. Graph 1(Bar Graph) Tag

Graph 1 tag is Bar/Meter/Closed region Graph tag.

(1) Type

  Bar graph tag
   - reads data of controller device or system buffer
   - draws bar graph which indicates the data's value
   - has 2 kinds of bar shape : 'frameless rectangle' or 'rectangle with frame'
   - 4 kinds of bar display direction : left, right, upward and downward
   - is capable of limiting input data's range by setting max. and min. value
  Meter graph tag
   - reads data of controller device or system buffer
   - draws meter graph which indicates the data's value by needle
   - has 2 kinds of bar shape : 'circle' or 'half circle'
   - 2 kinds of bar display direction : clockwise, counterclockwise
  Closed region graph tag
   - reads data of controller device or system buffer
   - draws fill-graph which indicates the data's value inner closed region
   - 4 kinds of bar display direction : left, right, upward and downward

(2) Registration

  1) Select graph 1 tag in tag menu or Graph 1 icon on Toolbar
  2) Determine device address or system buffer to read
  3) Click 'OK'

. . Setting

(1) General
  1) Scan Period : Determine time period to read data of device's address or system
     buffer.
     Reads the data and displays on bar graph every 'Scan Period x 500ms'.
     If scan Period is '0', reads the data and displays the data on bar graph always.

2) Address to read : Determine device address or system buffer to read

3) Type of Max/Min : 'Constant' or 'System Buffer'.   In case of 'System Buffer', the Max. and Min. value should be system buffer address. In this case, real Max/Min value is the value in the system buffer.
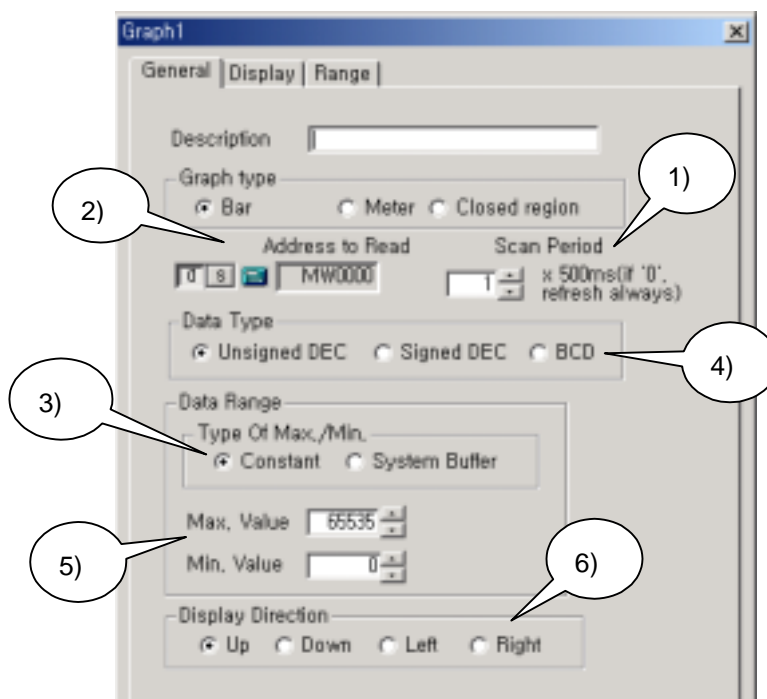
4) Data Type : Unsigned DEC., Signed DEC., BCD

5) Data Range

Data Type	Data Range
Unsigned DEC.	0~65535
Signed DEC.	-32767~32768
BCD	0~9999

6) Graph Direction : which direction to fill with an special color inside of graph.
- Bar or Closed region : Left, Right, Upward and downward
- Meter : clockwise, counterclockwise

(2) Display

1) Option

Click 'Option' button, a dialog box appears to choose tag's shape.
- - Bar : Frameless Rectangle or Rectangle with frame
- - Meter : Circle or Pie
- - Closed region : No shape

2) Color
1. Frame Color : Frame color of graph. It is no meaning in Closed region graph.
2. Background Color : Background color of graph.
3. Normal Color : Filled color in case that data is in determined range.
4. Out of range Color : Filled color in case that data is out of the range.
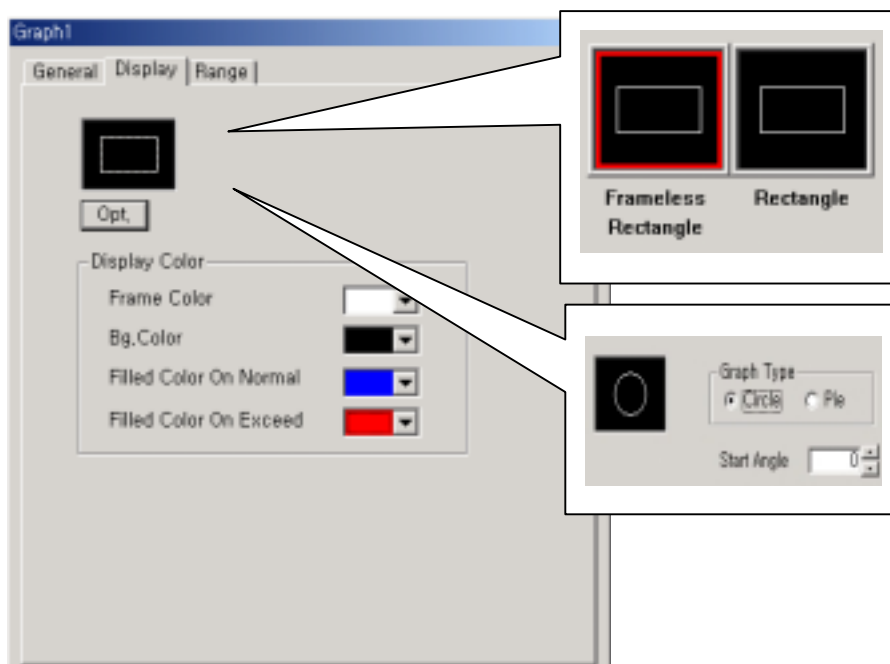
. .   Examples

1. Bar graph

Register a bar graph tag,

- scans 'MW0' every 2 second and draws bar graph from bottom to upward.

- type of Max/Min is 'Constant'

- Data Type is unsigned DEC.

- Data Range 'from 0 to 20000'

- Shape of graph is rectangle with frame

- Frame color is black, background is white, normal color is cyan, out of range color
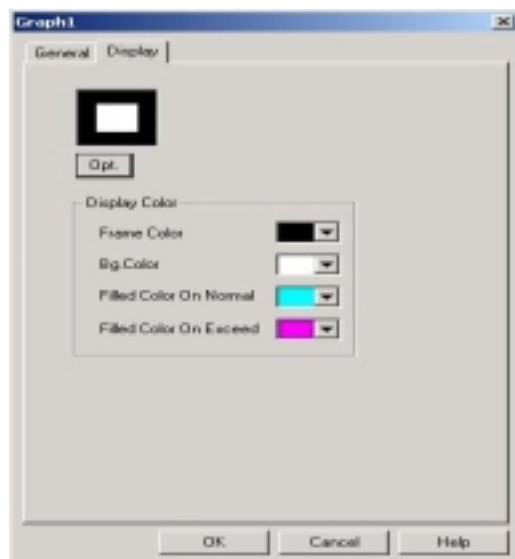 is pink.

.

1) General

- Scan Period : 4

- Address : MW0

- Type of Max./Min. : Constant

- Data Type : Unsigned DEC.

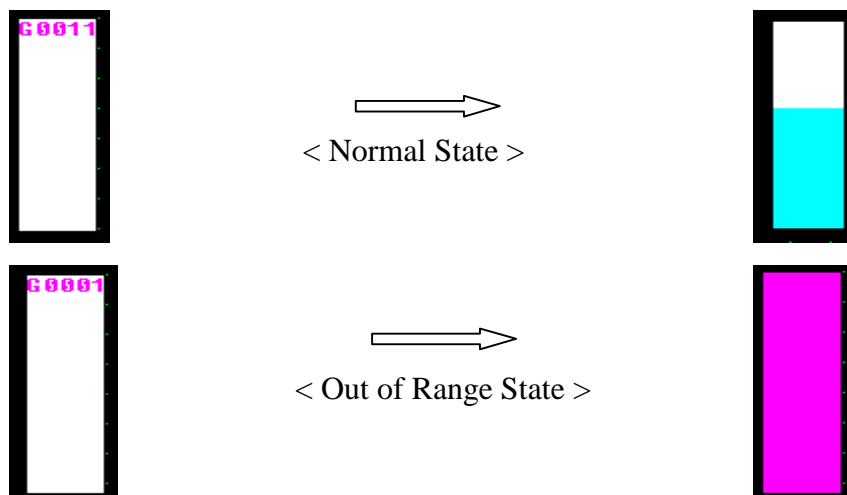- Data Range : Min. 0,   Max. 20000

- Graph Direction : Up
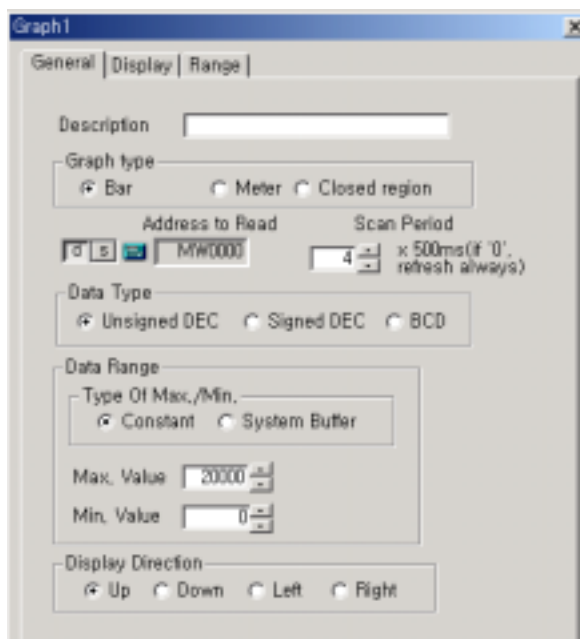
2) Display

- Graph Shape : Rectangle with frame

- Frame Color : Black

- Background Color : White

- Normal Color : Cyan

- Out of range Color : Pink

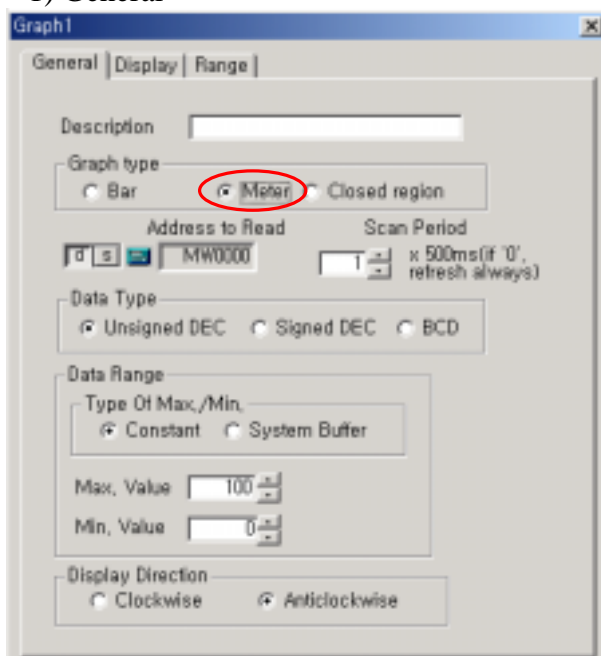3) Results

< Normal State >

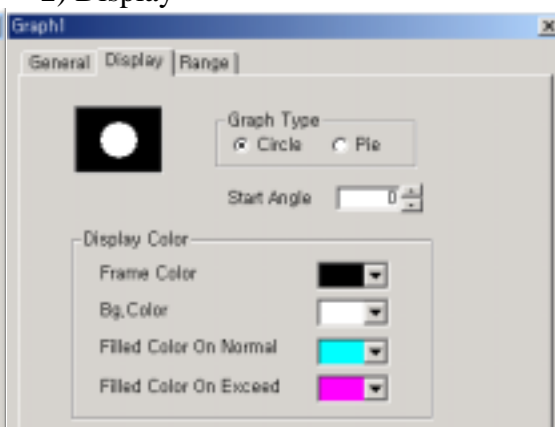< Out of Range State >

2. Meter graph

Register a meter graph tag,

- scans 'MW0' every 500ms and draws meter graph by needle.

- type of Max/Min is 'Constant'

- Data Type is unsigned DEC.

- Data Range 'from 0 to 100', increased by anticlockwise.

- Shape of graph is circle, and start angle 0°

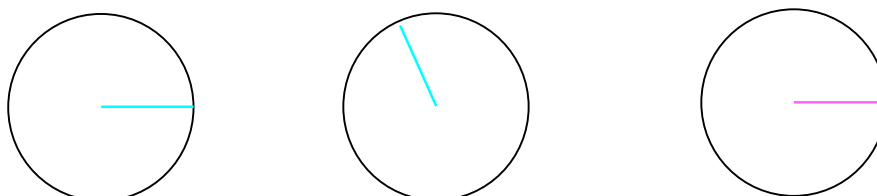- Frame color is black, background is white, normal color is cyan, out of range color is pink.

1) General   2) Display

3) Result

When MW0's value is 0 When MW0's value is 30   When MW0's value is over 100
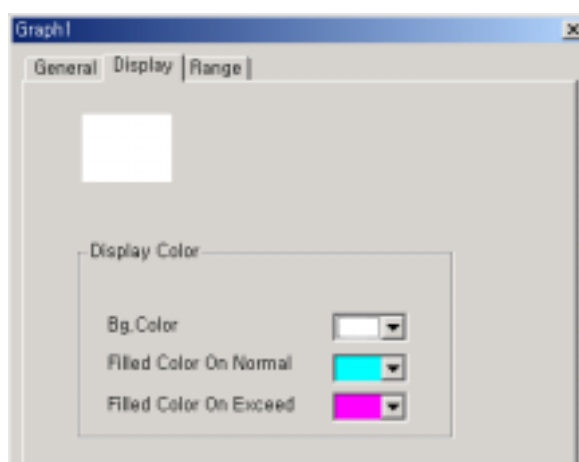
3. Closed region graph

Register a closed region graph tag inner closed diagram

- scans 'MW0' every 500ms and draws closed graph

- type of Max/Min is 'Constant'

- Data Type is unsigned DEC

- Data Range 'from 0 to 100', increased by UP

- Background is white, normal color is cyan, out of range color is pink
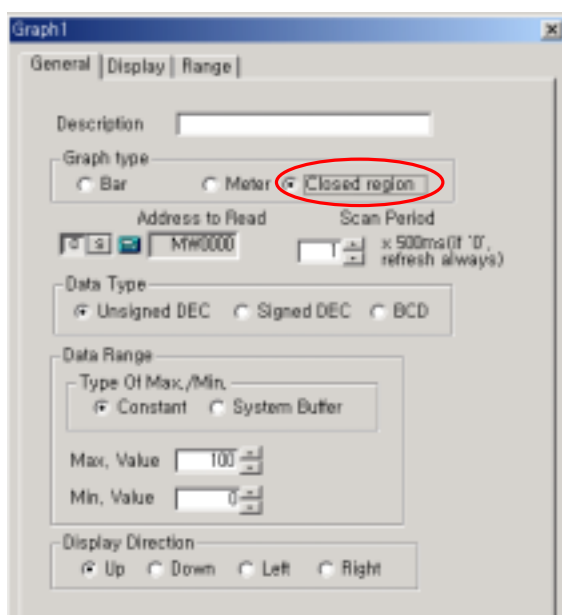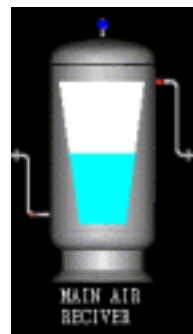
1) General   2) Display

3) Result

[Registration of Closed graph tag on PC]   [when MW0's value is 50, RUN]

.　　Graph2(Trend Graph) Tag

Graph 2 tag is Trend Graph tag.

(1) Trend Graph tag

Trend graph tag,
- reads data of controller device or system buffer
- draws trend graph which indicates the data's value along with time various
- Various types of line shape are available
- One trend graph tag can read and display maximum 10 address' data.

(2) Registration

Select the Graph2 tag in the menu or Graph 2 icon on Toolbar.

.　　.　　Setting

(1) General

1) Scan Period : Determine time period to read data of device's address or system buffer.　 Reads and displays the data on trend graph every 'Scan Period x 500ms'.　 If scan period is '0', reads the data always and displays the data on bar graph.

2) Data type : There are 3 kinds of data types, Unsigned DEC. , signed DEC., BCD

3) Data Range : Determine in the 'Range' tab.

| Data type	Data Range
Unsigned DEC.	0~65535
Signed DEC.	-32767~32768
BCD	0~9999

4) Display format

No. of X axis division : Determine number of divisions of X axis(time axis).

Scroll Over No. : 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.)

5) Graph direction : Running direction of graph.

Right (left to Right) or Left(Right to Left)
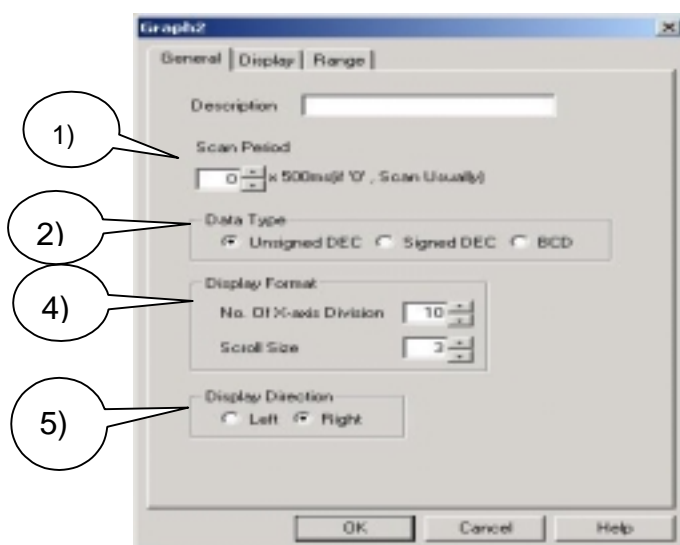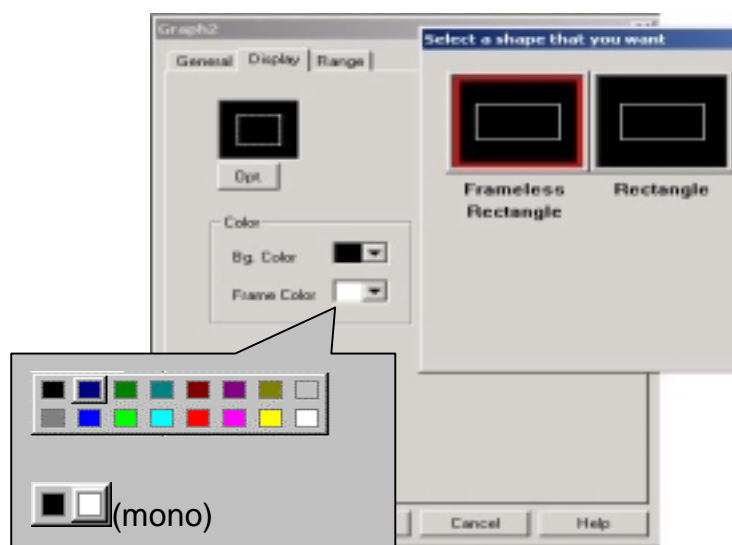

(2) Display

1) Option

Click 'Option' button, a dialog box appears to choose shape of graph plate.

There are two kinds of shape, 'Frameless Rectangle' and 'Rectangle with frame'.

2) Color

1. Frame Color : Frame color of graph plate
2. Background Color : Background color of graph plate

(3) Range

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.

1) Address to read
    Determine device address to display

2) Range (Min & Max)
    Determine Min & Max value of   1) Address to read
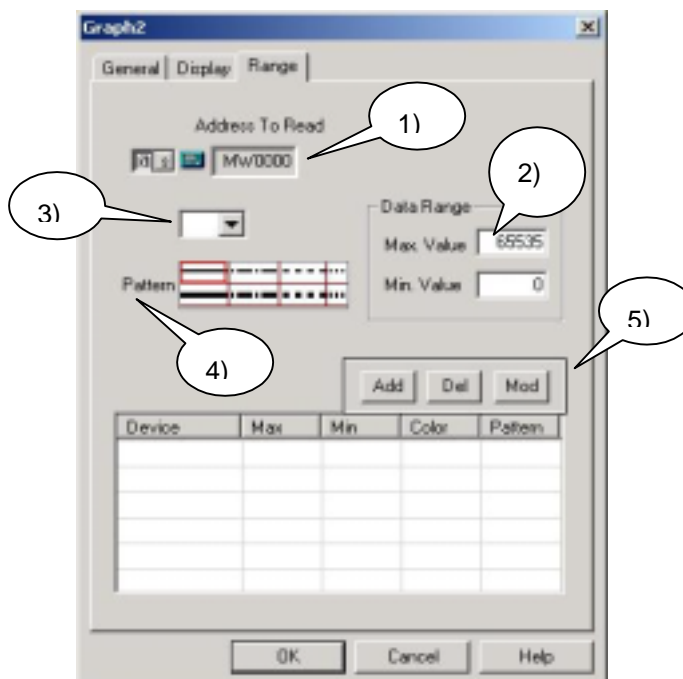
3) Line Color
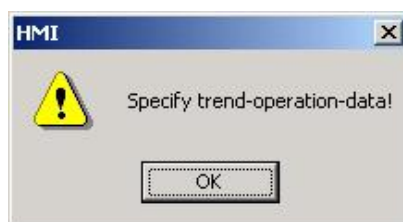   Determine line color of trend

4) Pattern
    Determine one among 8kinds of line pattern

5) Add, Delete, Modify
    It is same with the method of Calculation tag or Touch tag's 'Operation' tab.

Click 'OK' without any data in list, next error message appears,

## Ⅴ. ⅴ. **Examples**

Register a trend tag,

- 5sec scan period, data type is unsigned decimal, X axis division No is 20, scroll over number is 6
- and graph plate shape is rectangle which has black background color and white frame color.
- displays both of MW0's data and MW10's data.

 MW0's data is displayed with blue (----) line and data range is 'from 0 to 5000'

  MW10's data is displayed with cyan (   ) line and data range is 'from 5000 to 10000'

(1) General

- Scan period : 10 (10*500msec = 5sec)
- Data type : unsigned DEC.
- No of X axis division : 20
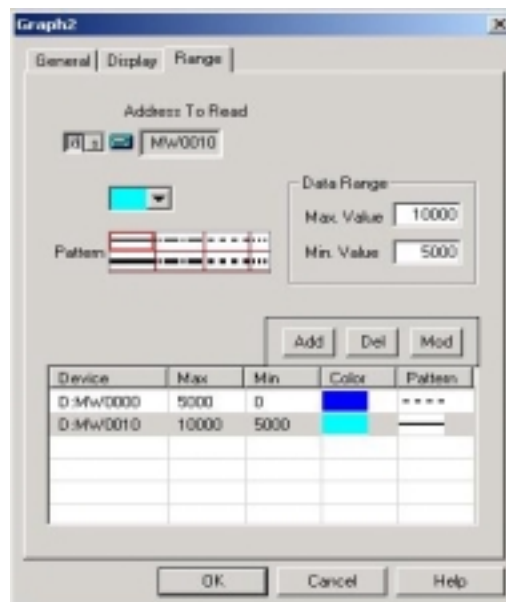- Scroll Over No.: 6
- Graph display direction : Right
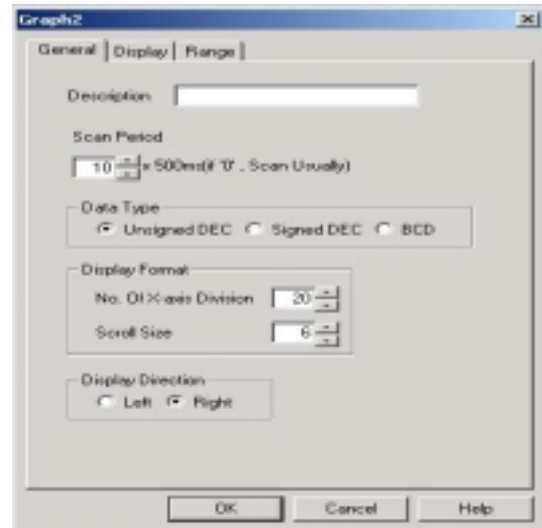
(2) Display

- Option (Graph plate type): Rectangle with frame
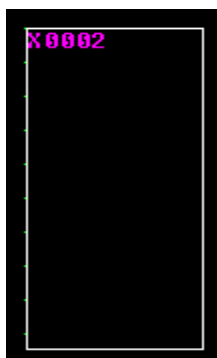- Background color: Black
- Frame color : White
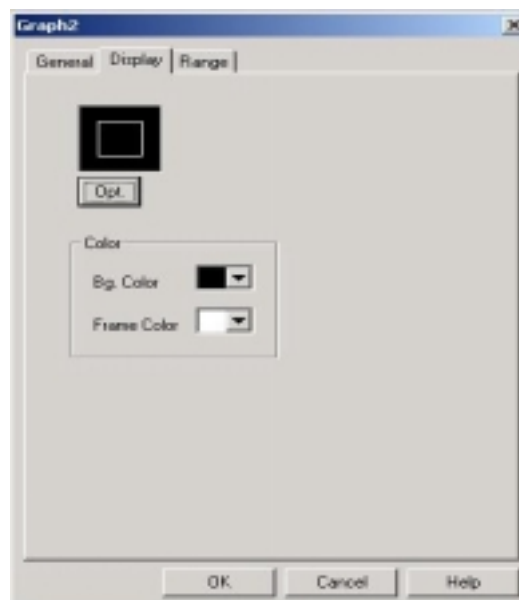
(3) Range

- Range 1:
  Address to read : MW0,
  Line color : Blue,
  Pattern : ----,
  Range(Max/Min) : 0 ~ 5000
- Range 2:
  Address to read : MW10,
  Line color : Cyan,
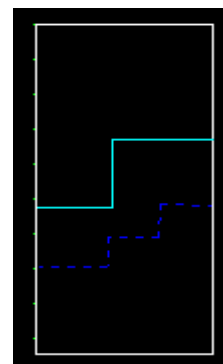 Pattern :   ,
 Range(Max/Min) : 5000 ~ 10000

(4) Results

With Numeric tag, it is possible to see variation of the value as both of 'number' and 'graph' at the same time.

<On PC>   < On Panel>

X axis division No. is 20 and Scan period is 5sec, so it takes 100sec to draw graph to the end of X axis.   And because scroll over No. is 6, trend graph shifts 6 division to the opposite side of display direction.

After reaching at this point, shifts 6 division to left and restart

20 divisions of x-axis
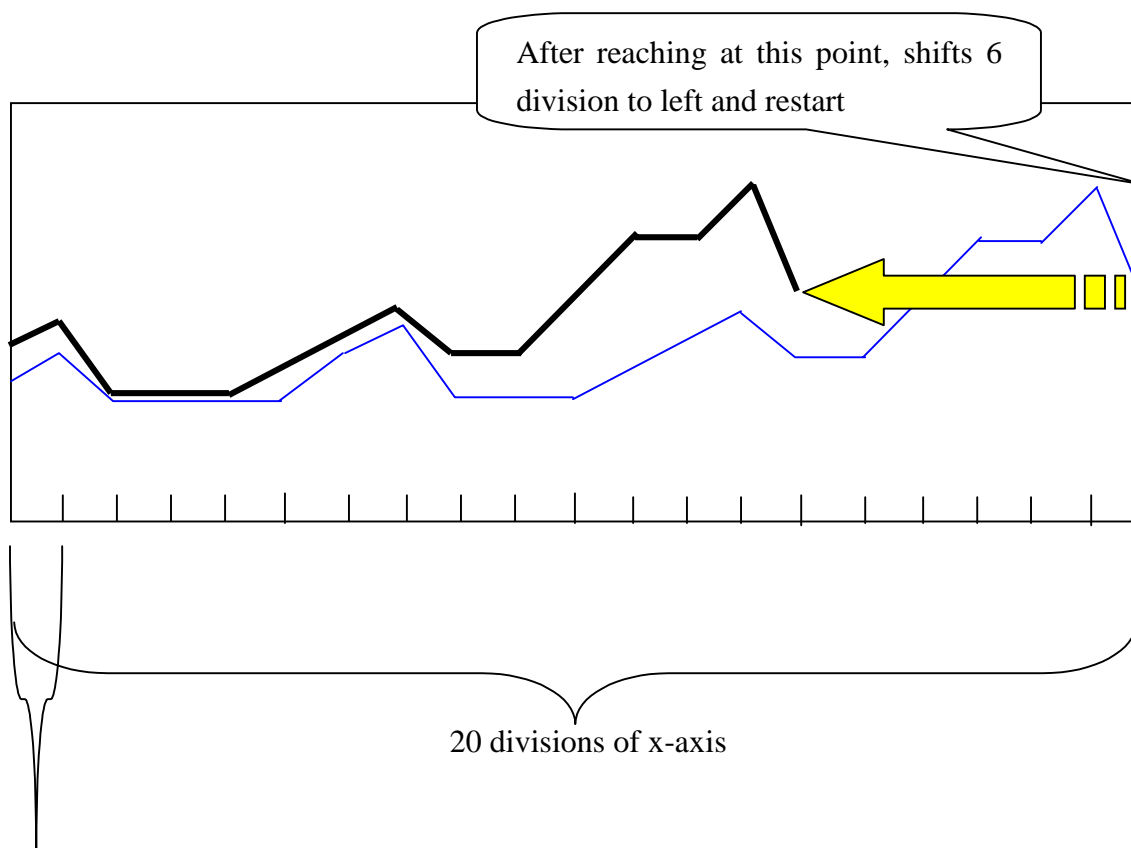
proceeds this length in every 5 second

. Communication Tag

Communication means

- Reads the controller's device data and write the data inner system buffer

or

- reads inner system buffer data and write the data in controller's device.

(1) Registration

1) Select communication tag in tag menu or communication tag icon.
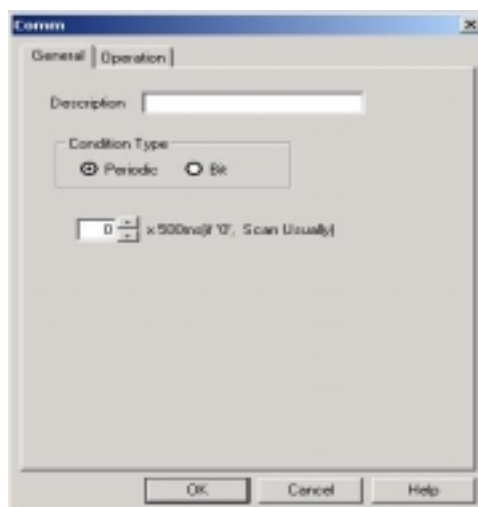2) Determine 'Condition, Communication type, Station No., Start address, etc'
3) Click 'OK'

. . Setting

(1) General

Determine communication Condition

1) Time period
  - period x 500msec is available .
  - Communication is executed every designated time period(scan period).
  - If scan time is 0, reads data always.

2) Bit

   - Determine condition-address to communicate(read or write).

   - Bit Condition : Select one of conditions.

     Case 1, 'ON' : When the bit is changed from '0' to '1'

     Case 2, 'OFF' : When the bit is changed from '1' to '0'
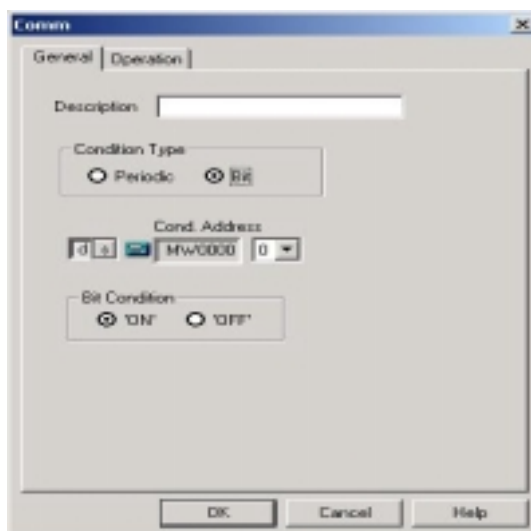
(2) Operation

1) Read or Write

    Select 'Read' or 'Write'

    'Read' : reads data of controller device and saves inner system buffer.

    'Write' : writes data in controller device from inner system buffer.

2) Station No.

    Determine station No. of controller device

3) Start address (of controller device)

    Determine controller device address to read or write.

    In 'Read' mode, the data of this address is read.

    In 'Write' mode, the data is written in this address

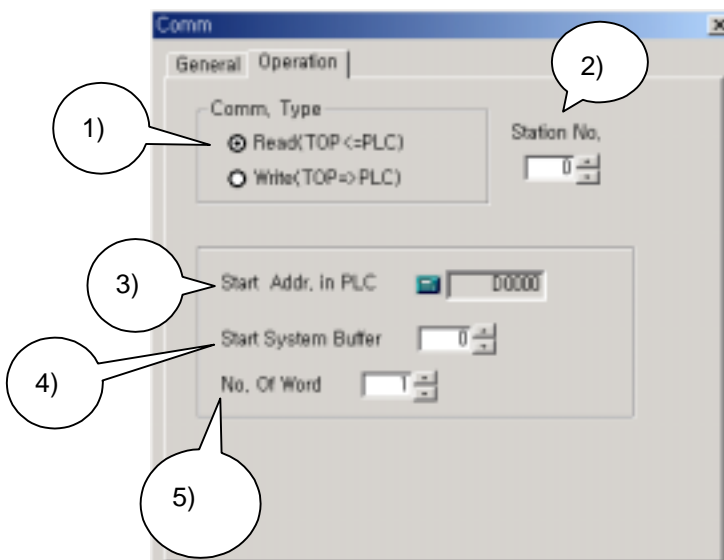4) Start system buffer

    Determine system buffer to read or write.

    In 'Read' mode, data of controller is written in this buffer.

    In 'Write' mode, the data of this buffer is read and written in controller.
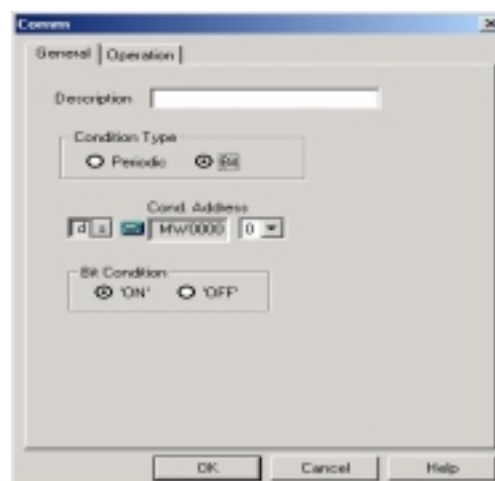
5) Word No.

　　Determine Word No. to communicate.

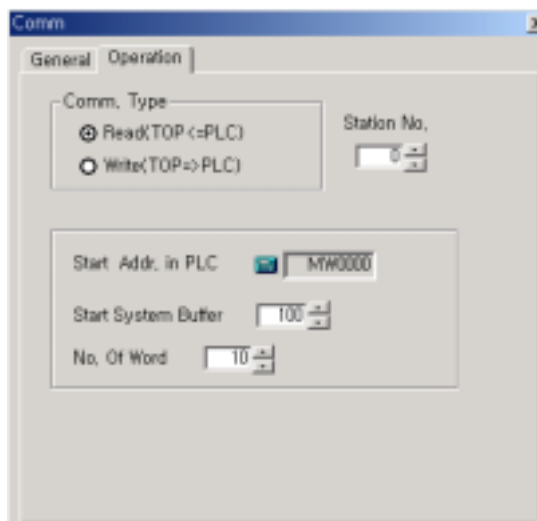

Ⅴ. Ⅲ. Examples

(1) In 'Read' mode

　　Register a communication tag,

　　- reads 10 word data from MW0 of station No. '0' when bit 0 of MW0 triggers to
　　　1,

　　- writes(saves) the data in system buffers '100'

　　　- Communication condition: Bit
　　　- Address : MW0's 0 bit
　　　- Bit Condition : ON

Ⅴ. Ⅲ - 3

- Communiction Type : Read
- Station No. : 0
- Start Address : MW0
- Start System buffer : 100
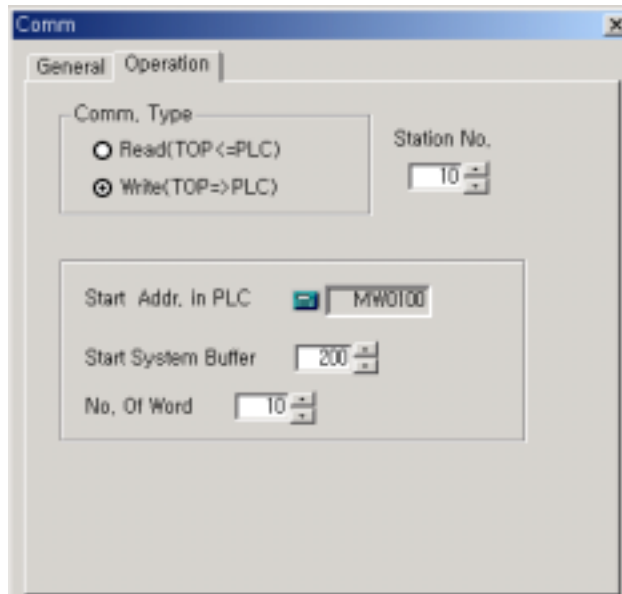- Word No. : 10

(2) In 'Write' mode

Register a communication tag,
- reads 10 word data of system buffer 200
- writes(saves) the data in MW100 of station No. 10 every 5 second.

- Communication condition : Time period
- Scan Period : 10 (10*500ms = 5sec)

- Communiction Type : Write
- Station No. : 10
- Start Address : MW100
- Start System Buffer : 200
- Word No. : 10

.   Window Tag

- Calls out a 'Window Screen' which was created already
- Selected 'Window Screen' is Pop-up on 'Base Screen'

(1) Registration

1) Select Window tag in tag menu or click Window tag icon on toolbar.
2) Determine 'Window Type, Device Type, Address, Condition, Window No. to display, Base position to display' in 'General' tab.
3) In case of bit condition, select window number of 'ON' and 'OFF' case.
4) In case of word-range condition, select window number for each range in 'Range' tab.
5) In case of word-variable condition, select window number directly.

Caution

- When more window tags than one are registered, only 1 window can be activated.
  If a window is already activated, the other window can not be activated. The other window can be activated after the current window is faded out.   But when base windows and auxiliary windows are registered in base screen at the same time, one base window and one auxiliary window can be activated together.
- When window is activated, tags on the back of the window don't operate till the window disappears from screen.
- Max size of window screen is determined by model

.   .   Setting

(1) General

1) Window Type (& Background restoring)

> Base(window) : When a window is disappeared from screen, the background is restored.   That is, removes traces of window on screen.
> Auxiliary(window) : When auxiliary window is disappeared from screen, the background is not restored.   That is, leaves black traces of window on screen.
> **So, never register any diagrams or tags on the area of back side of auxiliary window.**

2) Device Type

Bit condition.

- Address to read : Determine address and bit to read
- (Calling)Condition : Determine condition to call out selected window screen
  Case 1, 'ON' : When the bit is changed from 0 to 1
  Case 2, 'OFF' : When the bit is changed from 1 to 0
- Window No. : Determine window number to call out when determined condition is satisfied.
- Base position to display : Determine the position to display window.
  There are 9 kinds of position,
  LT(Left-Top), MT(Middle-Top), RT(Right-Top), RM(Right-Middle),
  RB(Right-Bottom), MB(Middle-Bottom), LB(Left-Bottom), LM(Left-Middle),
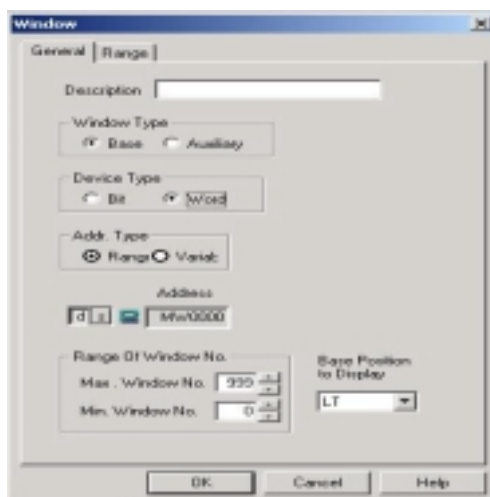 and Center
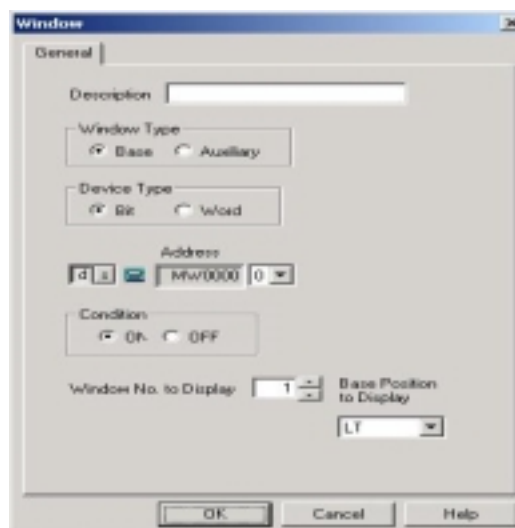
Word Condition

It is possible to call out different window for different range or for different value.
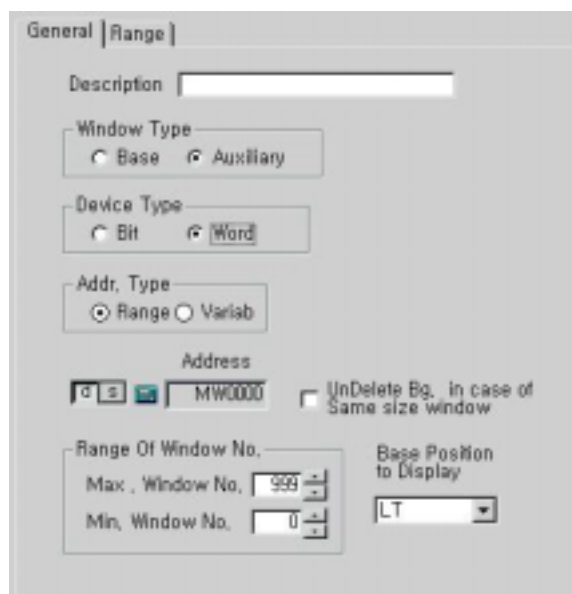
- Address Type

Case 1, Range Type : In 'Range' tab, determine each range and window number.

Case 2, Variable Type : the value of specified address corresponds to window screen No.   As variable-address value is changed, corresponding window pop-up.

[Base window]   [Auxiliary window]

- Max./ Min. Window No.

Determine maximum and minimum window number to display.   If the window No. is not within Min. and Max., it is not displayed.

- Un-Delete Background.   In case of registration of same size windows.

In the case of 'Word type' of 'Auxiliary window', 'Un-Delete Background…' check box is enabled.

When all of auxiliary windows used in this tag are created in equal size and this item is checked, it makes the speed of screen conversion fast and protect flickering because it don't remove the window traces.

(2) Range
- Determine minimum and maximum value of each range.
- And determine respective window numbers for each ranges .
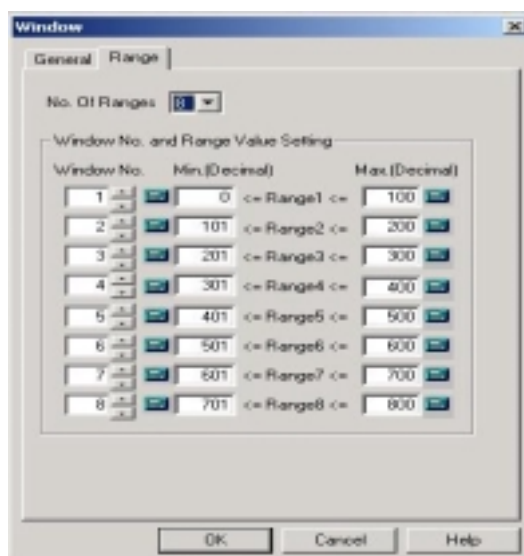
. . **Examples**

(1) Example of Bit condition

Register a base window tag,

- When 0 bit of MW0 is '1', window number 10 is pop-up.
- When 0 bit of MW0 is '0', window number 10 disappeared.
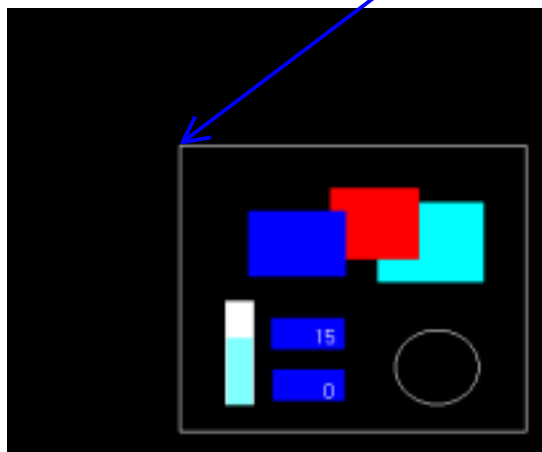- Displays the window tag on left-top side against registered position.

1) General
  - Window Type : Base
  - Device Type : Bit
  - Address to read : MW0 , 0Bit
  -(Calling) Condition : 'ON'
  - Window No. to dispaly : 10
  - Base position to display : LT
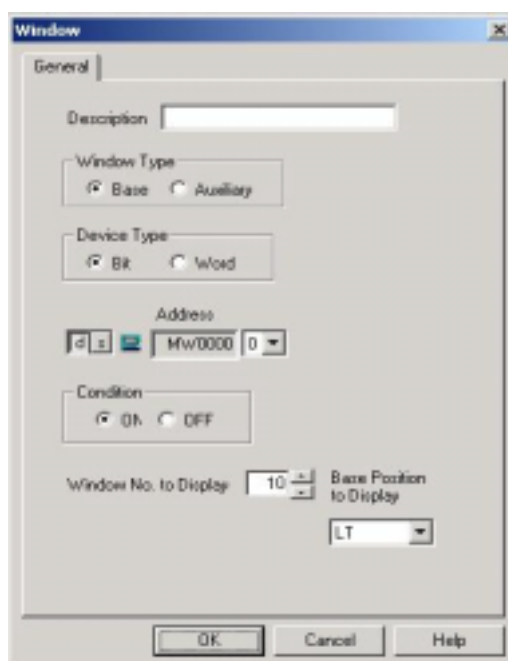
2) Results

 => On PC

This point is where window tag registered. It is that "*Base position to display*" was **LT(left top)**.

=> On Running

.   Calculation Tag

If some condition is satisfied,
- Sets selected bit as '0' or '1',
- or executes arithmetical and logical operation
  and writes the operation result in a determined device.

.   .   Setting

(1) General

1) Condition
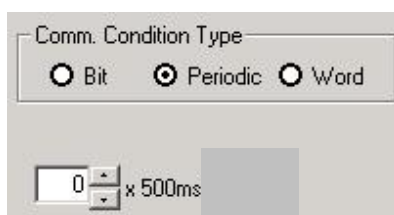
Bit Condition :

Determine condition address and bit.

Determine bit condition when the calculation will be executed.

- 'ON' : When the bit is changed from 0 to 1.
- 'OFF' : When the bit is changed from 1 to 0.
- 'Reverse' : When the bit is triggered 'from 0 to 1' or 'from 1 to 0'

Period Condition : Determine time period.   Scanning is executed every designated time period(scan period).

If scan period is 0, scans always.

Word Condition

- Design the expressions.

- Operates calculation when the expression is true

- Determine 'Operand' and 'Operator'

> : when a operand is larger than the other operand

>= : when a operand is larger than or equal to the other operand

< : when a operand is smaller than the other operand

<=: When a operand is smaller than or equal to the other operand

= : When a operand is equal to the other operand

!= : When a operand is not equal to the other operand
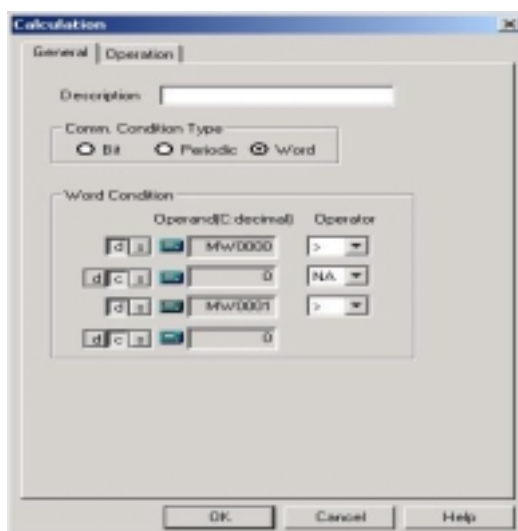
& : When the result of logic AND is '1'

| : When the result of logic OR is '1'

^ : When the result of logic XOR is '1'

NA : Not Available
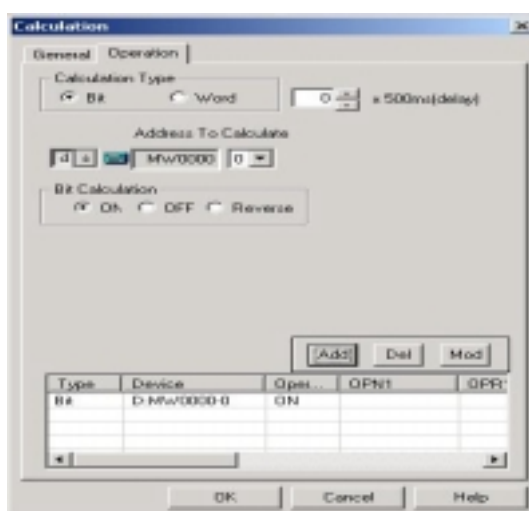
AND : AND operation

OR : OR operation

(2) Operation

If condition is satisfied, execute this operation.

1) Calculation type : Select 'Bit' or 'Word' type
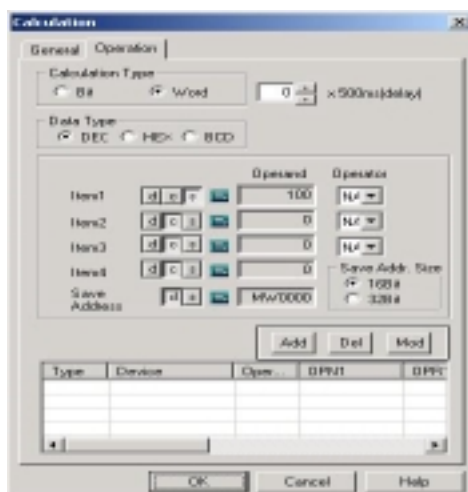
   Bit
   - ON : Triggers address value to '1'
   - OFF : Triggers address value to '0'
   - Reverse : Reverses address value
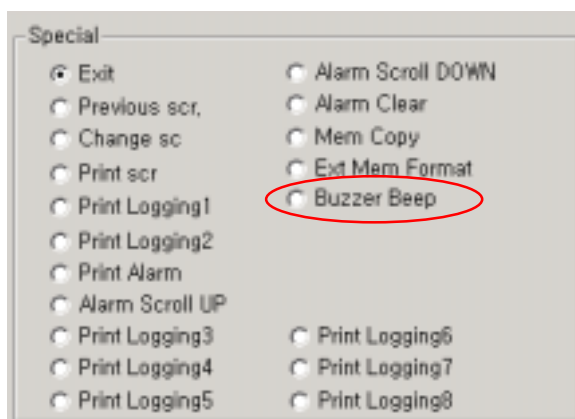

   Word
   - Data Type : Select one among DEC., HEX., BCD.
   - Operand : Select one among Device, System buffer, Constant
   - Saving Address : Determine address to save the result of calculation.
   - Saving address size : Determine the size of device, 16bit or 32bit.

Special

There are same function as touch tag except for 'Buzzer Beep'.

2) Delay Time : If the condition is satisfied, executes operation after delay time.
   If it is '0', executes operation immediately without delay.

3) Add, Delete, Modify : It is same with the method of Calculation tag or Touch
   tag.

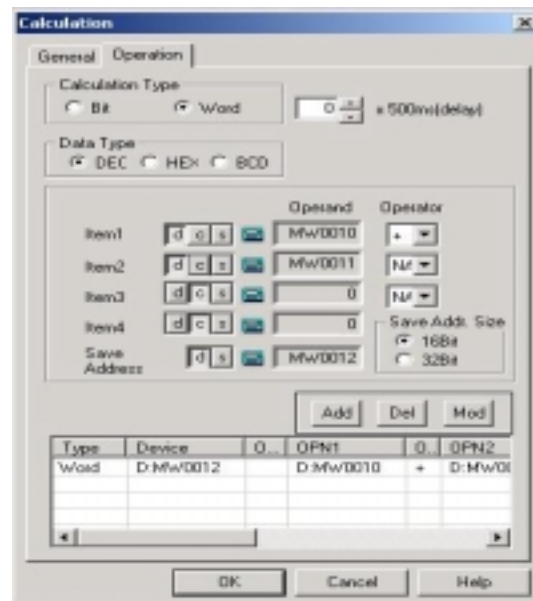## ． ． **Examples**

(1) Example of Bit Condition

Register a calculation tag,

- When MW0's bit 0 is changed from 0 to 1, add MW10 to MW11 and save the
  result in 2word from MW12

- Condition type : Bit

- Bit Condition : 'On'

- Condition Address : MW0, bit 0

- Calculation Type : Word
- Data Type : DEC
- Delay Time : 0
- Expression : (MW10) + (MW11) = (MW12)
- Saving Address: MW12
- Saving Address Size : 16bit

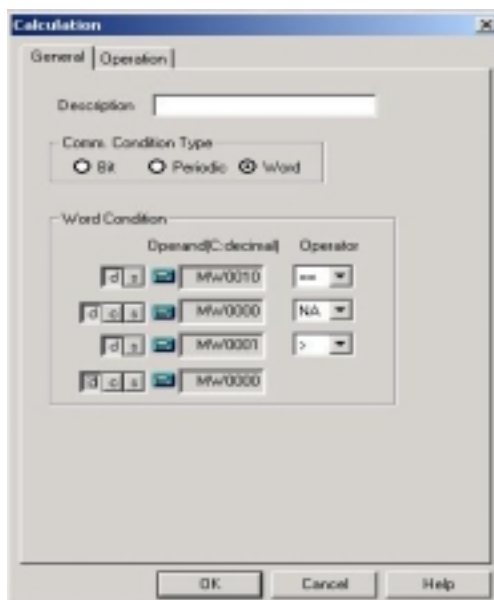**C 001**   => Registration on PC

(It is possible to confirm the result of calculation by use of Numeric tag)
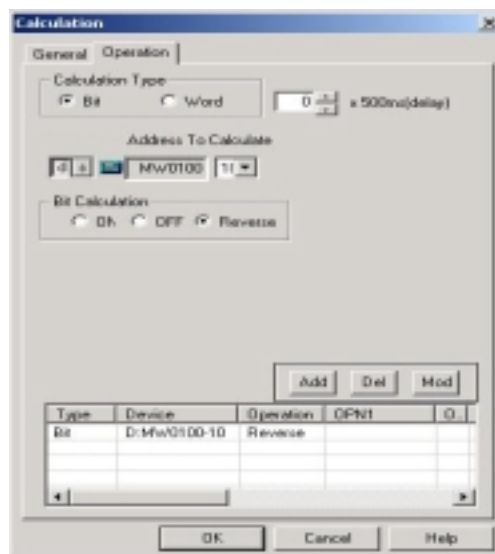
(2) Example of Word Condition

Register a calculation tag,

- When MW10 is equal to MW0, reverses MW100's bit10

- Condition Type : word
- Condition : MW10==MW0

- Calculation Type : Bit
- Condition Address : MW100, bit 10
- Bit calculation : Reverse

C002 : · · => Registration on S/W
(Please confirm the result of calculation by use of Numeric tag)

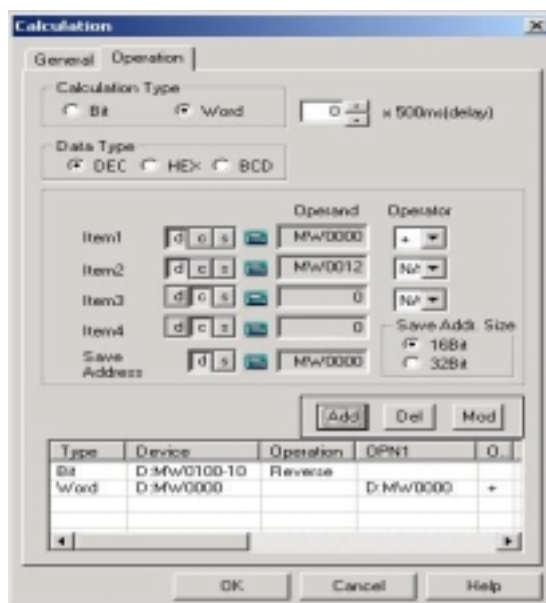## (3) Example Period Condition

Register a calculation tag.

In every 2 second,

- saves the result of adding MW0 to MW12 in 'MW0'
- reverses bit10 of 'MW100'

- Operation type : Period
- Time Period : 4 (4*500ms = 2sec)

- Calculation 1 : Reverse bit 10 of 'MW100'
   :Calculation Type : 'Bit'
- Calculation 2 : (MW0) + (MW12) = (MW0)
   :Calculation Type : 'Word'
   :Data Type : DEC
   :Saving Address : MW0
   :Saving Address Size : 16BIT

C001   => Registration on S/W
      (Please confirm the result of calculation by use of Numeric tag)

.   Animation Tag SYM

- Displays a registered bitmap or a sub-screen on base screen when a determined condition is satisfied.
- Effects of motion pictures by displaying several bitmap continuously like cartoon. (Animation effect)

Before registration of animation tag, bitmaps or sub-screens should be created.

(1) Registration

1) Select 'Animation tag' on 'Tag' menu or Animation tag icon
2) Determine 'Part Type, Group, Device Type, etc' in 'General' tab.
3) Determine 'Enlargement, Color, etc' in 'Display' tab.
4) In case of 'Word' device type, determine 'Part No. Max range, Min range, Foreground Color, Background color, etc' in 'Range' tab.
5) Click 'OK'

Caution   Background color

On 'Bit' condition
- if bitmap No. is '0'
- or if no bitmap is registered
- background is displayed with determined background color.

On 'Word' condition and 'Range' address type
- If value is not within any range,
- background is displayed with determined color of 'Other range'

On 'Word' condition and 'Variable' address type
- if no bitmap is registered for selected address,
- background is displayed with determined background color

．   ．   Setting

(1) General

1) Bitmap type : Select one among Symbol, Image, Sub-screen.
  Refer to chapter 5.4 'Bitmap' and chapter 3.2 'menu'

2) Group : Select symbol group to display, from A to Z
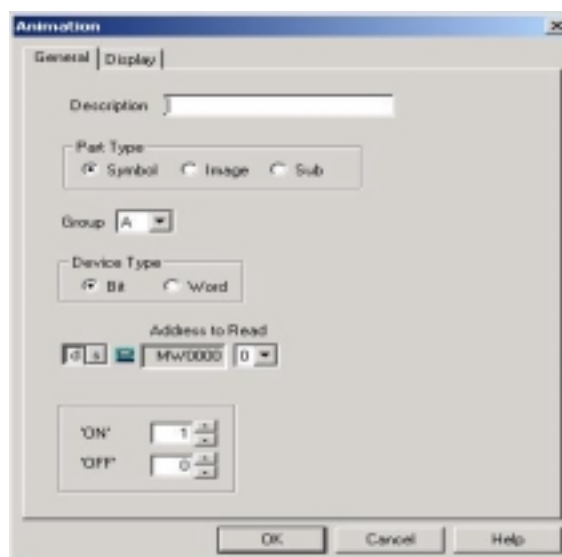
3) Device Type
  - Bit condition
      Address to read : Determine address and bit which is display condition
      'ON' bitmap : Select bitmap number to display when selected bit is '1'
      'OFF' bitmap : Select bitmap number to display when selected bit is '0'
      It there is not registered bitmap, it indicates '0'

  - Word Condition
    There are two kinds of 'Address type'.   Range and variable.

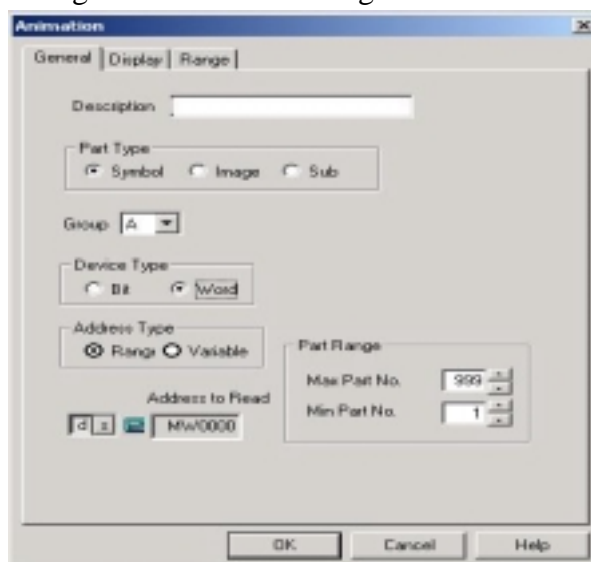   'Range' Address type
    Different bitmap is displayed for different range.

For example,

if MW0's value is within '0 and 100', bitmap #1 is displayed.

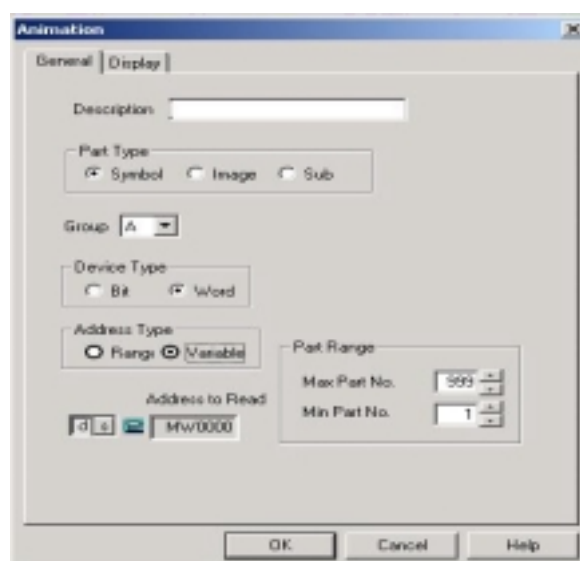if MW0's value is within '101 and 150', bitmap #2 is displayed.

And various foreground color and background are available.

'Variable' Address type

Variable No. corresponds to address' value.

When bitmap number or sub-screen number is not within Max. and Min. No.,

or selected part number doesn't exist, it doesn't display any bitmap or sub screen.

5) Bitmap Range

On word condition, if bitmap No. or sub-screen No. is out of this range, no bitmap is displayed.

Maximum No. is 999 and minimum No. is 1.

(2) Display

1) Enlargement (for only Symbol)

Determine enlargement size.

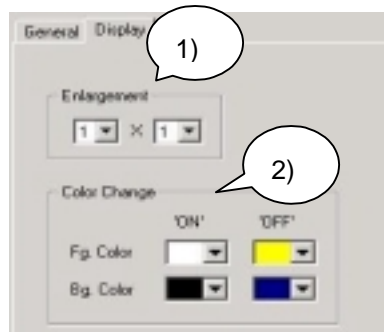2) Color (for only Symbol)

On 'Bit' condition

: Determine bitmap's front color & background color of 'ON' bit or 'OFF' bit

On 'Variable' condition

: Determine bitmap's front color and background color

On 'Range' Condition

: Determine Text color and background color of each ranges in 'Range' tab.

[Set as bit condition in general tab]   [Set word variable in general tab]

(3) Range

Determine each range's part No., Foreground color and background color.
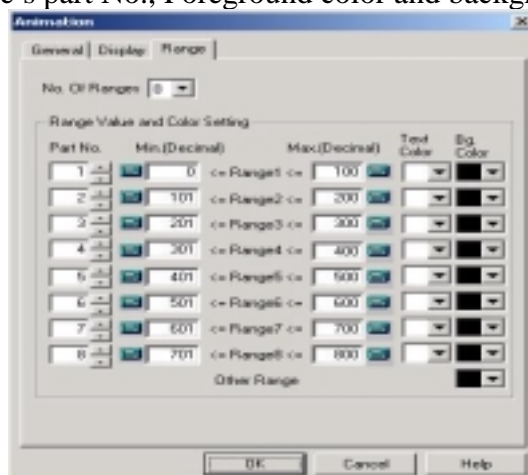
1) Range

  Maximum 8 ranges are available.

2) Part number

  Determine bitmap number or sub-screen number to display.

3) Min. / Max. of range : Determine maximum and minimum value of each
  ranges.

4) Foreground Color and Background Color

  For Symbol, foreground color and background color are available.

  For Image, foreground color is not available but background color is available.

  For Sub-screen, both of foreground color and background color are not
  available.

5) Other range : Determine background color when the value is not included in
  any ranges.

． ． **Examples**

(1) **Example of Bit type**

  Register a symbol bitmap tag as follows,

  When MW0's bit 9 is reversed by use of touch tag, the tag operates.

  When MW0's bit 9 is 'ON', bitmap #1 is displayed and front color is blue,
  background color is white.

  When MW0's bit 9 is 'OFF', bitmap #2 is displayed and front color is yellow,
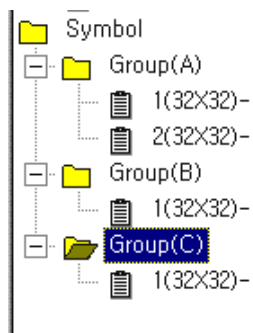 background color is blue.
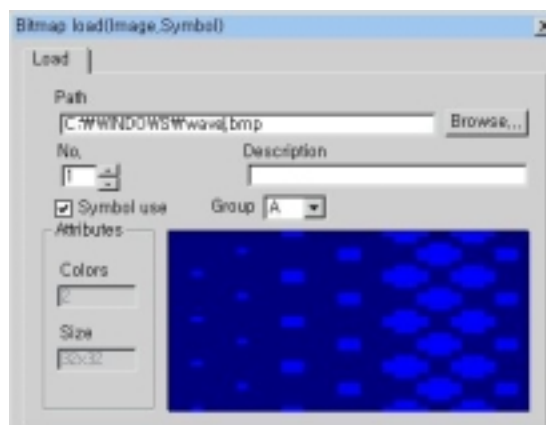
1) Register bitmaps

  A Group : # (1)

      # (2)

  B Group : # (1)

  C Group : # (1)
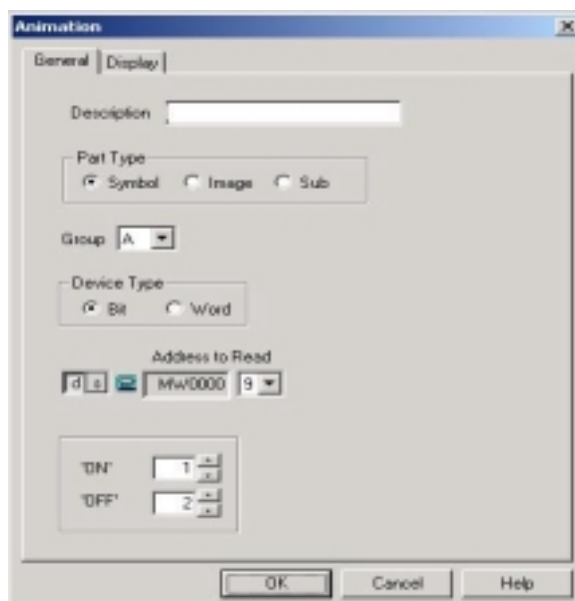

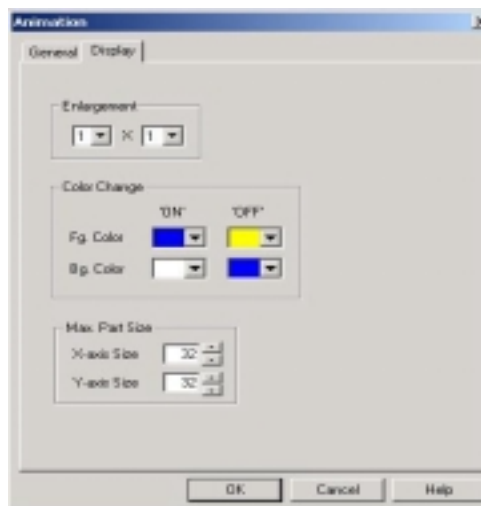   <Project Window>   [Bitmap registration]

2) General

 - Bitmap type : Symbol

 - Group : A

 - Device type : Bit

 - Address to read : MW0

 - Bit : 9

 - 'ON' bitmap number : 1 (When bit is 'ON', it displays A group's bitmap #1)

 - 'OFF' bitmap number : 2 (When it is 'OFF', it displays A group's bitmap #2)

3) Display
    - Character size : 1x1
  - Foreground color of 'ON' : Blue
    - Foreground color of 'OFF' : Yellow
    - Background color of 'ON' : White
    - Background color of 'OFF' : Blue

4) Register touch tag for ON/OFF operation
  ⇨ Setting of touch tag : Device(MW0000), bit(9), reverse

5) Results

     => On PC

              (SYM of SYM001 is an abbreviation of animation tag)

  Touched touch tag (ON)

 => It displays A groups' bitmap #1

  Touched touch tag again (OFF)

 => It displays A groups' bitmap #2

**(2) Example of Variable type**

Register an animation tag,

-'Word' device type

- MW0's value means A group's bitmap number.

- Max. bitmap number is 90, Min. bitmap number is 10

- Front color is black, background color is blue.

1) At first, register bitmap as like example of 'Bit' type.
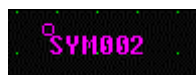2) Register animation tag

- Bitmap type : Symbol

- Group : A

- Device type : Word

- Address type : Variable

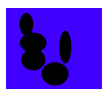- Address to read : MW0

- Bitmap No. range : 10~90
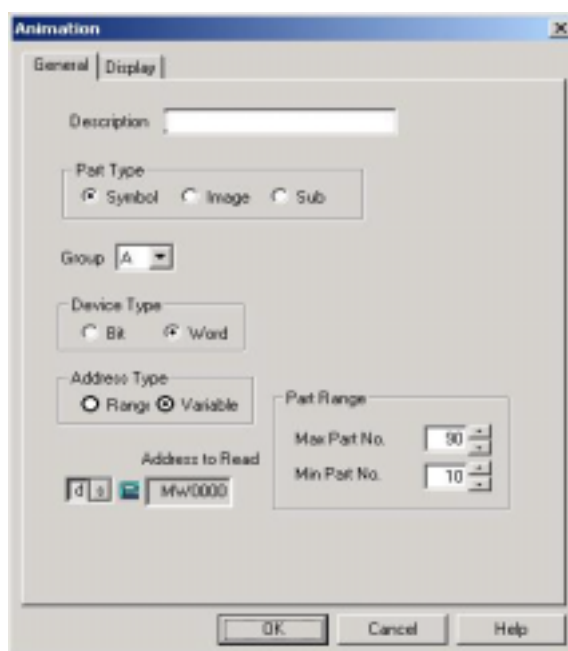
- Character size : 1x1
- foreground color is black and background color is blue
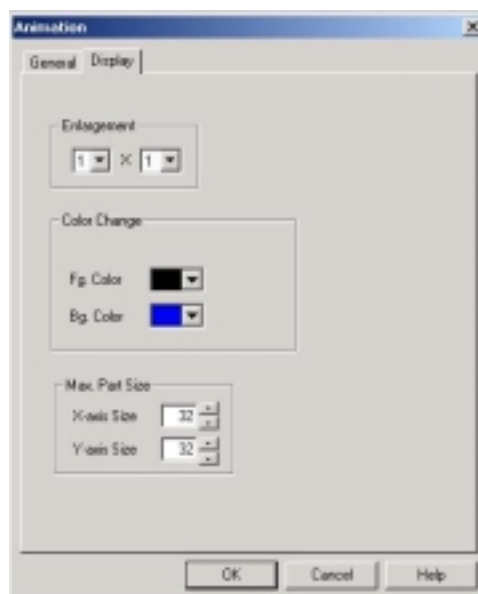
3) Result

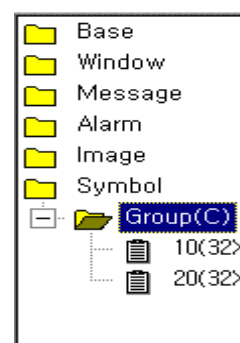   => On PC

  ⇨ While MWO is 10, it shows bitmap #10

(3) Example of range Type

Register a animation tag,
- 'Word' device type,
- When MW0's value is between 1 and 500, C group's part # 10 is displayed
- When MW0's value is between 501 and 999, C group's part # 20 is displayed
- Background color is yellow, foreground color is black.
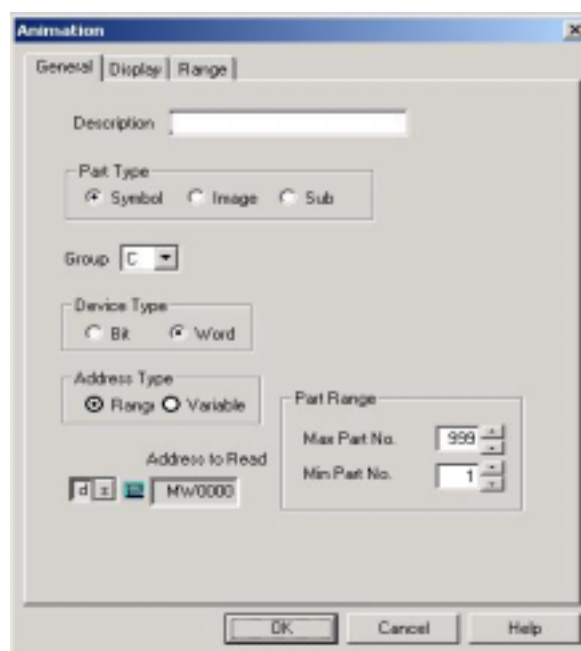
1) Register bitmap

C Group : # 10
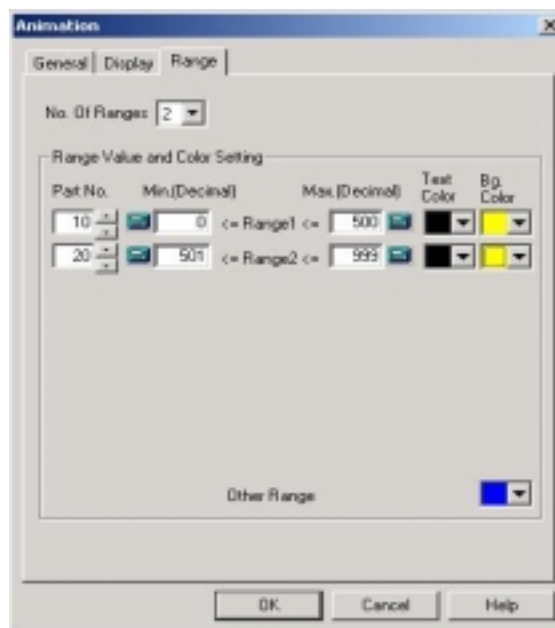
20

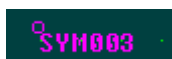[Registered Bitmap]

2) General
   - Bitmap Type : Symbol
   - Group : C
   - Device type : Word
   - Address type : Range
   - Address to read : MW0
   - Bitmap No. range : 1~999

- Bitmap # 10 : Min. 1, Max. 500, foreground color is black, background is yellow
- Bitmap # 20 : Min. 501, Max. 999, foreground color is black, background is yellow
- Other Range : Blue

3) Result

  => On PC

  => MWO is between 501 and 999, bitmap #20 is displayed
If the value is not in the range of 0 ~ 999, nothing appears on
screen