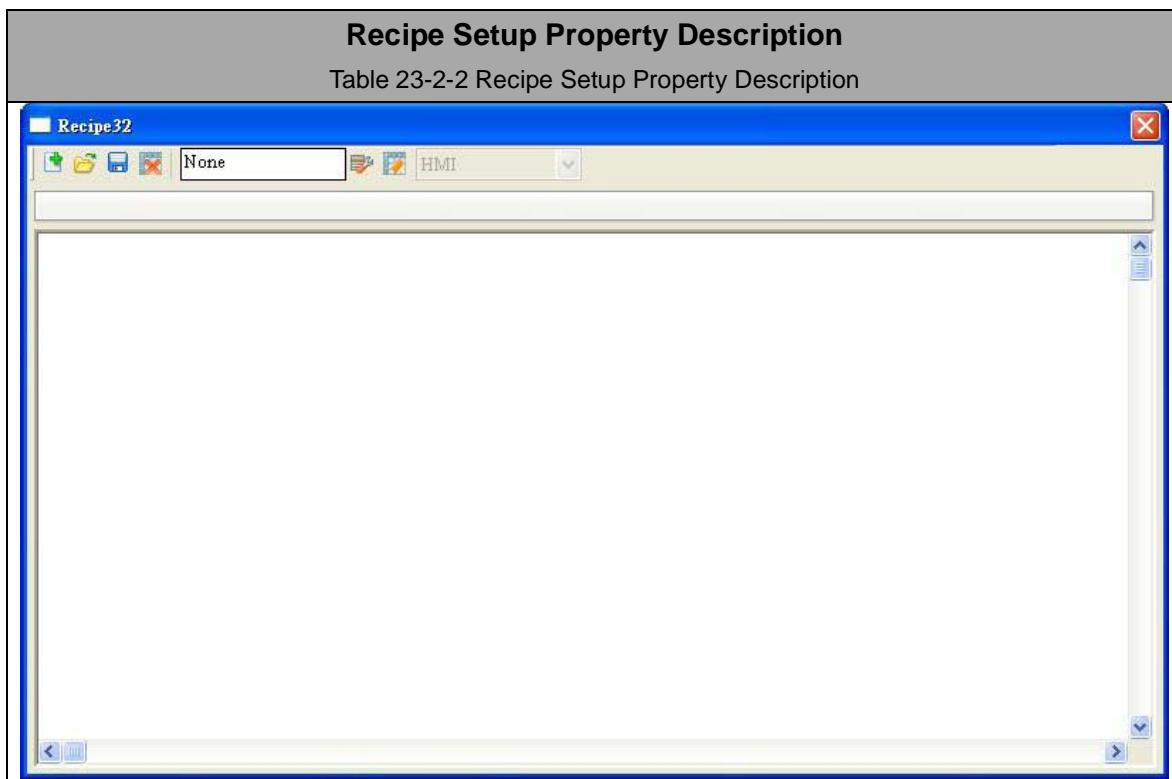
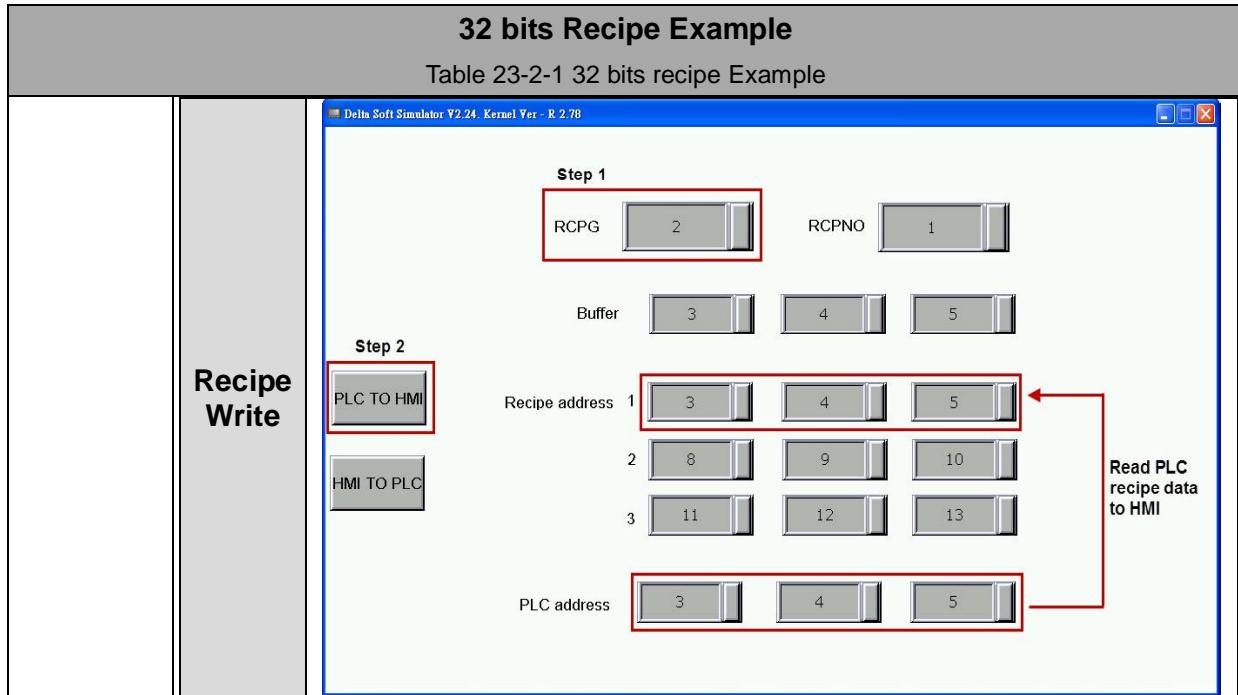
Table 23-2-1 32 bits recipe Example

buffers and the RCPs for the first group of recipe data are actually RCP3~RCP11.



Activate the Recipe Write button and the recipe data of the selected group will be written to PLC. Activate the Recipe Read button and the recipe data that were written to the PLC will be read back to HMI with reference to the selected recipe group. The recipe data will be changed to match the content of the selected group.

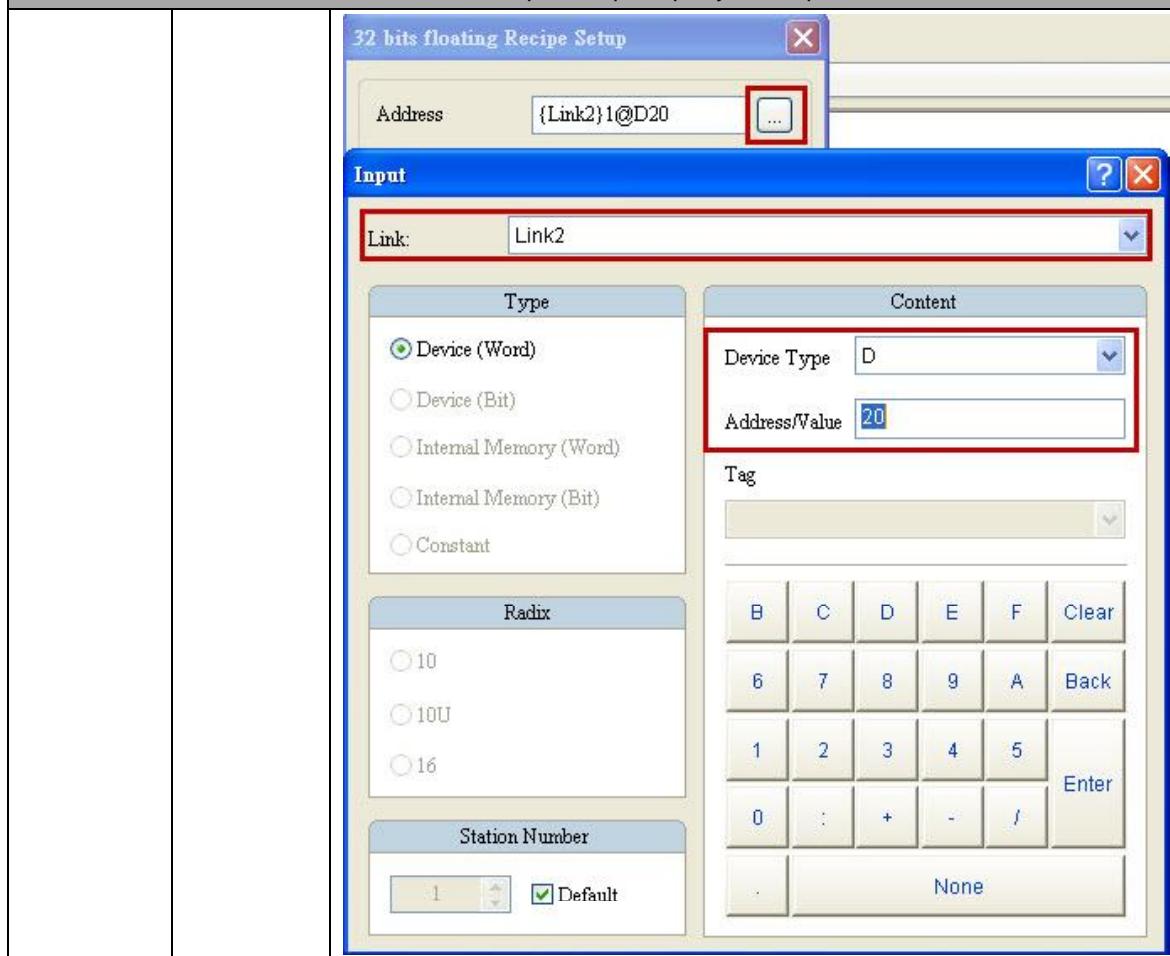


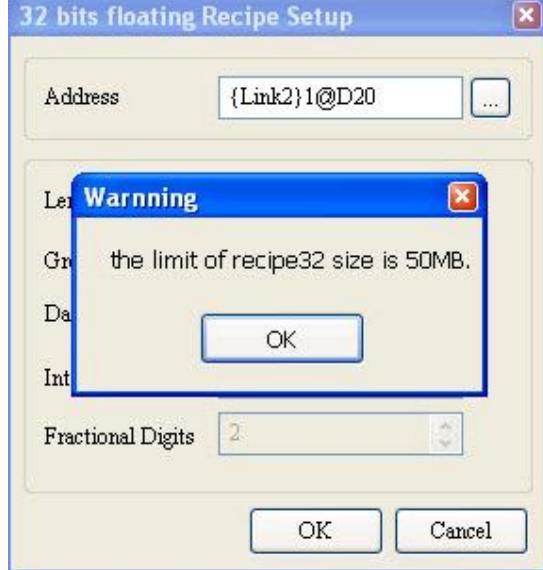
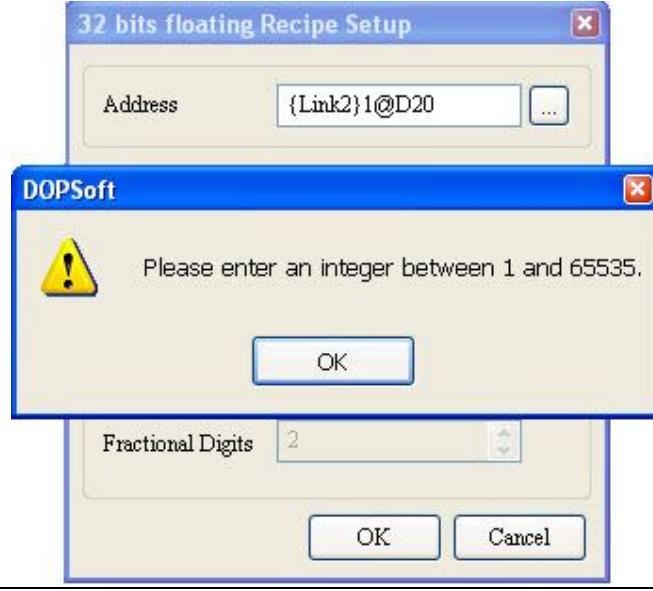


Recipe Setup Property Description	
	Table 23-2-2 Recipe Setup Property Description
Add 	<ul style="list-style-type: none"> ➤ The  must be clicked to add 32 bits recipe data in order to enter the 32 Bits Recipe Setup window.  <p>The dialog box is titled "32 bits floating Recipe Setup". It contains the following fields:</p> <ul style="list-style-type: none"> Address: A dropdown menu showing "None" with a "...>" button. Length: A numeric input field set to "1" with up/down arrows. Group: A numeric input field set to "1" with up/down arrows. Data Format: A dropdown menu set to "Unsigned Decimal" with a dropdown arrow. Integral Digits: A numeric input field set to "3" with up/down arrows. Fractional Digits: A numeric input field set to "2" with up/down arrows. <p>At the bottom are "OK" and "Cancel" buttons.</p>
	<ul style="list-style-type: none"> ➤ The user can operate  to add up to 255 32 bits recipe data records.
Address	<ul style="list-style-type: none"> ➤ Selects the address of internal memory or controller register. ➤ Selects link name or element type. Please refer to 5-1 Button for details. ➤ The same address is shared by all 32 bits recipes regardless of the number of groups.

Recipe Setup Property Description

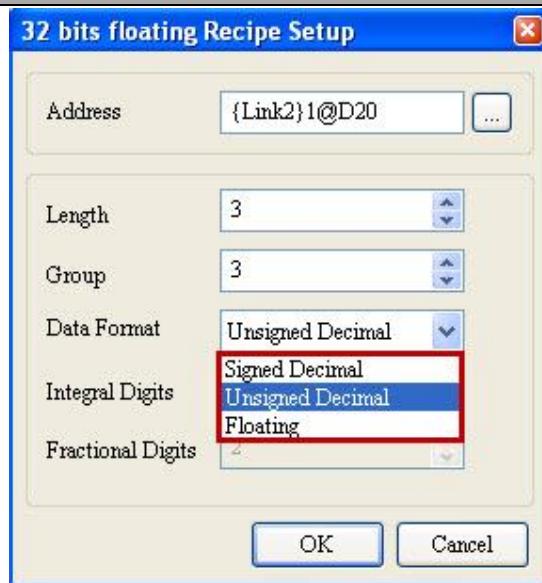
Table 23-2-2 Recipe Setup Property Description



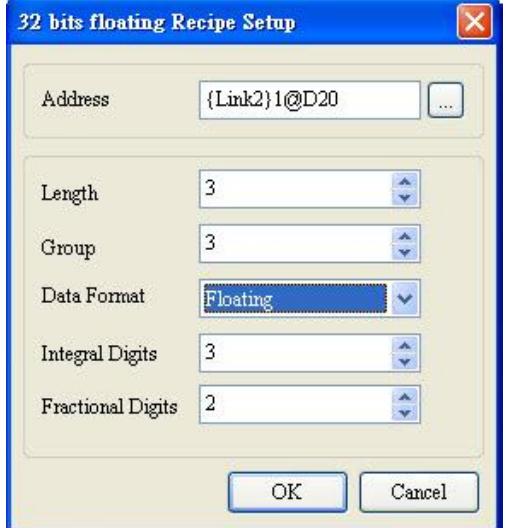
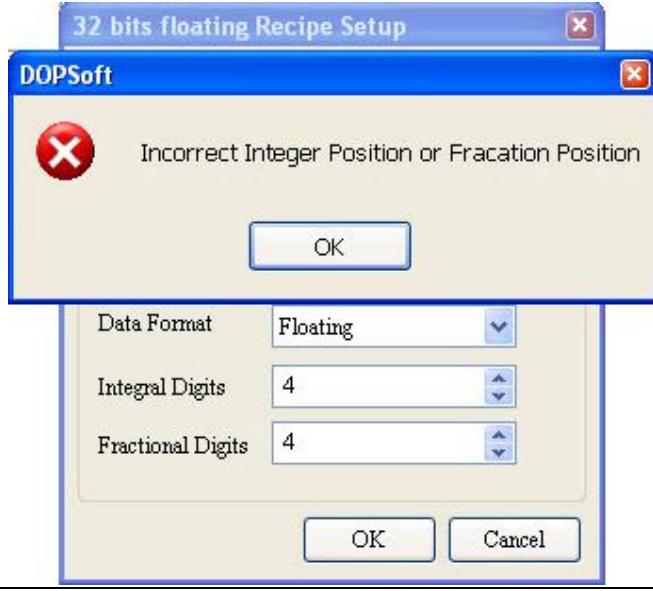
Recipe Setup Property Description		
Table 23-2-2 Recipe Setup Property Description		
	Length	<ul style="list-style-type: none"> ➤ The user enters the length and group sizes of the recipe in the Length and Group fields, respectively. The L*G size of the recipe should not be greater than 50MB. 
	Group	<ul style="list-style-type: none"> ➤ The Length and Group cannot be set to 0. If any of the values is set to 0, an error message will appear to warn the user. 
	Data Format	<ul style="list-style-type: none"> ➤ The Data Format supports Signed Decimal, Unsigned Decimal and Floating.

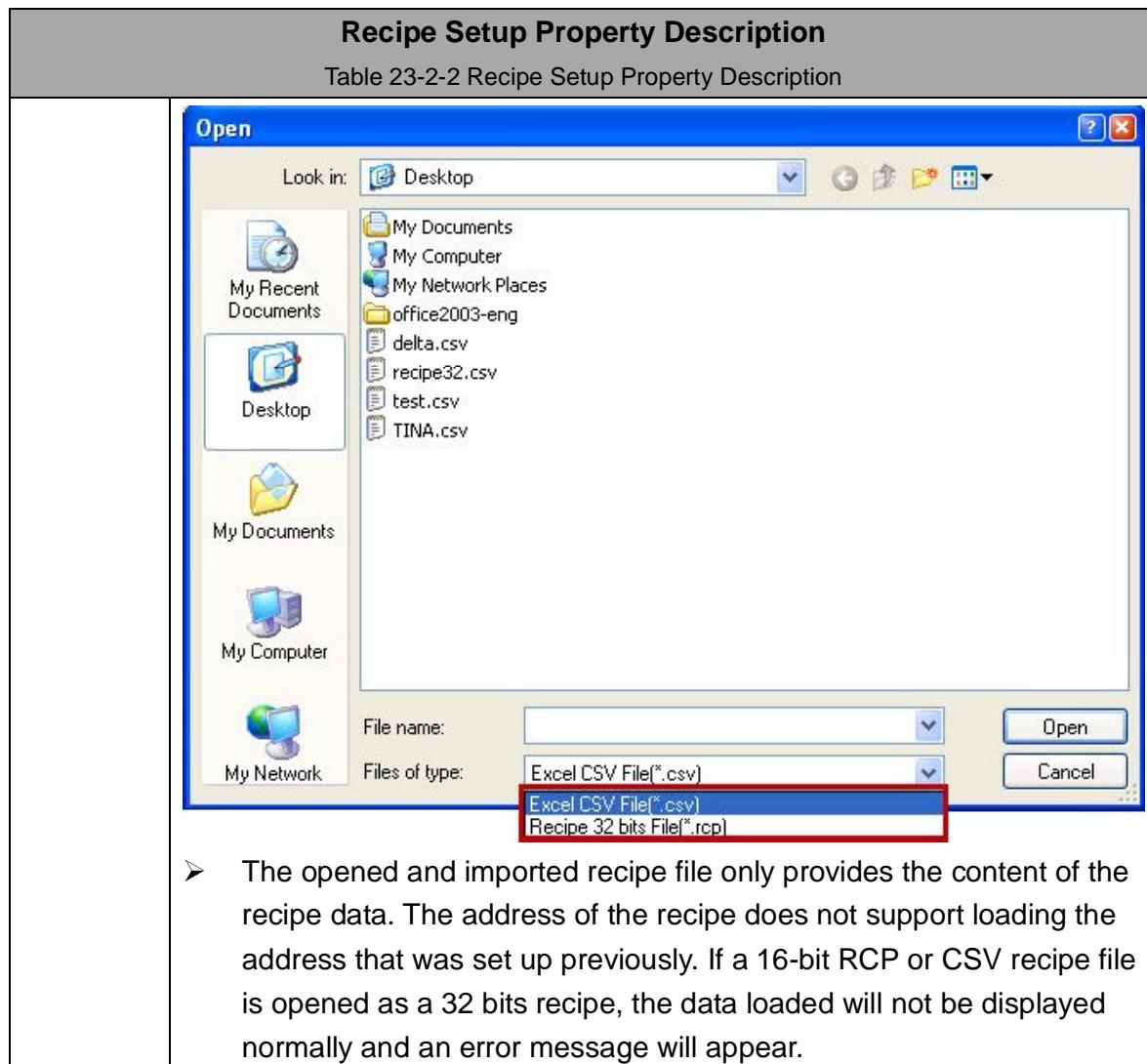
Recipe Setup Property Description

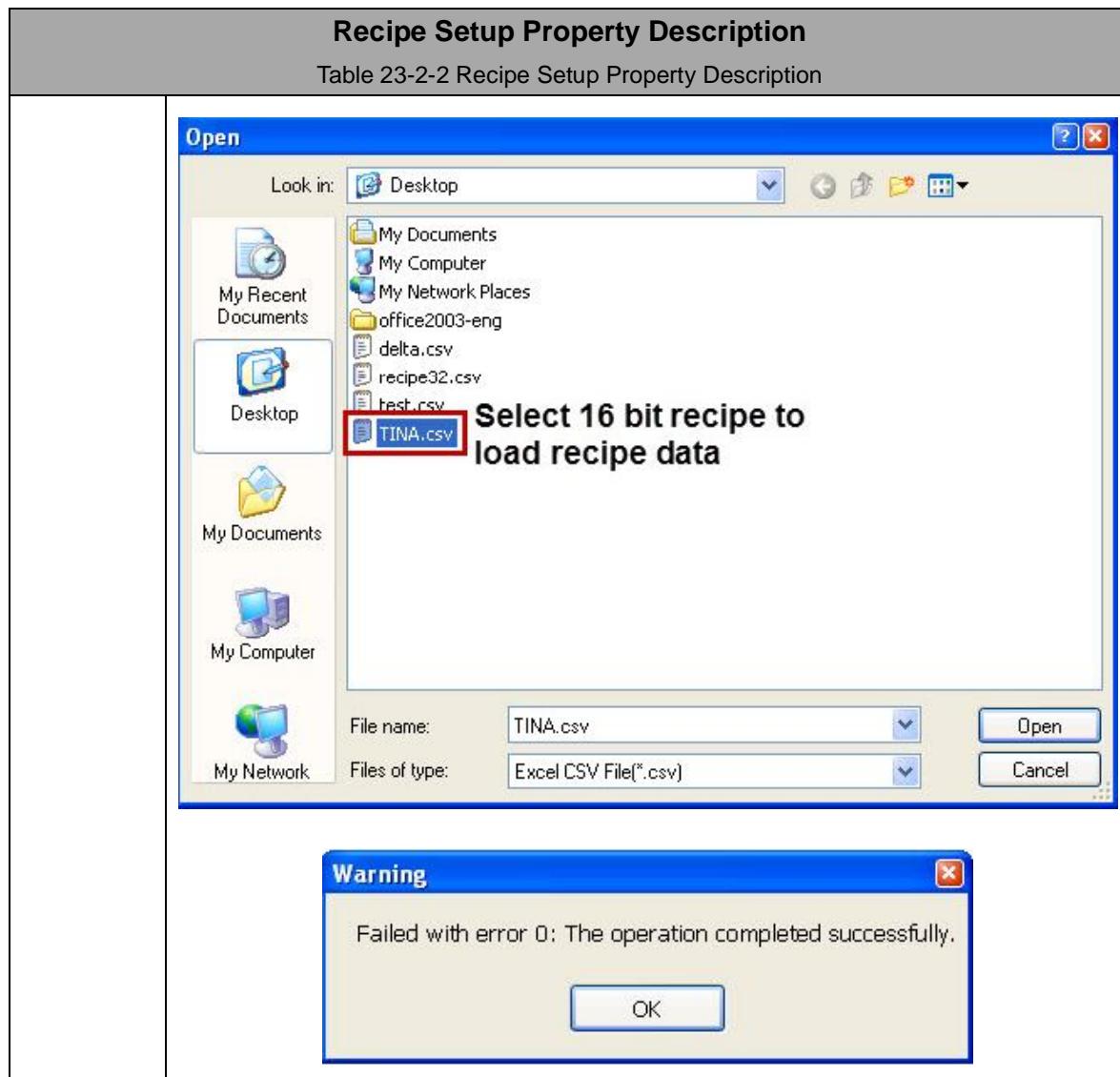
Table 23-2-2 Recipe Setup Property Description

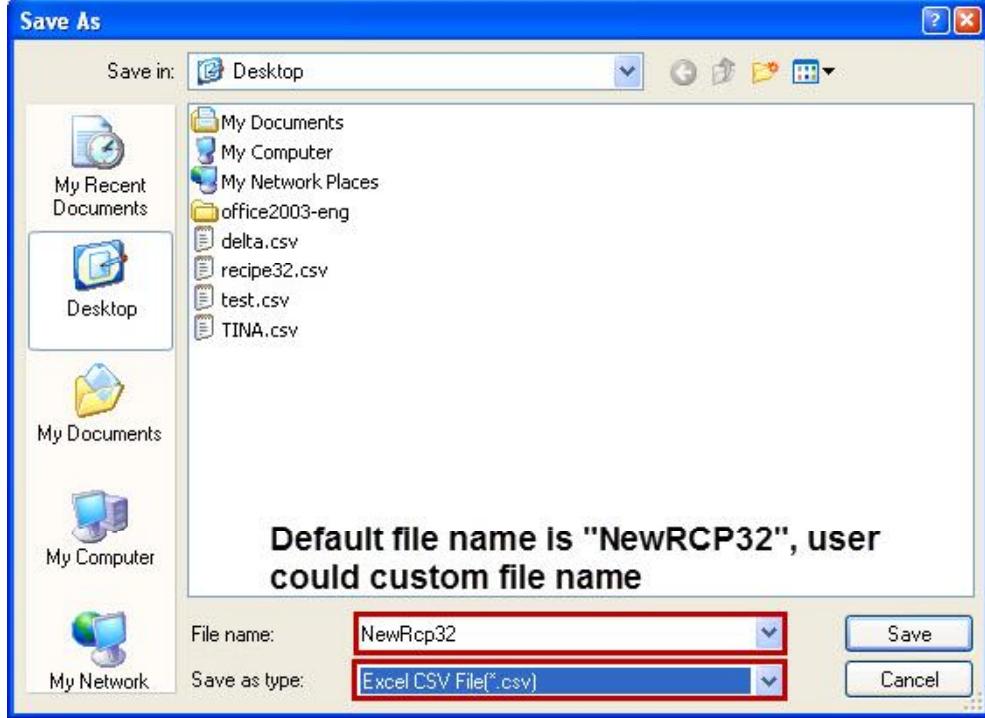


Recipe Setup Property Description		
Table 23-2-2 Recipe Setup Property Description		
Integer Place		<ul style="list-style-type: none"> ➤ Floating must be selected as the data format to set the integer and decimal places.
	Signed Decimal	<p>32 bits floating Recipe Setup</p> <p>Address: {Link2}1@D20</p> <p>Length: 3</p> <p>Group: 3</p> <p>Data Format: Signed Decimal</p> <p>Integral Digits: 3</p> <p>Fractional Digits: 2</p> <p>OK Cancel</p>
Decimal Place	Unsigned Decimal	<p>32 bits floating Recipe Setup</p> <p>Address: {Link2}1@D20</p> <p>Length: 3</p> <p>Group: 3</p> <p>Data Format: Unsigned Decimal</p> <p>Integral Digits: 3</p> <p>Fractional Digits: 2</p> <p>OK Cancel</p>

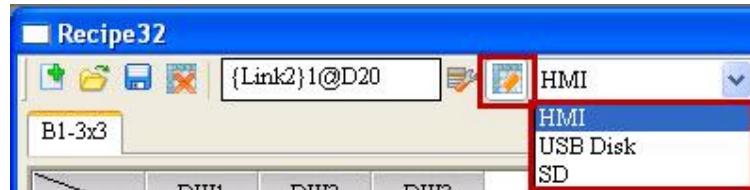
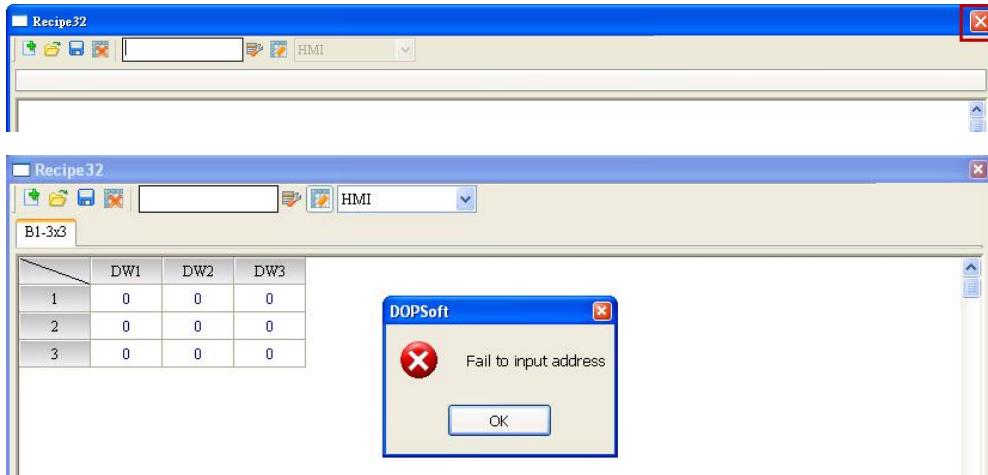
Recipe Setup Property Description Table 23-2-2 Recipe Setup Property Description		
		 <p style="text-align: center;">Floating</p>
		<ul style="list-style-type: none"> ➤ The sum of the integer and decimal places can only support 7 digits with Floating as the data format. If there are more than 7 digits, a warning message will appear to remind the user. 
 Open		<ul style="list-style-type: none"> ➤ The [Open] function provides CSV and RCP file formats for the user to import the recipe.





<h3 style="text-align: center;">Recipe Setup Property Description</h3> <p style="text-align: center;">Table 23-2-2 Recipe Setup Property Description</p>	
Save 	<ul style="list-style-type: none"> ➤ The [Save] function enables the user to save the current 32 bits recipe. Unlike the Open function, the Save function only supports CSV file format. <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  <p style="text-align: center;">Default file name is "NewRCP32", user could custom file name</p> </div> <ul style="list-style-type: none"> ➤ The recipe data that the user saved does not support the recipe address set up by the Save function.
Remove 	<ul style="list-style-type: none"> ➤ The [Remove] function is used to remove 32 bits recipe data. When executing the Remove function, a popup window will appear asking the user to confirm the removal. <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  </div>
Setup 	<ul style="list-style-type: none"> ➤ The [Setup] function is enabled and operable only when there are data in the 32 bits recipe. This function enables the user to change the length and group sizes as well as data format.



Recipe Setup Property Description	
Table 23-2-2 Recipe Setup Property Description	
\$66	<ul style="list-style-type: none"> ➤ This field is used to enter the recipe address. The user can also use the Add function to enter and set the address.
Retained Area	<ul style="list-style-type: none"> ➤ The [] option must be enabled to set the retained area.  <ul style="list-style-type: none"> ➤ The retained area can be HMI, USB Disk or SD Card. ➤ When HMI is selected as the retained area, the data will be recorded in HMI SRAM in case of power-off.
X on the Recipe 32 Window	<ul style="list-style-type: none"> ➤ This function is used to exit the editing window of the recipe data. The data will be saved no matter whether they are changed or not. The recipe address will also be checked for its correctness when pressing X. 

23-3 Indirect Recipe Index Register (*RCP)

Indirect recipe index register can be used by 16 bits and 32 bits register.

Indirect recipe index register (*RCP n) acquires the value from RCP n first. Regard this value as the new address. Then, access the value from the new address. For example, RCP1 = 3, RCP3 = 99, so *RCP1= 99. See figure 23-3-1.

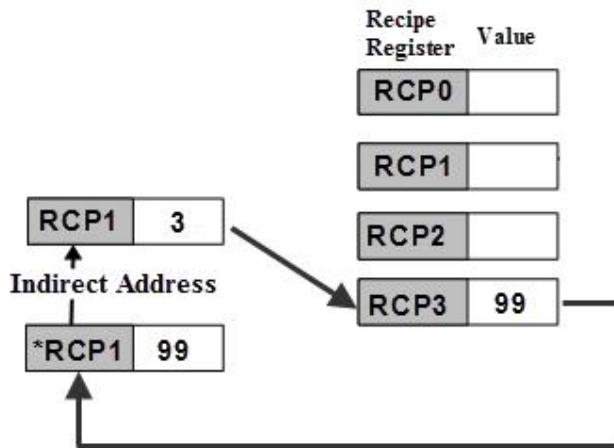


Figure 23-3-1 Recipe Index

The accessing range of indirect recipe index register:

Access Type	Element Type	Access Range
Word	*RCPn	RCP0~RCP65535
Note: n = Word (0-65535)		

Address accessing range provided by *RCP is limited according to the recipe size created by users. Assuming the recipe size is length 3* group 3, then address of RCP is range from *RCP0 to *RCP11. When creating address *RCP12, a warning message will pop up.

Please see figure below:

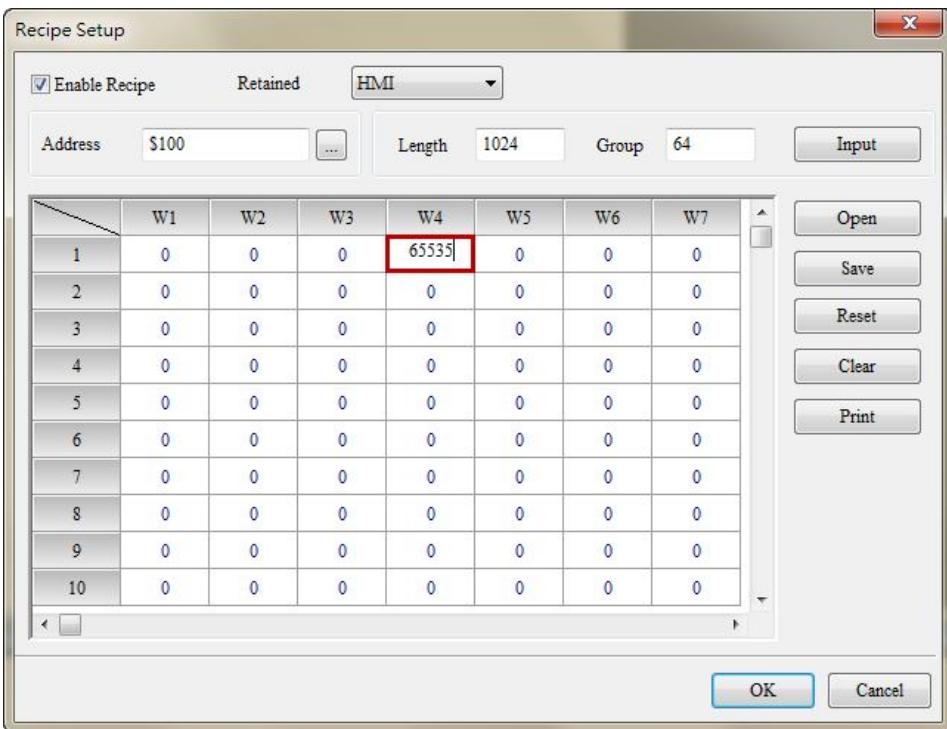
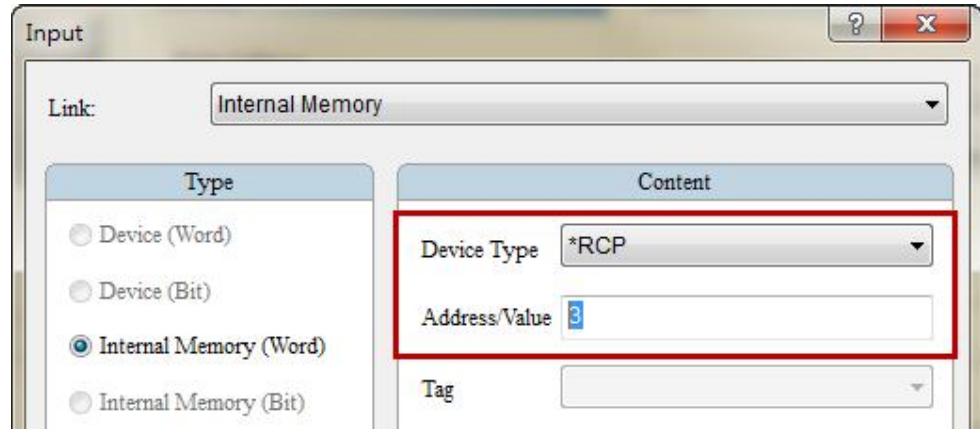


Figure 23-3-2 Indirect Recipe Index Register Configuration

Following will introduce the example of indirect recipe index.

Example of Indirect Recipe Index Register

Table 23-3-1 Example of indirect recipe index register

Sets16 bits recipe	<ul style="list-style-type: none"> ➤ Step1: Create 16 bits recipe (length-1024; group-64) and set RCP3 to 65535. 
Create Numeric Entry Element	<ul style="list-style-type: none"> ➤ Step2: Create numeric entry element and select the device type as *RCP, then enter 3 to address.  <ul style="list-style-type: none"> ➤ Step 3: Create numeric entry element and select the device type as RCP, then enter 3 to address. ➤ Step 4: Create numeric entry element and select the device type as RCP, then enter 65535 to address. ➤ Step 5: Create Clock macro command *RCP3 = *RCP3 + 1.

Example of Indirect Recipe Index Register

Table 23-3-1 Example of indirect recipe index register

Result	➤ After executing compiling, download it to HMI. Value of *RCP3 and RCP65535 will be increased simultaneously.
	<p>The diagram illustrates the state of registers after compilation. On the left, a digital input labeled <code>*RCP3</code> has the value <code>160</code>. To its right is a row of five digital outputs labeled <code>RCP0</code>, <code>RCP1</code>, <code>RCP2</code>, <code>RCP3</code>, and <code>RCP65535</code>. Each output has a value of <code>0</code> except for <code>RCP3</code> which has the value <code>65535</code>. Below this row is another row where each output has the value <code>160</code>.</p>

23-4 Enhance Recipe

During production process, sometimes information with character format is needed. Thus, enhance recipe which can record character format (String)/numeric format is provided. Its supported data type is Word or Double Word and its data format can be BCD, Signed Decimal, Unsigned Decimal, Hex, Floating and Char. Among them, the read length of Char format can up to 32 Words (= 64 bits).

The setting method of its control area is the same as 16 bits / 32 bits recipe, but applying different addresses. When reading or writing the recipe, users have to specify the recipe number and recipe group before reading/writing one group of recipes.

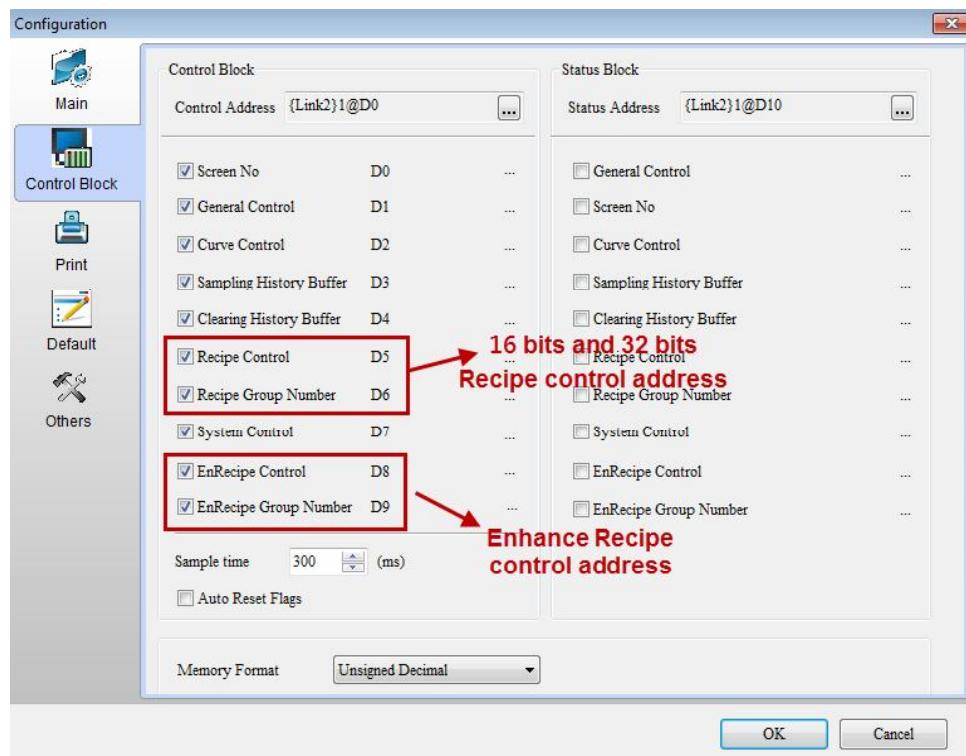


Figure 23-4-1 Using enhance recipe address in control area

Enhance recipe has its own register, including ENRCP, ENRCPO, ENRCPG and *ENRCP.

ENRCP	Enhance recipe register
ENRCPO	Enhance recipe number register
ENRCPG	Enhance recipe group register
*ENRCP	Enhance indirect recipe index register

Followings will introduce features of each register that mentioned above.

■ Enhance Recipe Number Register (ENRCPNO)

ENRCPNO is used to specify the group for the Enhance Recipe. Read/write of the recipe means to read/write a group of recipes according to the group assignment in the recipe number register. When the first group of recipes is selected, ENRCPNO = 1; when the fourth group of recipes is selected, ENRCPNO = 4.

NOTE:

The recipe number register does not provide the non-volatile function, and the data in the register cannot be maintained when HMI is powered off.

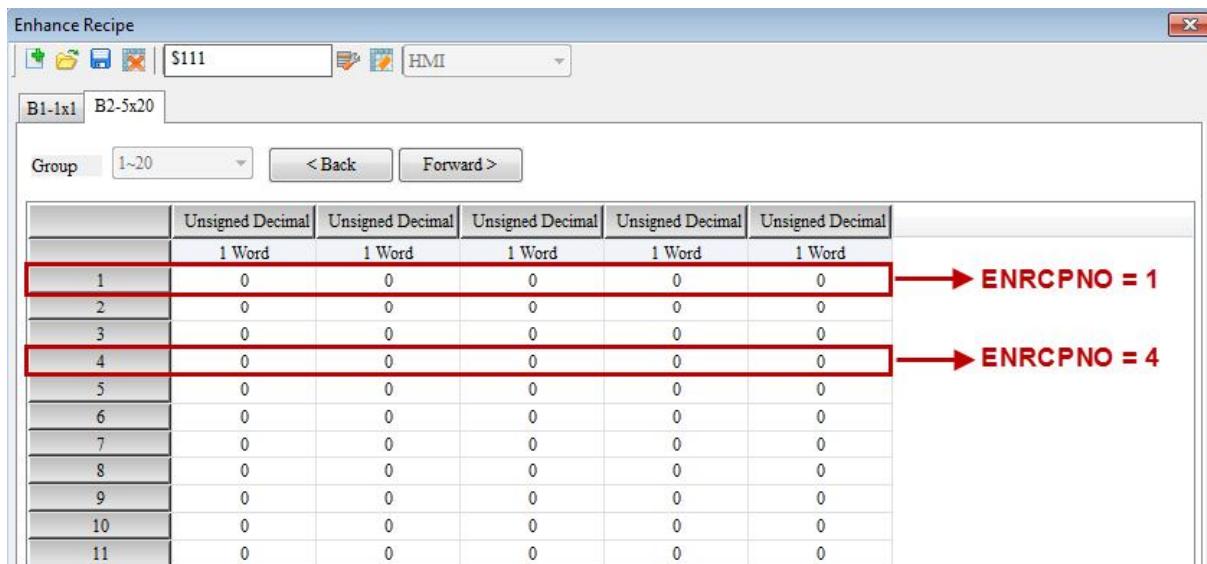


Figure 23-4-2 Enhance Recipe Number Editing Screen

■ Enhance Recipe Register (ENRCP)

A recipe buffer is provided in HMI and configured in the utmost front of the register. This buffer is used to store the recipe of the group that the user selected. The length of the buffer is equal to the length of the selected recipe, indicating that the recipe buffer occupies a number of registers equal to L. The number of the registers that a recipe form occupies is $L^*(G+1)$, where G+1 stands for the additional register for the buffer. With the recipe buffer, the user only needs to switch between the groups to check the currently specified recipe parameter. When the selected recipe group (ENRCPO) is 1, the recipe value of Group 1 will be displayed in the recipe buffer (i.e. ENRCPO = 1 in the figure below).

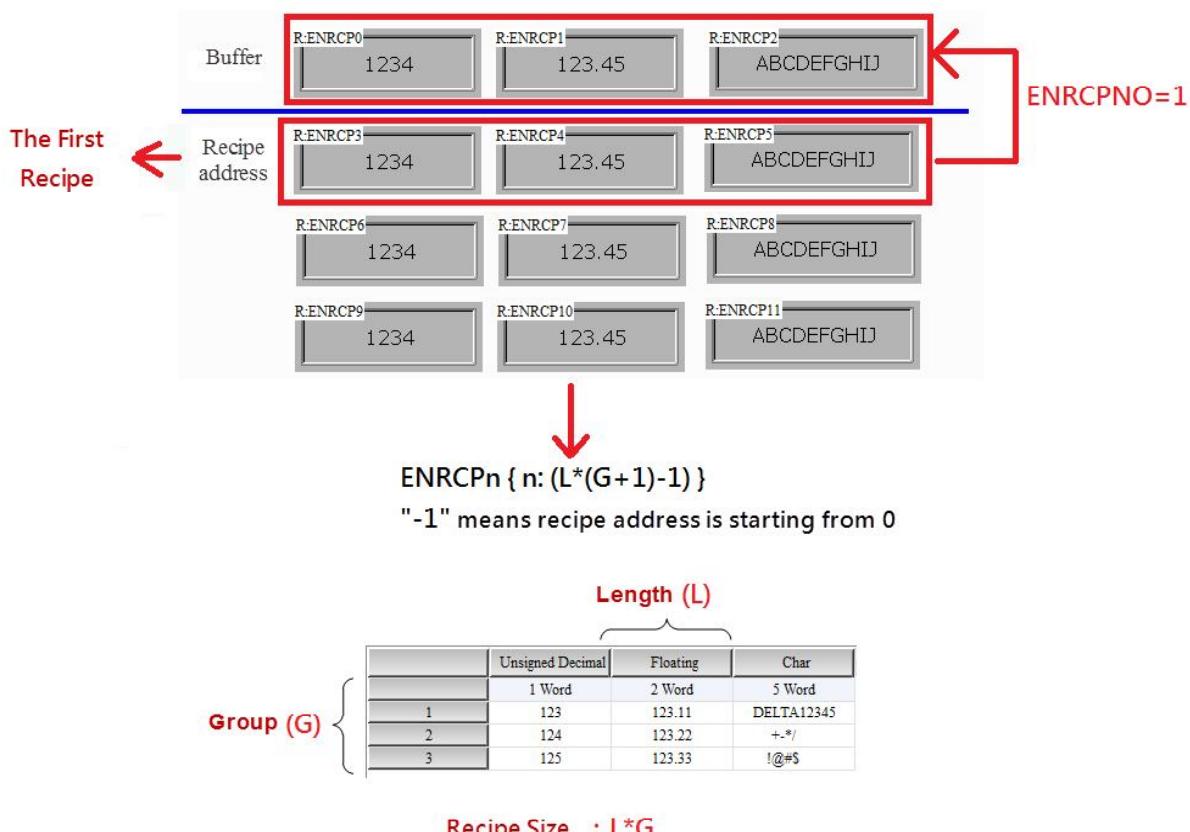


Figure 23-4-3 Enhance Recipe Buffer Area Configuration

■ Enhance Recipe Group Register (ENRCPG)

ENRCPG is used to specify enhance recipe group. Up to 255 groups of enhance recipe data can be created. ENRCPG 1~255 (RCPG 1~255) must be used to call enhance recipe data. If enhance recipe is activated, the default value of recipe group is 1.

When the first group of recipes in the first grouping is selected, ENRCPG = 1 and ENRCPNO = 1; when the third group of recipes in the second grouping is selected, ENRCPG = 3 and ENRCPNO = 2.

NOTE:

The recipe number register does not provide the non-volatile function, and the data in the register cannot be maintained when HMI is powered off.

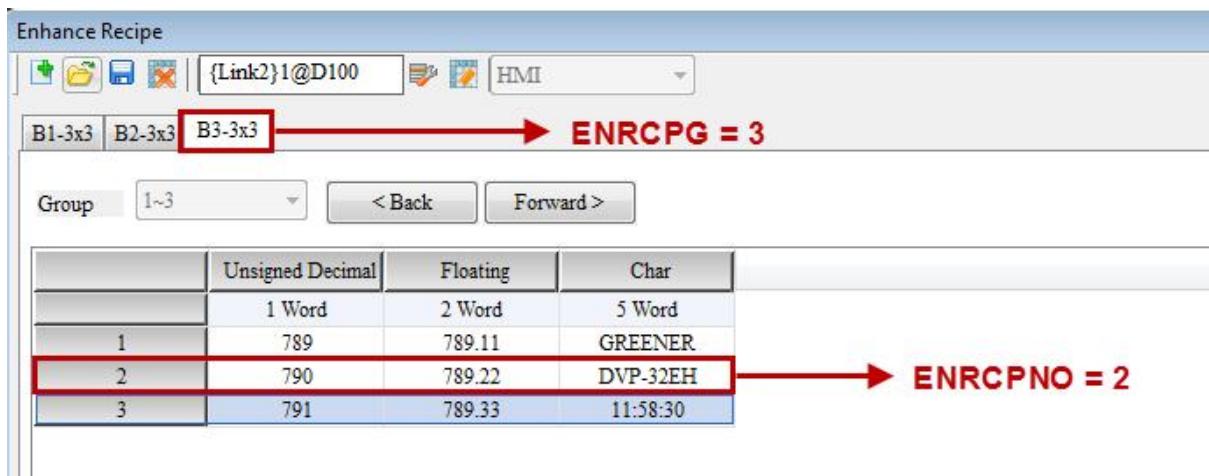
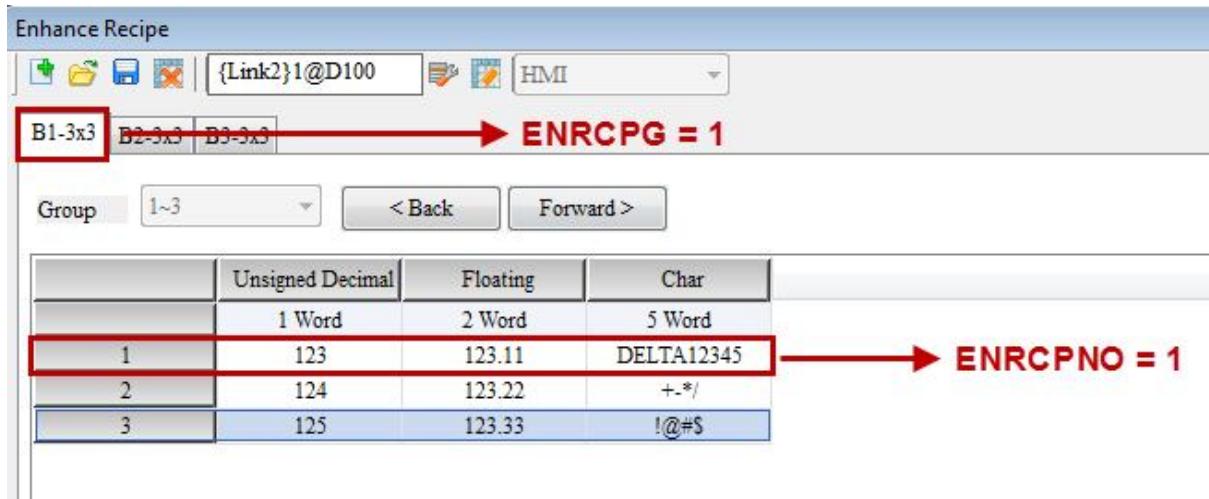
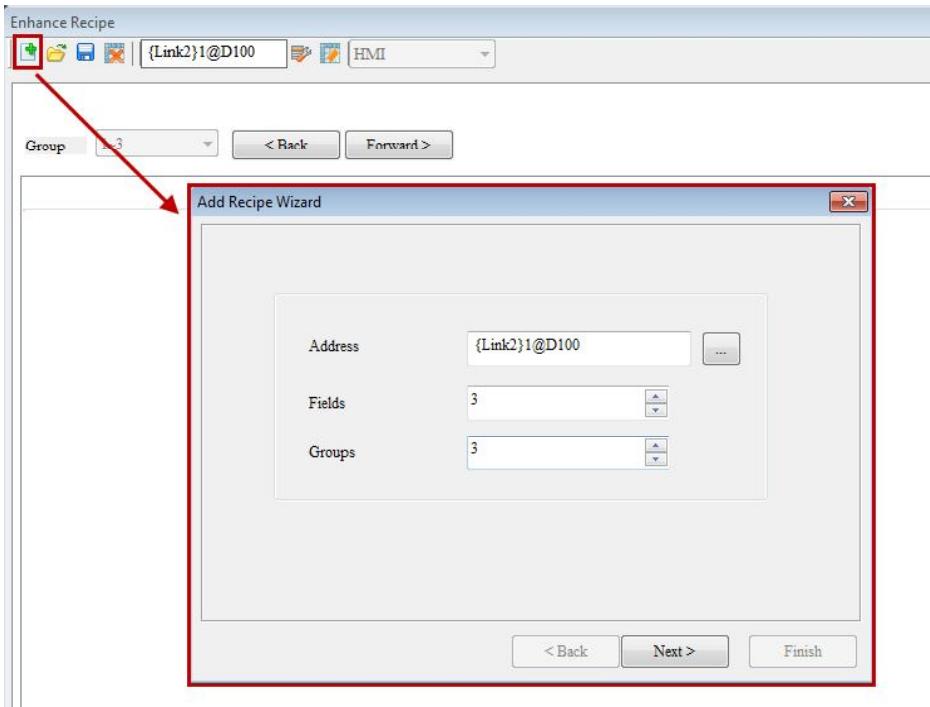


Figure 23-4-4 Recipe Group Editing Screen

■ Enhance Recipe Size Limit

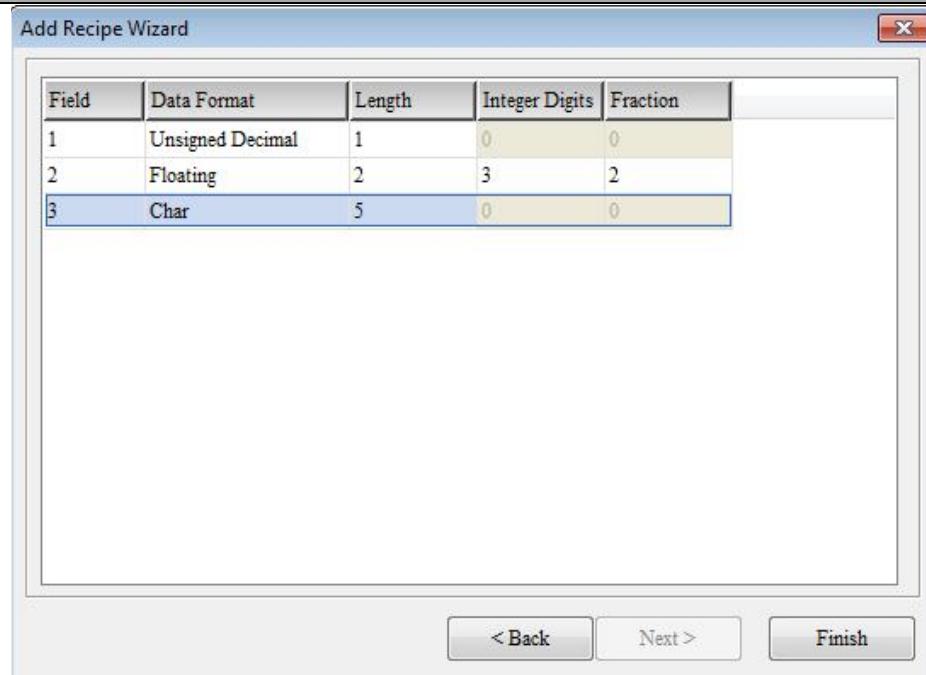
If the retained area is set to USB Disk or SD Card, the recipe size limit is 50MB; It is different from 16 bits recipe, if the retained area is set in HMI, the editing size of enhance recipe is determined by the specification of flash memory.

Please refer to table 23-4-1 below for example of enhance recipe.

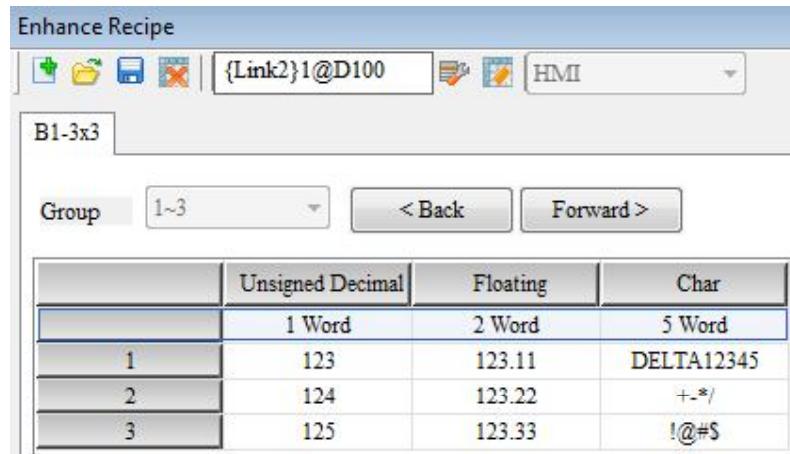
<h3 style="text-align: center;">Example of Enhance Recipe</h3> <p style="text-align: center;">Table 23-4-1 Example of enhance recipe</p>	
<p>Setup Enhance Recipe</p>	<p>➤ Step 1: Enter 【Option】 → 【Enhance Recipe】。</p> <ul style="list-style-type: none"> ● Click  to Add Recipe Wizard.  <ul style="list-style-type: none"> ● Set the recipe address as {Link2}1@D100. ● Setup field length 3 and group 3 of the first recipe. Field and group number cannot be 0. ● Setup different value format and read length base on different fields. The first field sets Unsigned Decimal format and the read length is 1. The second field sets Floating format and the read length is 2. Set its integer digits to 3 and fractional digits to 2. The third field sets Char format and the read length is 5.

Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe



- Step 2: Click “Finish” and enter recipe data. See as below:



- Step 3: Activate enhance recipe function.



- Step 4: Set retained area as HMI.

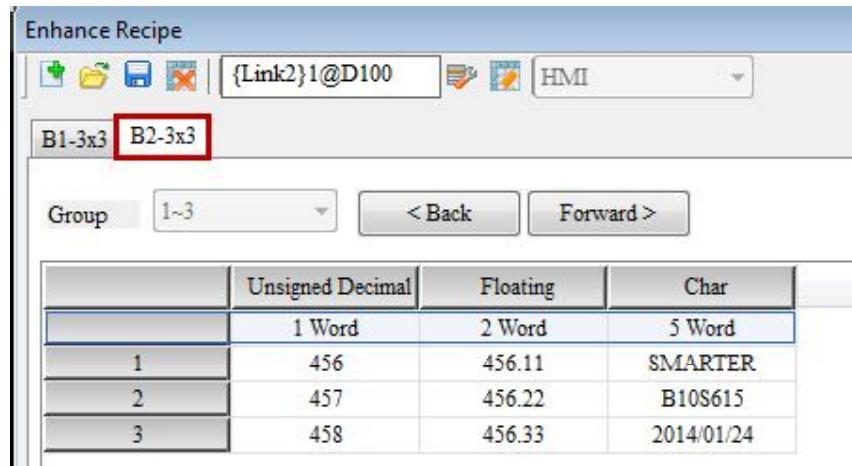


- Step 5: Repeat Step 1 and Step 2 to set length 3 and group 3. The

Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

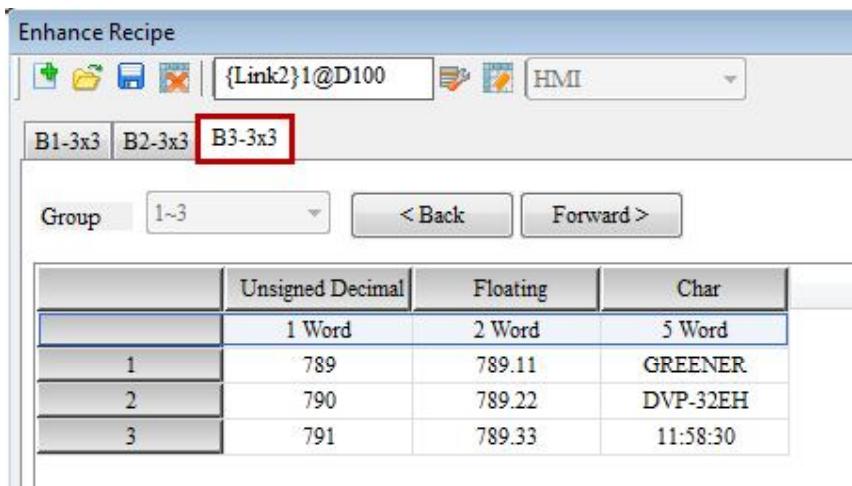
recipe data is shown as below:



The screenshot shows the 'Enhance Recipe' software interface. At the top, there are icons for file operations and a connection to 'Link2}1@D100'. Below that is a toolbar with icons for save, print, and HMI. The main area displays a table with three rows labeled 1, 2, and 3. The columns are grouped by type: Unsigned Decimal, Floating, and Char. The Unsigned Decimal column contains values 456, 457, and 458. The Floating column contains values 456.11, 456.22, and 456.33. The Char column contains values SMARTER, B10S615, and 2014/01/24.

	Unsigned Decimal	Floating	Char
1	1 Word	2 Word	5 Word
2	456	456.11	SMARTER
3	457	456.22	B10S615
	458	456.33	2014/01/24

- Step 6: Repeat Step 1 and Step 2 to set length 3 and group 3. The recipe data is shown as below:

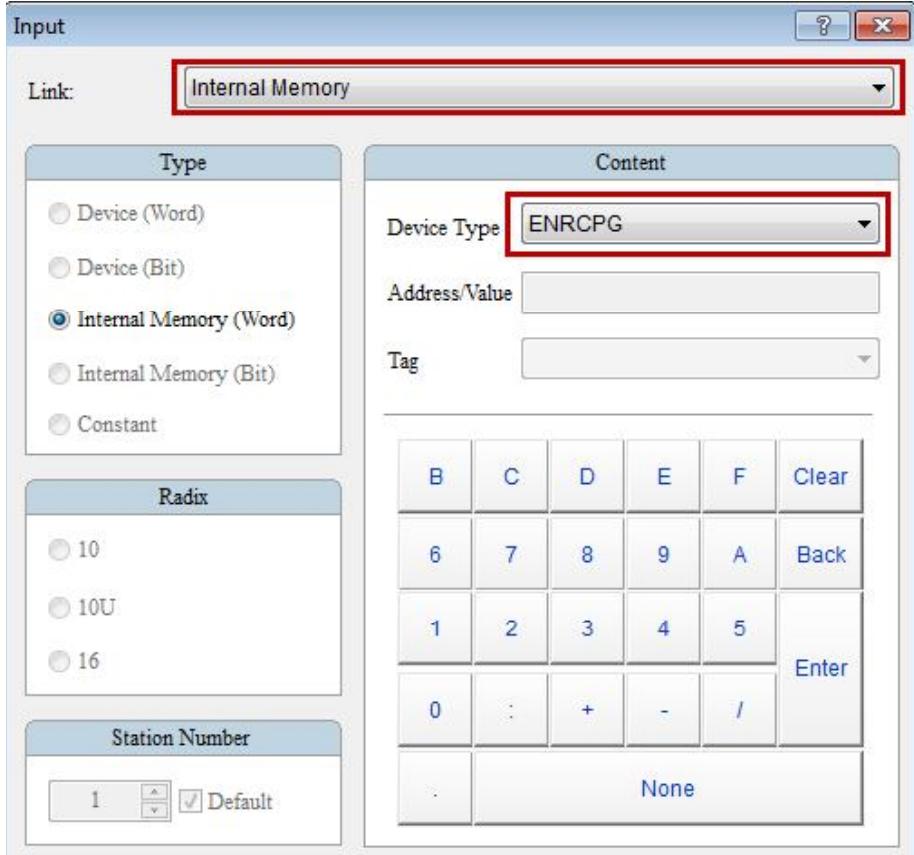


The screenshot shows the 'Enhance Recipe' software interface. At the top, there are icons for file operations and a connection to 'Link2}1@D100'. Below that is a toolbar with icons for save, print, and HMI. The main area displays a table with three rows labeled 1, 2, and 3. The columns are grouped by type: Unsigned Decimal, Floating, and Char. The Unsigned Decimal column contains values 789, 790, and 791. The Floating column contains values 789.11, 789.22, and 789.33. The Char column contains values GREENER, DVP-32EH, and 11:58:30.

	Unsigned Decimal	Floating	Char
1	1 Word	2 Word	5 Word
2	789	789.11	GREENER
3	790	789.22	DVP-32EH
	791	789.33	11:58:30

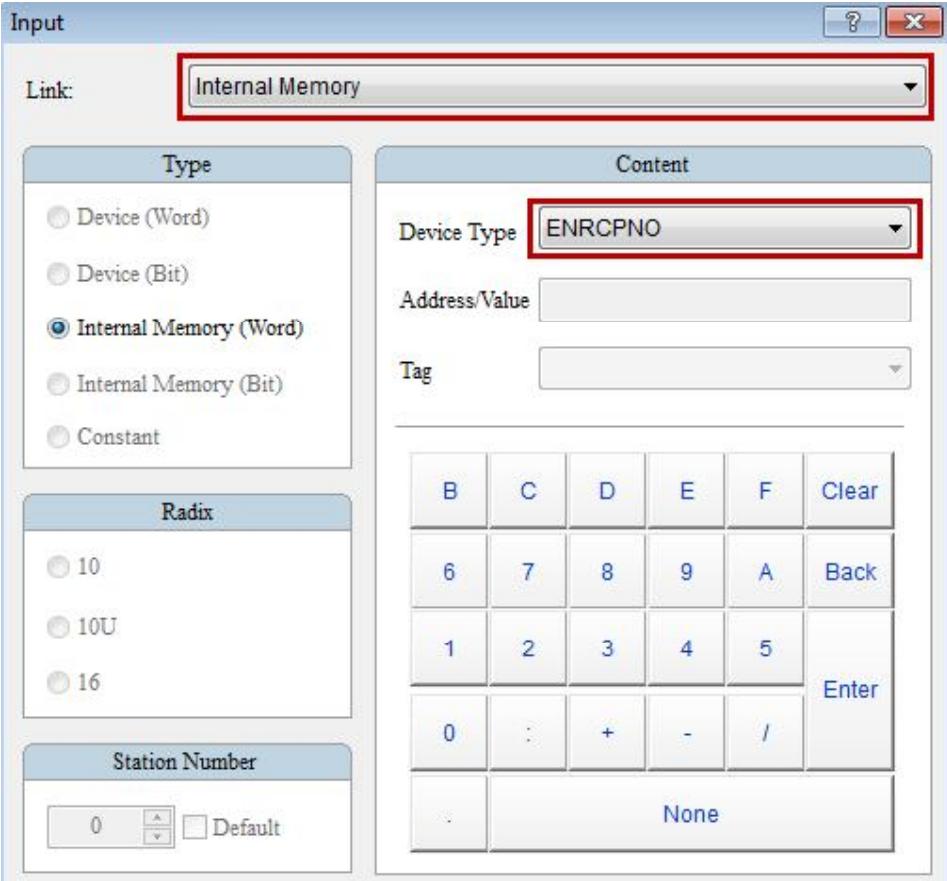
Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

Create Numeric Entry Element	<ul style="list-style-type: none"> ➤ Create one numeric entry element. Set the Write Address to Internal Memory. Choose ENRCPG as device type, which is used for selection of enhance recipe grouping. 
	<ul style="list-style-type: none"> ➤ The following is displayed when the creation is completed. 

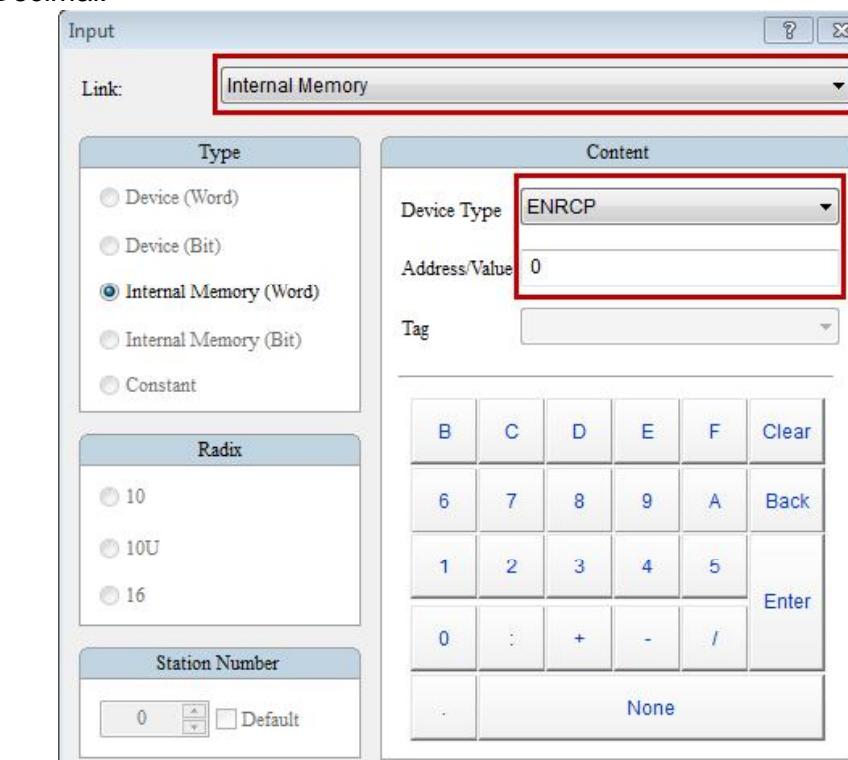
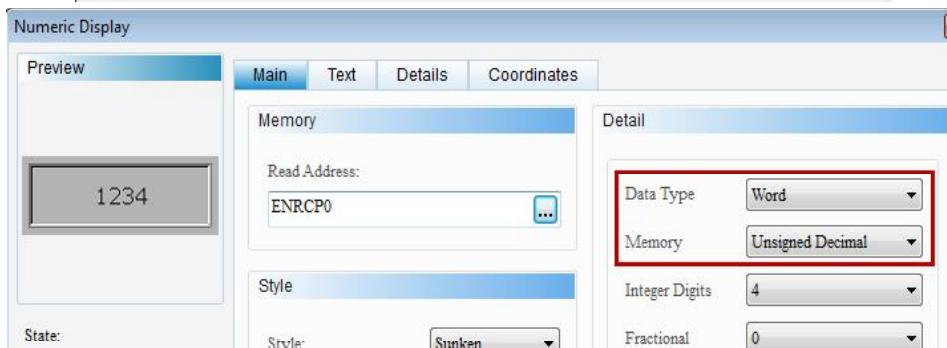
Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

	 <p>The screenshot shows the 'Input' dialog box. The 'Link:' dropdown is set to 'Internal Memory'. The 'Type' section has 'Internal Memory (Word)' selected. The 'Radix' section has '10' selected. The 'Station Number' section shows '0' in the input field and a 'Default' checkbox. The 'Content' section shows 'Device Type' set to 'ENRCPNO'. Below it is a numeric keypad with buttons for B, C, D, E, F, Clear, Back, Enter, and various digits and operators.</p>
	<p>➤ The following is displayed when the creation is completed.</p>  <p>The display shows the created recipe: W:ENRCPNO followed by four placeholder characters (#). The text 'ENRCPNO' is displayed in red at the bottom of the screen.</p>

Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

Create Numeric Display Element	<ul style="list-style-type: none"> ➤ Step 1: Before the numeric display element is created to display enhance recipe register, users can use the recipe register formula $[(L^*(G+1)-1)]$ to gain the number that n in ENRCPn represents. Put the size of the recipe ($L^G = 3 \times 3$) in the formula to gain $ENRCPn = ENRCP0\sim ENRCP11$. ➤ Step 2: Create 1 numeric display element and set the Read Address to Internal Memory ENRCP0. Setup the presentation method according to field 1 of recipe table. Data type is Word and memory is Unsigned Decimal.  
	<ul style="list-style-type: none"> ➤ Step 3: Create a numeric display element and set its read address as ENRCP1 of Internal Memory. Setup its presentation method base on recipe field 2. Data type is Double Word and memory format is Floating. Then, set the integer digits to 3, fractional to 2.

Example of Enhance Recipe

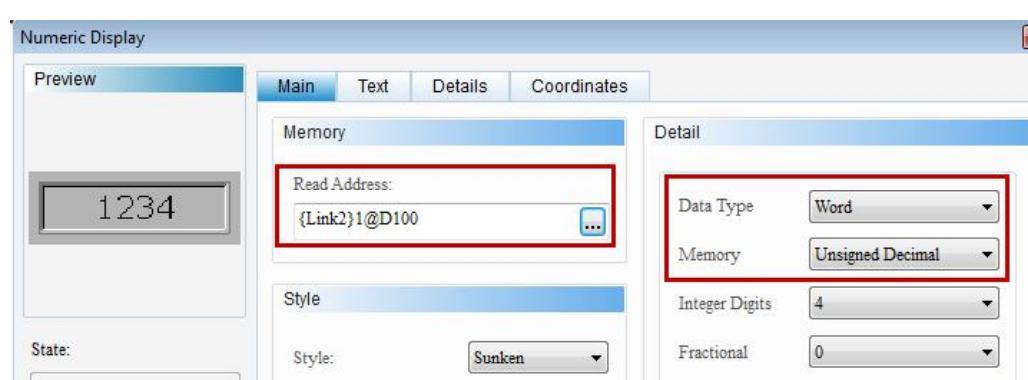
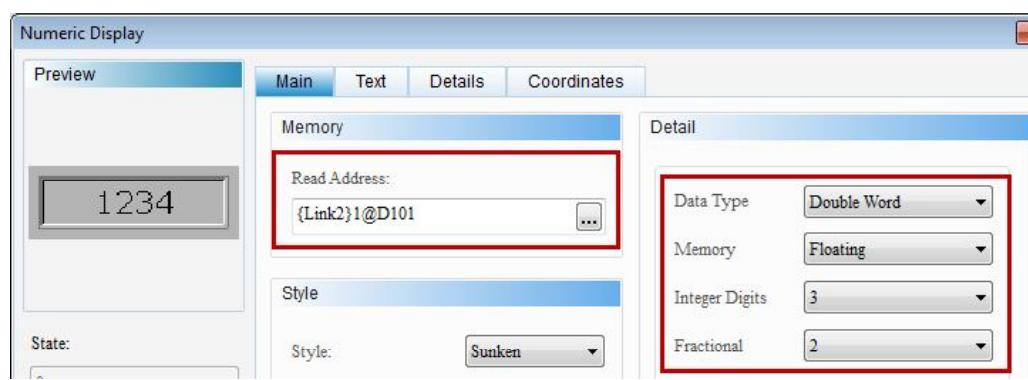
Table 23-4-1 Example of enhance recipe

	<p>Numeric Display</p> <p>Step 4: Create one character display element. Set the Read Address to ENRCP2 of Internal Memory. Setup its presentation method base on recipe field 3. And set the string length to 10 (The length of 1 word can store two bits.)</p> <p>Character Display</p> <p>Step 5: Repeat Step2 ~ Step4 and so on. The display element is range from ENRCP3 to ENRCP11. Then, setup the memory format.</p> <p>The following is displayed when the creation is completed.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 15%; text-align: right;">Buffer</td> <td style="width: 15%; text-align: right;">R:ENRCP0</td> <td style="width: 15%; text-align: right;">1234</td> <td style="width: 15%; text-align: right;">R:ENRCP1</td> <td style="width: 15%; text-align: right;">123.45</td> <td style="width: 15%; text-align: right;">R:ENRCP2</td> <td style="width: 15%; text-align: right;">ABCDEFGHIJ</td> </tr> <tr> <td colspan="7" style="border-top: 2px solid blue; border-bottom: 1px solid black;"></td> </tr> <tr> <td style="text-align: right;">Recipe Address</td> <td style="text-align: right;">R:ENRCP3</td> <td style="text-align: right;">1234</td> <td style="text-align: right;">R:ENRCP4</td> <td style="text-align: right;">123.45</td> <td style="text-align: right;">R:ENRCP5</td> <td style="text-align: right;">ABCDEFGHIJ</td> </tr> <tr> <td></td> <td style="text-align: right;">R:ENRCP6</td> <td style="text-align: right;">1234</td> <td style="text-align: right;">R:ENRCP7</td> <td style="text-align: right;">123.45</td> <td style="text-align: right;">R:ENRCP8</td> <td style="text-align: right;">ABCDEFGHIJ</td> </tr> <tr> <td></td> <td style="text-align: right;">R:ENRCP9</td> <td style="text-align: right;">1234</td> <td style="text-align: right;">R:ENRCP10</td> <td style="text-align: right;">123.45</td> <td style="text-align: right;">R:ENRCP11</td> <td style="text-align: right;">ABCDEFGHIJ</td> </tr> </table> <p>NOTE: ENRCP0 ~ ENRCP2 are the buffer areas of recipe. The actual recipe data is ENRCP3 ~ ENRCP11. Please refer to 《Figure 23-1-4》 16 bits recipe buffer</p>	Buffer	R:ENRCP0	1234	R:ENRCP1	123.45	R:ENRCP2	ABCDEFGHIJ								Recipe Address	R:ENRCP3	1234	R:ENRCP4	123.45	R:ENRCP5	ABCDEFGHIJ		R:ENRCP6	1234	R:ENRCP7	123.45	R:ENRCP8	ABCDEFGHIJ		R:ENRCP9	1234	R:ENRCP10	123.45	R:ENRCP11	ABCDEFGHIJ
Buffer	R:ENRCP0	1234	R:ENRCP1	123.45	R:ENRCP2	ABCDEFGHIJ																														
Recipe Address	R:ENRCP3	1234	R:ENRCP4	123.45	R:ENRCP5	ABCDEFGHIJ																														
	R:ENRCP6	1234	R:ENRCP7	123.45	R:ENRCP8	ABCDEFGHIJ																														
	R:ENRCP9	1234	R:ENRCP10	123.45	R:ENRCP11	ABCDEFGHIJ																														

Example of Enhance Recipe	
Table 23-4-1 Example of enhance recipe	
	area configuration for further details.

Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

Create Numeric Display Element	<ul style="list-style-type: none"> ➤ Create a numeric display element and refers to the address set by enhance recipe. When reading or writing PLC recipe, it will display the change of data. Each field length of enhance recipe is not fixed. Thus, users have to setup PLC address base on the recipe table. For example, first field of the recipe table is in Unsigned Decimal format and its read length is 1. So, the read address is set to D100, data type is Word and memory format is Unsigned Decimal.  
	<ul style="list-style-type: none"> ➤ Create a numeric display element. Its read address is D101, data type is Double Word and memory format is Floating. Its integer digits is set to 3 and fractional is 2. 
	<ul style="list-style-type: none"> ➤ Create a character display element and set the string length to 10.

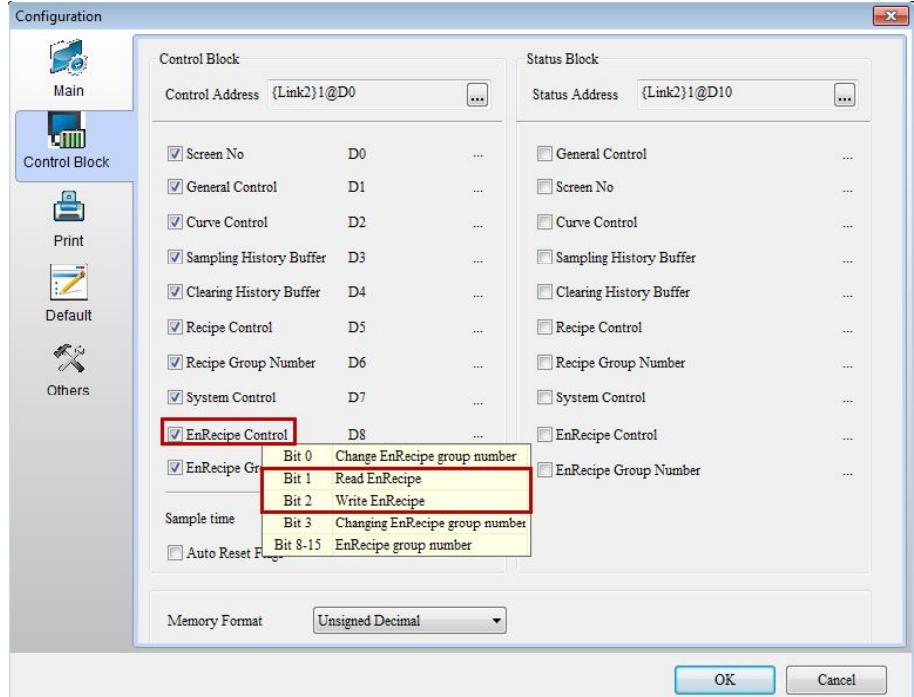
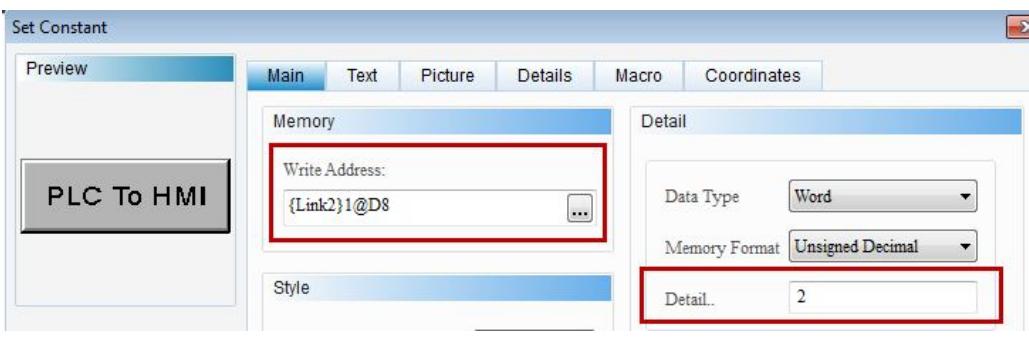
Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

	 <p>Character Display</p> <p>Main Tab Selected</p> <p>Memory Section:</p> <ul style="list-style-type: none">Read Address: {Link2}1@D103String Length: 10 <p>Detail Section:</p> <p>Resulting String: ABCDEFGHIJ</p>			
	<p>➤ The following is displayed when the creation is completed.</p> <p>PLC Address</p> <table border="1"><tr><td>R:{Link2}1@D100 1234</td><td>R:{Link2}1@D101 123.45</td><td>R:{Link2}1@D103 ABCDEFGHIJ</td></tr></table>	R:{Link2}1@D100 1234	R:{Link2}1@D101 123.45	R:{Link2}1@D103 ABCDEFGHIJ
R:{Link2}1@D100 1234	R:{Link2}1@D101 123.45	R:{Link2}1@D103 ABCDEFGHIJ		

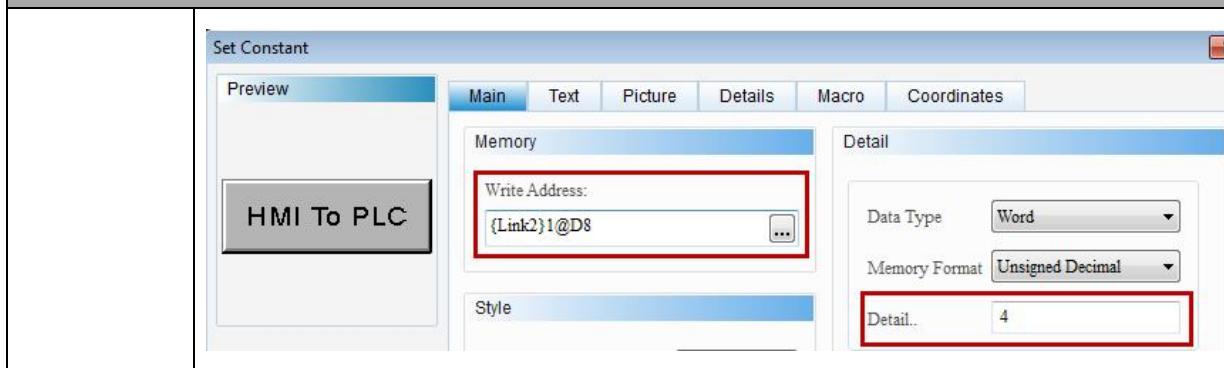
Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe

Set Recipe Control Flag in Control Block	<ul style="list-style-type: none"> ➤ Enter [Options] → [Configuration....] → [Control Block] and check the [EnRecipe Control] flag. Set the Control Address in the Control Block to define Enhance Recipe Control address. After the setting is completed, click [OK] to leave the Configuration Window. 
Create Set Constant Button Element	<ul style="list-style-type: none"> ➤ Create 2 set constant buttons. Set the Write Address to D8 and the setting value to 2 and 4, respectively, corresponding to Bit 1 and Bit 2 of the Enhance Recipe Control flag D8. This setup is used for read and write of the recipe. 

Example of Enhance Recipe

Table 23-4-1 Example of enhance recipe



Example of Enhance Recipe

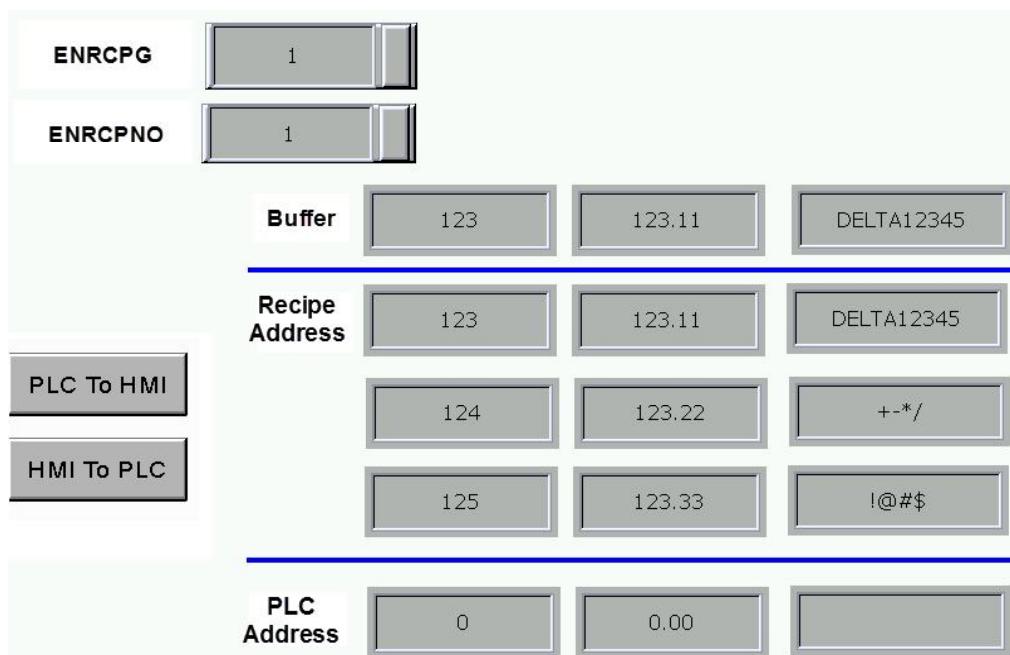
Table 23-4-1 Example of enhance recipe

- After creation of all elements, perform the compilation and download the screen data and recipe to HMI.



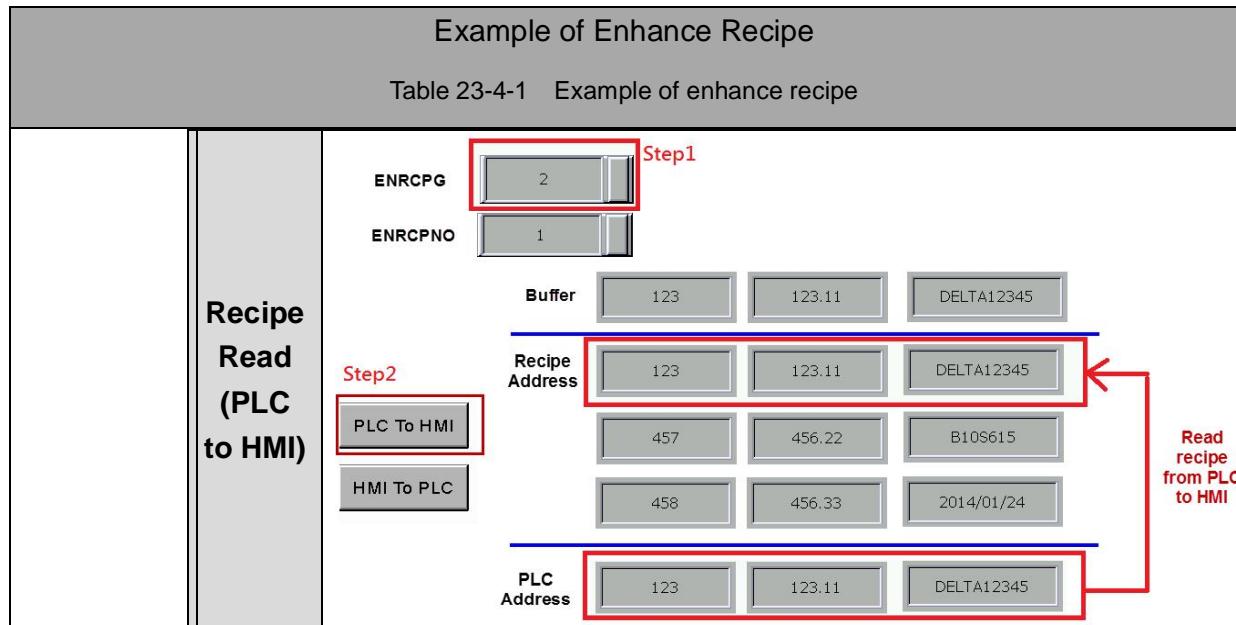
After enhance recipe number is loading into HMI, its default value is 1. To display different number, users can select different enhance recipe number according to different demands.

Result



The recipe data will be displayed in the created ENRCPO~ENRCP11 with reference to the selected recipe group. The ENRCP0~ENRCP2 created are the recipe buffers and the start address for the first group of recipe data are ENRCP3.

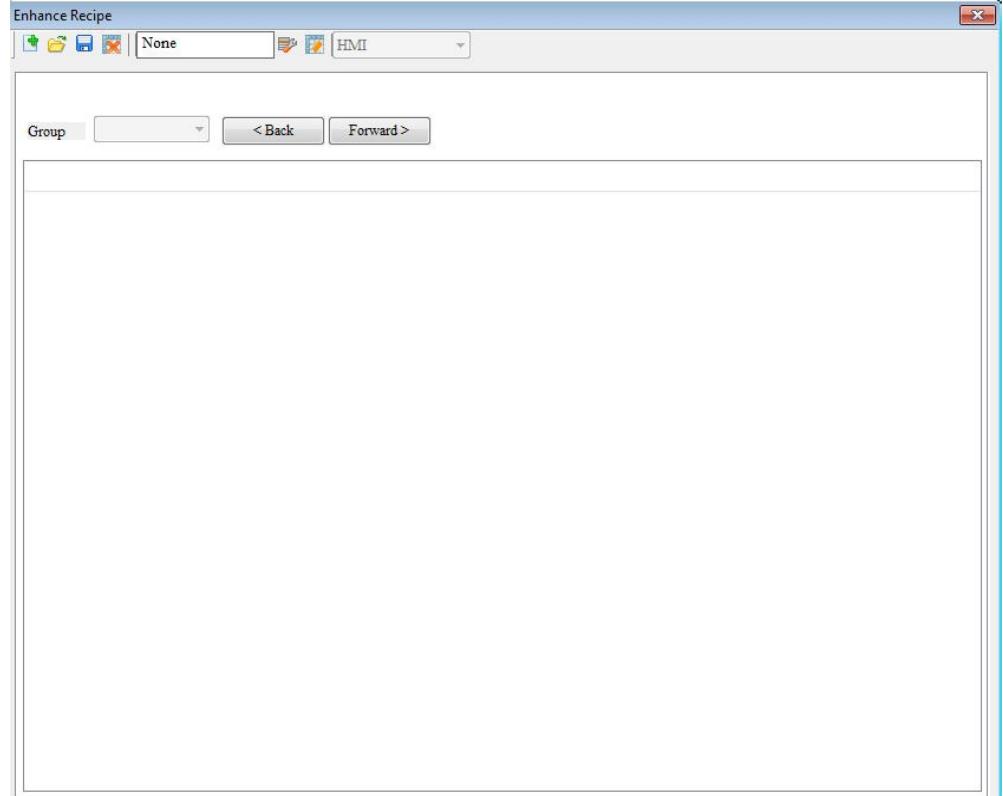
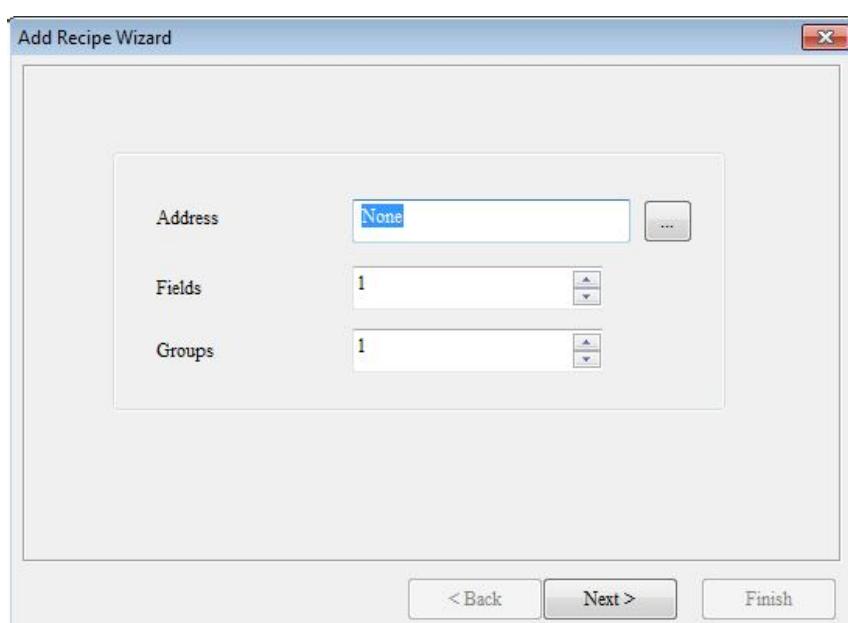
Example of Enhance Recipe																	
Table 23-4-1 Example of enhance recipe																	
	<p>ENRCPG</p>  <p>ENRCPNO</p>  <p>Buffer</p> <table border="1"> <tr> <td>123</td> <td>123.11</td> <td>DELTA12345</td> </tr> </table> <p>Recipe Address</p> <table border="1"> <tr> <td>123</td> <td>123.11</td> <td>DELTA12345</td> </tr> <tr> <td>124</td> <td>123.22</td> <td>+-*/*</td> </tr> <tr> <td>125</td> <td>123.33</td> <td>!@#\$</td> </tr> </table> <p>PLC To HMI</p> <p>HMI To PLC</p> <p>Via Enhance RCP Control address "D8" to Read and Write</p> <p>PLC Address</p> <table border="1"> <tr> <td>0</td> <td>0.00</td> <td></td> </tr> </table>	123	123.11	DELTA12345	123	123.11	DELTA12345	124	123.22	+-*/*	125	123.33	!@#\$	0	0.00		<p>PLC address (D100) default value is 0</p>
123	123.11	DELTA12345															
123	123.11	DELTA12345															
124	123.22	+-*/*															
125	123.33	!@#\$															
0	0.00																
	<p>Activate “HMI to PLC” button and the recipe data of the selected group will be written to PLC. Activate “PLC to HMI” button and the recipe data that were written to the PLC will be read back to HMI with reference to the selected enhance recipe group. The recipe data will be changed to match the content of the selected group.</p>																
Recipe Write (HMI to PLC)	<p>ENRCPG</p>  <p>ENRCPNO</p>  <p>Buffer</p> <table border="1"> <tr> <td>123</td> <td>123.11</td> <td>DELTA12345</td> </tr> </table> <p>Recipe Address</p> <table border="1"> <tr> <td>123</td> <td>123.11</td> <td>DELTA12345</td> </tr> <tr> <td>124</td> <td>123.22</td> <td>+-*/*</td> </tr> <tr> <td>125</td> <td>123.33</td> <td>!@#\$</td> </tr> </table> <p>PLC To HMI</p> <p>HMI To PLC Step1</p> <p>PLC Address</p> <table border="1"> <tr> <td>123</td> <td>123.11</td> <td>DELTA12345</td> </tr> </table>	123	123.11	DELTA12345	123	123.11	DELTA12345	124	123.22	+-*/*	125	123.33	!@#\$	123	123.11	DELTA12345	<p>Recipe write to PLC</p>
123	123.11	DELTA12345															
123	123.11	DELTA12345															
124	123.22	+-*/*															
125	123.33	!@#\$															
123	123.11	DELTA12345															



Followings will introduce the property set by enhance recipe.

Property Set by Enhance Recipe

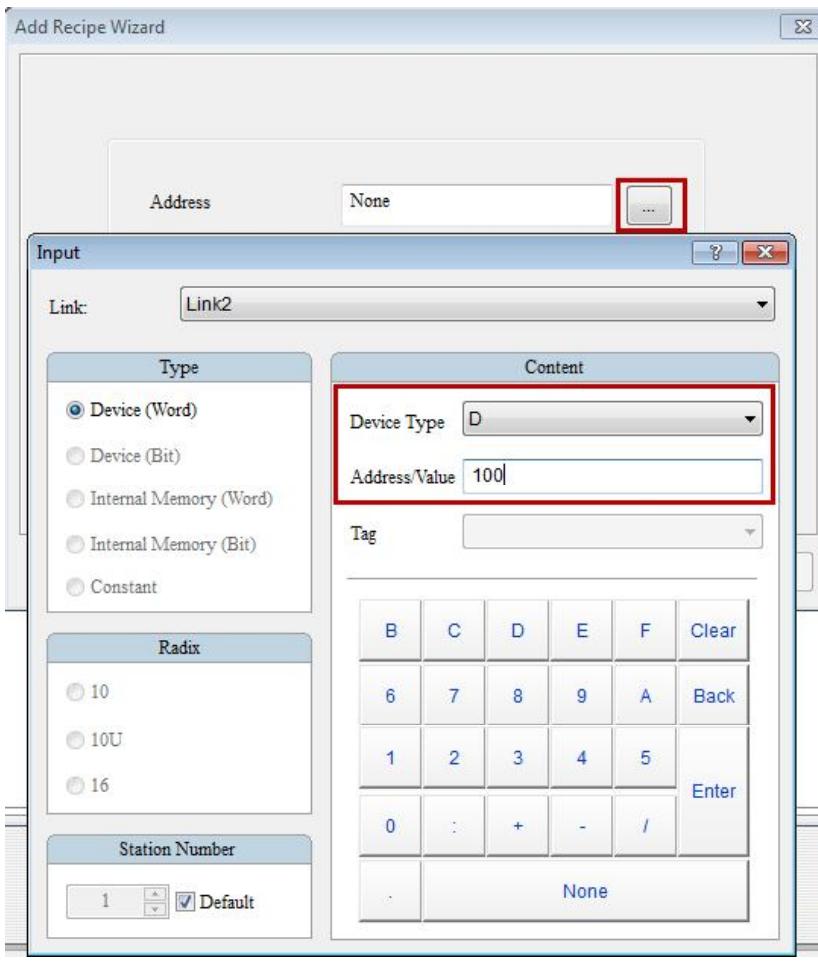
Table 23-4-2 Property set by enhance recipe

			
<p>Add </p>	<ul style="list-style-type: none"> ➤ Go to enhance recipe window, please click  to add enhance recipe data. <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  </div> <ul style="list-style-type: none"> ➤ Through , users can add 255 groups of enhance recipe data. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Address</td> <td style="padding: 2px;">➤ Choose internal memory or control address.</td> </tr> </table>	Address	➤ Choose internal memory or control address.
Address	➤ Choose internal memory or control address.		

Property Set by Enhance Recipe

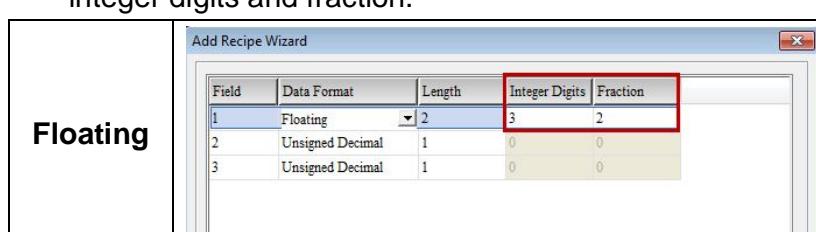
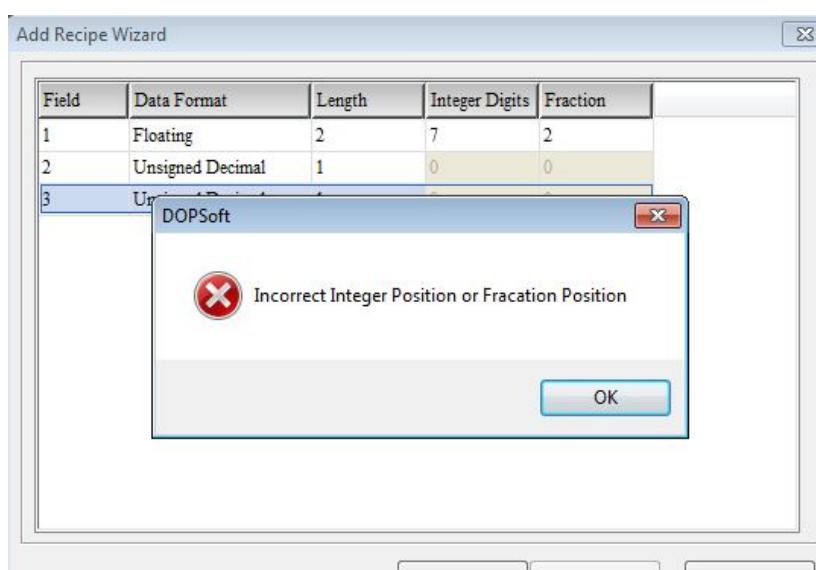
Table 23-4-2 Property set by enhance recipe

- Select the connection name(Link) or device type. Please refer to 5-1, Button Element.
- Addresses set by enhance recipe share one memory address, regardless the group number of recipe.



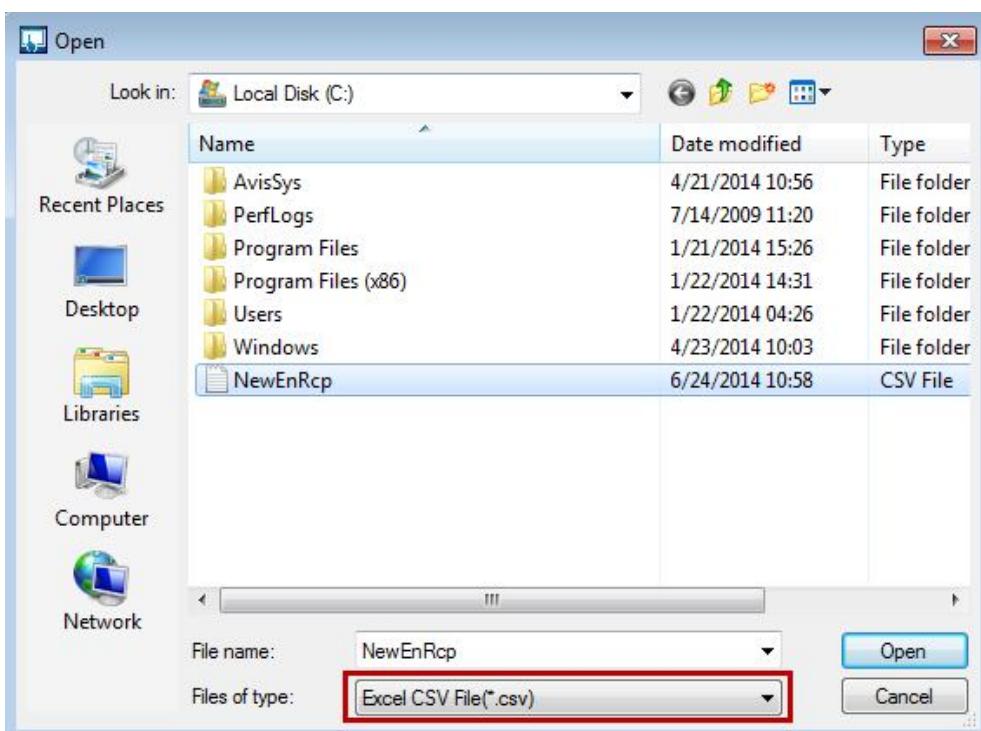
Property Set by Enhance Recipe		
Table 23-4-2 Property set by enhance recipe		
	Field	<ul style="list-style-type: none"> ➤ Field and group represent the recipe length and group that users enter, respectively. Recipe field size cannot exceed 50 MB.
	Group	<ul style="list-style-type: none"> ➤ Field and group number cannot be 0. Once one of the value is 0, the system will set the value to the minimum, 1.
	Data Format	<ul style="list-style-type: none"> ➤ Data format is divided into BCD, Signed Decimal, Unsigned Decimal, Hex, Floating and Char. <p>NOTE:</p> <ul style="list-style-type: none"> ➤ If selecting Char as the data format, the character set as separator cannot be used as its content. Otherwise, it might cause data error or fail to import the data.
	Read Length	<ul style="list-style-type: none"> ➤ Limit of read length varies with different data formats. ➤ If selecting BCD, Signed Decimal, Unsigned Decimal or Hex as the data format, the read length can be 1 (means Word) or 2 (means Double Word). ➤ If selecting Floating as the data format, the read length

Property Set by Enhance Recipe		
Table 23-4-2 Property set by enhance recipe		
		<p>only can be 2 (means Double Word).</p> <ul style="list-style-type: none">➤ If selecting Char as the data format, the read length is range from 1 to 32. It can support up to 32 Words (which is 64 bits). When setting up recipe data, if it still has spare space, the system will automatically enter the blank string.

Property Set by Enhance Recipe	
Table 23-4-2 Property set by enhance recipe	
Integer Digits	<ul style="list-style-type: none"> ➤ Only when the data format is floating, can users setup integer digits and fraction. 
	<ul style="list-style-type: none"> ➤ When the data format is floating, integer digits and fraction only support 7 digits in total. If exceeding the range, a warning message will pop up. 
Open 	<ul style="list-style-type: none"> ➤ 【Open】function supports CSV file format for users to select and import the recipe.

Property Set by Enhance Recipe

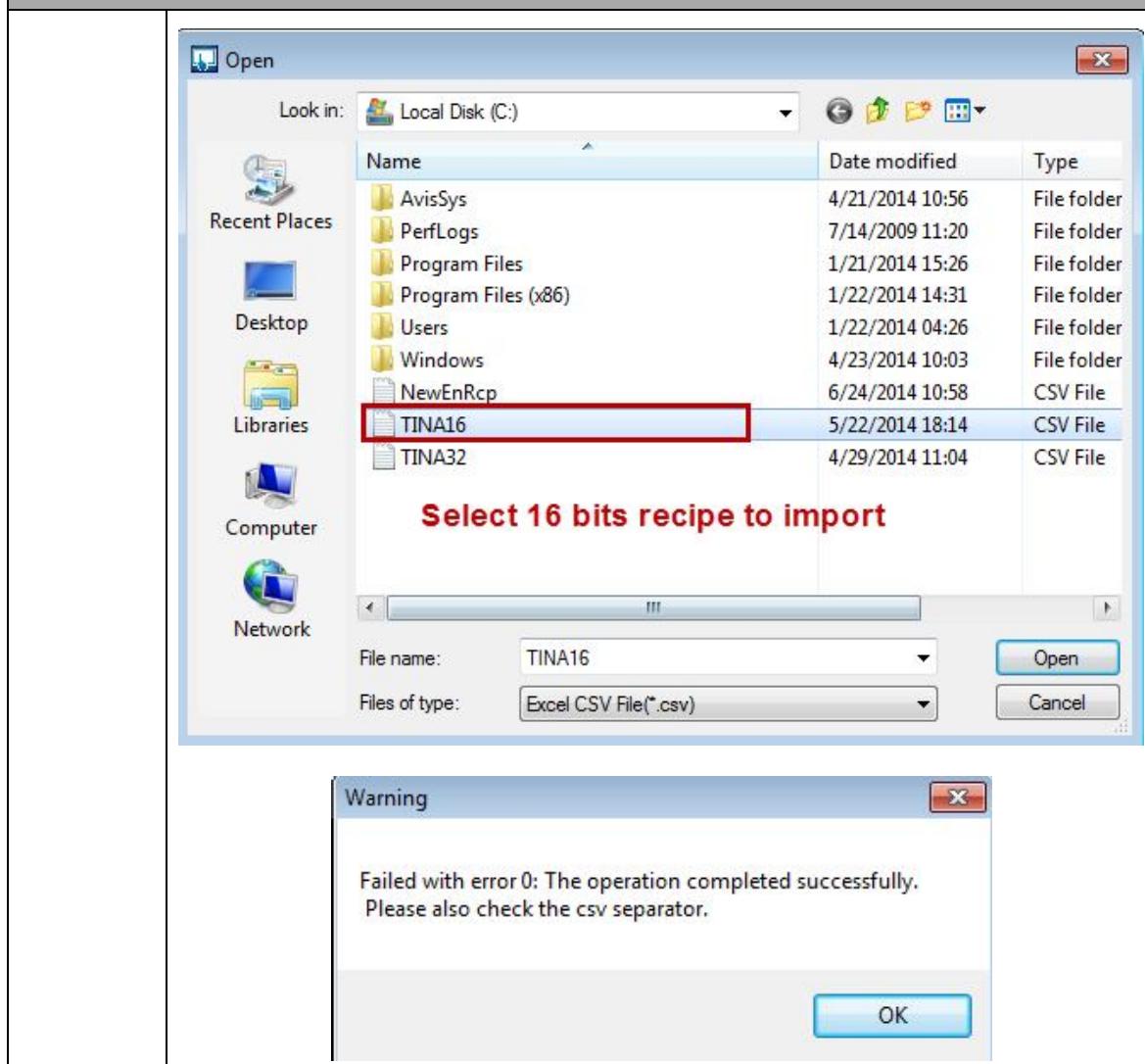
Table 23-4-2 Property set by enhance recipe

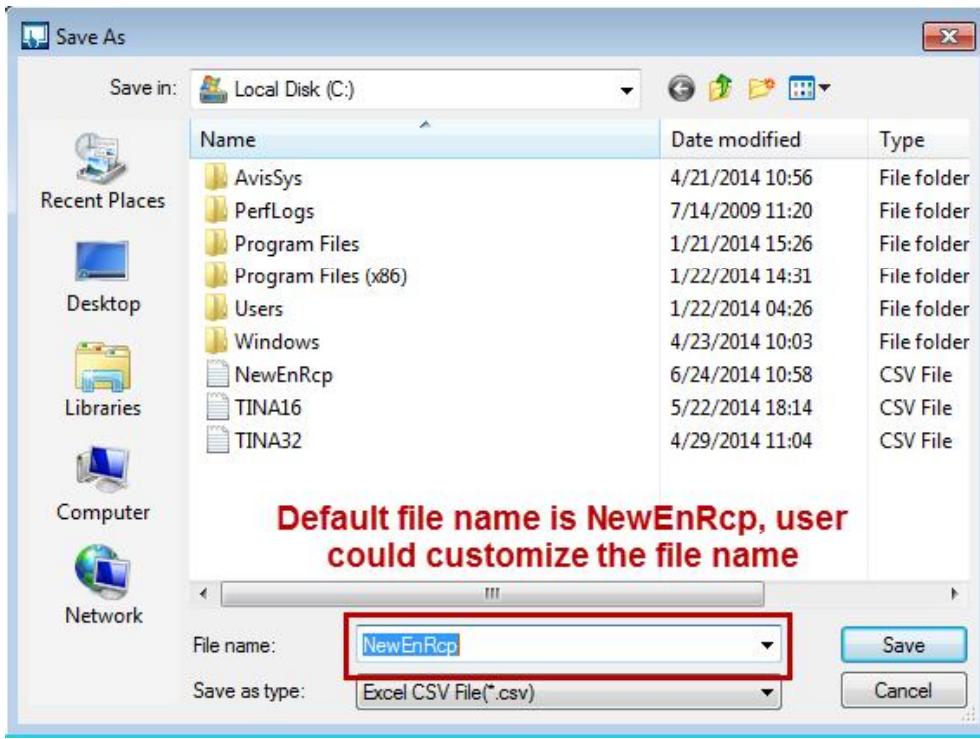


- The opened and imported recipe file provides recipe contents only. Its address does not support 16 or 32 bits recipe. If the CSV file of 16 bits recipe or 32 bits recipe is opened by enhance recipe, it might be unable to display recipe data and a pop-up message will prompt to show error.

Property Set by Enhance Recipe

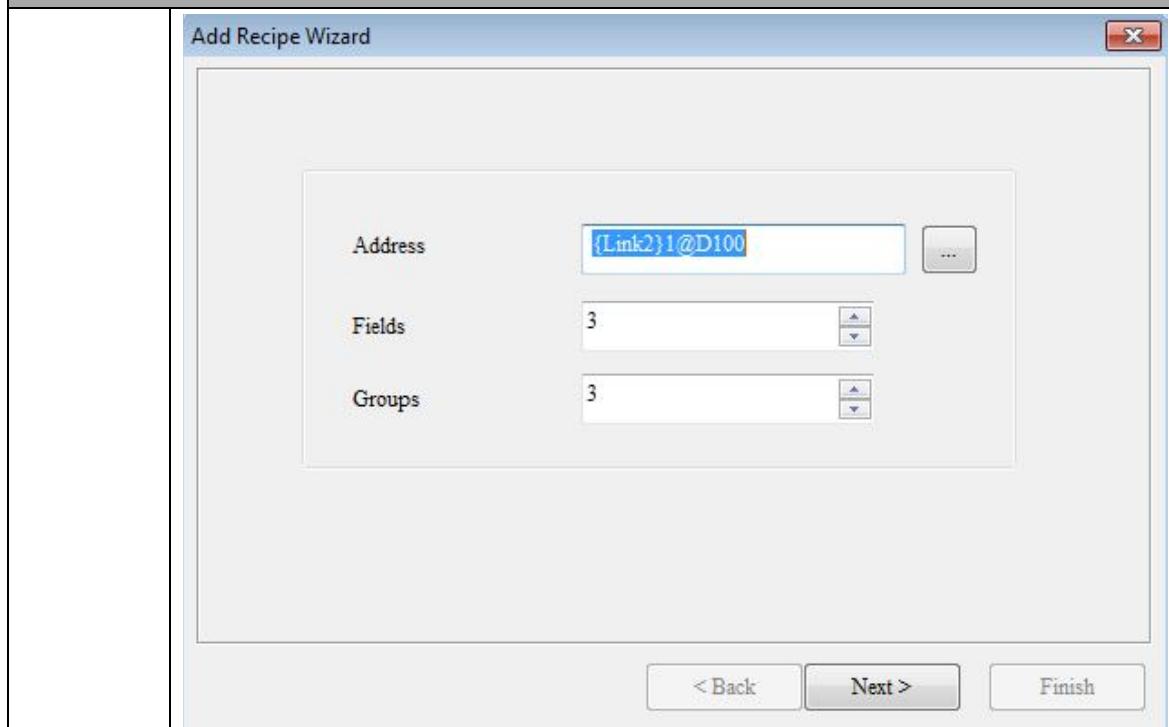
Table 23-4-2 Property set by enhance recipe



<p style="text-align: center;">Property Set by Enhance Recipe</p> <p style="text-align: center;">Table 23-4-2 Property set by enhance recipe</p>	
	<ul style="list-style-type: none"> ➤ 【Save As】function can save the current enhance recipe. The supported file format is the same as the Open function, CSV only.  <p style="color: red; text-align: center;">Default file name is NewEnRcp, user could customize the file name</p>
	<ul style="list-style-type: none"> ➤ 【Delete】function deletes 32 bits recipe data. When executing this function, a warning message will pop up and ask if users are sure to delete the data. 
	<ul style="list-style-type: none"> ➤ Only when recipe data exists in enhance recipe, can the user use 【Setting】to change the content of field, group and data format.

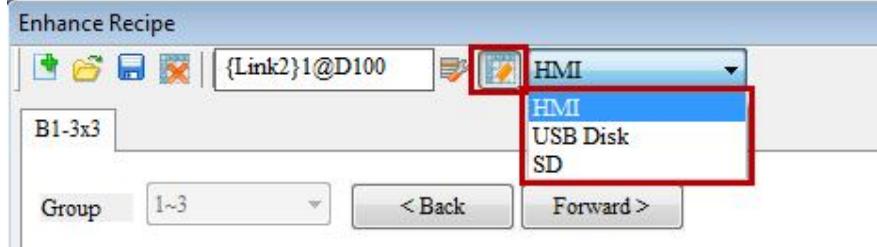
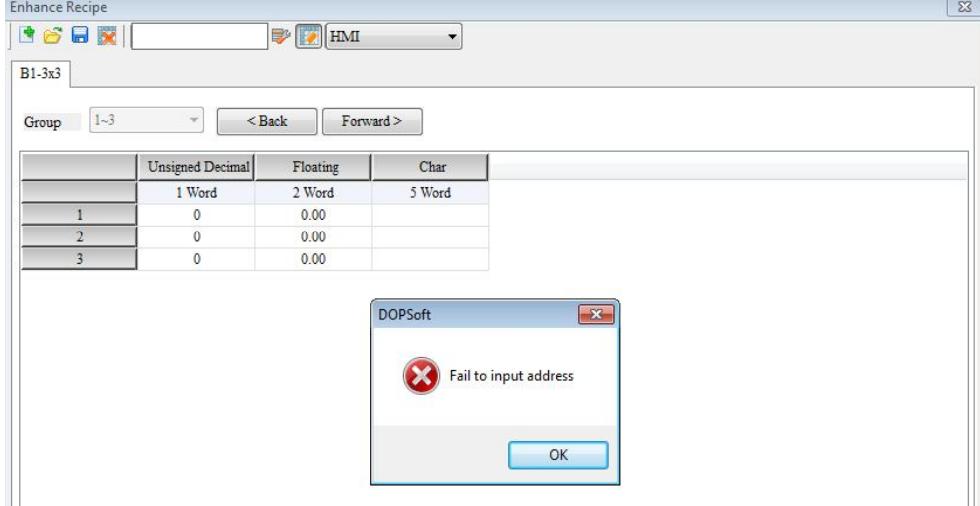
Property Set by Enhance Recipe

Table 23-4-2 Property set by enhance recipe



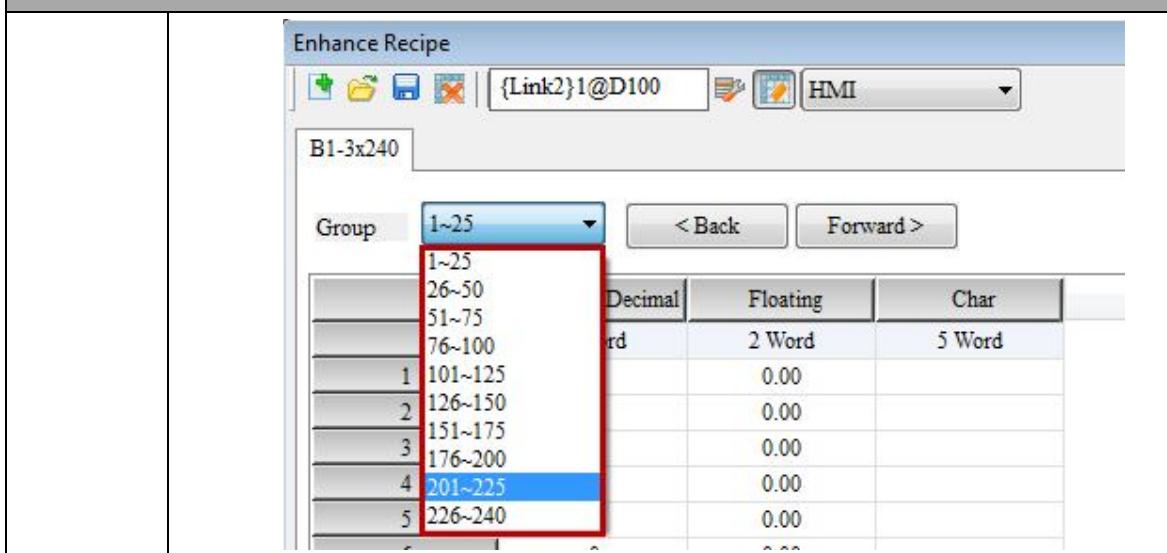
Property Set by Enhance Recipe

Table 23-4-2 Property set by enhance recipe

<input type="text" value="\$66"/>	<ul style="list-style-type: none"> ➤ Set recipe address. Users can self enter recipe address in this field. Or users can setup address through “Add” function.
Data Retained	<ul style="list-style-type: none"> ➤ Before setting retained area, please activate  first.  <ul style="list-style-type: none"> ➤ Retained area includes HMI, USB Disk and SD Card. ➤ If choose to save the data in HMI, it means when the power is off, the data will be recorded in SRAM of HMI.
X in Enhance Recipe Window	<ul style="list-style-type: none"> ➤ This function stores the data anyway when complete editing recipe data and will judge if the recipe address is wrong. 
組數 <input type="button" value="1~25"/>	<ul style="list-style-type: none"> ➤ The recipe table displays 25 groups of recipe data in one page. Users can quickly select the recipe group.

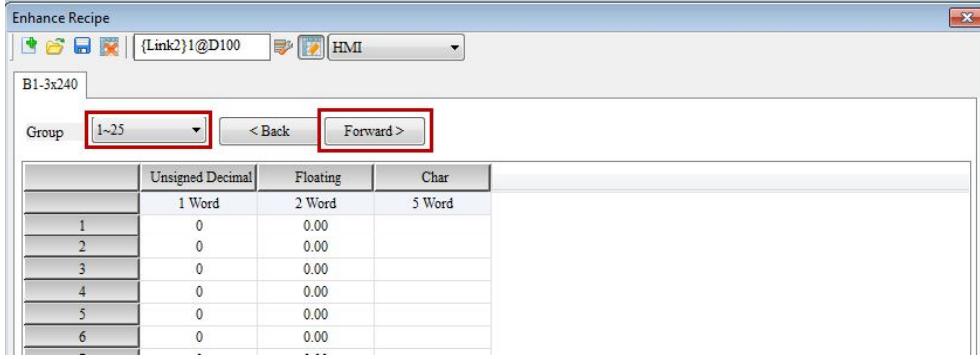
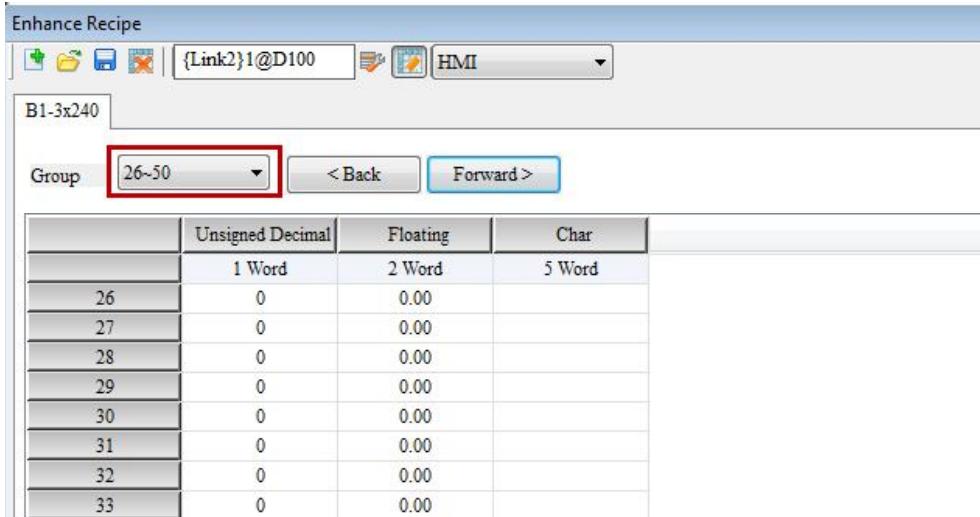
Property Set by Enhance Recipe

Table 23-4-2 Property set by enhance recipe



Property Set by Enhance Recipe

Table 23-4-2 Property set by enhance recipe

	<ul style="list-style-type: none"> ➤ The recipe table displays 25 groups of recipe data in one page. 【Forward】 button enables users to quickly view forward 25 recipe data. ➤ Following figure shows recipe data from group 1 to 25. Click 【Forward】 , the displayed recipe data becomes group 26 to 50.  <p style="margin-left: 20px;">往下 ></p>
< 往上	<ul style="list-style-type: none"> ➤ The recipe table displays 25 groups of recipe data in one page. 【Back】 button enables users to quickly view previous 25 recipe data. ➤ Following figure shows recipe data from group 26 to 50. Click【Back】 , the displayed recipe data becomes group 1 to 25. 

Property Set by Enhance Recipe

Table 23-4-2 Property set by enhance recipe

	Enhance Recipe {Link2}1@D100 HMI			
	B1-3x240 Group 26-50 < Back			
	Unsigned Decimal 1 Word 2 Word 5 Word	Floating 0.00	Char -	
	26	0	0.00	
	27	0	0.00	
	28	0	0.00	
	29	0	0.00	
	30	0	0.00	
	31	0	0.00	
	32	0	0.00	
	33	0	0.00	
	Enhance Recipe {Link2}1@D100 HMI			
	B1-3x240 Group 1~25 < Back			
	Unsigned Decimal 1 Word 2 Word 5 Word	Floating 0.00	Char -	
	1	0	0.00	
	2	0	0.00	
	3	0	0.00	
	4	0	0.00	
	5	0	0.00	
	6	0	0.00	
	7	0	0.00	

23-5 Enhance Indirect Recipe Index Register (*ENRCP)

The enhance indirect recipe index register is used to specify the enhance recipe register.

*ENRCPn acquires the value from ENRCPn and regards it as the new address. Then, access the value from new address. For example, if ENRCP1 = 3 and ENRCP3 = 99, then *ENRCP1= 99. See figure 23-5-1.

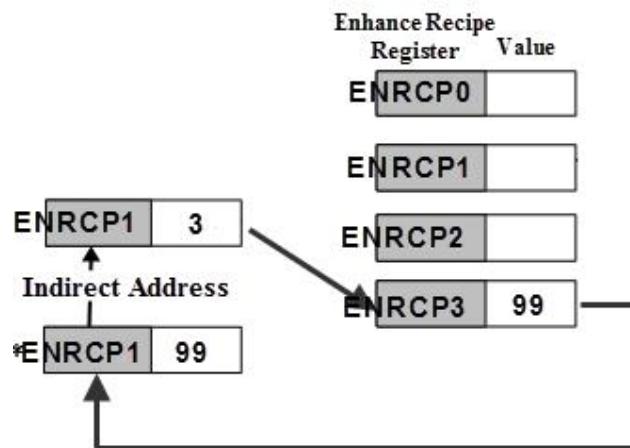


Figure 23-5-1 Enhance Indirect Recipe Index

Accessing range of enhance recipe index register:

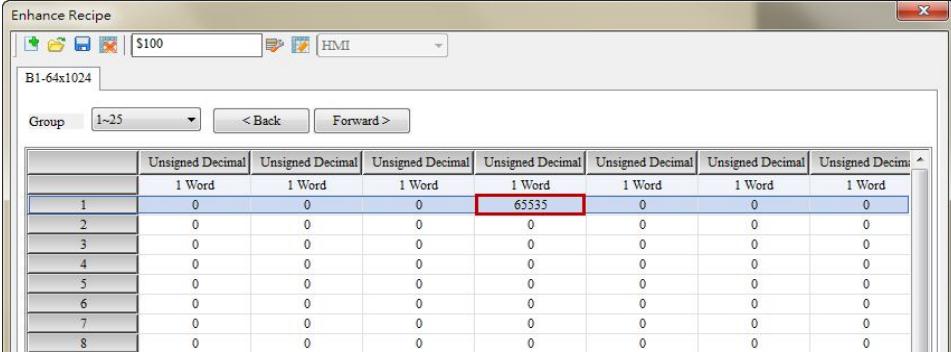
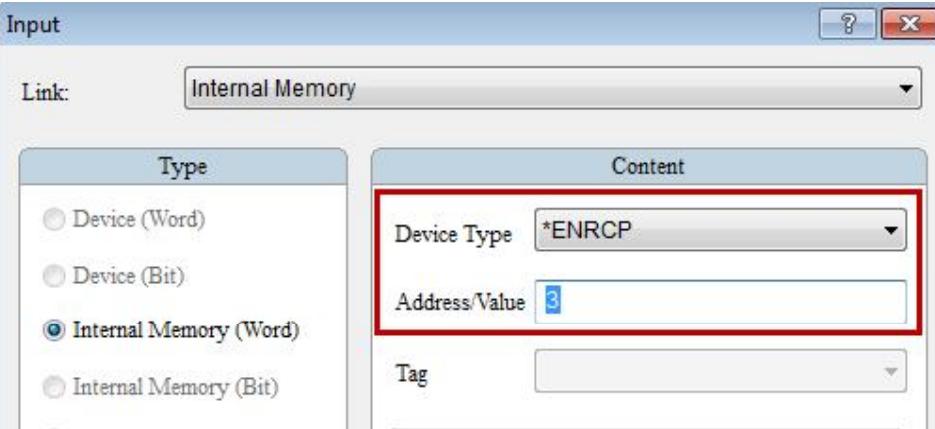
Access Type	Element Type	Access Range
Word	*ENRCPn	ENRCP0~ENRCP65535
Note: n = Word (0-65535)		

Address accessing range provided by *ENRCP is limited according to the recipe size created by users. Assuming the recipe size is length 3*group 3, then address of ENRCP is range from *ENRCP0 to *ENRCP11. When creating address of *ENRCP12, a warning message will pop up. See the figure below.



Figure 23-5-2 Enhance indirect recipe index register configuration

Followings will introduce the example of enhance indirect recipe index.

Example of Enhance Indirect Recipe Index Register	
Table 23-5-1 Example of enhance recipe index register	
Set Enhance Recipe	<ul style="list-style-type: none"> ➤ Step 1: Create the Enhance Recipe (Fields set to 64 and Groups set to 1024) and set ENRCP3 to 65535. 
Create Numeric Entry Element	<ul style="list-style-type: none"> ➤ Step 2: Create numeric entry element and select its memory address as “*ENRCP” “3”.  <ul style="list-style-type: none"> ➤ Step 3: Create numeric entry element and select its memory address as “ENRCP” “3”. ➤ Step 4: Create numeric entry element and select its memory address as “ENRCP” “65535”. ➤ Step 5: Create Clock macro command *ENRCP3 = *ENRCP3+1.
Result	<ul style="list-style-type: none"> ➤ Compile the screen and download it to HMI. Value of *ENRCP3 and ENRCP65535 will be increased simultaneously.

Example of Enhance Indirect Recipe Index Register

Table 23-5-1 Example of enhance recipe index register

	*ENRCP3									
	ENRCP0	0	ENRCP1	0	ENRCP2	0	ENRCP3	65535	ENRCP65535	160