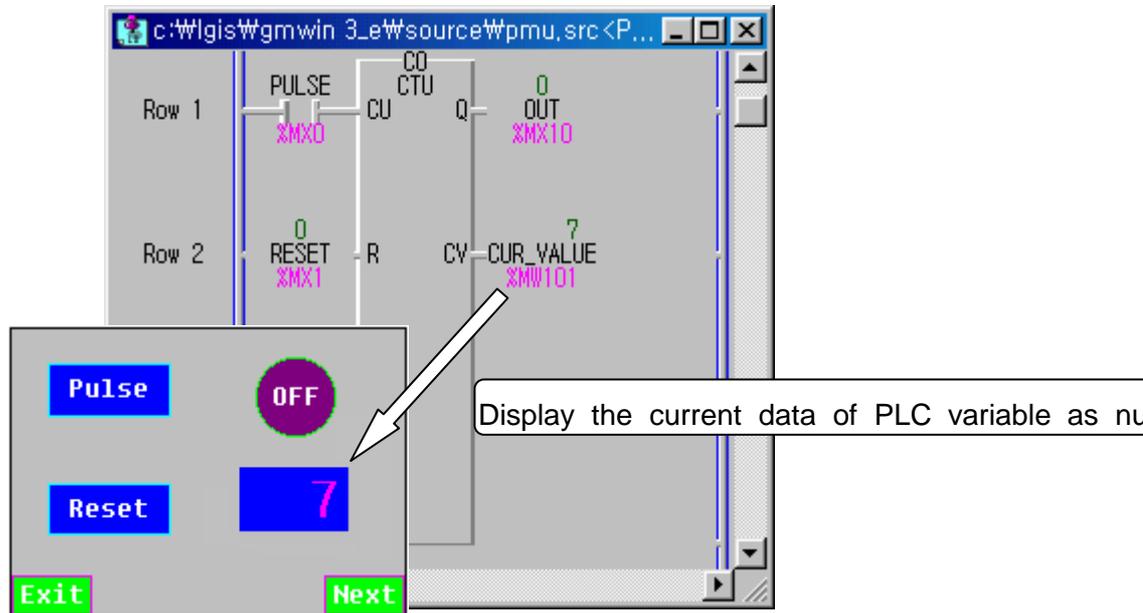


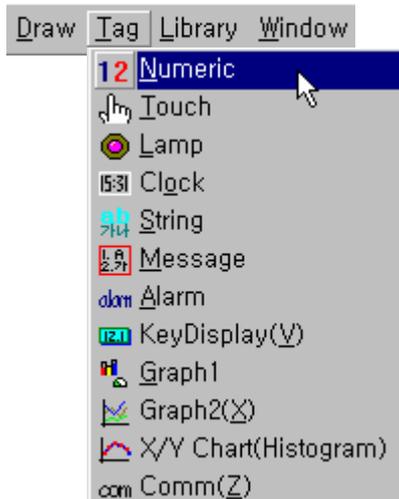
4-1-3 Numeric Tag

1) Display numeric data on PMU screen.

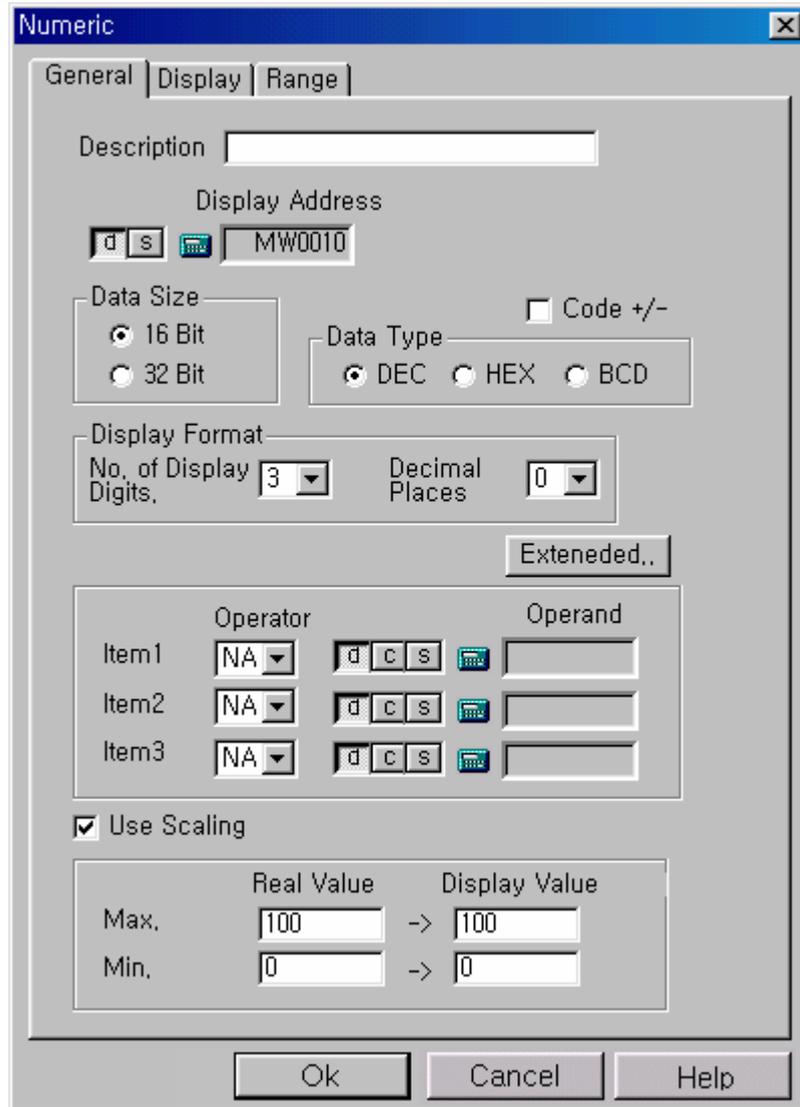
In this example, display the current value of counter which addressed %mw101.



① Click  icon on icon collection or Tag > Numeric on menu bar.



② General Tap



- ▶ Click input tool () after select 'd' to use PLC memory address and type MW0010.
- ▶ Data Size and Data Type – Available display data range is limited by data size and data type.
Code +/- is available only data type is selected as DEC. If it is checked data is consumed as signed decimal.

	DEC		HEX	BCD
	Signed	Unsigned		
16 bit	$-2^{15} \sim 2^{15}-1$	$0 \sim 2^{16}-1$	0 ~ FFFF	0 ~ 9999
32 bit	$-2^{31} \sim 2^{31}-1$	$0 \sim 2^{32}-1$	0 ~ FFFFFFFF	0 ~ 99999999

- ▷ Display Format – Assigns the position of floating point
No. of Display digits – Total digits of displaying data.
Decimal Places – Digits of floating number.

Ex) No. of Display digits is 3, Decimal Places is 1, and current data is 123
then 12.3 is displayed on PMU screen.

- ▷ Extended – Add numerical calculation to data read from PLC and display the result.

Available calculation : Addition(+), Subtraction(-), Multiply(×), Divide(÷),
Mod(%), AND(&), OR(|), Power(^), Shift Left (<<), Shift Right (>>).

d : Use PLC memory data as operand.

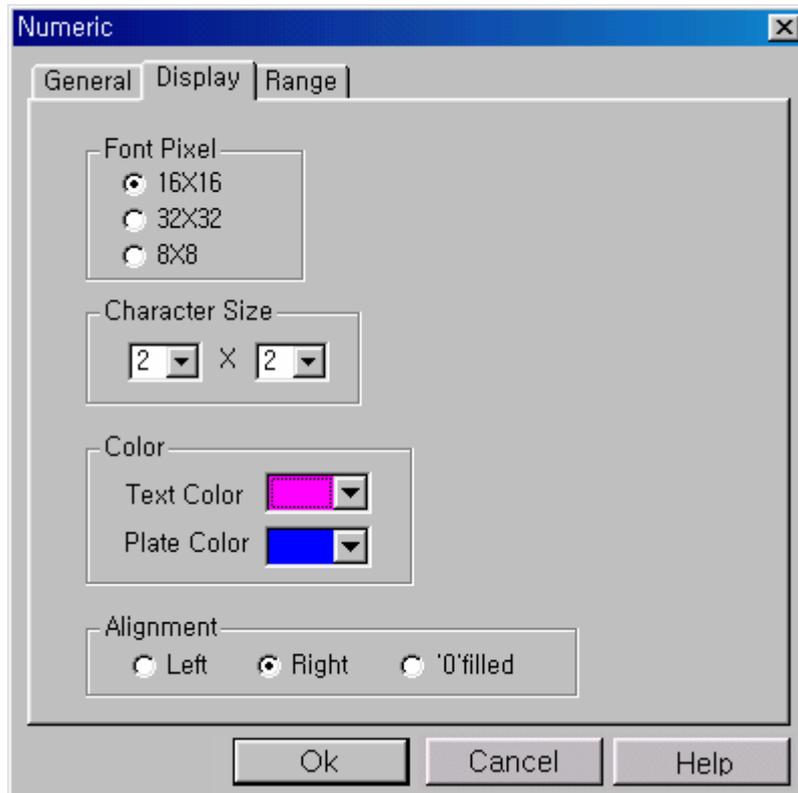
C : Use constant data as operand.

S : Use system buffer data as operand.

- ▷ Use Scaling – Convert the range of real data to the range of display data.

Ex) Real data's Min. is 0, Max. is 100, and Display data's Min. is 0, Max is 1000, and current real value is 30, then 300 is displayed on PMU screen.

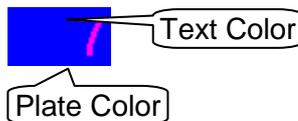
③ Display Tap



- ▷ Font Pixel, Character Size – The character size of 1digit character.

Ex) If Font Pixel is set to 16X16 and Character Size is set to 2X2 then total size of character is 32X32

- ▷ Color – Assigns display color



- ▷ Alignment – Assigns display direction.

Ex) No. of Display digits is 3 and current data is 12 then data is displayed on PMU screen.

Left is selected : **12**

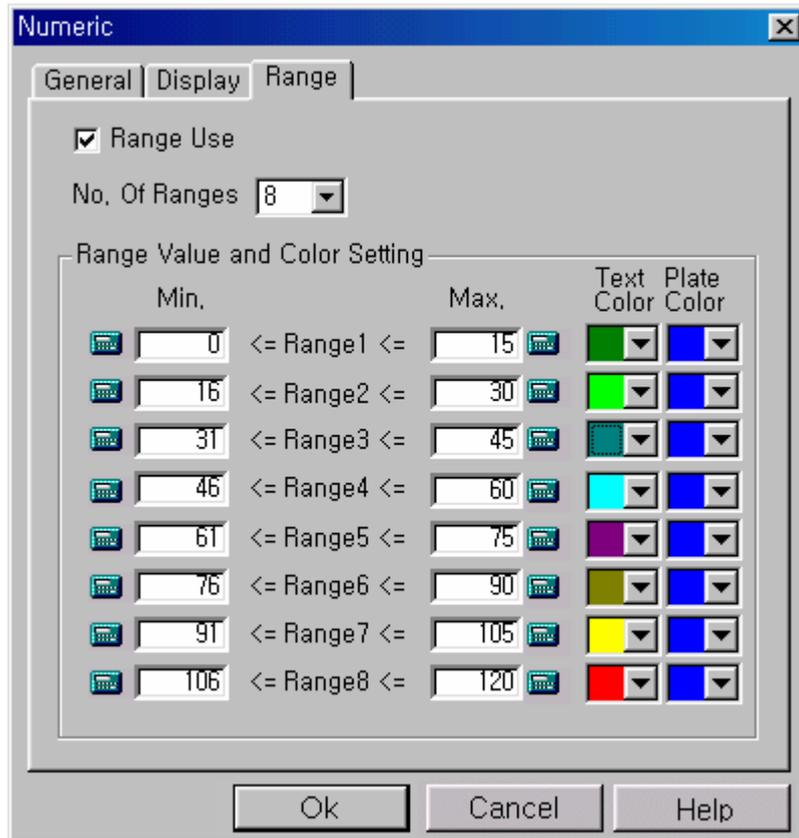
Right is selected : **12**

'0'filled is selected : **012**

④ Range Tap

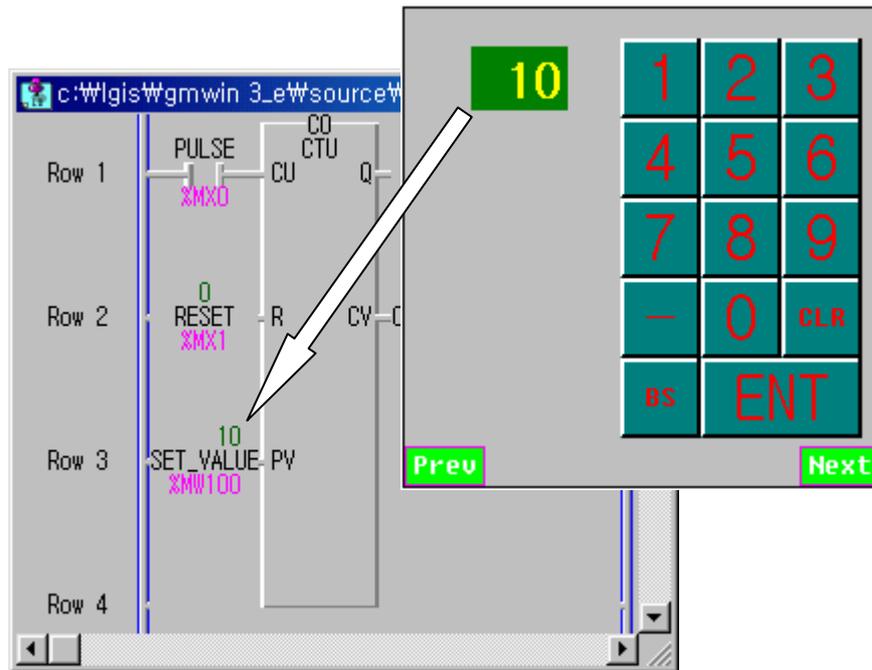
Numerical data can be displayed with different color according to data range.

When range is used, Text Color and Plate Color assigned in Display tap is ignored.

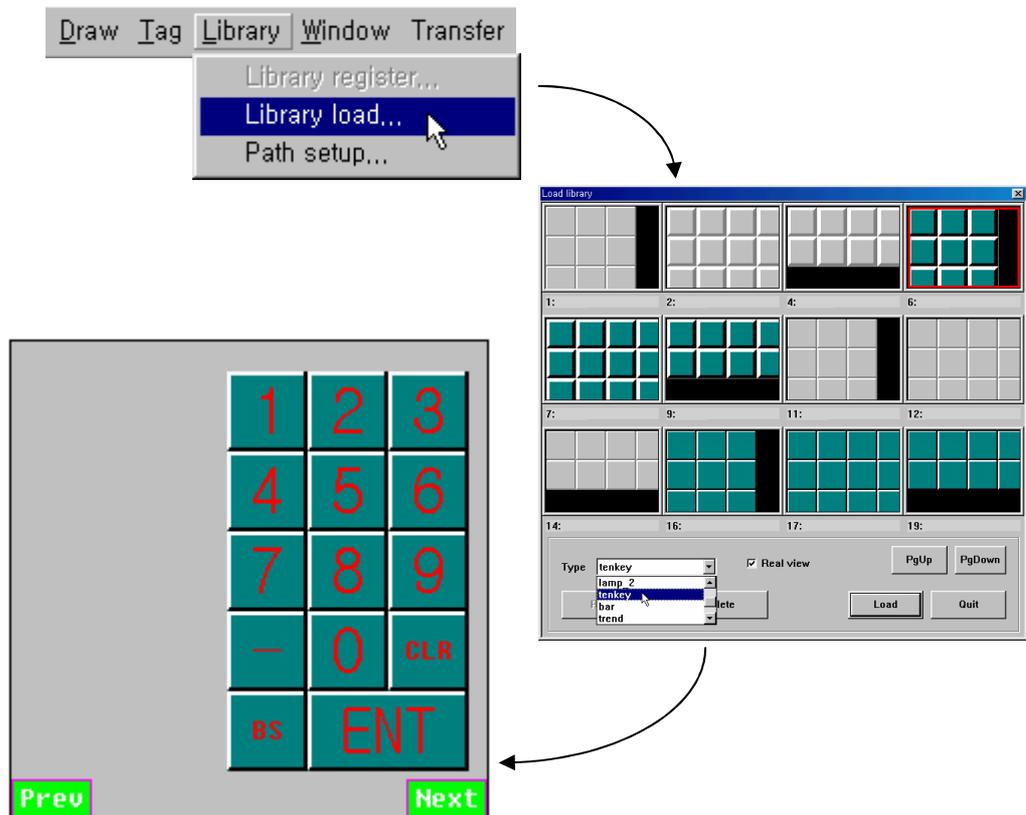


4-1-4 Keydisplay Tag

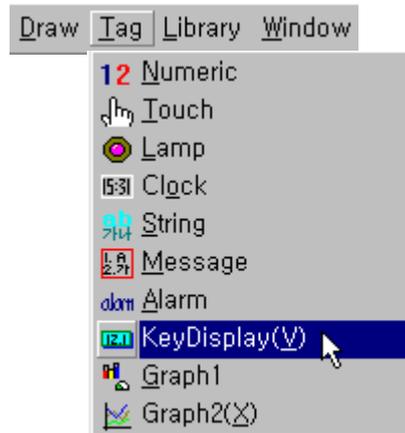
Change a data of PLC variable , for example setting value of counter, using PMU.
To change a data touch Keydisplay Tag, input data and touch ENT key of tenkey.



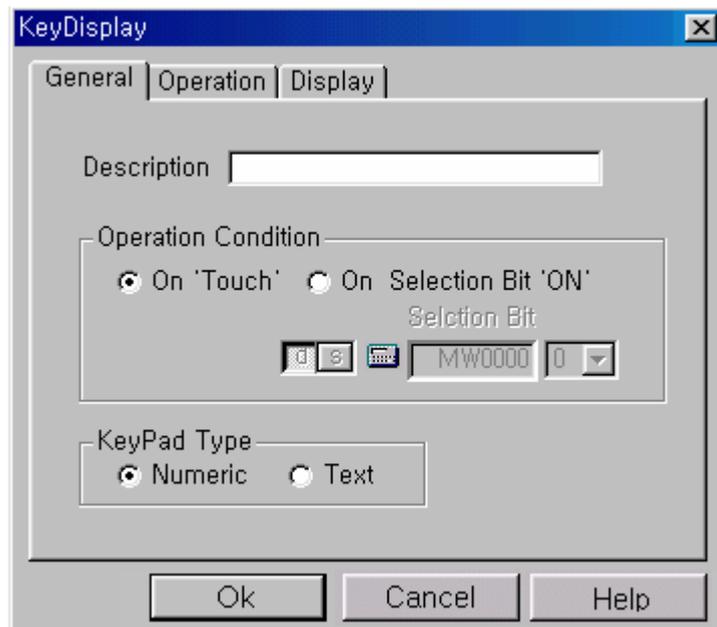
① Library Load – To change data, tenkey library is need.



- ② Click  icon on icon collection or Tag > Keydisplay on menu bar.

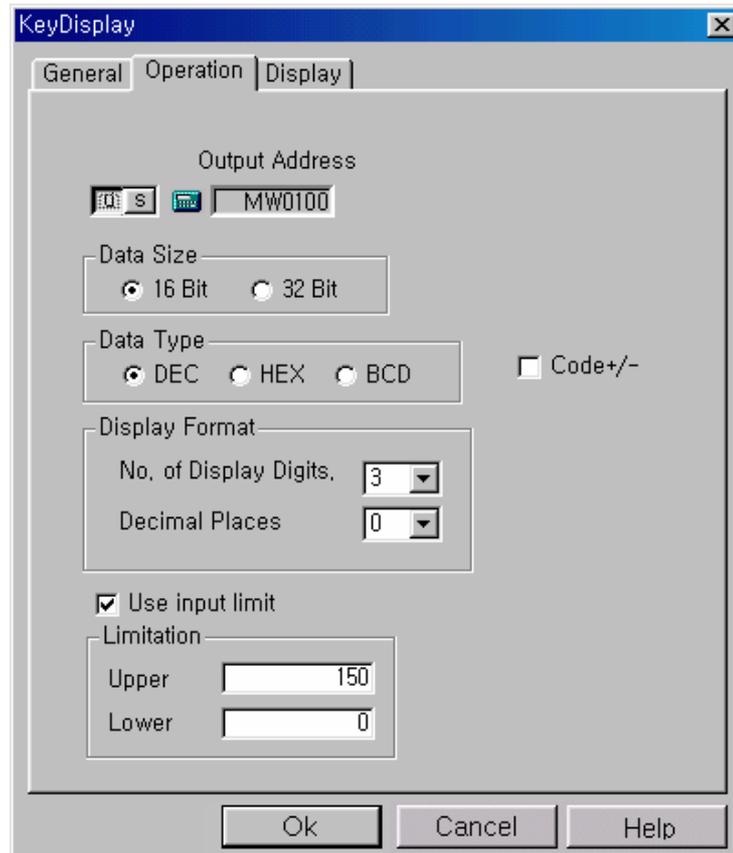


- ③ General Tap of Keydisplay Tag



- ▷ Operation Condition
 - On Touch – New data is transferred to PLC when ENT key is touched.
 - On Selection Bit ON – New data is transferred to PLC when designated bit is ON
- ▷ KeyPad Type
 - Numeric – Change Numeric data
 - Text – change Character data

④ Operation Tap of Keydisplay Tag



- ▷ Click input tool () after select 'd' to use PLC memory address and type MW0010.
- ▷ Data Size and Data Type – Available display data range is limited by data size and data type.
Code +/- is available only data type is selected as DEC. If it is checked data is consumed as signed decimal.

	DEC		HEX	BCD
	Signed	Unsigned		
16 bit	$-2^{15} \sim 2^{15}-1$	$0 \sim 2^{16}-1$	0 ~ FFFF	0 ~ 9999
32 bit	$-2^{31} \sim 2^{31}-1$	$0 \sim 2^{32}-1$	0 ~ FFFFFFFF	0 ~ 99999999

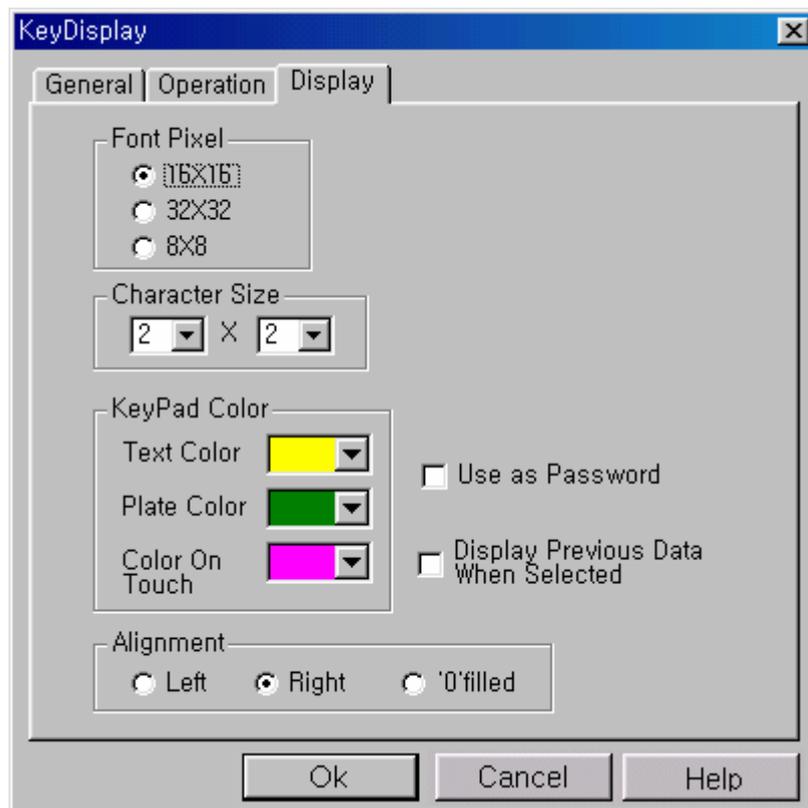
- ▷ Display Format – Assigns the position of floating point

No. of Display digits – Total digits of displaying data.

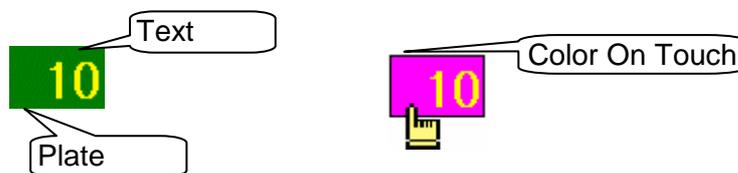
Decimal Places – Digits of floating number.

- ▶ Use input limit – Limits the range of input data. If new data is greater than Upper or less than Lower, than new data cannot be transferred to PLC.

⑤ Display Tap of Keydisplay Tag



- ▶ Font Pixel and Character Size – Decide the size of character.
- ▶ KeyPad Color



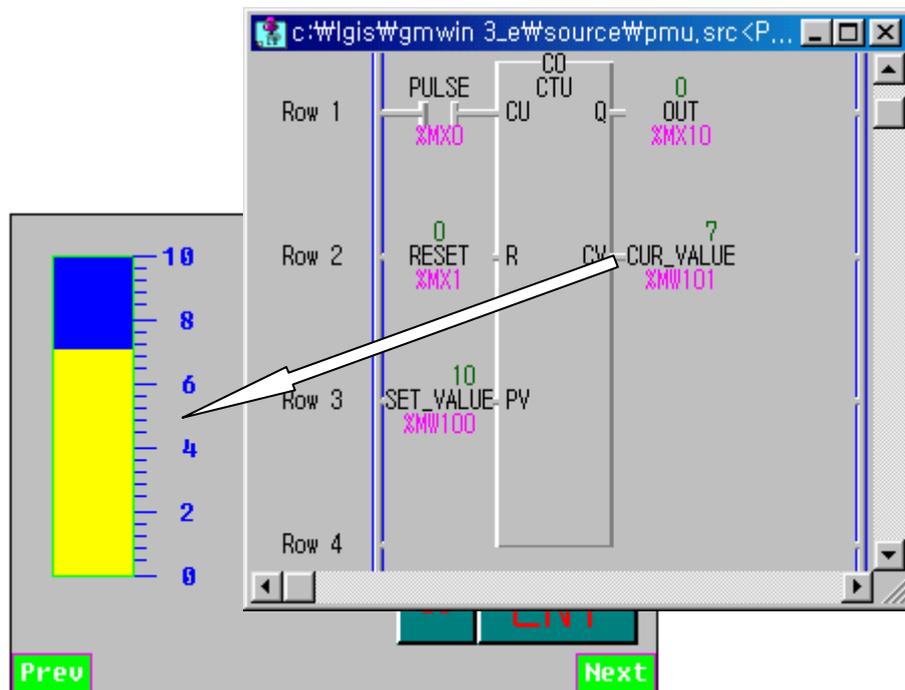
- ▶ Use as Password – Not numeric data but ‘ * ‘ mark is displayed.
- ▶ Display Previous Data When Selected – Keydisplay tag should be touched when input new data. When touched, old data is displayed until ENT key is touched.

Remark How to use tenkey library and keydisplay tag when input more than two data
Use 1 tenkey library and keydisplay tag as many as you want, and when input data touch keydisplay tag you want to input data.

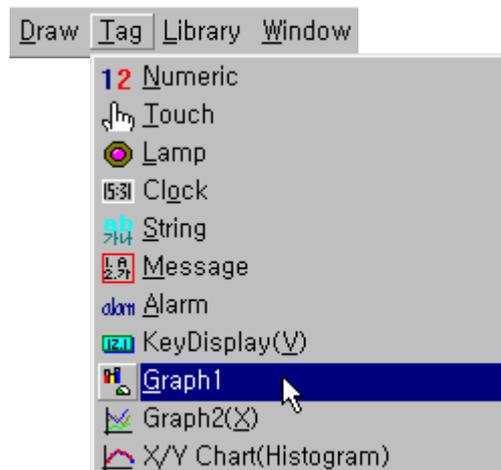
4-1-5 Graph1 Tag(Bar graph/Meta graph

- 1) Bar graph – Set Maximum value and Minimum, and display the rate of current value to Maximum value.

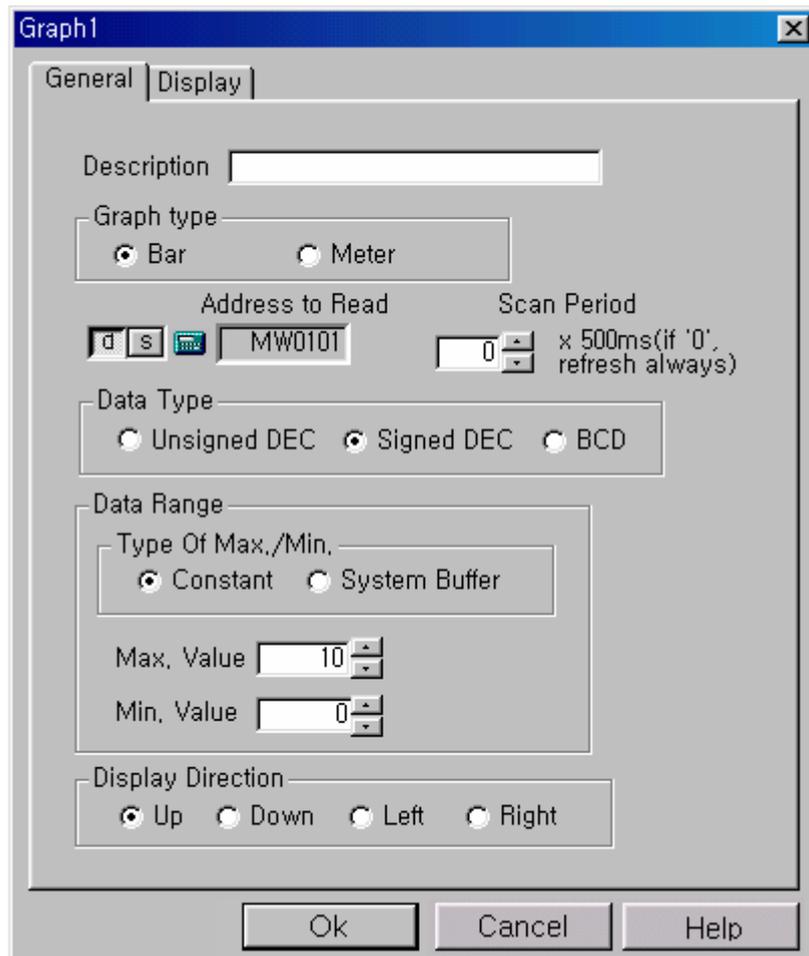
In this example, the current value of counter is displayed as bar graph under th condition maximum value is 10 and minimum value is 0.



- ① Click  icon on icon collection or Tag > Graph1 on menu bar.



② General Tap of Graph1 Tag



- Graph type – Select the shape of graph.



Bar



Meter

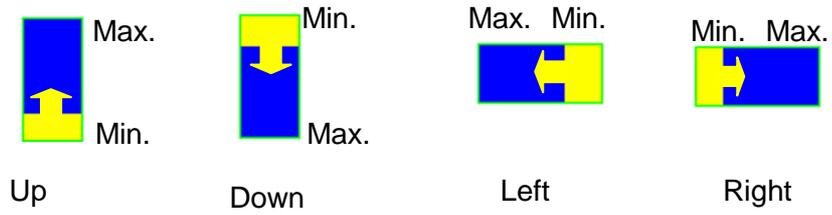
- Type of Max./Min.

Constant – Use constant as maximum value and minimum value.

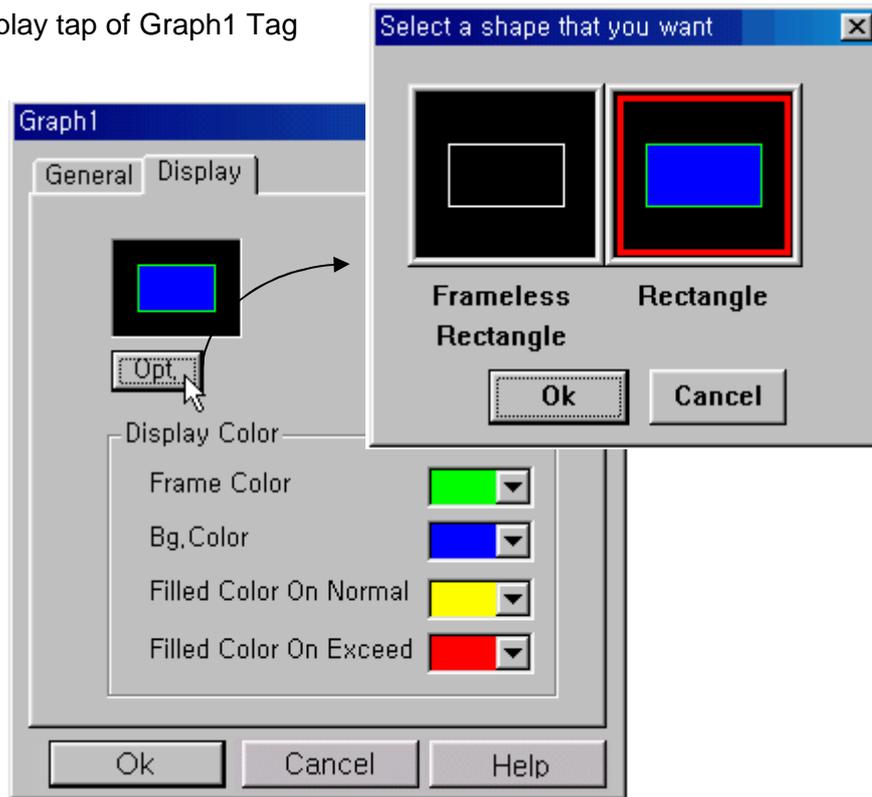
System Buffer – The data of designated system buffer is used as maximum

value and minimum value.

▷ Display Direction

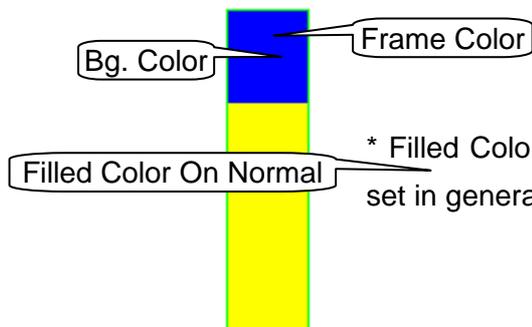


③ Display tap of Graph1 Tag



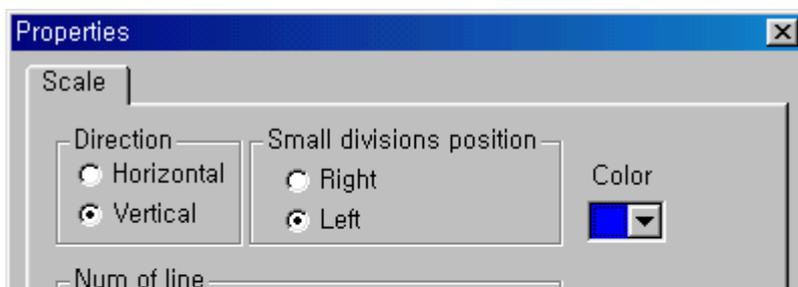
▷ Click Opt and select a shape of graph frame

▷ Display Color



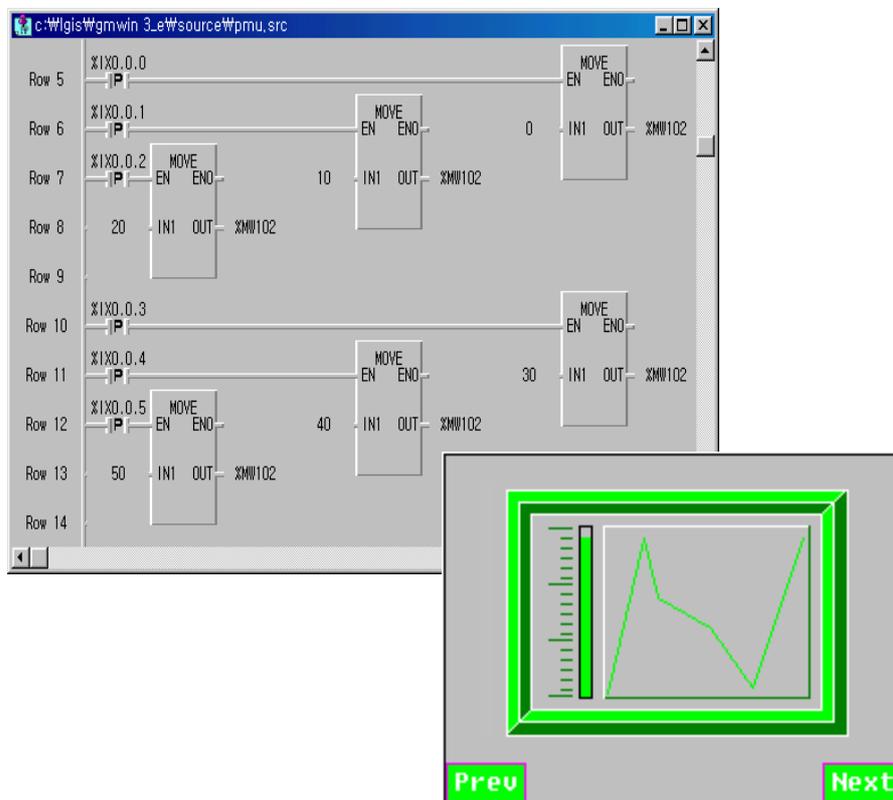
* Filled Color On Exceed appears when data is greater than the value set in general Tap.

④ To insert Scale Click  icon on icon collection.

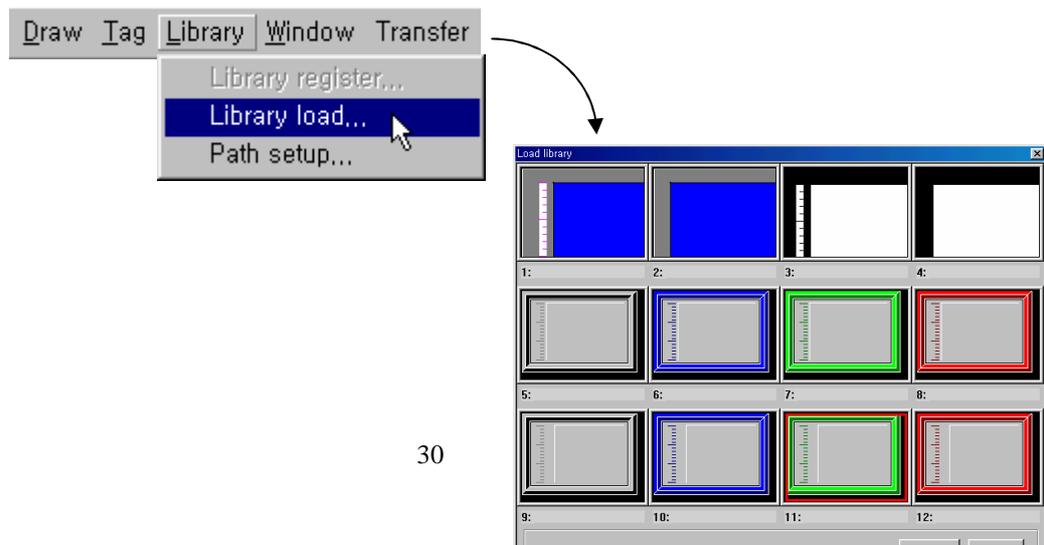


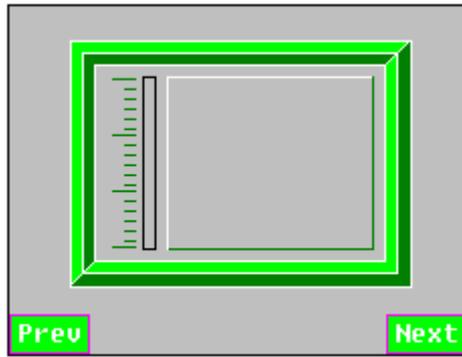
4-1-5 Graph2 Tag (Trend graph)

Read a data of PLC variable periodically and display the data as historical trend graph. In this example, monitor %mw102 every 500ms and display the data as historical trend graph

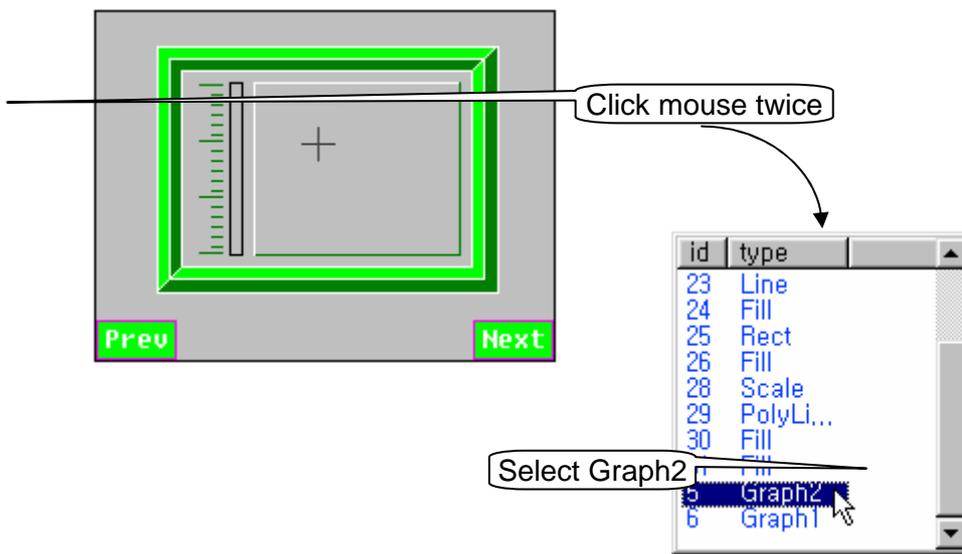


① Library Load

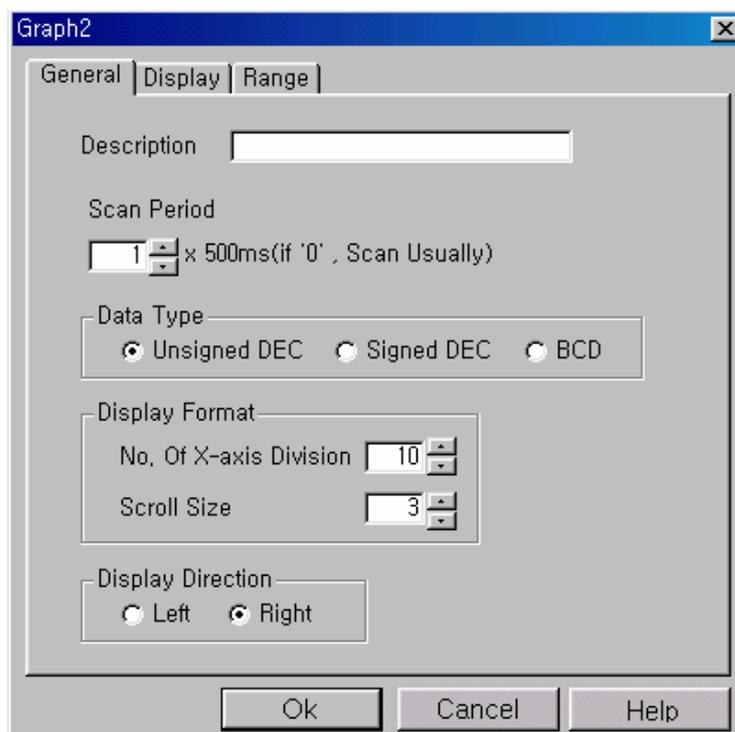




② Library Edit

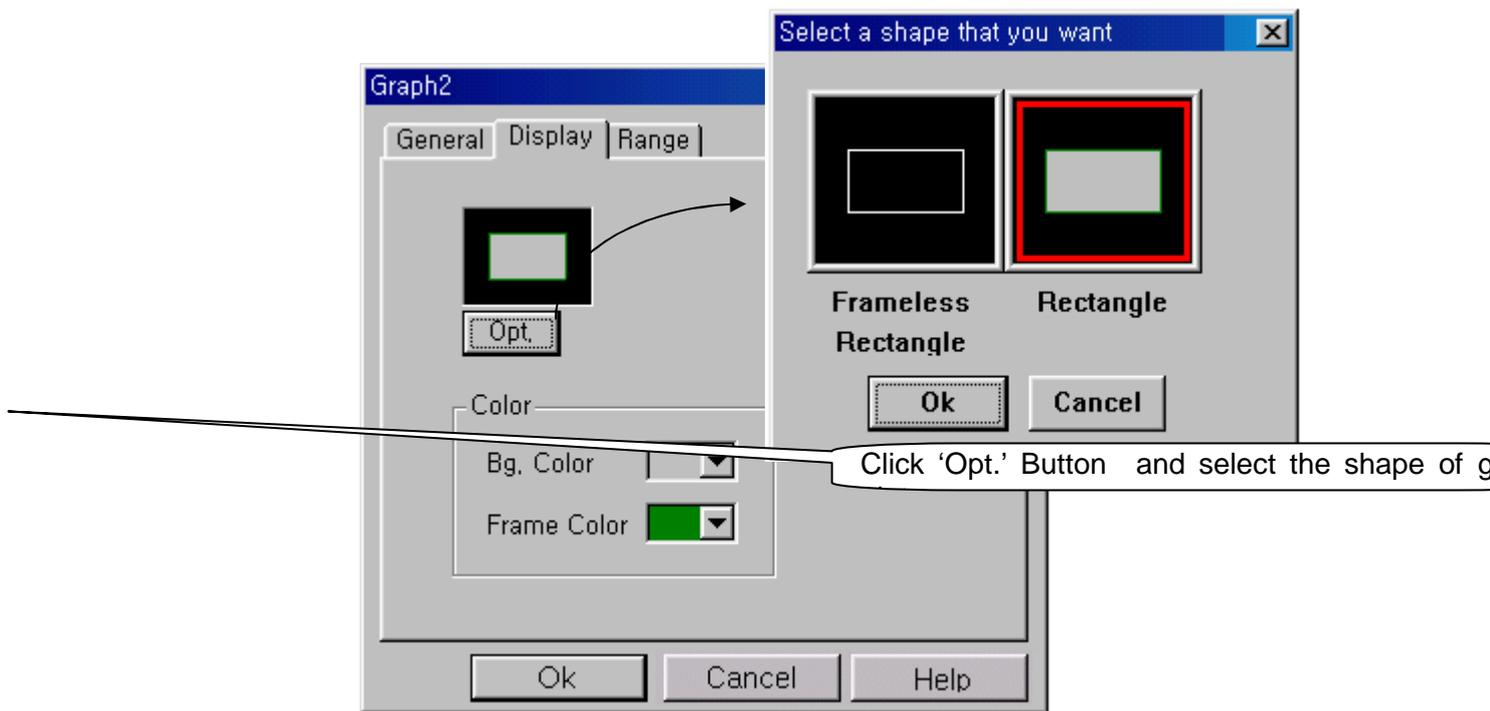


③ General Tap of Graph2 Tag



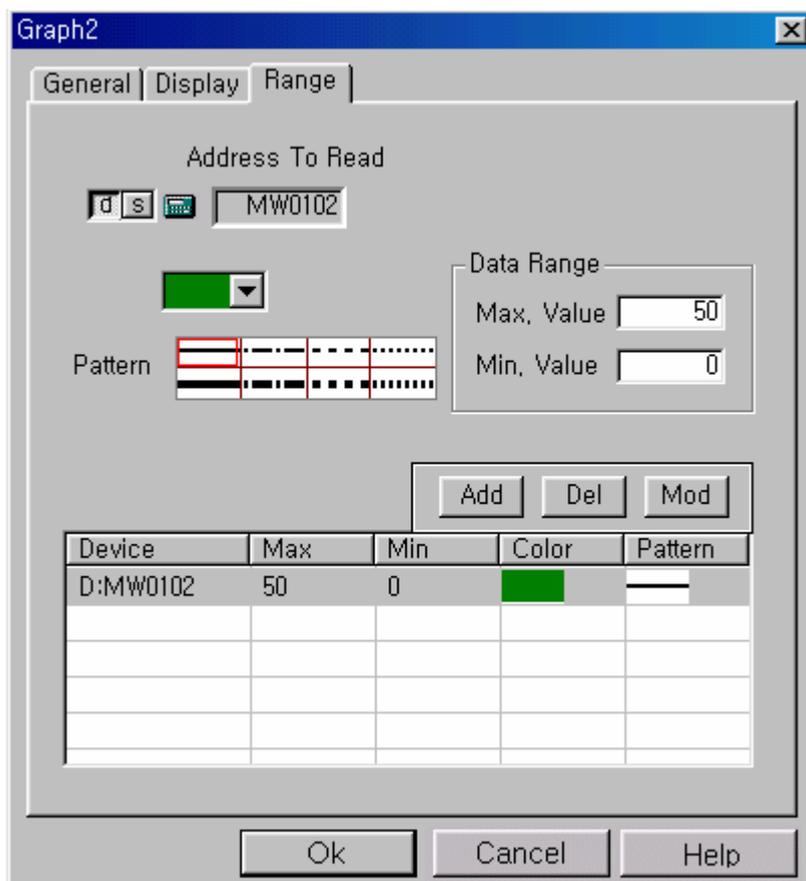
- ▷ Scan Period – Decide data read period.
- ▷ Display Format
 - No of X-axis Division – Determine number of divisions of X axis(time axis).
 - Scroll Size – After trend graph is drawn to the end of X axis on screen, and then X axis shifts to the opposite side of graph’s running direction. Determine the shift size. (Scroll No. should be smaller than X axis division No.)
- ▷ Graph direction : Running direction of graph.
 - Right (left to Right) or Left(Right to Left)

④ Display Tap of Graph2 Tag



- ▷ Color
 - Bg. Color – Background color of graph plate
 - Frame Color – Frame Color of graph plate.

⑤ Range Tap og Graph2 Tag



- ▷ Address to Read - Determine device address to display
- ▷ Range (Min & Max) - Determine Min & Max value of data to be displayed.
- ▷ Line Color - Determine line color of trend
- ▷ Pattern - Determine one among 8kinds of line pattern

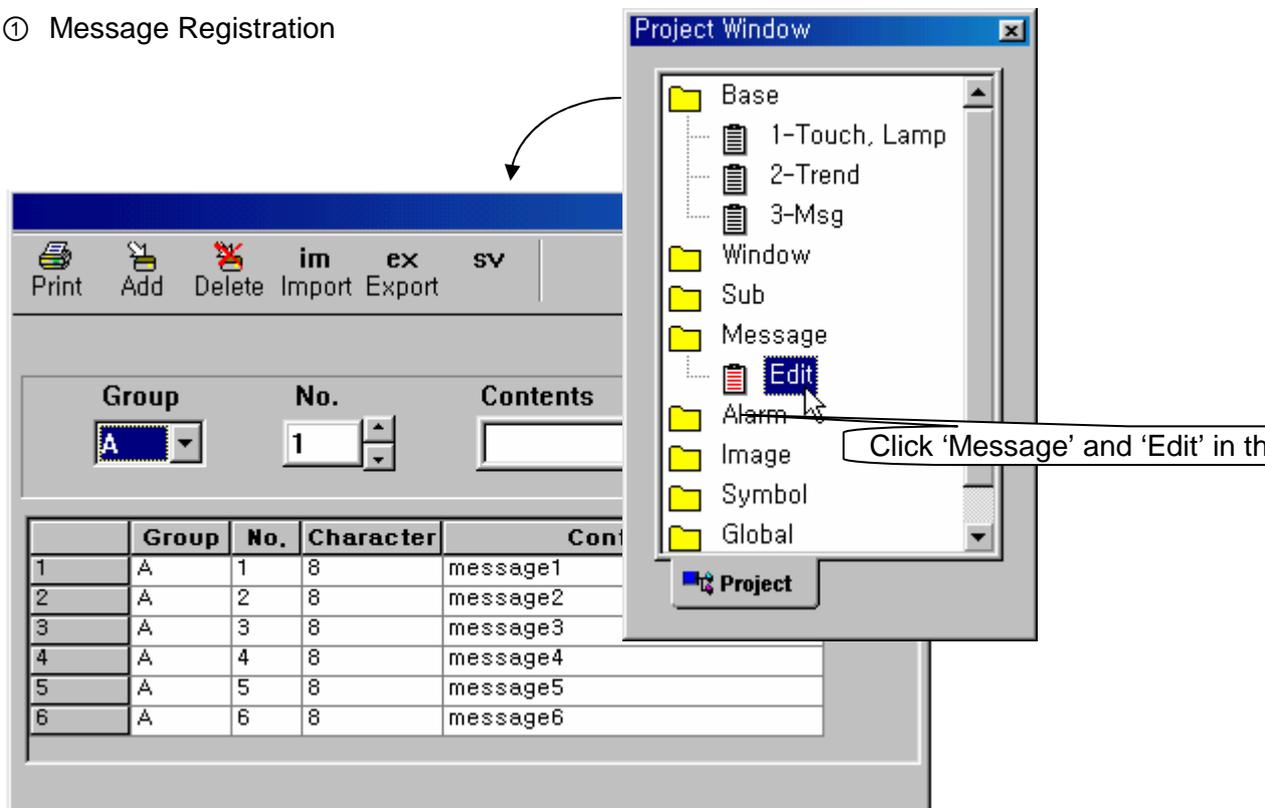
Remark How many data can be displayed on 1 graph2 tag.
 One trend graph tag is capable of displaying maximum 10 address data with different line and with different color and with different Min/Max limits.
 After modifying next properties in 'Range' tab and click 'Add' button. It is registered.

4-1-6 Message Tag

Displays a message registered 'Message' file on determined condition. Message Tag can be used different two method. The first method is monitor 1 bit variable and message is displayed when the designated bit variable turn on, and disappeared when turn off. The second method is monitor 1 word variable and displays message corresponding to variable's value.

In this example, explain the second method.

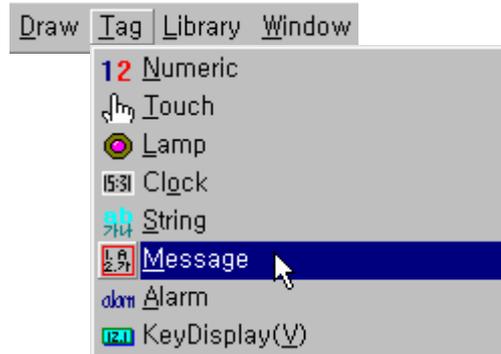
① Message Registration



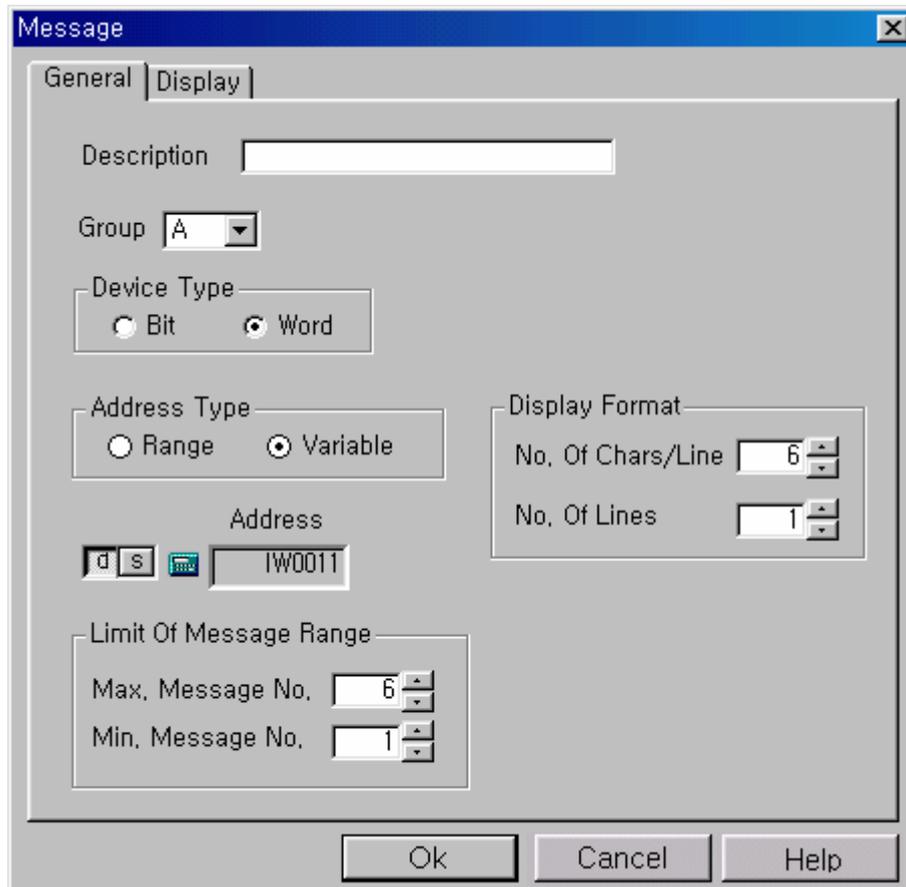
- ▷ Group – Decide group of message. Available group is A ~ Z
- ▷ No. – Decide number of message.

- ▶ Contents – Character to be displayed when condition of message tag is satisfied.

② Click  icon on icon collection or Tag > Message.



③ General Tap of Message Tag



- ▶ Group – Decide the group of message to be displayed.
- ▶ Display Format – Decide the number of line and character to be displayed per line.
- ▶ Device Type – Variable type to be monitored.
- ▶ Address type
 - Range – Displays different message for different range of the device’s value.

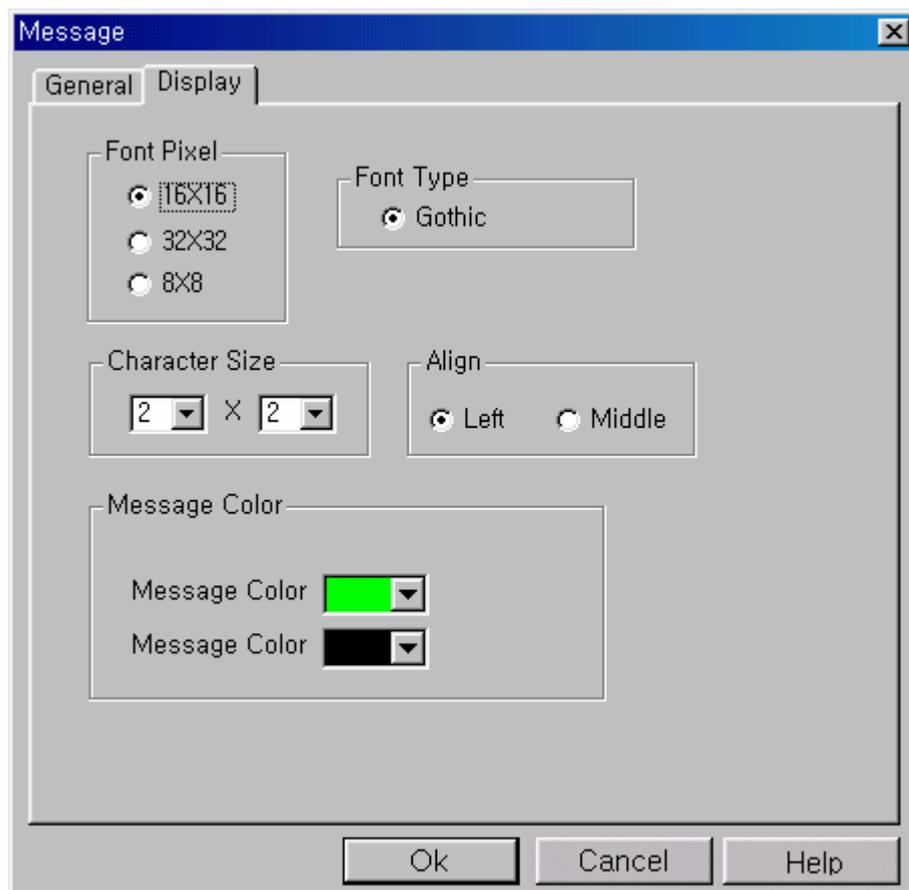
For example, if device's value is between '0' and 100, it displays message #1. And if the value is between '101' and '150', it displays message #2. And it is also possible to display different color for each range. Max. number of range is 8.

Variable - Displays message corresponding to the device's value. If the device's value is not between Max. message number and Min. message number or if message number does not exist or if the device's value is NULL(0), no message is displayed.

▷ Limit of Message Range

On 'Word' condition, maximum available message number is '999', and minimum '1'.

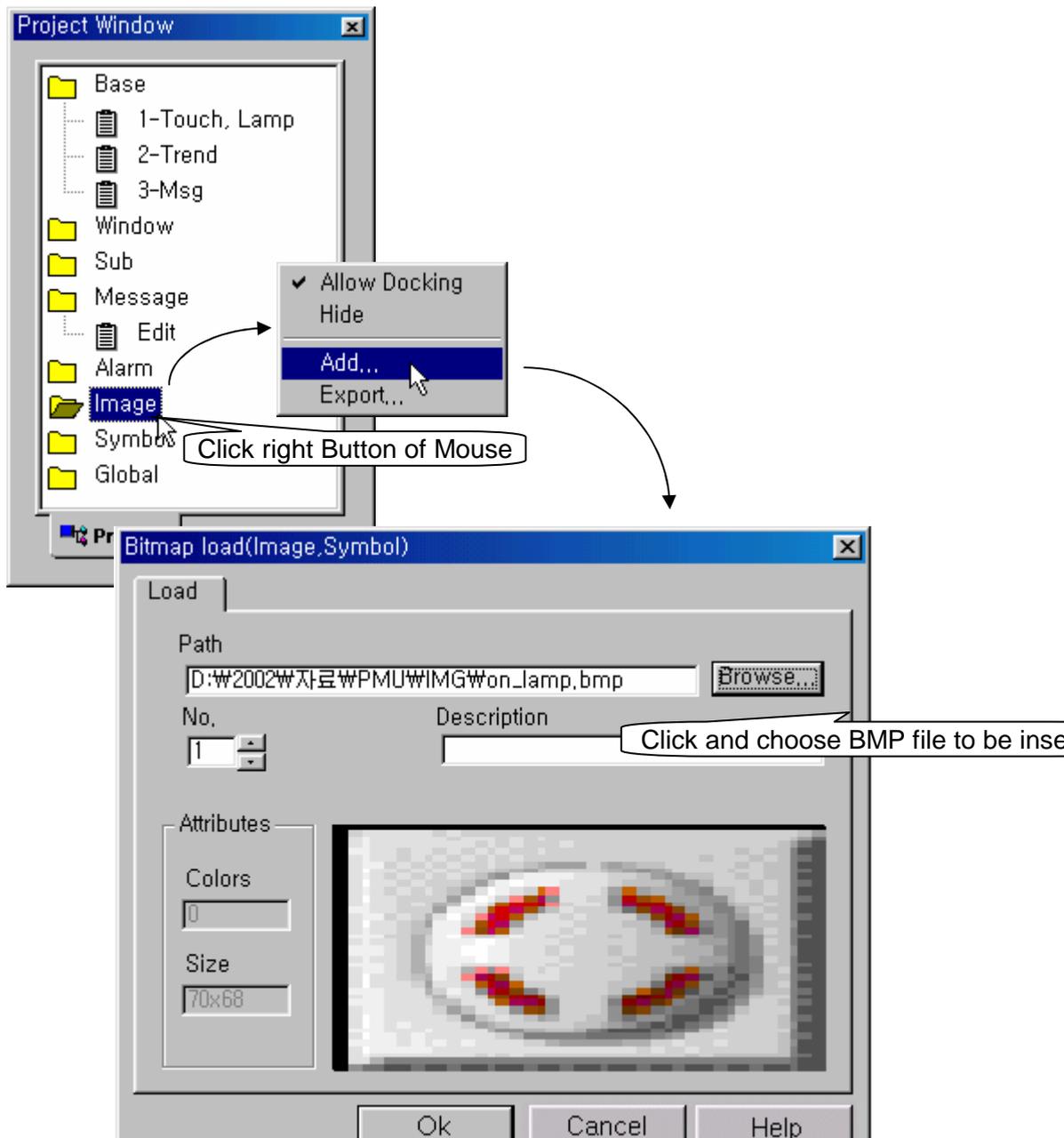
④ Display Tap of Message Tag



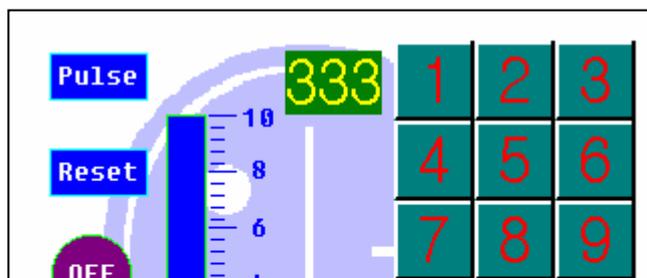
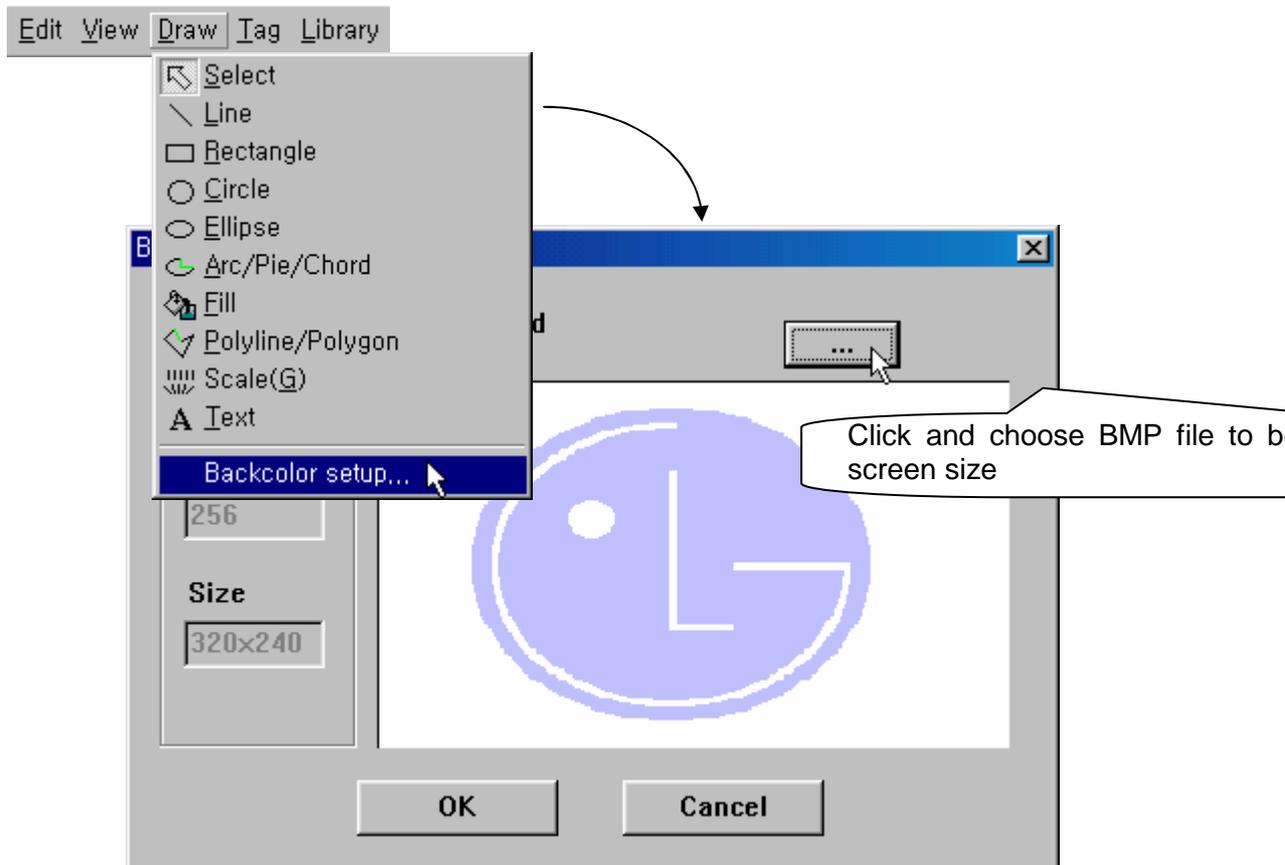
- ▷ Font Pixel and Character Size – Decide Total size of character to be displayed
- ▷ Message – Decide character color and plate color.

4-1-7 Bitmap Functions.

- 1) Insert BMP file into Project



2) Background Bitmap –Use BMP file with the same size of screen as background.



Chosen BMP file is used as

4-1-8 Data Logging

'Logging' is to save external device's data or PMU's data semi-permanently in PMU's memory(SRAM) at regular time-interval.

At the same time, logging time(YY/MM/DD/hh/mm) is also saved.

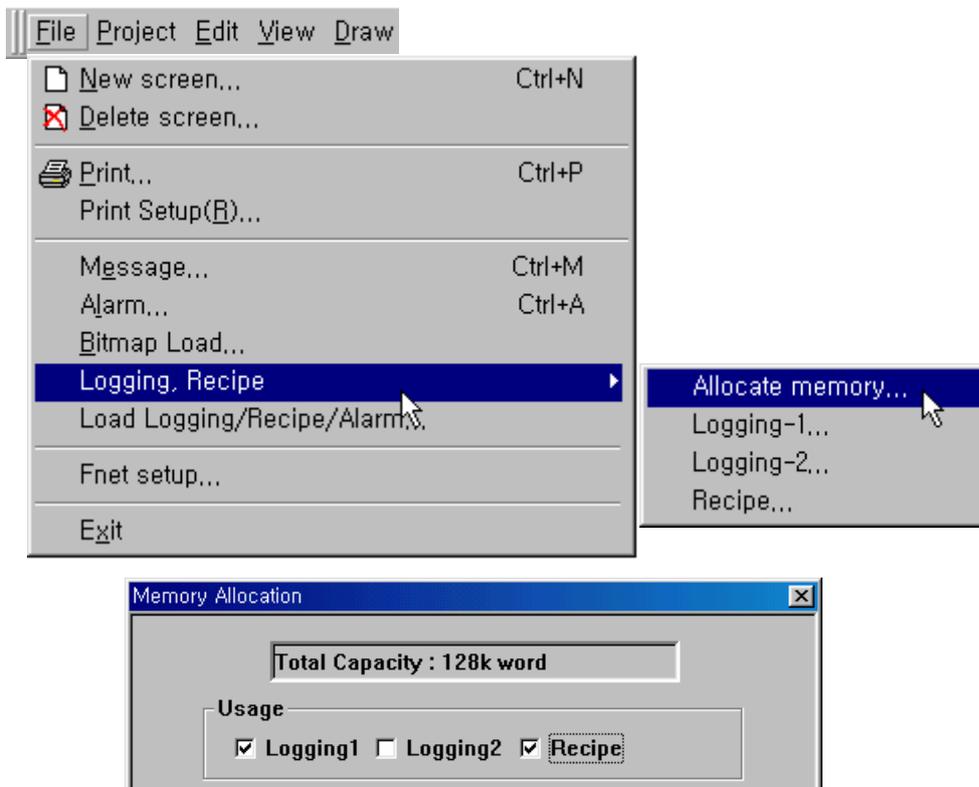
Logged data in PMU can be uploaded to PC anytime.

Logged data is preserved unless user downloads new project file, or O/S data.

On the condition that PMU's power is off over 4days, to preserve the logged data, there should be backup battery. When power is off over 4days without backup battery, logged data and special buffer related to logging are deleted.

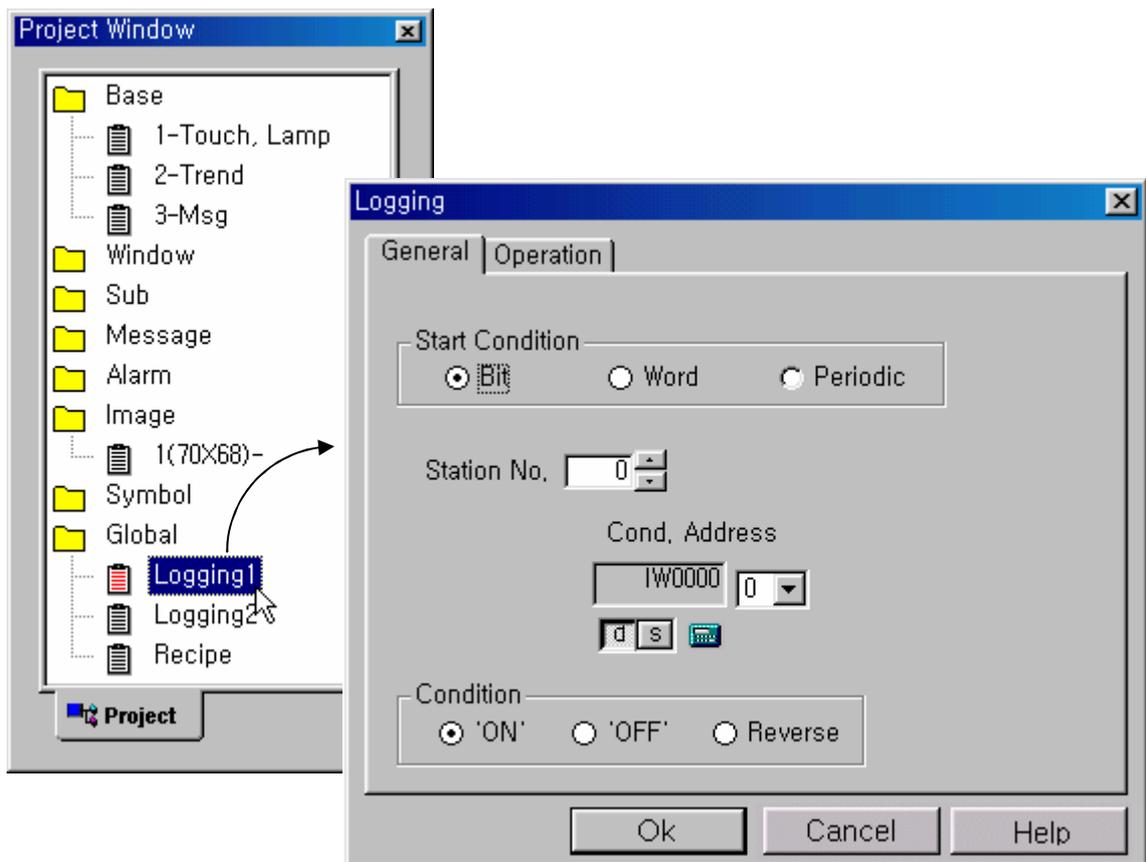
① Memory Assignment

Before setting Logging and Recipe, assign memory,



- ▷ Usage - Determine what to use among 'logging 1', 'logging2' and 'recipe'
- ▷ Memory allocation - Assign Memory for each items.

② General Tap of Logging



▷ Bit (condition)

On : As device's address changes from 'off' to 'On' , it starts logging.

Off : As address changes from 'on' to 'Off' , it starts logging.

Reverse : As address value reverse – 'from On to Off' or 'from Off to On', it starts logging.

- ▷ Word (condition)
 - Starts logging when device's value is within determined range.
 - If address value is out of the range and back to the range, it restarts logging.
- ▷ Time (condition)
 - Starts logging on every setting day/time (hour/minute)

③ Operation

The screenshot shows the 'Logging' dialog box with the 'Operation' tab selected. The 'logging Interval' section contains dropdown menus for 'Every' (0), 'Day' (0), 'Hour' (1), and 'Minute'. Below this is a 'Logging Times' spinner set to 2. The 'Logging Source' section has fields for 'Station No.' (0), 'Start Address' (MW0101), and 'No. Of Words' (2). At the bottom, there is a 'Total Logging Times' spinner set to 10 and a checkbox for 'Display the latest At Top'. Buttons for 'Ok', 'Cancel', and 'Help' are located at the bottom of the dialog.

- ▷ Logging Interval : Determine logging time interval.
- ▷ Logging Times : Determine number of times of logging
 - For example, to log from 8:00 in the morning with 1hour interval till 17:00 of the same day, Logging interval is '0 Day 1 Hour 0 Minute' and Logging times is '10'.

Caution : On time condition, please set 'Logging Times' as more than 2.

- ▷ Logging Target : Determine external device's station number, address or TOP's system buffer, and word number to be logged at one time
- ▷ Total Logging Times : Determine total number of logging.
 Total Logging Times is multiple of 'Logging Times'.
 Total logging memory is not permitted to excess assigned memory volume.
 Total Logging memory = Total Logging Times * (Word Number+4)+2 ['4' is to save logging time]
- ▷ Display the latest at top
 Checked : The last logged data is displayed on the top line.
 Not Checked : The last logged data is displayed on the bottom line

4-1-9 Recipe

Recipe is saving parameter data, which PMU or external device need, in PMU or transmitting data block to working area(controller's address or PMU's system buffer) on determined condition.

It is possible to upload data to PC or to print into printer.

PMU uses parameters in SRAM.

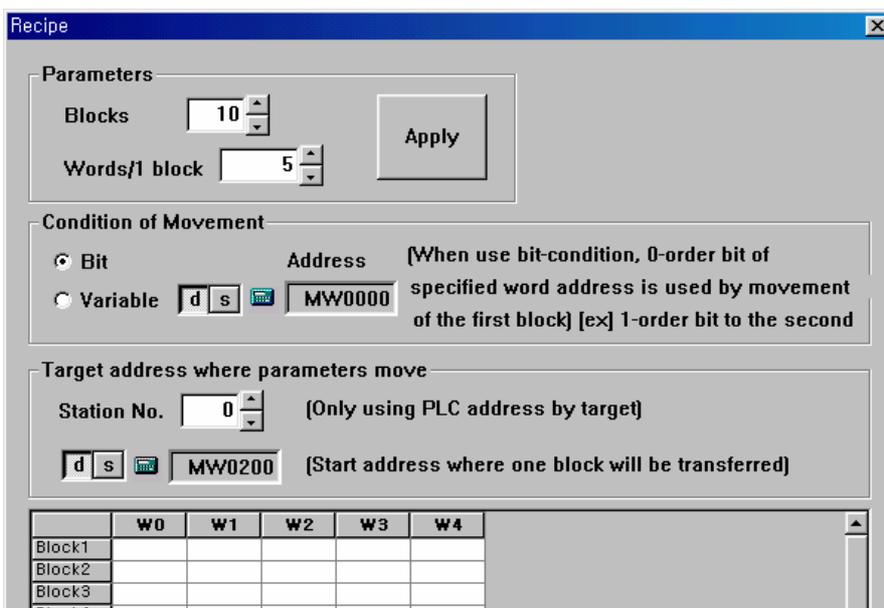
Parameter data in SRAM are preserved unless modifying parameters, downloading new project file or O/S.

On the condition that PMU's power is off over 4days, to preserve the logged data, there should be backup battery. When power is off over 4days without backup battery, logged data and related special buffer are deleted.

Likewise with logging, total word number is not permitted to exceed 'Assign memory'

$$\text{Total Word Number} = \text{Word Number} * \text{Block number} + 2$$

As total memory exceed assigned memory, an error message appears.



▷ Parameter

Block : Write block number

Words / 1 block : Write word number per 1 block

Click 'Apply', blocks and words are formed as many as determined numbers.

▷ Transmission Condition

Bit : From '0'bit of selected address, parameter transmission condition bit and block number make a one-to-one correspondence.

As bit value changes from '0' to '1', the corresponding block's data are transmitted to working area. For example, bit '0' is changed from '0' to '1', block #1's data are transmitted to working area.

Caution :

In case that block number is not 16's multiple, should pay attention.

For example, if block number is 10, bit '10'~ '15' are not used.(0~9bit used)

But, never use address bit, '10' ~ '15'.

Variable : The value of selected address becomes block's number.

If the value of address is '5', block #5's data are transmitted to working area.

And if the value of address is '0' or exceed 'total block number', the value is ignored. For example, when total block number is 10, if address value is '0' or '11' or '23' etc, no block data are transmitted.

▷ Target Address

Determine station number and working area address which parameter data are transmitted to.

▷ Table : Column is block and row is word.