SCREEN CREATOR 5
User's Manual
Vol. 6

SCREEN CREATOR 5
K-Basic
Program Description

■ Contents

How This Manual Is Organized

This manual, Chapter 1 through 4, includes structures of data to be displayed on the OIP and operations in detail for you to use the OIP.

Chapter 1 Fundamentals in Creating Screens
Outlines general ideas and organizations of data to be displayed on the OIP. You should read through this chapter before referencing the other chapters.

Chapter 2 Installation for Screen Creator 5
Covers the environment in operation and installation of Screen Creator 5.

Chapter 3 Basic Operations for Screen Creator 5
Describes each function name of Screen Creator 5 and operations for the keyboard and mouse.

Chapter 4 Menu Reference
Thoroughly discusses each menu of Screen Creator 5.

You are recommended to reference the following manuals for using Screen Creator 5.

Vol.1 Screen Creator 5 Manual Introduction
Introduces fundamental operations of Screen Creator 5.

Vol.2 Screen Creator 5 Manual Operations
Describes operations of Screen Creator 5 in details.

Vol. 3 Screen Creator 5 Manual PLC/External Equipment Connection
Covers the communications procedures with a host computer and connections to peripheral devices.

Vol. 4 Screen Creator 5 Manual Standard Component Catalog
You can get to know the standard components and their functions the maker. offers.

Vol. 5 Screen Creator 5 Manual Control Reference
Describes what are controls and how to use controls for creating components.

Vol. 6 Screen Creator 5 Manual K-Basic Programming
Offers information on how to write action programs for creating screens and how to use functions.

Vol. 7 Screen Creator 5 Manual Trouble Shooting and Error Codes
Covers restrictions on creating screens with Screen Creator 5, how to cope with trouble, and error codes.

Safety Precautions

Be sure to follow the safety precautions listed below in order to use the OIP safely. Koyo Electronics Industries Co,Ltd.. cannot be held liable for any damages incurred if these safety precautions are not followed.

⚠ WARNING

- **Design your system so that there are sufficient countermeasures for personnel accidents and major equipment accidents. The system should have an external protection and safety circuit, so that even if the OIP should malfunction or even if there is a defect in the program the safety of the system is assured.**
- **Do not use the touch panel of the OIP to make switches that are related to safety or people or major damages (emergency safety switches, etc.). Be sure that the system is designed so that it can cope with any errors or malfunctions in the touch panel.**
- **Be sure that type 3 grounding is used for the protective-grounding terminal. There is a possibility of electrical shock if the unit is not grounded.**
- **If the OIP should malfunction, immediately turn off the poser and leave it alone.**
- **If there is direct output to external output device such as PLCs, direct output will be driven regardless of the ladder circuit interlock. Output may be used to drive motors and the like, so avoid using direct output because it is dangerous.**

⚠ CAUTION

- **Use and store the OIP in the environment described in the specifications (regarding vibration, shock, temperature, humidity, etc.).**
- **Do not use the OIP where it is subjected to inflammable or explosive gas, or steam.**
- **Before turning on the power, be sure that the power voltage rating of the OIP and the voltage rating power supply match. Using a mistaken power supply can damage the unit.**
- **Do not disassemble or modify the OIP. Doing so can cause malfunctions and lead to other problems.**
- **The OIP touch panel is made of glass. Striking it with hard objects or pressing hard on it may break the glass.**
- **Do not push down on the OIP touch panel with mechanical pencils, screwdrivers, or other sharp objects. Doing so can damage the touch panel or cause malfunctions.**

Notations Used In This Manual

This manual uses the following symbol marks for you to use this system comfortably.

WARNING	Describes a peril that may cause operator's death or serious injury in neglecting the WARNING item(s).
Caution	Describes a peril that may cause bodily injury or serious device damage in neglecting the CAUTION items(s).
Caution	Describes general note(s) in use.
Note)	Explanations and supplements.

Glossaries used in this manual are as follows.

OIP	Stands for Operator Interfase Panel.
PLC	Stands for programmable controller. It is also called a sequence controller.
Link unit	A link unit is a communication equipment which connects this equipment and the PLC. The nomenclature of the communication equipment is different from each manufacture and the equipment is called a link unit in general.
Device	A device is such equipment that an input/output relay, internal relay, timer, counter, or resister in the PLC.

Notice

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2) Contents of this manual shall be subject to change without notice.

3) While every precaution has been taken in the preparation of this manual, if the reader notice any errors or has any advice on the contents of this manual, please contact our customer support in Sales Division of Koyo Electronics Industries Co,Ltd..

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Version Up

Koyo Electronics Industries Co,Ltd.. has upgraded Screen Creator 5 for adding new functions, operationability and so forth.
Below will be introduced the updated functions.

1. Version 2.10

- Supporting middle size systems (GC53) of GC5x Series

- Adding the uploading editing function

  To make this function effective, attach all screen data and K-Basic programs used in the project and download them to the panel. Then download the uploaded entities from the panel and restore them. Then you can edit the data and programs. Note that the data with the project attached increase their size.

- The following PLCs have been added.

Omron	SYSMAC α
Fuji Dennki	FLEX-PC NJ-T/NS-T
Fuji Dennki	Computer-link protocol
Fuji Dennki	Loader command protocol
Toyota Koki	PC1
Toyota Koki	PC3
Matsushita Electric Industry	Panadac 7000

- Standard components, centered on the parts used for middle size systems (GC53) in the GC5x Series have drastically been added.

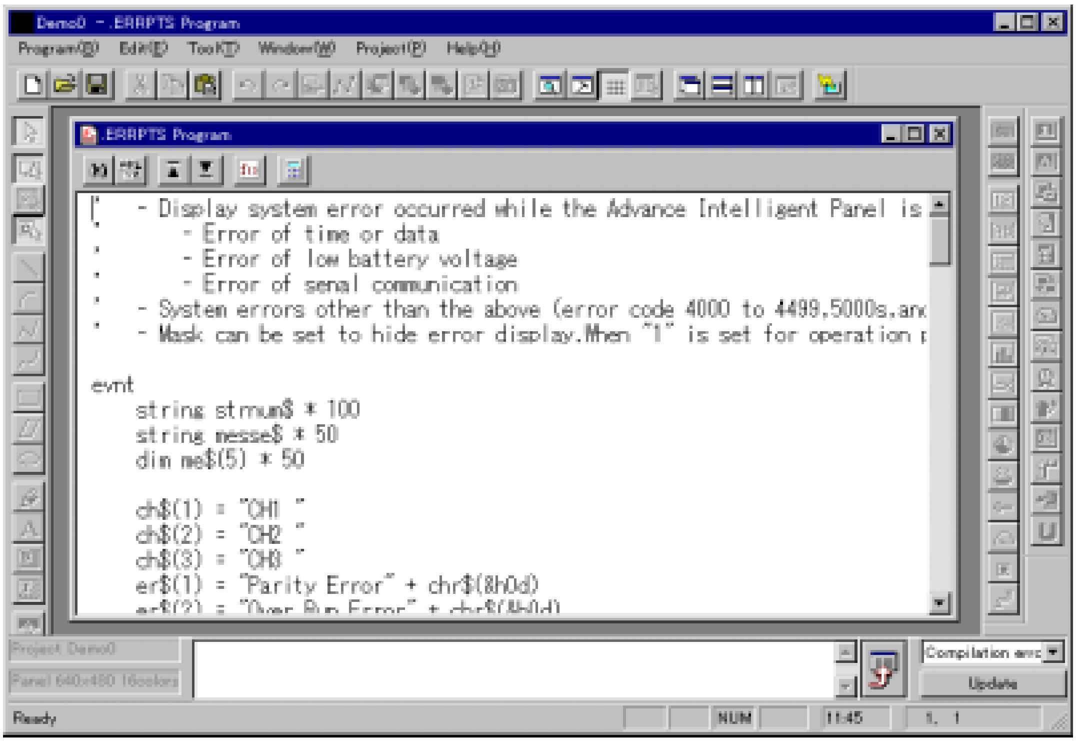
CHAPTER 1

INTRODUCTION

1-1 What is an Operation Program?

You must code an operation program to display data such as numerical values and characters in a part or to make a switch operate when you press it on the touch panel.

A dedicated language K-Basic is used to code the specific operation of each part.



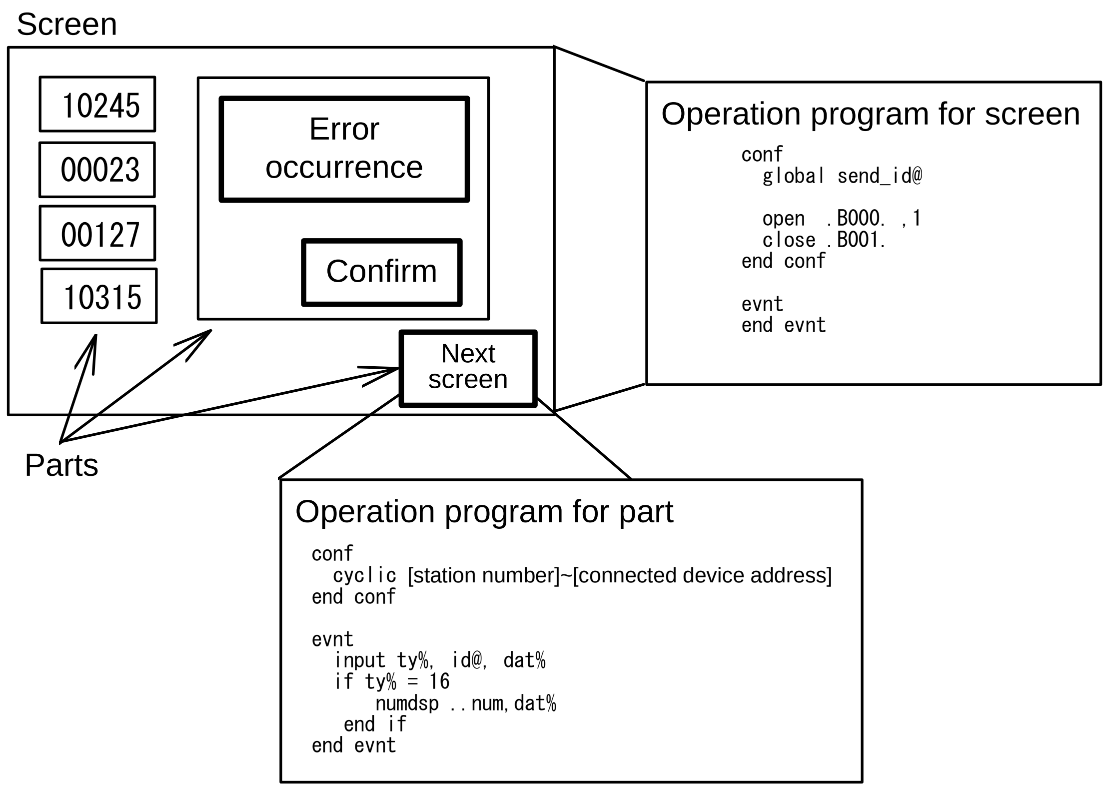
1-2 Objects to be Described in Operation Programs

1-2-1 Operation programs for parts

You can code an operation program individually for each part.

1-2-2 Operation programs for screens

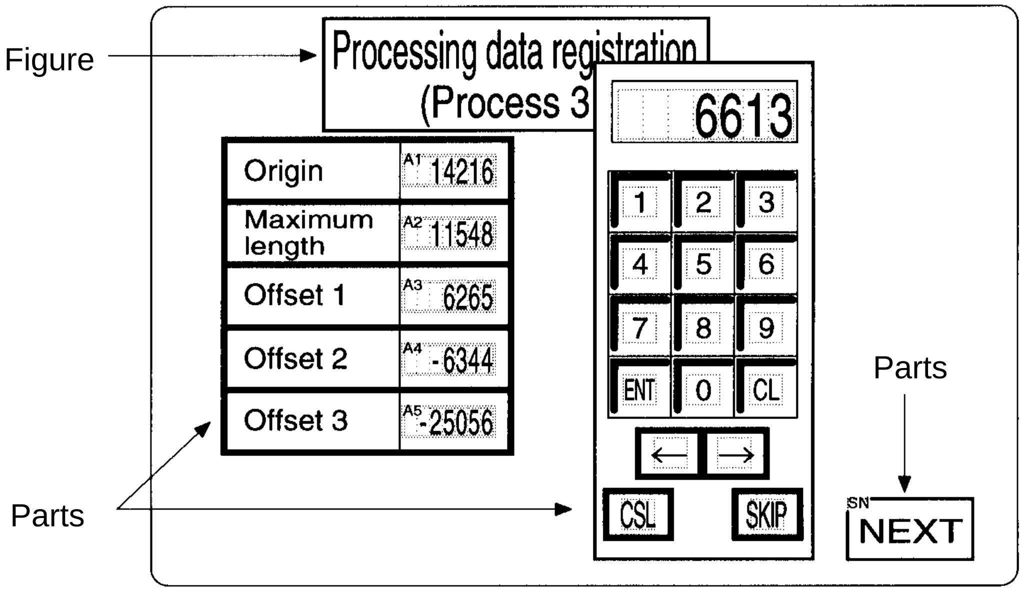
You can also code an operation program for each screen just like for a part.



1-3 Terms

1-3-1 Screens

A screen consists of a figure (screen background) and some parts.

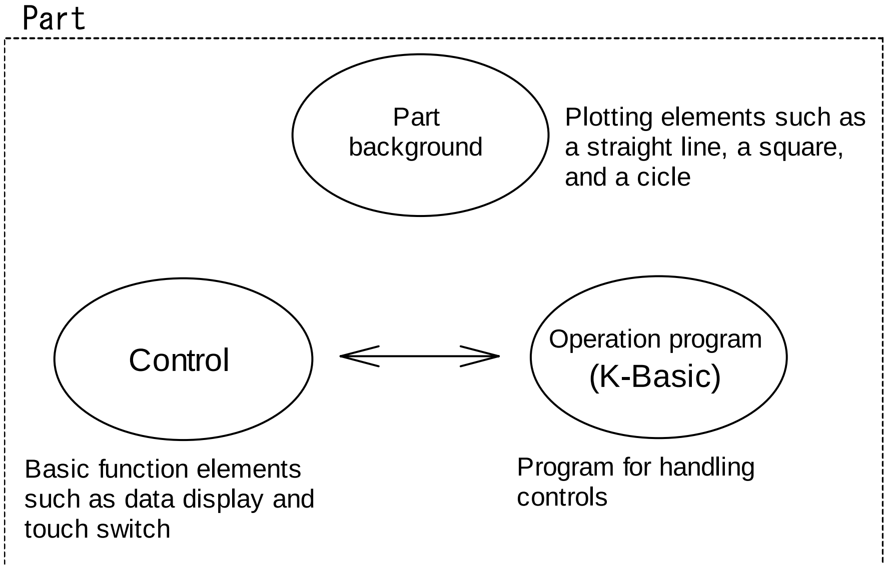


1-3-2 Figures (backgrounds)

You can draw a figure on a screen or a part by plotting elements such as lines, rectangles, circles, and characters.

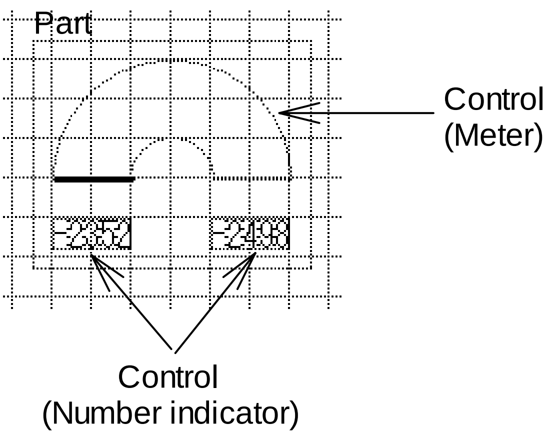
1-3-3 Parts

A part is a combination of a figure (part background) and same controls such as displays and touch switches. The operation of such a part is coded as an operation program.



1-3-4 Controls

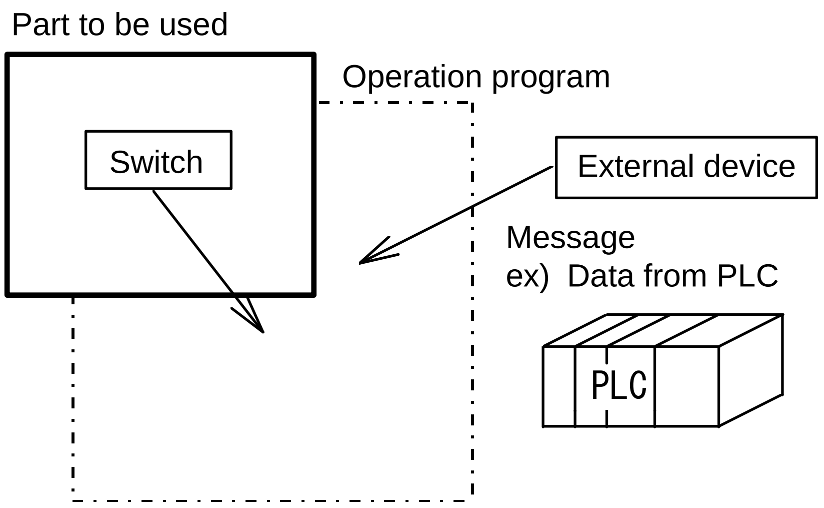
A control is used to display the value of a part or a meter value or to activate a switch. (The designation "primitive" has been used for GCSGP3, instead of control.)
It is possible to overlay several controls on a single part.



1-3-5 Messages

A message is a trigger for activating an operation program. A part starts its operation when it receives a message. Switches and external devices such as a PLC can issue messages.

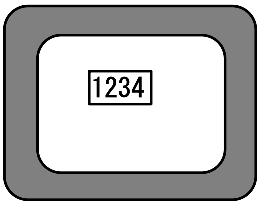
Each message contains a sender ID (PLC device name, part name, etc.), data and so on.



CHAPTER 2

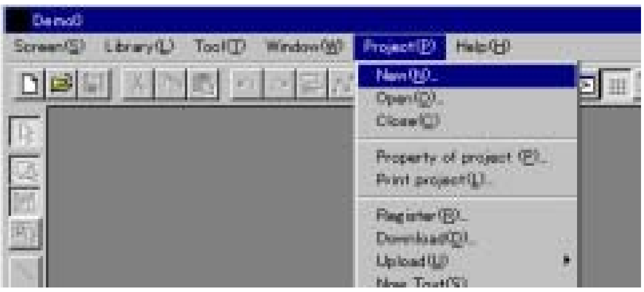
EXAMPLES OF PROGRAMMING

2-1 Creating a Part for Displaying Numerics

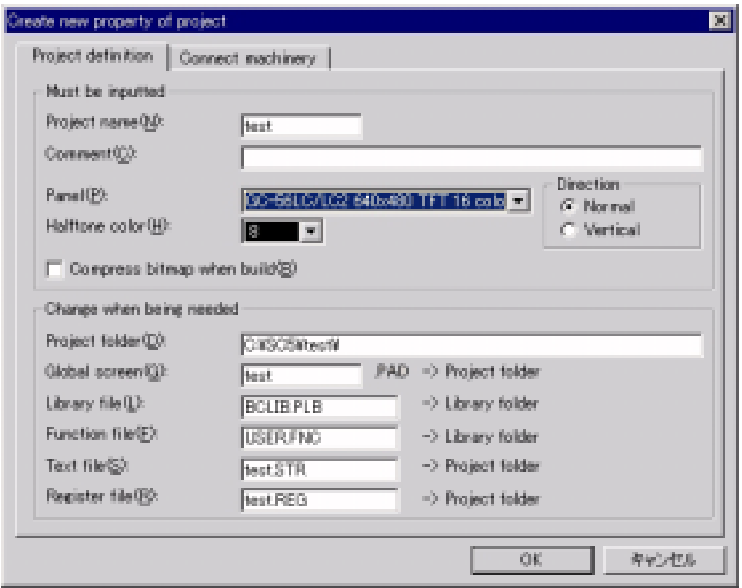


Let's create the part that displays 1234 on the screen.

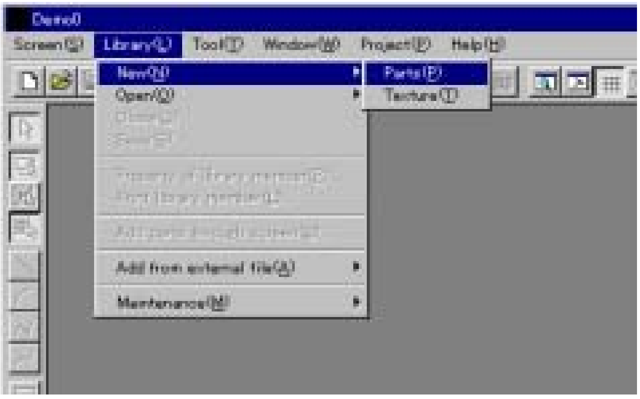
In this section, try to create a part which displays a numeric value on the OIP, for example. First, create a project on Screen Creator 5. To create a project, select "Project" on the Screen Creator 5 menu, then select "New".



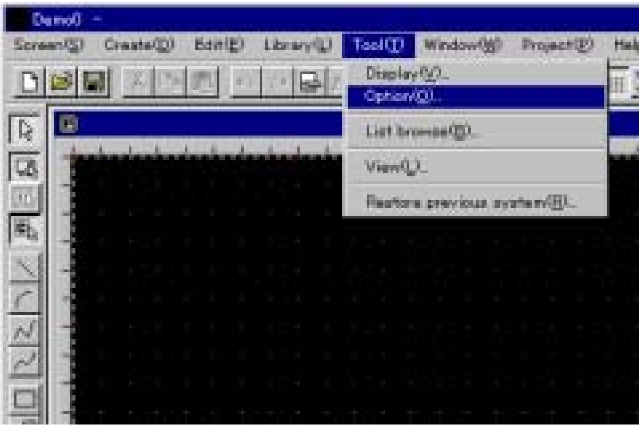
Now, the "Create new property of project" dialog box opens. Select "test" in the "Project Name" field and a model to be used in the "Panel" field, then press the OK button.



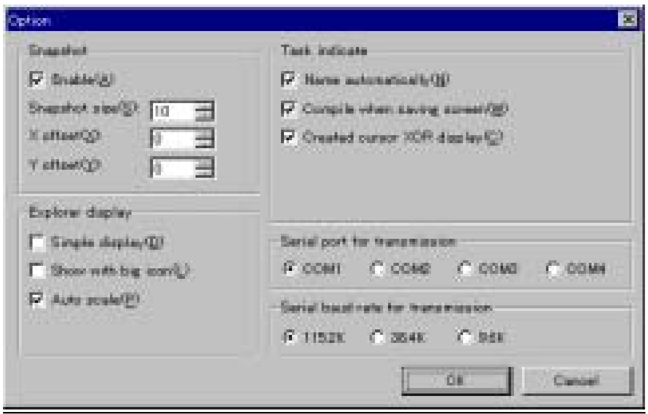
Then, select "Library" on the Screen Creator 5 menu. Select "New", then select "Part". Now, the part creation window opens.



Then, set the environmental conditions for creating a part. Select "Tool" on the Screen Creator 5 menu, then select "Option". The option setting dialog box opens. (Hereinafter, figures showing on-menu selection are not shown.)

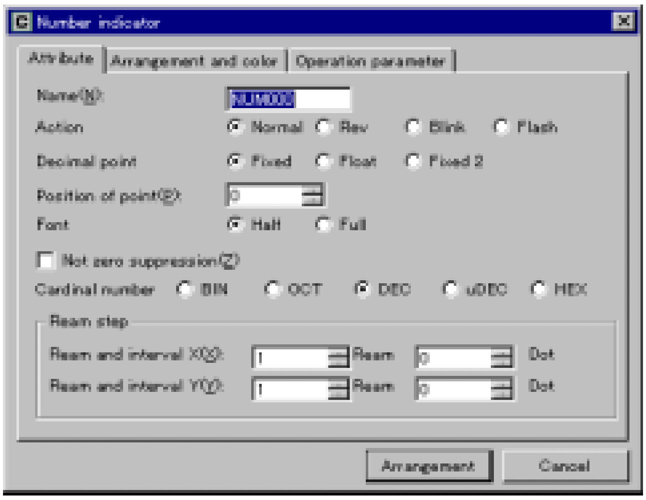


In this dialog box, check off the "Name automatically" check box and "Compile when saving screen" check box. Keep these boxes checked off.

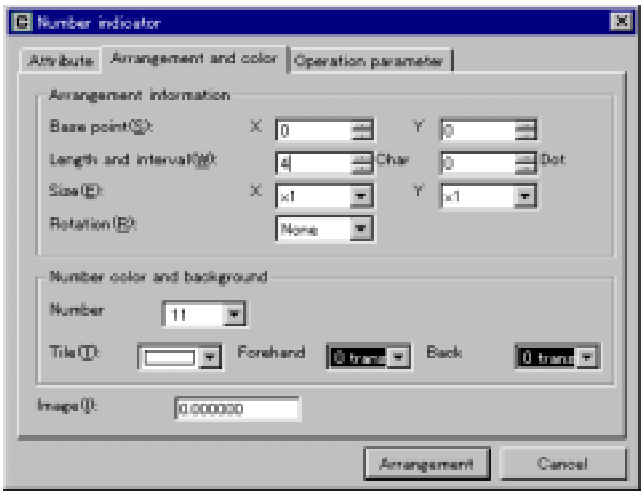


2-1-1 Arranging controls

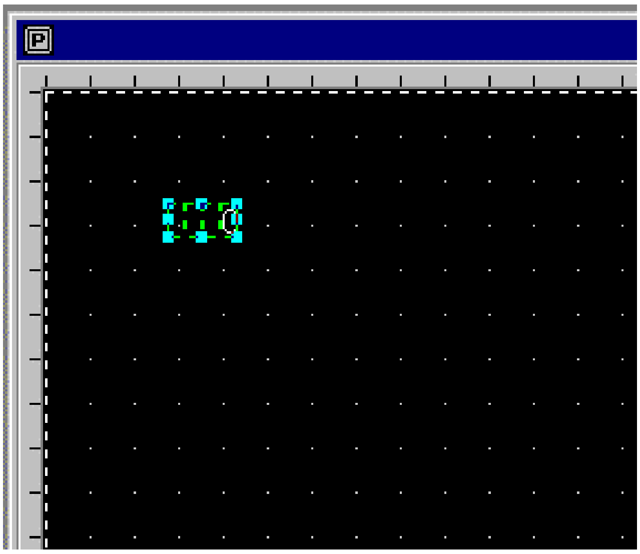
This section describes how to arrange a number indicator for displaying numeric values in the part creation window. In this example, use the number indicator control. For details of the controls, refer to the Control Reference Manual. To arrange the number indicator control, select "Create" on the menu, select "Control", then select "number indicator". The number indicator setting dialog box appears. Leave the default properties unchanged. Do not forget that the control name is "NUM000".



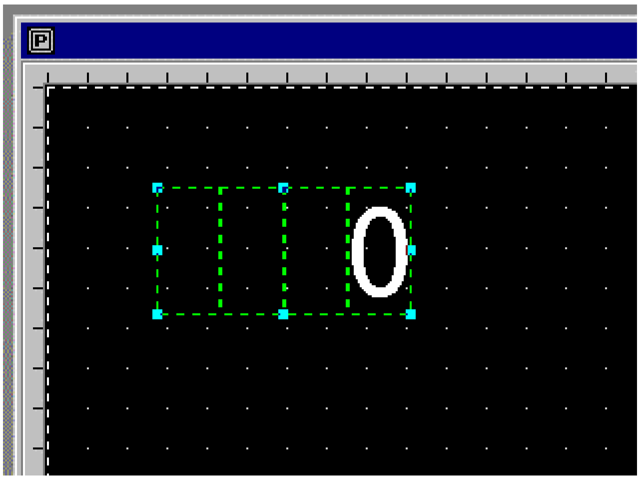
Then, click on the "Arrangement and color" tab in the dialog box as shown below. Try to change the number of digits of values displayed on the number indicator control. Change the value in the "Length and Interval" field into 4. Now, the number indicator control has been set. Press the Arrangement button.



The dialog box is closed, and the mouse cursor changes into the mouse. In this condition, move the cursor to a window where the control is to be arranged (i.e., part creation window), and click the left mouse button. The mouse cursor changes into a rectangle frame, which shows the size of the number indicator control. Click the left mouse button at any position, and the number indicator control is arranged at that position.

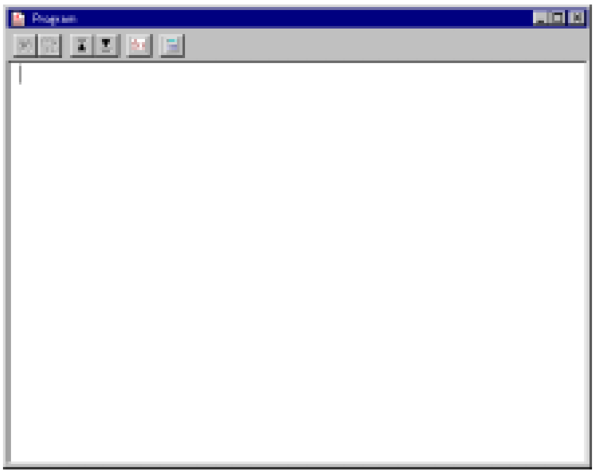


Then, try to change the size of this number indicator control. There are light blue squares on the frame of the control. These are called handles. When you brings the mouse pointer close to a handle, the pointer shape changes. In this condition, drag the handle, and you can change the control size as you like. In the example shown below, the control is enlarged four times as large as the original control size vertically and horizontally by dragging the lower right handle.



2-1-2 Coding a program

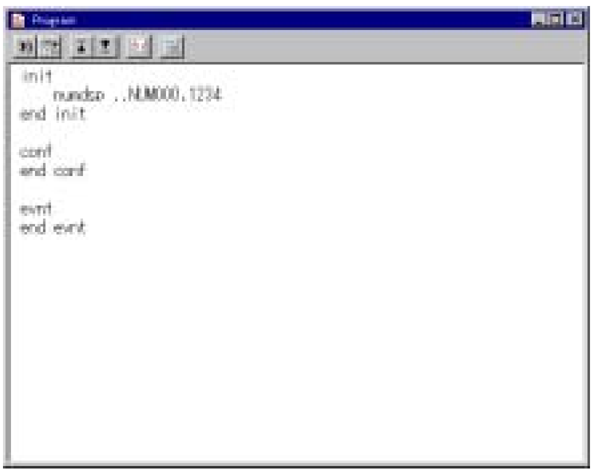
In this section, try to code a program for the part being created. Select "Edit" on the menu, then select "Edit Part Programs". The program editor window opens as shown below.



Type the following program on this screen.

```
init
    numdsp ..NUM000,1234
end init

conf
end conf

evnt
               end evnt
```

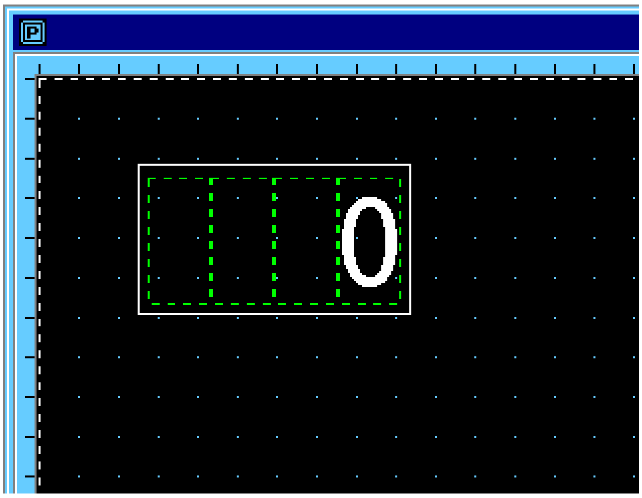
The program contents will be explained later. First of all, type the following program. The program editor screen will change as follows:



To save this program, select "Program" on the menu, then select "Save". Then, select "Program" on the menu and select "Close" in order to close the program editor window. Now, the program editor window is closed and the part editor window is re- displayed.

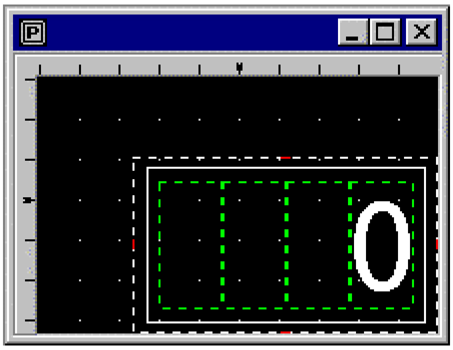
2-1-3 Drawing a figure in a part

Then, try to add a pattern to the part. In this example, enclose the number indicator control in a rectangle.
Select "Create" on the menu, select "Rectangle", and drag the rectangle along the diagonal line of the number indicator control. Now, the number indicator control is enclosed in a rectangle. The rectangular frame should be slightly larger than the control.
While drawing the rectangle, the dialog box for inputting the rectangle properties is open. It is possible to make changes in the rectangle shape, color, etc. in this dialog box. However, no properties are changed in this example.
Even after a rectangle has been drawn, the rectangle drawing mode is still active. To cancel this mode, click the right mouse button.

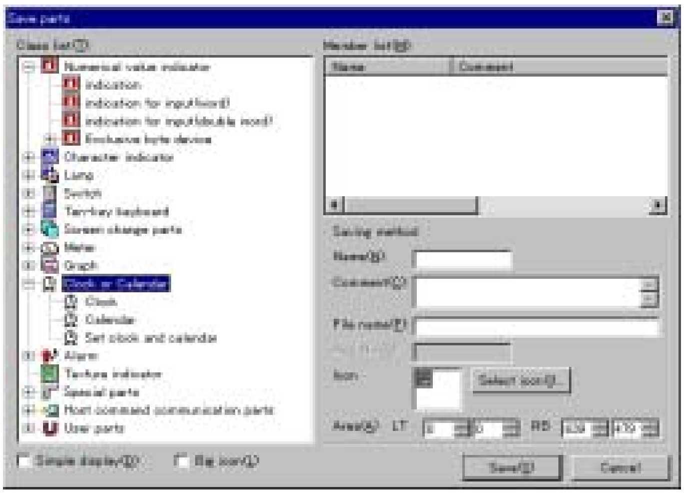


2-1-4 Saving a created part

Select "Window" on the menu, then select "Adjust to Object Size" in order to reduce the screen size to the current size of the part. The part must be displayed all over the OIP screen. Since such a part is too large, reduce the area to a size enough to accommodate the created numeral display enclosed in the rectangle. Look at the screen periphery, and you may see that the screen is enclosed in dotted lines. These dotted lines indicate the size of the part. Each side of the dotted rectangle has a red mark at the center. The red mark is a handle for changing the part area. Move the mouse pointer to one of the handles. The mouse pointer shape changes. Then, drag the handle to change the area size. The following shows an example of reducing the area.



Then, save this part. Select "Library" on the menu, then select "Save". The dialog box shown below opens. The Class List field on the left shows the groups of the parts in the library. This example assumes that the part is saved in "User Parts". Thus, click on "User Parts". Input "test" in the "Name" field and "test part" in the "Comment" field. Click on the "Save" button to save the part. Then, select "Close" on the "Library" menu to close the part creation window.

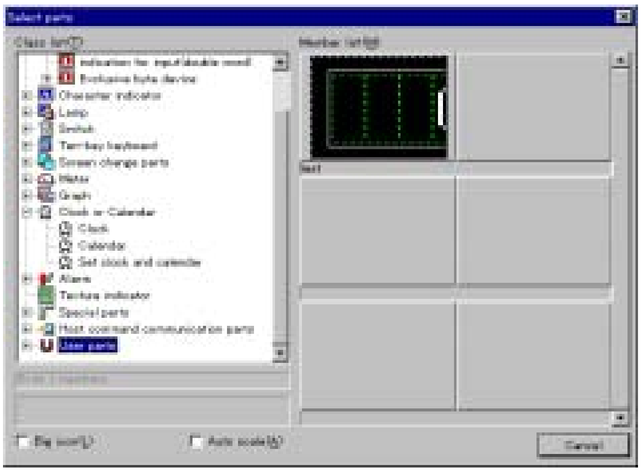


Now, part creation procedures are completed.

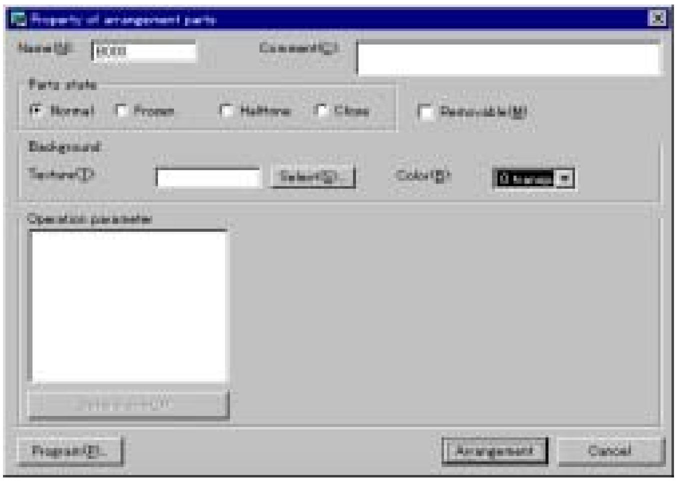
2-1-5 Using a created part

"New" to create a new screen. The screen creation window opens as shown below.

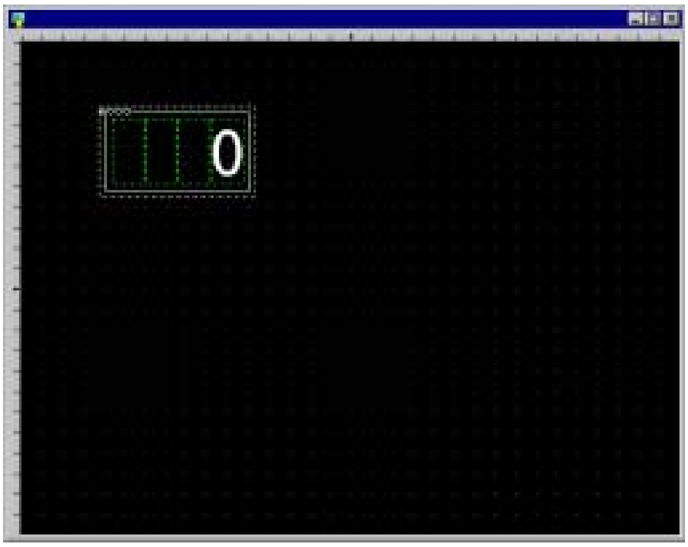
Arrange the part created above on this screen. Select "Create" on the menu, select "Parts", then select "User Parts". The part selection dialog box opens. Click on "test" created above.



The "Arranged Part Properties" dialog box opens. In this dialog box, only press the OK (Arrange) button without changing any items.

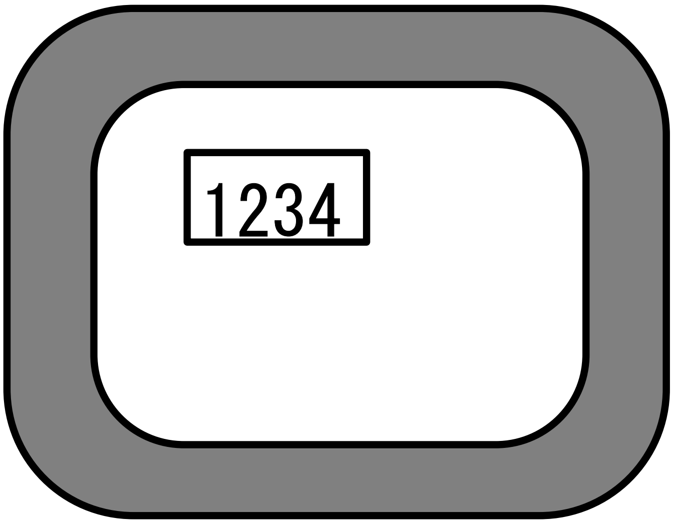


The dialog box closes, and the mouse cursor changes into the mouse. In this condition, move the cursor to a screen where the part should be arranged, then click the left mouse button. The mouse cursor changes into a rectangular frame, which shows the size of the part. Click the left mouse button at an intended position on the screen, and the part is arranged at that position on the screen as shown below.



Then, save this screen. Select "Screen" on the menu, then select "Save". Input "gamen1" in the "Name" field, "test screen" in the "Comment" field, and "1" in the "Registration No." field in the "Save Screen" dialog box, then press the "Save" button. Now, the screen with the created part is saved.

Then, try to download this screen and display it. Connect the downloading cable between the OIP and the personal computer on which Screen Creator 5 is running, and bring the OIP into the download condition. Select "Project" on the menu, and select "Download". The download dialog box appears. Select "Build Transmit" in the download dialog box. When data to be downloaded is created and it is downloaded properly, bring the OIP into the user mode. A character string "1234" enclosed in a rectangular frame should be displayed on the OIP.
If an error occurs while creating data, check carefully if the input program is correct. If an error occurs while downloading data, read carefully the description about downloading in the Operation Manual and check the serial port channel, baud rate, etc.



2-1-6 Explanation for coded program content

The following program was used.

```
init
    numdsp ..NUM000,1234
init init

conf
end conf

evnt
end evnt
```

The operation program for this part will be explained in detail below.

(1) init-end init
This portion is called a Configuration Block, and is first executed in this program, which is generally used for declaring variable or initializing them,

(2) numdsp ..NUM000,1234
The “numdsp” instruction displays a numerical value in a number indicator control. Write the name of the number indicator control for displaying data and the data to be displayed following the instruction. "..NUM000" shows the name of the control.

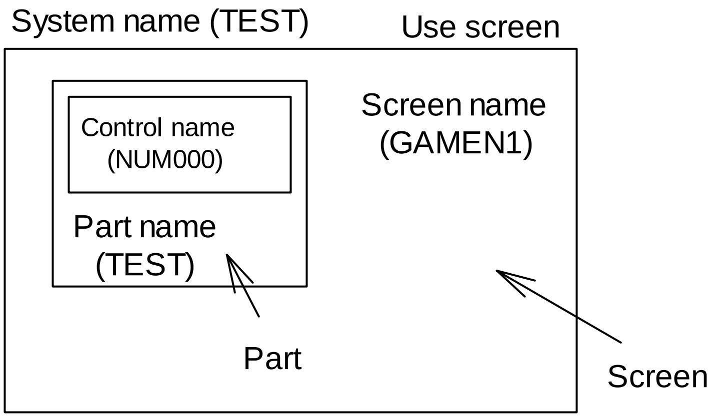
The following rules apply to this naming.

● Control names and naming rules

Screen:	GAMEN..
Part on GAMEN:	GAMEN.TEST.
Control in BUHIN on GAMEN:	GAMEN.TEST.NUM000
Current part on the current screen:	.. (Omitted)
Control in the current part on the current screen:	..NUM000

Note: Be sure to specify the names only with alphabetical and numerical characters.

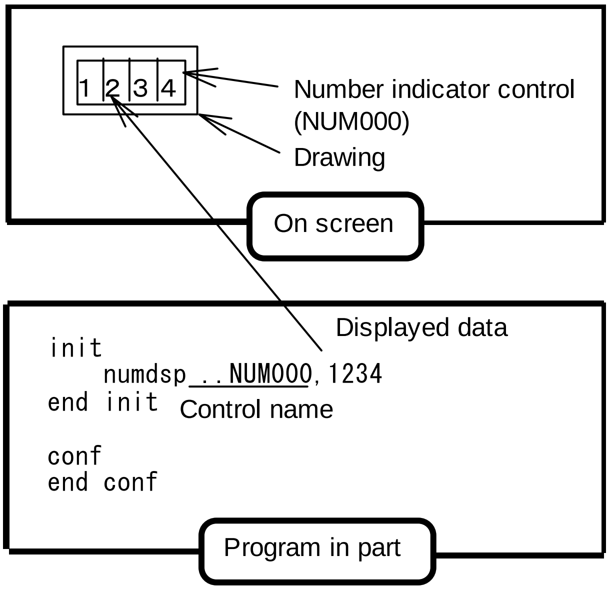
Just like the part in this example, if a control is set in the same place as that of a programmed part, you can omit the screen name and the part name to specify the control.



The program in part TEST is supposed to indicate control NUM000.

GAMEN.TEST .NUM000
or ..NUM000

The other parameter is the numerical value to be displayed. You can change the display value by changing this parameter.



Correlation of this part

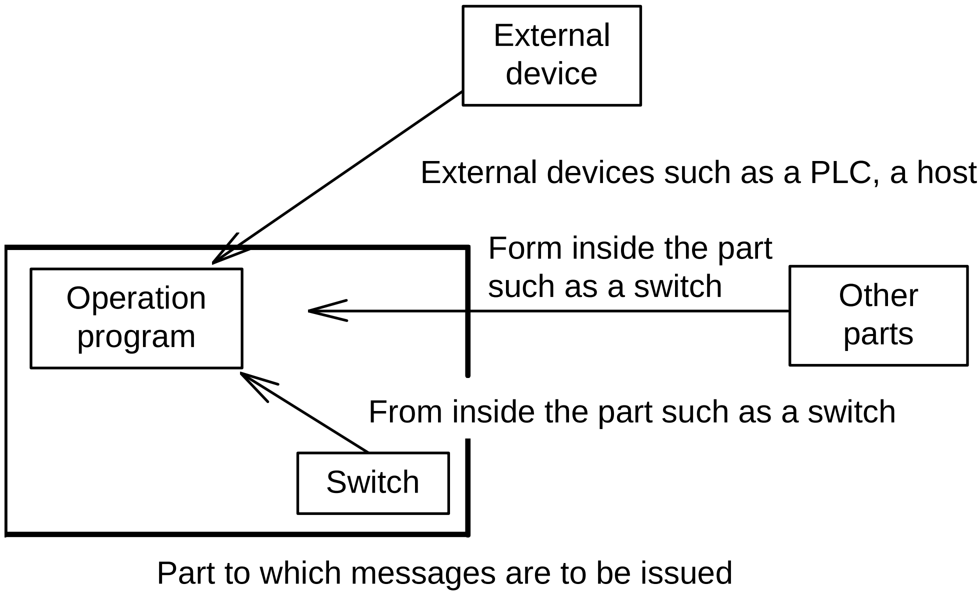
This sample program displays a character string "1234" on the number indicator control, which is the only control for the part.

(3) conf to end conf
This block is called a configuration block, which executes a program between "conf" and "end conf" only when a part is displayed on the screen (i.e., a part is opened or the screen is displayed or, to be accurate, immediately before the screen is displayed). The configuration block in this sample program causes no processing.

(4) evnt to end evnt
This portion is called Event Block. The program between these statements is executed only when a message is transmitted to this portion. In this example, no program is processed.

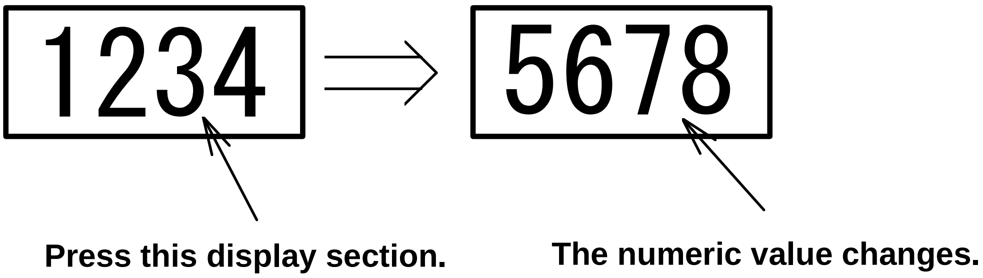
Note: A K-Basic program always requires the “conf”, “end conf”, “evnt”, “end evnt” statements.

Messages arrive at a part from several devices and parts. For details, try to use the part actually in the following section and see what messages come.



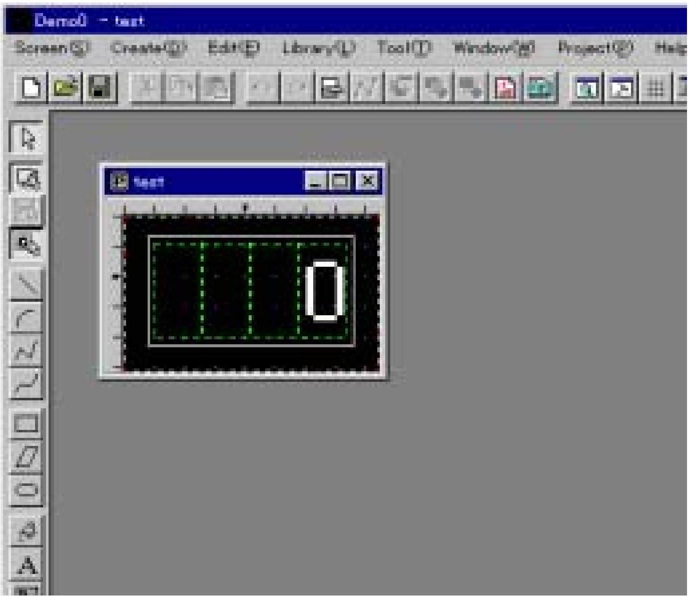
Message issuance

2-1-7 Modifying a created part



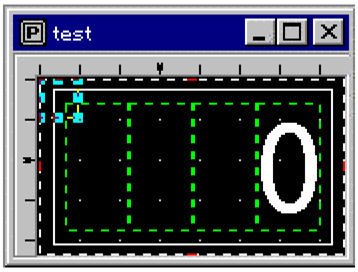
Modify the created part so that a numerical value may change when the display section is pressed.

First, read "test" which has been created above. Select "Library", select "Open", then select "Parts". The "Open Parts" dialog box appears. Select "User Parts" and open "test".

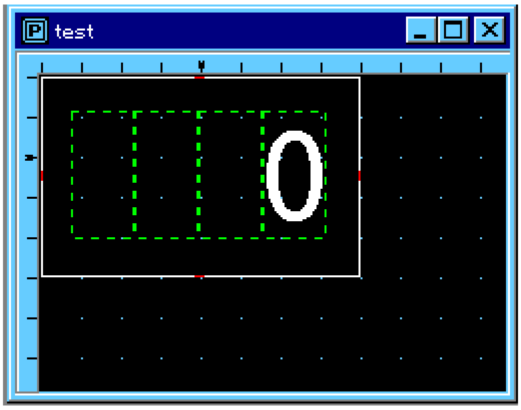


In this example, try to add a switch control to this part in order to use the touch panel. Select "Create" on the menu, select "Control", then select "Switch". The switch control setting dialog box is displayed. Press the OK (Arrange) button, since the default setting is not changed in this example. The mouse cursor changes into the mouse. Click on the part editor window of the part "test". The mouse cursor changes into a square switch control. Put this in the upper left of the part area. Since the switch control is a switch of the touch panel (20 dots x 20 dots), it moves in 20-dot steps.

Note: ***This switch is a momentary switch. It is turned on when you press it and turned off when you release the finger.***



Then, try to change the size of the switch control. To change the size, drag a handle around the switch control with the mouse. Drag the lower right handle of the switch control, since the area should be expanded to the lower right. By the way, the part was created above without taking the switch size into consideration, and the size of the enlarged switch may not fit the size of the part. In such a case, drag the lower right of the part editor window to enlarge the window sufficiently. Then, enlarge the switch to a size enough to cover the part. Then, expand the part area identically to the switch size. As a result, the number indicator control shifts from the center of the part area. Select and move it to a proper position. In addition, drag the handle to enlarge the rectangular outer frame so that it shows the switch area. The part shown below is now created.



Then, select "Edit" on the menu, and select "Edit Part Programs" in order to edit the programs. The program editor window opens. Add programs to the initialization block and event block as shown below.

```
init
    local type%, id@, data%
    numdsp ..NUM000,1234
end init

conf
end conf

evnt
    input type%,id@,data%
    if type%=3 and id@=..SWT000 and data%=1 then
        numdsp ..NUM000,5678
    end if
end evnt
```

Line to be added

Line to be added

Try to explain where the program has modified.
The program added to the initialized block is a statement of declaring the variable used in the Event Block.
The “input” statement added in the Event Block enables to receive messages from the Switch control. You can know the message sender’s type, message sender’s ID, and data. If the condition is satisfied in the “if” and “end if” statements, the display of the Number indicator control changes.

First, the “input” instruction will be explained.

The “input” instruction can read various information from messages. The standard usage of the “input” instruction is given below.

```
input  type%,id@,data%
```

In this example, the statement reads the type and ID of sender and data as explained below.

type%: The number indicating sender's type. For example, if the message is send by a switch, it is set to 3. If it is send by a PLC, it is set to 16. (For details, refer to 3-2, "Message format" reference.)

id@: The identification (ID) of sender. For example, if the message is send by a switch, it is set to the name of the switch. The ID is written in order of the screen name, the part name and the control name, delimiting each by a period(.).

Example: GAMEN.BUHIN.NUM000

This ID is called an ID-type constant; it is specific to K-Basic. You can also handle the ID as a variable by adding a "@" after the variable just like "id@".

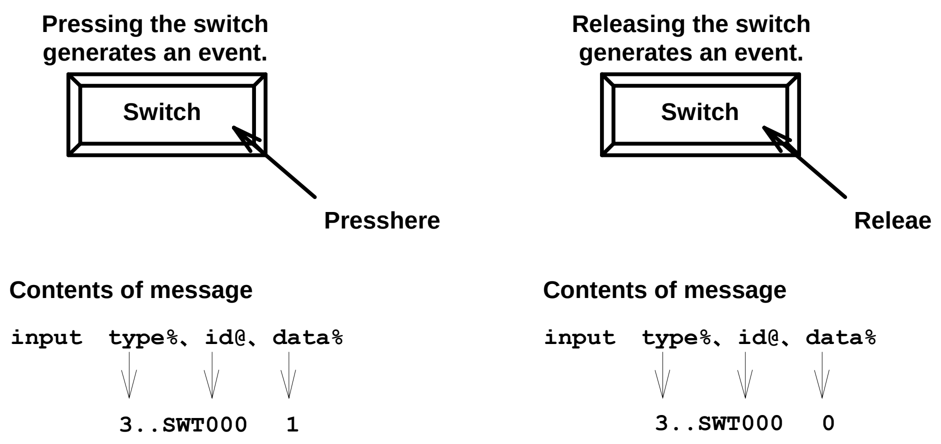
Note: A message contains sender's type, ID and data in order.

data%: Data written by sender. For example, if the switch is ON, it is set to 1. If the switch is OFF, it is set to 0.

Next line is "if" and "end if" statements.

```
if type%=3 and id@=..SWT000 and data%=1 then
        : : : : : : : : : : : : : : : :
end if
```

Condition "type%=3" following "if" means a message from a Switch control. "id@=..SWT000" means the ID of the Switch control. "data%=1" means that the switch is ON. Inserting "and" between these three conditions enables the instruction of the next line executed if all the conditions are satisfied. If the "if" statement consists only of "type%=3 and id@=..SWT000", this condition is satisfied twice, when the switch is pressed and when it is released. In this example, the operation is restricted to be executed only when the switch is pressed after "data%=1" is added.



Note: If the switch type is set to "Momentary", it generates two messages "when it is pressed and when it is released".

These programs are so modified to execute the numdsp instruction and display "5678" on the number indicator control when the if statement is satisfied.
The part is almost completed now. Save the programs in the same manner as described in 2-1-2. Also save the part as described in 2-1-4. Though a warning message is given since the part "test" has already been registered, overwrite it to replace the old part with the new part.
Now, use this part actually. Open "gamen1" created above again, and replace the old part with the new "test". To replace the old part, click on it, select "Edit" on the menu, then select "Delete". From now on, arrange the new part, create the screen data, and download it to the OIP in the same manner as described in 2-1-5. When the screen appears, "1234" must be displayed on the screen as previously. Press a point inside the frame, and you can see that "1234" changes into "5678".

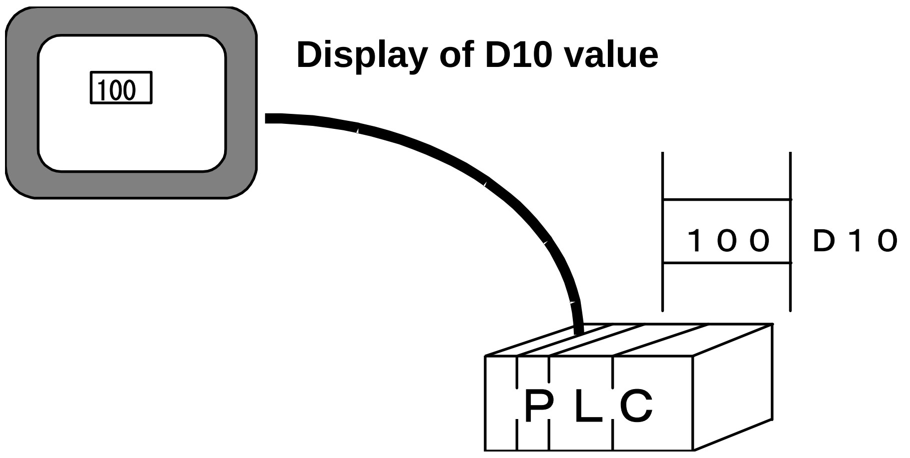
In K-Basic, an “input” statement is used to receive messages and “if and “end if” statements used to judge various messages and execute operations.

For how to receive messages of other events, see the examples introduced in subsequent chapters.

2-2 Creating a Part to be Linked to a PLC Device

All the programs in this examples are for Mitsubishi PLCs. If you use a PLC of other maker, change the station number and device name of those programs and select the PLC type to be used in setting a connecting device setting.

2-2-1 Numeral displays

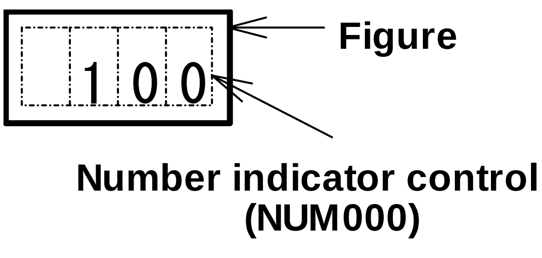


Create the part that displays a PLC value on the screen.

Control to use

One Number indicator control (NUM000)

Exterior view of the part



An example of the program is given below.

```
init
    local type%, id@, data%
    cyclic 00~D10
end init

conf
end conf

evnt
    input type%,id@,data%
    if type%=16 and id@=00~D10 then
       numdsp ..NUM000,data%
    end if
end evnt
```

- Configuration Block

`cyclic 00~D10`	The “cyclic” instruction reads the value of a device “D10” of the PLC whose station number is set to “00”.

The “cyclic” instruction is used to keep observing of PLC device values.

The “cyclic” instruction reads PLC device values periodically. When a PLC device value changes, the “cyclic” instruction transmits a messages to the Event Block. Type the station number and device name to be read after “cyclic”. K-BASIC rules require you to link the station number and the device name by a tilde “~”.

This instruction transmits a message when ever the screen changes.

- Configuration Block

Noting is processed.

- Event Block

```
input type%,id@,data%
```

The “input” instruction reads the messages transmitted to the part. The format of the messages are in order of “type%” (16), id@ (00~D10) and data% (PLC value: 00~D10).

```
if type%=16 and id@=00~D10 then
     : : : : : : : : : : :
end if
```

A condition “type%=16” put after “if” means a message from the PLC. “id@=00~D10” means that the ID of the device that has issued this message is 00~D10. Inserting “and” between these two items enables the subsequent programs to be executed only when both the conditions are satisfied.

```
numdsp ..NUM000,data%
```

The “numdsp” instruction displays data specified as a variable “data%” in the number indicator control specified as “..NUM000”. The variable “data%” in the “numdsp” instruction has the same value as that of “data%” of the “input” instruction (PLC device). This displays the PLC device value on the screen.

The flow of this program is as follows: The PLC device value is observed because the “cyclic” instruction is used in the Initialization Block. If the PLC device value changes, a message is issued to this part and the newest PLC device value is displayed on the screen by “numdsp” instruction.

Try to change the numerical value of the device used in this program from the PLC. You can see the numerical value on the screen changes simultaneously.

● How to make the part easier to use

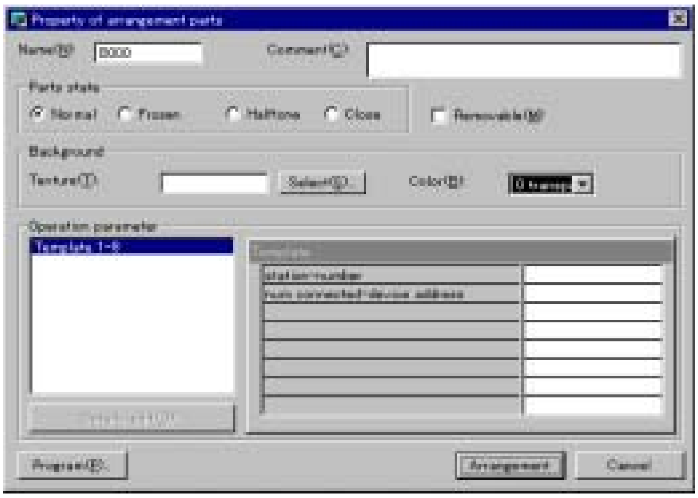
If you want to observe plural PLC devices on one screen, you must rewrite and arrange two or more parts accordingly, each of which has a different device name. This will make you troublesome. The “Parameter” function will make this operation easier.

```
cyclic [station-number]˜[num connected-device-address]
```

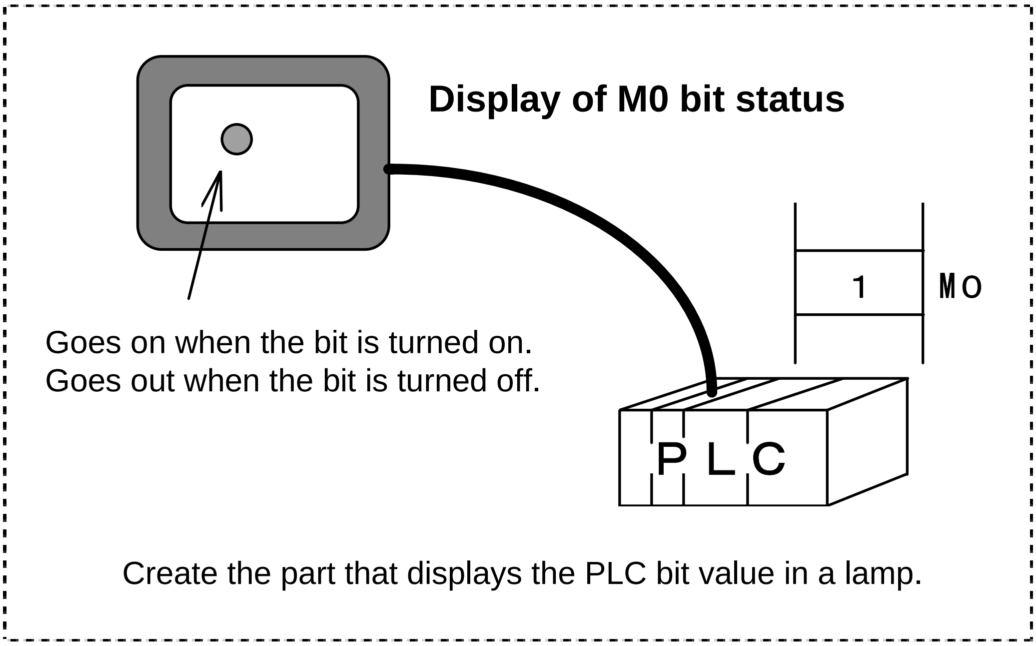
A character string enclosed in a pair of brackets, [ ], as shown above is called a template. (A maximum of 32 half-size characters can be written in [ ].) Since a character string written in brackets is displayed in the template of the corresponding part, the part can be used like a standard part. A a result, you only have to rewrite an operation parameter to change any device name without the need of changing the program.
A program example using templates is shown below.

```
init
     local type%, id@, data%
     cyclic [station number]~[num connected-device address]
end init

conf
end conf

evnt
     input type%,id@,data%
     if type%=16 and id@=[station number]~[num connected-device name]
then
       numdsp ..NUM000,data%
     end if
end evnt
```

The "station number" and "num connected device address" templates are displayed in the "Property of arranged part" dialog box of the part having this operation program as shown below. It is possible to input values for these templates of each arranged part.



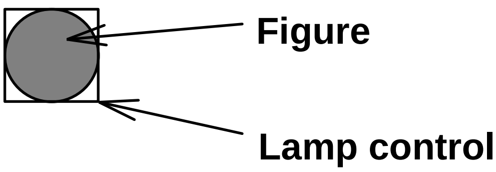
2-2-2 Indicator lamps



Control to use

One Lamp control (LAM000)

Exterior view of part



Note: ***The Lamp control has a function to change the OFF color of its area to the ON color if it is set to ON. So, the figure of the Lamp area must be painted with the OFF color.***

A program of a indicator lamp to be linked to a PLC device is given below.

```
init
    local type%, id@, data%
    cyclic [station-number]˜[lamp connected-device-address]
end init

conf
end conf

evnt
    input type%,id@,data%
    if type%=16 and id@= [station-number]˜[lamp connected-device-address]
then
      lampdsp ..LAM000,data%
    end if
  end if

conf
    cyclic [station-number]˜[connected-device-address]
end conf

evnt
    input type%,id@,data%
    if type%=16 and id@=[station-number]˜[connected-device-address] then
        lampdsp ..LAM000,data%
    end if
end if
```

- Initialization Block

As explained above, a “cyclic” instruction is written in this block.

Configuration Block

Noting is processed.

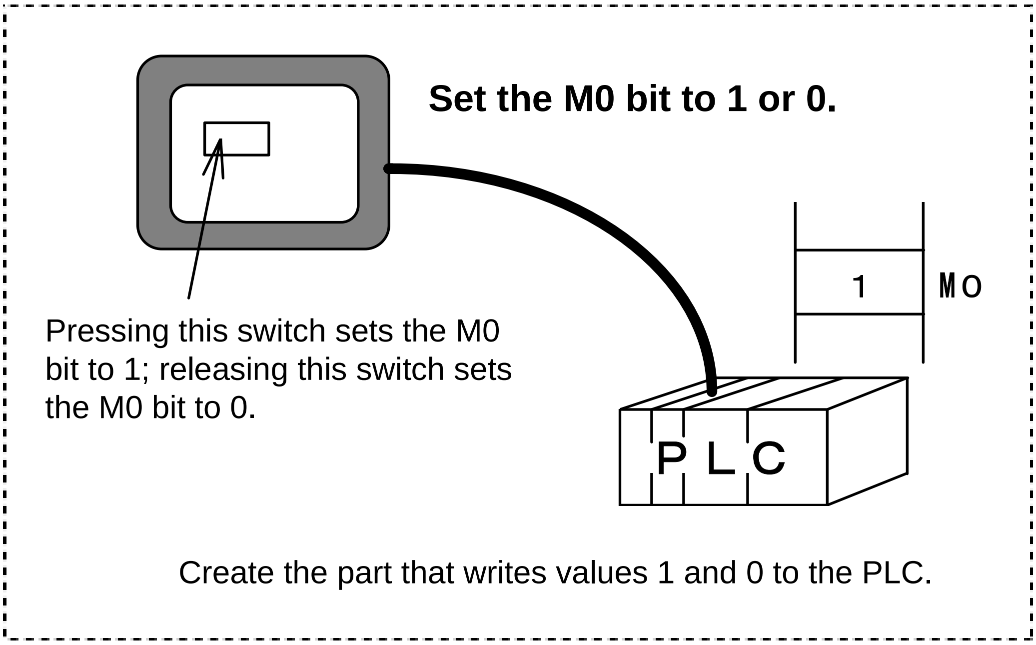
- Event Block

The “input” and “if” instructions are the same as that given in 2-2-1.

```
lampdsp ..LAM000,data%
```

The “lampdsp” instruction displays the ON or OFF color in the Lamp control. When the “data%” value is 0, the instruction displays the OFF color. When it is 1, the instruction displays the ON color.
The lanm displayed part has been created. Try to set and reset the PLC device bit specified in the program from the PLC. You can see the lamp color changes.

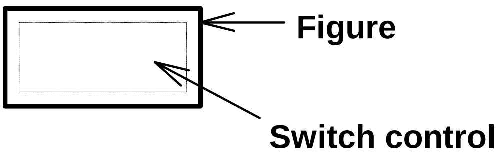
2-2-3 Switches



Control to use

One Switch control (SWT000)

Exterior view of part



A program of a switch to be linked a PLC device is given below.

```
init
    local type%, id@, data%
end init

conf
end conf

evnt
   input type%,id@,data%
   if type%=3 and id@=..SWT000 and data%=1 then
      [station-number]~[connected-device-address]=1
   else if type%=3 and id@=..SWT000 and data%=0 then
      [station-number]~[connected-device-address]=0
   end if
```

```
end evnt
```

- Initialization Block

You don’t have to use any “cyclic” instruction in this example because a value is only written to the PLC.

- Configuration Block

Nothing is processed.

- Event Block

```
input type%, id@, data%
```

The “input” instruction reads messages from the switch. Messages are read in order of “type%=3”, “id@=...SWT000.”, and data%” =ON/OFF (1 or 0) of switch.

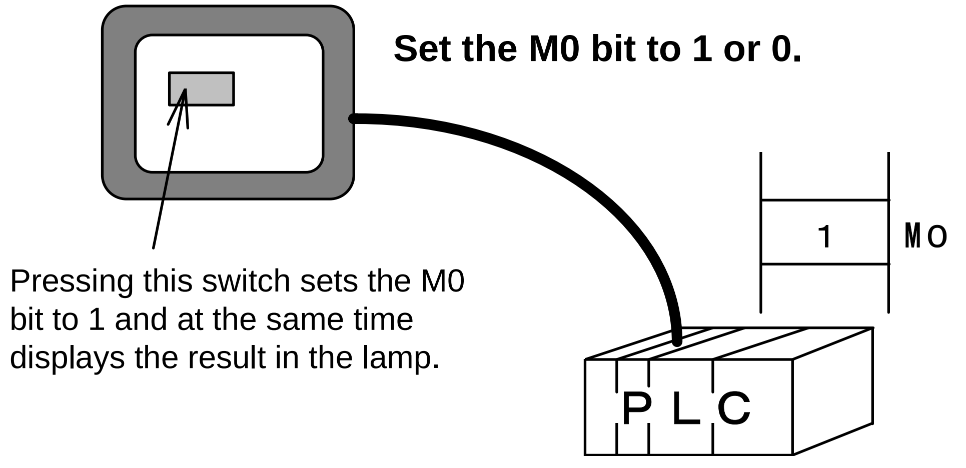
```
if type%=3 and id@=..SWT000 and data%=1 then
     : : : : : : : : : : : : : :
else if type%=3 and id@=..SWT00 and data%=0 then
     : : : : : : : : : : : : : :
end if
```

“type%=3” means the message from the switch. “id@=..SWT000” means the ID of the switch control. “data%=1” means that the switch is pressed and “data%=0” means that the switch is released. The following instruction is executed when these three conditions are satisfied simultaneously.

[station-number]˜[connected-device-address]=1

In this statement, 1 is written in the PLC device. 0 may be written in the same manner.
The "if" statement of this program detects the moment the switch is pressed and writes 1 in the PLC device. The "else if" statement detects the moment the switch is released and writes 0 in the PLC device.

2-2-4 Indicator switches

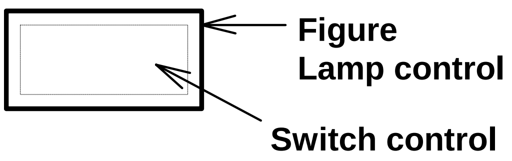


Create the part that writes values 1 and 0 to the PLC and displays the result in the lamp.

Control to use

One Switch control (SWT000) and one Lamp control (LAM000)

Exterior view of part



These two contorls are placed, overlapping each other.

A program of an indicator lamp switch is given below.

```
init
     local type%, id@, data%
     cyclic[station-number]˜[connected-device-address]
end init

conf
    cyclic[station-number]˜[connected-device-address]
end conf

evnt
```

```
    input type%,id@,data%
    if type%=3 and id@=..SWT000 and data%=1 then
        [station-number]˜[connected-device-address]=1
    else if type%=3 and id@=..SWT000 and data%=0 then
        [station-number]˜[connected-device-address]=1
    else if type%=16 and id@=[station-number]˜[connected-device-address] then
        lampdsp ..NUM000,data%
    end if
end evnt
```

This program consists of a lamp part and a switch part.

- Initialization Block

In this example, you can use a “cyclic” instruction to observe the PLC bit device that turns on/off the indicator lamp according to the device value.

- Configuration

Nothing is processed.

- Event Block

```
input type@,id@,data%
```

The “input” instruction reads messages from the switch and the PLC. If the message is from the switch, “type%” is set to 3, “id@” is set to ..SWT000, and “data%” is set to switch ON/OFF status (1 or 0). If the message is from the PLC, “type%” is set to 16, “id@” is set to the device ID (station number and device name), and “data%” is set to device value.

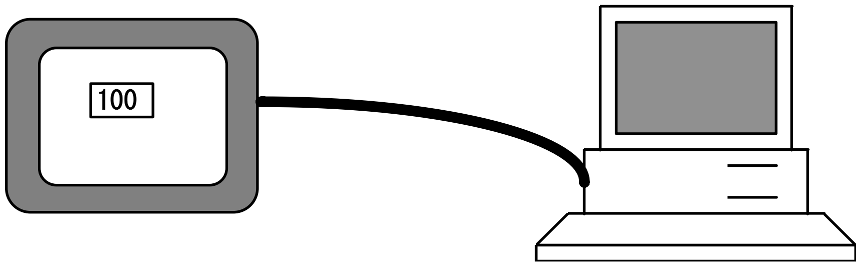
```
if type%=3 and id@=..SWT00 and data%=1 then
     : : : : : : : : : : : : : :
else if type%=3 and id@=..SWT000 and data%=0 then
     : : : : : : : : : : : : : :
else if type%=16 and id@=[station-number]˜[connected-device-address]
     : : : : : : : : : : : : : :
end if
```

In this portion, the message from the switch writes a value in PLC devices and the message from PLC turns on/off of the lamp.

2-3 Creating a Part to be Linked to an External Device

2-3-1 Display for host computer

Connection to the host

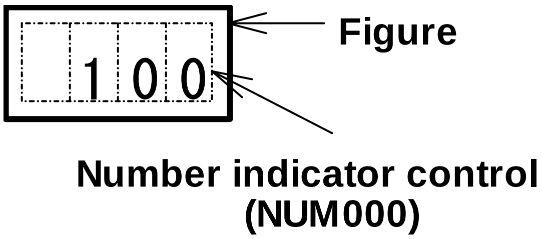


Create the part that displays the value transmitted from the host on the screen.

Control to use

One Number indicator control (NUM000)

Exterior view of part



A program of a numeral display used for the host computer is given below

```
init
    local type%, id@, data%
    opencom HST
end init

conf
end conf

conf
   opencom HST
```

```
end conf

evnt
    input type%,id@,data%
    if type%=22 then
        numdsp ..NUM000,data%
    end if
end evnt
```

- Initialization Block

The “opencom” instruction is written in the Configuration Block.

```
opencom HST
```

The “opencom” instruction declares receiving of messages from external devices. Specify the following external device names after the “opencom” instruction.

HST: Host computer
BCR: Bar-code reader
TKY: Ten-key pad

- Configuration Block

Nothin is processed.

- Event Block

```
input type%,id@,data%
```

The “input” instruction reads messages from the host computer.

```
if type%=22 then
  : : : : : : :
end if
```

The condition “type%=22” put after “if” means a message from the host computer. If the message is transmitted from the host computer, the statement following “then” will be executed.

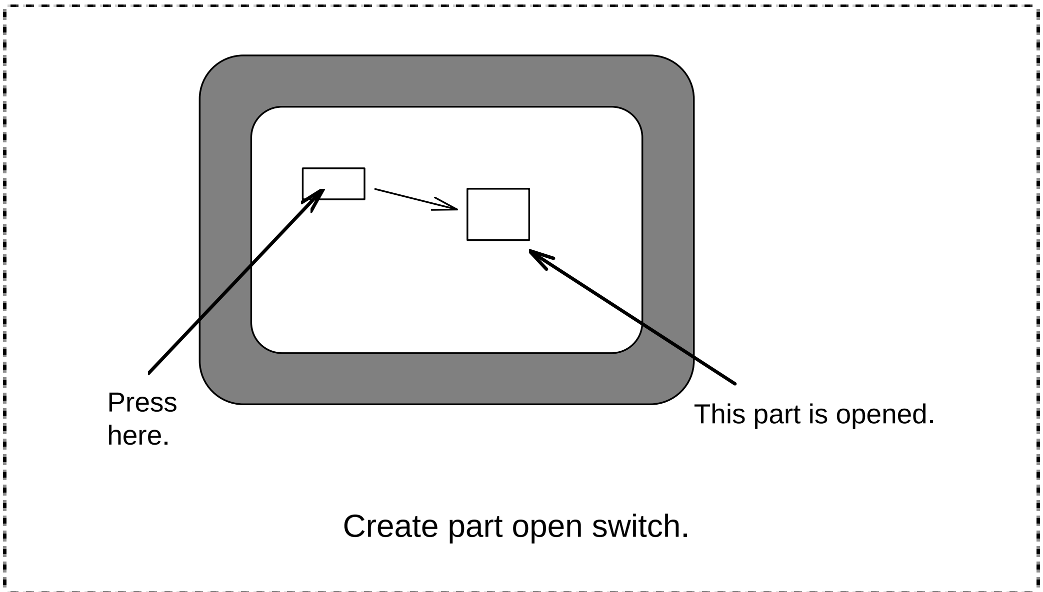
```
numdsp ..NUM000,data%
```

This block displays data on the numeral display. A numeric value from the host is input in "data%" in this block. This program ends here. The configuration block of this program receives a message from the host, and the event block displays the numerical data in the message from the host.

Note: For how to send data from the host computer, refer to the “Communication Manual”.

2-4 Creating a Part for Controlling Others

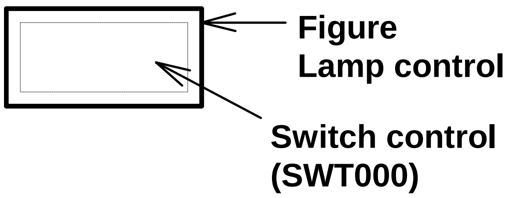
2-4-1 Part for calling others from touch panel



Control to use

One Switch control (SWT000)

Exterior view of part



A program of a part for calling other parts from the touch panel is given below.

```
init
    local type%, id@, data%
end init

conf
end conf

evnt
    input type%,id@,data%
    if type%=3 and id@=..SWT000 and data%=1 then
```

```
        open .[name-of-part-to-be-opened].,1
    end if
end evnt
```

- Initialization Block

Nothing is processed except that the block declares local variables.

- Configuration Block

Nothing is processed.

- Event Block

```
input type%,id@,data%
```

The “input” instruction reads messages from the switch control.

```
if type%=3 and id@=..SWT000 and data%=1 then
     : : : : : : : : : : : :
end if
```

The portion indicates that the program between the “if” and “end if” statements is executed when the switch is pressed.

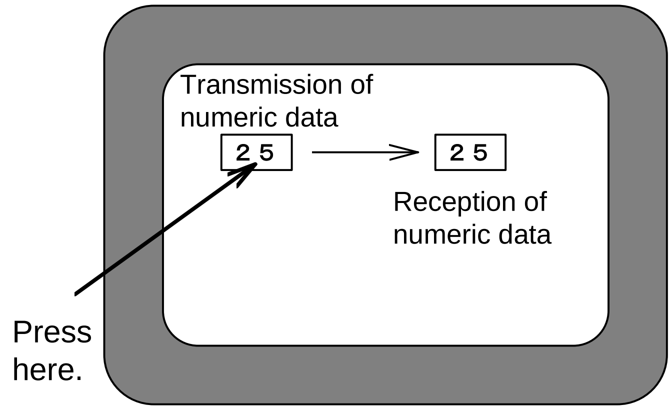
```
open.[name-of-part-to-be-opened].,1
```

The “open” instruction changes the part state specified by ID from close to open. If the numerical value following the part name is 1, the Configuration Block of the opened part is executed when the part opens. If the value is 0, the Configuration Block is not executed. This block uses an operation parameter for allowing a called part to be changed easily.

This program ends here. The configuration block of the part specified in the operation parameter is executed and the part is opened when the switch is pressed.

Note: Close the part specified for [name-of-part-to-open] on the screen.

2-4-2 Part for sending/receiving numerics to/from others



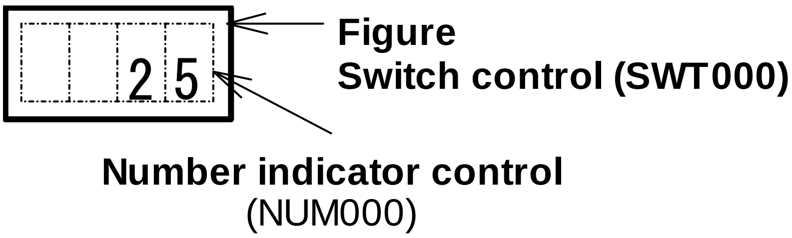
Create a part that transmits numeric data and a part that receives numeric data.

First, create a part that transmits numerical data.

Control to be use

One Number indicator control (NUM000) and one Switch control (SWT000)

Exterior view of part



These two controls overlap each other.

A program of a part for sending numerical data is given below.

```
init
     local type%, id@, data%
conf
    numdsp ..NUM000,[numeric-value-to-be-displayed]
end init

conf
end conf
```

```
evnt
    input type%,id@,data%
    if type%=3 and id@=..SWT000 and data%=1 then
        print [numeric-value-to-be-displayed]
        send .[remote-destination-part-name].
    end if
end evnt
```

- Initialization Block

```
numdsp ..NUM000,[numeric-value-to-be-displayed]
```

The “numdsp” instruction in the Configuration Block is necessary to display a numerical value from the beginning.

- Configuration Block

Nothing is processed.

- Event Block

```
input type%,id@,data%
```

The “input” instruction reads messages from the switch control.

```
if type%=3 and id@=..SWT000 and data%=1 then
    print [numeric-value-to-be-displayed]
    send .[remote-destination-part-name].
end if
```

This portion executes “print” and “send” instructions when the switch is pressed.

```
print [numeric-value-to-be-displayed]
```

The “print” instruction transmits messages to other parts. A message comprises a type, an ID, and a “display value” described here. If you want to transmit two or more numeral values, you can chain them by delimiting each value by a comma (‘).

```
Example print 123,456,789
```

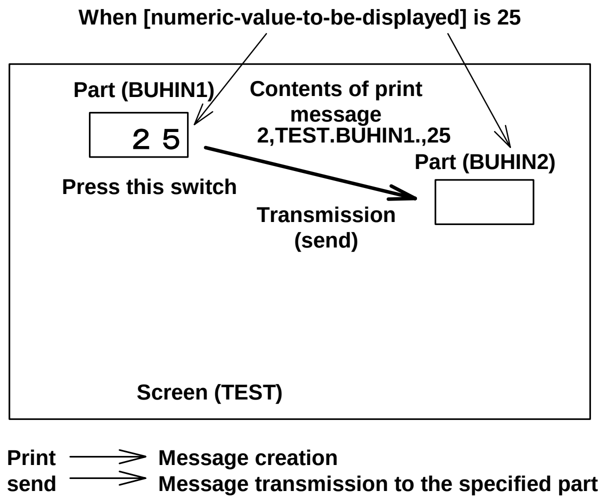
In this case, the “input” instruction set for the part receiving data is divided into three as shown below.

```
Example input type%,id@,data1%,data2%,data3%
```

In this example, “data1%” is read to 123, “data2$” is read to 456, and “data3%” is read to 789.

```
send .[remote-destination-part-name].
```

The “send” instruction transmits a message generated by the “print” instruction to the specified part ([remote-destination-part-name]). Be sure to use print” and “send” instructions in combination.

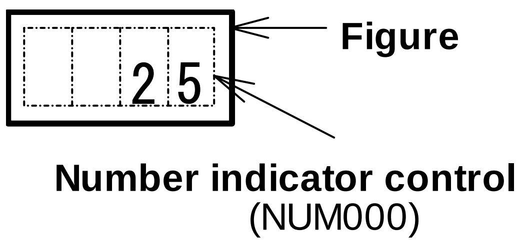


The program of this part ends here. This program sends a message containing a [display value] to the [remote destination part] specified in the operation parameter when the switch is pressed.
In the next place, create a part that receives numerical data.

Control to use

One Number indicator control (NUM000)

Exterior view of part



A program of a part that receives numerical data is given below.

```
init
    local type%, id@, data%
end init

conf
end conf

evnt
   input type%,id@,data%
   if type%=2 then
      numdsp ..NUM000,data%
   end if
```

```
end evnt
```

- Initialization Block
  Nothing is processed except that this block defines local variables.

- Configuration Block
  Nothing is processed.

- Event Block

```
input type%,id@,data%
```

The “input” instruction reads messages from the specified part.

```
if type%=2 then
   numdsp ..NUM000,data%
end if
```

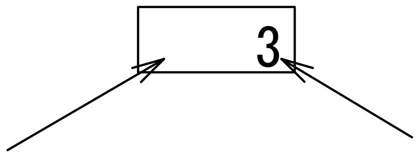
The condition “type%=2” means receiving of a message from the part. The message is set in “data%” and displayed by the “numdsp” instruction.

The program of this part ends here. When another part sends numerical data to this part, this program displays the numerical data.

Next, try to paste two parts on the screen and use them actually. The operation parameter [destination-part-name] must coincide with the name of the part to receive the data. If you press the switch of the part that transmits numerical data, the same value will be displayed in the part that receives data.

2-5 Creating a Part for Using a Timer

2-5-1 Part for counting up



When the switch is pressed, the timer start operation. When pressed again, it stops.

The numeric value is incremented per second like 4, 5, 6.

Create a timer function part.

Control to use

One Number indicator Control (NUM000) and one Switch Control (SWT000)

Exterior view of part

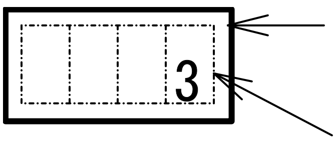


Figure
Switch control (SWT000)

Number indicator control
(NUM000)
These two controls overlap each other.

A program of a part that increments a numerical value is given below.

```
init
    local type%, id@, data%
    static timeid@
    static flag%
    static number%
    flag%=0
    numdsp ..NUM000,0
end init

conf
end conf
```

```
evnt
    input type%,id@,data%
    if type%=3 and id@=..SWT000 and data%=1 then
        if flag%=0 then
            timeid@=opentim()
            settim timeid@,10,1
            starttim timeid@
            flag%=1
        else if flag%=1 then
            stoptim timeid@
            closetim timeid@
            flag%=0
        end if
    else if type%=4 then
        number%=number%+1
        numdsp ..NUM000,number%
    end if
end evnt
```

- Initialization Block

The definitions of the local variables and static variables are written.

```
static timeid@
static flag%
static number%
```

You can use the “static” instruction to retain the contents of variables during a program execution. In this example, these instructions are used to retain the value of the timer ID, the timer ON/OFF flag, and the display value. Some “static” instructions can also be written as a group. The list of parameters also can be chained, delimiting each parameter by a comma in this case.

```
Example: static timeid@,flag%,number%
```

```
flag%=0
```

The statement “flag%=0” initializes the flag variable which indicates the timer ON/OFF state.

```
numdsp ..NUM000,0
```

The “numdsp” instruction displays “0” first at starting.

- Configuration Block

Nothing is processed.

- Event Block

```
input type%,id@,data%
```

The “input” instruction reads messages from the Switch control and the timer.

```
if type%=3 and id@=..SWT000 and data%=1 then
       : : : : : : : :          ← When the switch is pressed
else if type%=4 then
       : : : : : : : :          ← When messages from the timer are read
end if
```

An operation to be performed when the switch is pressed and an operation to be performed when a message is received from a timer are described after “then”. A message is received from the timer each time the displayed value is counted. (A message is transmitted every second.)

If the switch is pressed, the following program is executed:

```
if type%=3 and id@=..SWT000 and data%=1 then
   if flag%=0 then
     timeid@=opentime()
     settim timeid@,10,1
     starttim timeid@
     flag%=1
   else if flag%=1 then
     stoptim timeid@
     closetim timeid@
     flag%=0
   end if
```

When the timer stops (flag%=0), the program following the “if flag%=0 then” statement is executed.

```
timeid@=opentim()
```

This function acquires the ID of the timer to be used. The ID is assigned for a variable “timeid@”.

```
settim timeid@,10,1
```

This instruction sets the time limit of the timer to generate events. You can set the time limit in units of 100 milliseconds. Parameter “1” following “10” means that the timer generates events repeatedly. If it is set to “0”, the timer generate only an event.

```
starttim timeid@
```

This instruction starts the timer.

You must use these three instructions as a set to operate the timer.

```
flag%=1
```

In this example, the variable "flag%" is used to indicate and retain the timer state. "flag%=1" means that the timer is in operation.

The statements following "else if" stop the timer in operation (flag%=1).

```
stoptim timeid@
```

This instruction cancels counting up the timer.

```
closetim timeid@
```

This instruction cancels the use of the timer obtained with "opentim" and returns the timer to the system.

You can use up to 16 times. Unnecessary timers must be returned to the system.

```
flag%=0
```

flag%=0 indicates that the flag is set to 0 because the timer stopped.

When a message is transmitted from the timer, the following program is executed.

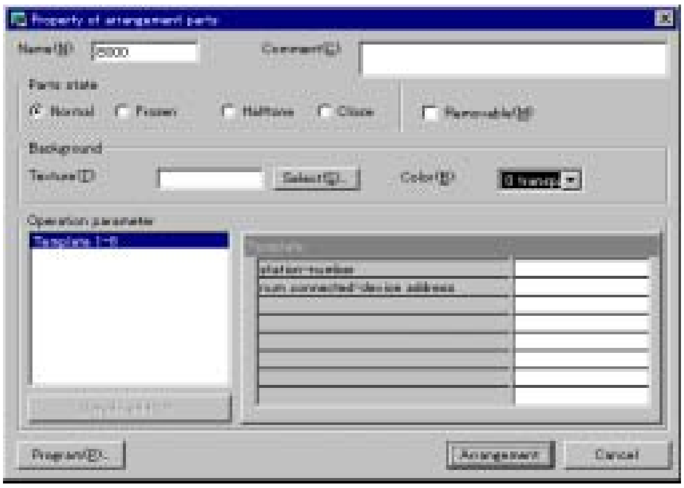
```
else if type%=4 then
    number%=number%+1
    numdsp ..NUM000,number%
end if
```

Each time a message is transmitted from the timer, the numerical value to be displayed (variable "number%) is incremented by "1" and displayed in the Number indicator control.

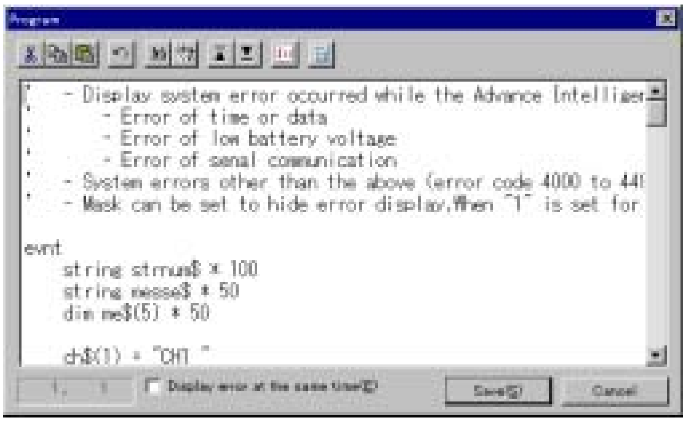
The program ends here. The initialization block of this program declares the variable and displays the default value of 0. The event block processes a message from the switch or timer. As a result, this program alternates two conditions. Every time the switch is pressed, a displayed value increased by one in one condition or such increase stops in the other condition.

2-6 Editing a Program for a Displayed Part

To edit the program of a part arranged on the screen, double-click on that part in the screen creation window. The "Property of arrangement part" window opens. Select "Program" in the window.



The program editor window opens.



CHAPTER 3

CODING RULES

3-1 Usable Characters

Half-size alphanumeric characters (0x20 to 0x7f ASCII codes), half-size Kana characters (0xa0 to 0xdf ASCII codes), and full-size characters (2-byte codes) can be used to write programs. As for the full-size characters, character strings enclosed in double quotation marks, " " , are valid. As for the Kana characters, device names and character strings enclosed in double quotation marks, " " , are valid. Alphabetic characters can be written in either capital letters or small letters. However, capital alphabetic letters and small alphabetic letters are discriminated from each other when they are used in character strings.

What uppercase and lowercase letters are not identified means that variable, function, and subroutine names used in K-Basic are handled as follows:

Label means the same as LABEL.
variable means the same as Variable.

3-2 Special Characters

Some characters in OIP K-Basic have special meanings. These characters are called special characters. The following special characters are used in OIP K-Basic.

Period "."

Used to delimit screen, part, and control. Also used to represent a decimal point.
Example of using periods to delimit screen, part, and a control
GAMEN.BUHIN.PRIM
BUHIN.
Example of using periods to represent decimal points
1.23, 0.01

&, &0, &H

& and &0 are used to represent an octal number.
&H is used to represent a hexadecimal number.
&7 (octal notation) represents 7 in decimal notation.
&10 and &010 (octal notation) represent 8 in decimal notation.
&H20 (hexadecimal notation) represents 32 in decimal notation.

%, $, !, @

Used to represent the types of variables or functions. These special characters are added to the ends of variable names or function names.
%: Represents an integer-type variable. (VAR%)
$: Represents a character-type variable. (MOJI$)
!: Represents a floating-point-type variable. (FLOAT!)
@: Represents an ID-type variable. (ID@)

Tilde " ˜ "

Used to delimit a station number and a PLC device name.
00˜D100: 00 is a station number and D100 is a PLC device address.

" [", "] "

Used when operation parameters are written.

```
conf
  cyclic [station-number]˜[connected-device-address]
end conf
```

Apostrophe " ' "

Symbol for indicating the start of a comment. The portion from this symbol to the end of a line is treated as a comment. An apostrophe is used as follows:

```
conf
  global var(3,2)    ' This is the declaration of a variable.
end conf
```

" : "

Used to delimit a label. A label is used as a GOTO jump destination or a subroutine name.

```
evnt
  if var% = 0 then goto LABEL
  aa% = bb% + 1
LABEL: aa% = 10
end evnt
```

3-3 Constants

OIP K-Basic uses character constants, integer-type constants, floating-point-type constants, and ID-type constants.

Character constant

A character string enclosed in double quotation marks (”) is called a character constant. Character strings of up to 80 bytes can be enclosed in double quotation marks.
“ABCDEF” and “1234”, etc., are character constants.

Integer-type constant

Integer-type constants can be represented in the octal, decimal, and hexadecimal formats.

&123,&66 (octal notation)	& or &O is added to the beginning of numbers 0 to 7.
100,322 (decimal notation)	Values from -2147483648 to 2147483647 can be assigned.
&H123,&HFF	&H is added to the beginning of (hexadecimal notation) characters 0 to F.

Floating-point-type

Floating-point-type constants can consist of values from 1.70141E+38 to constant +1.70141E+38. The number of significant digits is 6 digits.
A floating-point-type constant can be written like 1.23,0.001,-2,3E-4. E-4 indicates the -4 power of 10.

ID-type constant

Screen names, part names, primitive names, logical device names, graphic names, text names, and PLC device names can be written as ID-type constants.

- Screen name, part name, and primitive name
  A screen name can be written like SCREEN.. and a part name can be written as SCREEN.PART. A primitive name can be written like SCREEN.PART.PRIM.
- Logical device name
  In OIP BASIC, HST (host computer), PRN (printer), BCR (bar code reader), MCR (magnetic card reader), TKY (ten-key pad), ICC (memory card), and SIO (serial port) can be written as logical device names. Logical devices are connected to the OIP.
- For figures and texts, the names assigned to register them can be written as they are.
- PLC device names are written as 00˜D100 and 00˜M10, etc.

3-4 Constant Declaration

In Screen Creator 5, it is possible to declare constants. Declaring constants means giving constant names to constants in frequent use and using such constant names, instead of constant values, in programs. The character constants, integer constants, and real number constants can be declared. It is impossible to declare ID constants. Constant declaration allows the user to change the values of constants in programs at a time. It also makes programs easy to read.

Declare a constant as shown below.

const constant name = constant value

A constant name is a character string which is created in the same manner as creating a variable name and enclosed in a pair of # symbols. The constant value is as described in 3-3 above.

Example: const #pai# = 3.1415

When the "pai" constant is declared as shown above, all "pai" constants in the programs are replaced with the value of 3.1415.

Constants can be declared in portions other than the screen operation programs on a global screen. If a constant is declared in a screen operation program on a global screen, a compilation error occurs.

3-5 Variables

Alphanumeric characters and an underscore "_" can be used as variable names. (Uppercase and lowercase letters of variable names are not identified.) A variable name cannot begin with a number. Write each variable name with up to 20 characters (bytes).

Add one of the type declaration characters $, %, ! and @ in order to the end of a constant name to express the type of the constant. The real number constant is the only exception. No type declaration character is added to the end of the real number constant.

3-5-1 Classification of variables

Character-type variable	Variable that stores characters. A variable ending with "$" is a character-type variable. For the default, up to 20 characters (bytes) can be stored in a character-type variable. Use the STRING command to increase the number of characters.
Integer-type variable	Variable that stores an integer. A variable ending with "%" is an integer-type variable.
Floating-point-type variable	Variable that stores a floating-point number. A variable ending with "!" is a floating-point-type variable. Variables that do not end with ! are also treated as floating-point-type variables.
ID-type variable	Variable that stores ID-type values such as a screen name, a part name, a primitive name, and a logical device name. A variable ending with "@" is an ID-type variable.
Array-type variable	A character-, integer-, floating-point-, or ID-type variable followed by the element(s) enclosed in parentheses is an array-type variable. Array-type variables can be used by declaring their arrays in the DIM command. They are usually written as follows: GLOBAL VAR$(2,3), VAR1%(10) An array element can be usually referenced by specifying the subscript value in the parentheses. The subscript starts at 0. That is, VAR1%(10) is an integer-type array having 11 elements. Array-type variables can handle two-, three-, and ten-dimensional arrays.

Note: Variables followed by different symbols (!, @, %, and $) are handled as different variables although their names are the same. Variables are also handled as different variables, depending on whether they have an array.

VAR!, VAR@, VAR%, VAR$, VAR!(5), VAR@(5), VAR%(5), VAR$(5) are all different variables.

3-5-2 Types of Variables

The variables may be classified according to the storage method and difference between the ranges of the program to which can be referred in addition to the types.

Global variables	Variables defined in the global declaration. Global variables are the common variables that can be referenced by all the global-declared BASIC programs. This variable can be referenced in a program where the variable is declared, as far as it is declared as a global variable. When the OIP is started, global variables are initialized only once. Integer- and floating-point-type global variables are initialized to 0. Character- and ID-type global variables are placed in the status in which nothing is written. A global variable is declared as follows: GLOBAL VAR% When this declaration is made in two or more programs, they reference the same variable.
Static variables	Variables defined in the static declaration. Static variables can be referenced only in the declared program. When the OIP is started, static variables are initialized only once. Integer- and floating-point-type static variables are are initialized to 0. Character- and ID-type static variables are placed in the status in which nothing is written. A static variable is declared as follows. STATIC VAR%
Backup variables	Backup variables have almost the same characteristics as global variables except that their contents are retained even if the OIP power is turned off. Backup variables are not initialized even if the power is turned on again. However, a backup variable which hasn't been initialized is initialized to 0 when new screen data is down-loaded. A backup variable is declared as follows: BACKUP VAR% When this declaration is made in two or more programs, they reference the same variable. Backup variables can be used for only OIP units with built-in backup memory. The backup memory stores data in it even when the OIP is turned off. If backup variables are used for an OIP with no backup memory, they cause the same functions as global variables. In other words, the values of backup variables are lost when the OIP is turned off and are initialized to 0's when the OIP is turned on again. An OIP with backup memory uses the backup memory for backup variables and RAM files (MS-DOS file systems or memory files). Thus, the sum of the memory size used for backup variables and the memory size used for RAM files must be less than the total size of the backup memory. The memory size used for RAM files is

specified in "RAM File Setup" of "System Setup" on the OIP system screen.

Models	Backup memory sizes	Backup variable operations
GC56LC2	256KB	Can be backed up.
GC55EM2	256KB	Can be backed up.
GC53LC3	256KB	Can be backed up.
GC53LM3	256KB	Can be backed up.

Local variables

Local variables denote variables defined by local declarations (LOCAL) and undeclared variables used in portions other than the screen programs on global screens. Local declaration is not allowed in the screen programs on global screens.
Use LOCAL for local declaration as far as possible in Screen Creator 5, though it is possible to use DIM for local declaration of arrangement variables and STRING for local declaration of character string variables for compatibility with K-Basic of GCSGP3. Local variables are initialized every time programs are executed.
Each integer variable or real number variable is initialized to 0.
Each character variable or ID variable is initialized to a blank.
A local variable is declared as shown below:

```
LOCAL VAR%
```

Auto variables

Auto variables denote variables defined by auto declarations (AUTO).
Auto variables can be defined and referred to in functions only.
Auto variables are initialized every time functions are executed.
Each integer variable or real number variable is initialized to 0.
Each character variable or ID variable is initialized to a blank.
An auto variable is declared as shown below:

```
AUTO VAR%
```

3-5-3 Checking variable types and variable interpretation in compilation

When screen data is created, the compiler executes syntactic analysis and processing of the program. If the program contains global declaration, static declaration or other distinctive declaration, processing is executed according to such declaration. In some cases, the type is interpreted and processing is done tacitly. If you do not keep such tacit interpretation in mind as a rule of writing programs, programs may not function as you expect. This section describes which types are interpreted tacitly.

1) Variables contained in screen programs on global screens not defined by global declaration, static declaration or backup declaration are interpreted as global variables tacitly, and variables are created automatically.

2) Variables contained in screen programs on screen other than global screens and variables contained in all part programs not defined by global declaration, static declaration, backup declaration, local declaration or auto declaration are interpreted as local variables tacitly, and variables are created automatically.

Tacit variable generation as shown above is one of the features of general BASIC languages. However, such a feature may not be desirable for some programmers. For example, if an incorrect variable name is written in a program, a local variable or global variable is generated automatically, while the programmer does not realize it. It is quite difficult to find such an error, since compilation of the program cannot find it.
To avoid such a trouble, Screen Creator 5 is capable of giving an error when it finds a variable with no declaration while it compiles a program. Normally, Screen Creator 5 goes not give an error. When a LOCAL CHECK statement is written in a program, Screen Creator 5 gives an error when it finds a variable with no declaration. For details of using the LOCAL CHECK statement, see Chapter 4 "Instruction Reference". To make programs as easy to read as possible and to minimize errors, it is recommended that the "LOCAL CHECK 1" statement be written at the beginning of a program to validate the error check function and all variables be declared.

3-5-4 Initializing variables

Screen Creator 5 can initialize a variable when it is declared. To initialize a variable, write an assignment statement behind declaration of the variable as shown below.
Example: STATIC VAR% = 12
In the case of an arrangement variable, the initialization data is complicated. Use "{" and "}" to list the initialization data. In the case of one-dimensional arrangement, write elements having subscripts which begin with 0.

Example: GLOBAL ARRAY%(5) = {0, 1, 2, 3, 4, 5}

In the case of multi-dimensional arrangement, write elements so that the subscripts increase from the right.

```
Example:  GLOBAL ARRAY%(2, 3) = {{0, 1, 2, 3, 4}, {4, 5, 6, 7}, {8, 9, 10, 11}}
          GLOBAL ARRAY%(1, 2, 3) = {{{0, 1, 2, 3, 4}, {4, 5, 6, 7}, {8, 9, 10, 11}},
                                    {{12, 13, 14, 15}, {16, 17, 18, 19}, {20, 21, 22, 23}}}
```

If the type of the initialization data is different from the type of the variable, the data is initialized in the variable type.
It is impossible to initialize ID variables. Other types of variables can be initialized. Initialization applies to all types of variables. Note that, however, if initialization of backup variables is specified, backup variables are initialized every time the OIP is turned on and accordingly the purpose of using backup variables, i.e., storing values even after turning off the power, is not achieved.
It is also possible to initialize variables into backup variables. Note that, however, backup variables are initialized every time the OIP is activated and the purpose of using backup variables such as memorizing variable values is is not fulfilled in this case.
Global variables, static variables and backup variables are initialized before all blocks in all programs are executed.
The position of initializing a variable depends on the variable type and where declaration is done. Global variables, static variables and backup variables are initialized before the program blocks are executed. Local variables are initialized when the block where the local variables are declared are executed. Therefore, note that, if local variables are declared in configuration blocks or event blocks, the variables are initialized every time these blocks are executed. Auto variables are initialized when the functions for which the auto variables are declared are called and executed.

3-6 Expressions and Operations

This section explains operations performed between variables and constants.

- Arithmetic operators

^ (exponent operation)	Exponent operation is written like X ^ Y. This represents the Y power of X.
- (minus sign)	-100,-VAR! Integer- and floating-point-type numeric values are converted to minus values.
* (multiplication)	VAR1*VAR2 VAR1 is multiplied by VAR2.
/ (division)	VAR1/VAR2 VAR1 is divided by VAR2.
¥ (division)	VAR1¥VAR2 VAR1 is divided by VAR2. The quotient becomes an integer-type value.
+ (addition)	VAR1+VAR2 VAR2 is added to VAR1.
- (subtraction)	VAR1-VAR2 VAR2 is subtracted from VAR1.
MOD (remainder of integers)	VAR1 MOD VAR2 The remainder is obtained by dividing VAR1 by VAR2.

- Relational operators

  Relational operators are used to compare two numeric values. The comparison result is true (-1) or false (0).

= (equal to)	= is used like VAR1=VAR2. When two values (VAR1 and VAR2) are equal, the result becomes true.
<> (not equal to)	<> is used like VAR1<>VAR2. When two values (VAR1 and VAR2) are not equal, the result becomes true.
< (less than)	< is used like VAR1<VAR2. When VAR1 is less than VAR2, the result becomes true.
> (greater than)	> is used like VAR1>VAR2. When VAR1 is greater than VAR2, the result becomes true.
<= (less than or equal to)	<= is used like VAR1<=VAR2. When VAR1 is less than or equal to VAR2, the result becomes true.
>= (greater than or equal to)	>= is used like VAR1>=VAR2. When VAR1 is greater than or equal to VAR2, the result becomes true.

● Logical operators

NOT	NOT is used like NOT VAR%. Logical negation applies to the numerical expression (variable or constant) following NOT.
AND	AND is used like VAR1% AND VAR2%. VAR1% and VAR2% are ANDed for each bit.
OR	OR is used like VAR1% OR VAR2%. VAR1% and VAR2% are ORed for each bit.
XOR	XOR is used like VAR1% XOR VAR2%. VAR1% and VAR2% are XORed for each bit.

Logical operators are used to operate two numeric values for each bit. For NOT, however, inversion is applied for each bit.

● Character operations

- Character connection

+	+ is used like VAR1$+VAR2$. That is, + is used to connect two characters. For VAR$=VAR1$+VAR2$, the connected characters are assigned to VAR$.

- Character string comparison

Two character strings are compared. The comparison result is true (-1) or false (0).

=	= is used like VAR1$=VAR2$. It is used to judge whether two character strings (VAR1$ and VAR2$) are equal.
<>	<> is used like VAR1$<>VAR2$. It is used to judge whether two character strings are not equal.
<	< is used like VAR1$<VAR2$. When VAR1$ is less than VAR2%, the result becomes true.
>	> is used like VAR1$>VAR2$. When VAR1$ is greater than VAR2%, the result becomes true.
<=	<= is used like VAR1$<=VAR2$. When VAR1$ is less than or equal to VAR2$, the result becomes true.
>=	>= is used like VAR1$>=VAR2$. When VAR1$ is greater than or equal to VAR2$, the result becomes true.

Two character strings are compared from the beginning for each byte. When two different characters are found, whether one character is greater than or less than the other is judged. When one character string becomes shorter than the other during comparison, the shorter string becomes small.

- **Priorities of operators**

Operators are written according to priorities below.

Expressions	Expression enclosed in parentheses
Functions	System-defined function and user-defined function
-	Minus sign
^	Exponent operator
*, /, ¥	Multiplication and division
+, -	Addition and subtraction
MOD	Remainder of integer
=, <>	Relational operators
NOT	Logical negation
AND, OR, XOR	Conjunction, disjunction, and exclusive

Note: ID-type variables and constants can be applied only to the comparison between two items using relational operator "=".

3-7 Type Conversion

If logical operation is performed for different types when integer- and floating-point-type values are assigned to variables of different types, type conversion occurs.

- Assignment

The following is an example of assigning floating-point-type data to integer-type data.

```
VAR1% = 2.45
VAR2% = 2.56
```

In this case, 2 is assigned to VAR1% and 3 assigned to VAR2%.

A real number is rounded off when it is converted to an integer. The value obtained as a result of this rounding-off becomes an integer type.

- Logical operation

For logical operation, floating-point-type data is converted to integer-type data and operated.

```
VAR% = 23
FLOAT! = 12.35
      VAR%   AND   FLOAT!
```

The result of this calculation is like 23 AND 12.

- Others

When an integer-type value is converted to a floating-point-type value, which in turn is converted to an integer-type value again, loss of significant digits may occur. In the OIP, the number of significant digits is 6 digits.

```
VAR% = 99999999
FLOAT! = VAR%
      VAR% = FLOAT!
```

As a result of executing the above, 100000000 is set in VAR%.

3-8 Labels

Labels indicate a program jump destination and a subroutine name, etc. Labels are assigned names like variables. They are delimited by a colon (:). An example of a program that use labels is given below.

```
evnt
   input ty%,id@,dat%
   if dat% = 1 then goto LABEL1
   gosub SUBNAME
   ........
   .......
LABEL1: dat% = 20
end evnt

SUBNAME:
  dat% = 10
  return
```

3-9 Subroutines

Subroutines are written as a subroutine block outside the event block. Description of a subroutine begins with a label name and ends with RETURN. No K-BASIC command can be written in the line where a label name is written. Two or more subroutines can be written in one program.

```
conf
   ....
   Description of configuration block
   gosub SUB1
   ....
end conf
evnt
   ....
   Description of event block
   gosub SUB10
   ....
end evnt
SUB1:
    ....          Subroutine body

    RETURN
SUB10:
    ....          Subroutine body

    RETURN
```

Subroutines are classified into two types: local and global.

- Global subroutine
  Global subroutines are the subroutines written on the global screen. Global subroutines can be called from all screen and part programs. Variables to be used by global subroutines are global and static variables. When a global subroutine is called from a screen (local screen) other than the global screen, only the variables for which “global” or “static” was declared on that screen can be used as global subroutine variables.

- Local subroutine
  Subroutines written on screens other than the global screen are called local subroutines. Local subroutines can be used only in the program where they are written.

If the name of a written local subroutine is also contained in the global subroutine, the global subroutine is executed when the local subroutine is called. It is possible to give a warning indicating that the local subroutine name and global subroutine name are duplicated when creating download data by writing a LOCAL CHECK statement in such a program. For details of using the LOCAL CHECK statement, see Chapter 4, "Instruction Reference".

3-10 User-defined Functions

Screen Creator 5 supports user-defined functions. Several arguments are input by a caller, the user-defined functions are executed, and return values are sent to the caller.

3-10-1 Definition of user-defined functions

A user-defined function is defined in the format as shown below:

```
function function name [type declaration character] (argument 1, argument 2, .... )
  Program of the function
end function
```

The block between "function" and "end function" is called a function block. It is one of the program elements like the initialization block, configuration block, event block and subroutine block. It is impossible to write a function block in any other block.
The function name consists of a character string written in the same manner as writing a variable name. One of the type declaration characters $, %, ! and @, which indicate the type of a return value, should be added to the function name. The real number function name is the only exception. It needs no type declaration character.
Argument 1, argument 2 and so forth enclosed in parentheses are given by the caller to the function. The type of the arguments is declared by the type declaration character. If no type declaration character is written, arguments are regarded as real numbers. The function caller can use variables, constants and calculation expressions as arguments.
If variables are specified as arguments, the function may substitute values for the arguments and, as a result, the arguments may be changed. In such a case, the variables of the caller are also changed. In other words, the function uses such arguments as the original variables, though they are called arguments, not variables.
If constants or calculation expressions are specified as arguments, the values are substituted for the arguments and the function is executed. If values are substituted for the arguments, the values of the arguments are changed, while no influences are placed upon the caller. In other words, the function regards such arguments as variables having default values (i.e., auto variables).
When a value is substituted for the function name with a type declaration character, a return value for the function is decided. The function caller can use the function name in an expression as a variable or an argument of another function.
The program of the function ends when processing reaches "end function" and processing is handed over to the caller. Use "exit function" to terminate processing of a function in the middle of a function program.
The following shows an example of user-defined function declaration:

```
function my_div%(a%, b%)
   if b% = 0 then
      if a% < 0 then
         my_div% = -217483648
      else
         my_div% = 217483647
      end if
      exit function
   end if
   my_div% = a% / b%
end function
```

3-10-2 Definition positions of user-defined functions and ranges of referencing

The types of programs which can refer to user-defined functions and the ranges of referencing differ with the positions where the functions are defined. The user-defined functions are classified into three types as shown below:

- Global functions
  A global function has its function block written in the global screen program. A global function can be read from any screen or part program.

- Local functions
  A local function has its function block written a program for a screen other than the global screen. A local function can only be called by the program in which it is defined.

- Library functions
  A library function has its function block written in a function library under the control of Screen Creator 5. A library function can be read by any program.

3-10-3 How to call user-defined functions

To call a user-defined function, the user should declare the type of the function (i.e., prototype declaration) before all blocks of the program (i.e., initialization block, configuration block, event block, subroutine block and function block). The following format is used to declare a function.
declare function name [type declaration character] (argument 1, argument 2, ...)
The type of the function shown in 3-10-1 "Definition of user-defined functions" is declared as shown below:

```
declare my_div% (a%, b%)
```

Functions to be actually referenced are selected in the order of the library functions, global functions, and local functions. If there are several types of functions having the same function name, these functions are referenced in the order shown above. By writing a LOCAL CHECK statement at the beginning of the program (before function declaration), it is possible to give an error indicating that function names are duplicate when compiling the program. For details of using the LOCAL CHECK statement, see Chapter 4, "Instruction Reference".

3-10-4 Variable declaration in user-defined functions and referencing external variables

It is possible to use auto variables in function blocks by declaring them. It is impossible to declare other types of variables.
Global variables and local variables contained in operation programs can be referenced, provided they can be referenced in the programs. In other words, it is possible to reference global variables, static variables and backup variables if they are declared in the programs. It is also possible to reference local variables which are declared or not declared in programs.
No library functions can be referenced, except auto variables declared in programs.

3-11 Program Operation

Operation of an OIP program is started when a message is issued to the part or screen written in the program. GCSGP3 provides the following types of messages:

- Part and screen messages
  - Part and screen programs can execute the SEND instruction to issue messages to a part or screen.

- Switch messages
  - A message is issued when the switch primitive placed on a part is set to ON or OFF.
  - A message is also issued by touching the switch primitive.

- Internal timer messages
  - A message is issued when the specified time has elapsed.
  - The internal timer in the program must be operated to receive messages from the timer. (See "OPENTIM.")

- Alarm messages
  - A message is issued when the specified time is reached.
  - For how to operate alarms, see "SETALARM Command."

- PIO messages
  - A message is issued when the parallel input status changes.
  - To receive messages from the parallel input, which PIO bit is to be used must be declared in the program in advance. (See "OPENPARALLEL.")

- Non-procedual communication messages
  - A non-procedual communication message is issued when non-procedual communication data reception is completed.

- Sampling messages
  - A sampling message is issued when the primitive that is performing sampling reads data.

- PLC messages
  - PLC device values are transmitted as a message. A PLC message is transmitted when the device contents change during communication between the OIP and PLC.
  - If the values of several PLC devices change, the changes are detected after the OIP communicates with the PLC. Therefore, messages may not been issued in the order of the changes in the device values.
  - To receive messages from the PLC, what PLC device is to be used must be declared in the program in advance. (See "CYCLIC command.")

- Bar code/ten-key pad messages
  - A message is issued when a bar code reader or ten-key pad starts communication with a part or screen. The contents of a message are the data itself transmitted from the bar code reader or ten-key pad.
  - The program must be coded in advance so that messages can be received from the bar code reader and ten-key pad. See "OPENCOM."

- Host messages
  - A message is issued when the host computer starts communication with a part or screen. The contents of a message are the data itself transmitted from the host computer.

- The program must be coded in advance so that messages can be received from the host computer. See “OPENCOM.”

Messages are processed in the order they are issued (execution of the program that received messages).

Messages can also be issued to the undisplayed screen (rear screen). The operation program that received messages on the rear screen also operates.

3-12 Message Format

A message is a trigger for operating an OIP program. Each message consists of an issuer, an issuer ID, and issued data. By the way, each message can have one or more data.
Three types are as shown below:

1	Value indicating the type of the message issuer	(integer type)
2	Value indicating the ID of the message issuer	(ID type)
3	Data itself	(type of data to be issued)

Use the INPUT instruction to read messages into a program. Suppose, for example, that numeric data 10 was transmitted from the program whose screen name is SCREEN and whose part name is PART. In this case, the INPUT statement that reads messages is written as follows:

```
INPUT TYPE% , ID@ , DATA%
```

`TYPE%:` Value 2 indicating that messages were transmitted from the part is set in TYPE%.
`ID@:` GAME.BUHIN. indicating the ID of the transmitted part is set in ID@.
`DATA%:` Data itself. 10 in this case.

The message format is as follows:

- **Screens**
  Type of the message issuer: 1
  ID of the message issuer: Screen name
  Data: Data written in the PRINT statement

- **Parts**
  Type of the message issuer: 2
  ID of the message issuer: Part name
  Data: Data written in the PRINT statement

- **Switches**
  Type of the message issuer: 3
  ID of the message issuer: Switch name
  Data (single switch): 1 (when ON), 0 (when OFF)
  Data (multi-switches): Switch number 1 (when ON), 0 (when OFF)
  Data (selector switch): Switch number
  The switch number of a selector switch indicates the number of an activated switch when the number is 1 or more. If it is 0, it indicates that all switches are deactivated.

- **Timers**
  Type of the message issuer: 4
  ID of the message issuer: ID of the timer opened by OPENTIM
  Data: 1 (fixed)

- **Alarms**
  Type of the message issuer: 5
  ID of the message issuer: ID of the timer opened by SETALARM
  Data: 1 (fixed)

- PIO

Type of the message issuer: 6
ID of the message issuer: ID representing the parallel port
Data: First: Bit number matching the condition set by OPENPARALLEL.
Second: Bit status (1: ON, 0: OFF)
Third: PIO channel number (0 to 3)

- Non-procedual communication

Type of the message issuer: 7
ID of the message issuer: –
Data: First: Port number
Second: Status
Third: Number of received bytes

- Sampling

Type of the message issuer: 9
ID of the message issuer: ID of the primitive that is performing sampling
Data: Sampled value

- PLC and memory link

Type of the message issuer: 16
ID of the message issuer: Device name or memory table name
Data: Device value or memory table value

- Bar codes

Type of the message issuer: 18
ID of the message issuer: Logical name “BCR”
Data: Character string read from bar code reader

- Ten-key pad

Type of the message issuer: 20
ID of the message issuer: Logical name “TKY”
Data: Characters read from the ten-key pad

- Host computer (command communication)

Type of the message issuer: 22
ID of the message issuer: Logical name “HST”
Data: Data transmitted from the host computer

Use the INPUT instruction to read messages into a program. Suppose, for example, that numeric data 10 was transmitted from the program whose screen name is SCREEN and whose part name is PART. In this case, the INPUT statement that reads messages is written as follows:

```
INPUT TYPE% , ID@ , DATA%
```

TYPE%: Value 2 indicating that messages were transmitted from the part is set in TYPE%.
ID@: GAME.BUHIN. indicating the ID of the transmitted part is set in ID@.
DATA%: Data itself. 10 in this case.

3-13 Program Blocks

An OIP K-Basic program consists of THE blocks: INITIALIZATION (INIT to END INIT), configuration (CONF to END CONF), event (EVNT to END EVNT), subroutine (label name: - RETURN), AND FUNCTION (FUNCTION to END FUNCTION).
This section describes the initialization block, configuration block and event block. For details of the subroutine block, see 3-9 "Subroutines" above. For details of the function block, see 3-10, "User-defined functions" above.
The following shows an example of a program using these blocks:

```
declare func%(a%, b%)                 'Function-type declaration
init                                  'Initialization block
  static var1% = 10
  global var2% = 20
end init
conf                                  'Configuration block
  var2% = 30
end conf
evnt                                  'Event block
  input type% , id@ , data%
  if type% = 3 then
    var1% = func%(data, var2%)
    ...............
    ...............
  endif
end evnt
SUB1:                                 'Subroution block
   ....
   RETURN
function func%(a%, b%)                'Function block
...............
...............
end function
```

- Initialization block (INIT ˜ END INIT)
  - An initialization block written in a screen or part program is executed only once when the configuration block or event block of that program is executed for the first time.
    An initialization block is used to declare or initialize variables needed in a configuration block or event block.

- Configuration block (CONF ˜ END CONF)
  - The configuration block where screens and parts are written is executed only once when a screen is displayed. This block is not executed while a screen is being displayed. It is executed only once again when another screen is redisplayed.
  - The configuration block for global screens and parts is executed only once when the system is started.
  - The configuration block is used to write processing such as initialization.
  - Only the closed part's configuration block is not executed even if a screen is displayed; it is executed when a part is opened. (See “OPEN Instruction.”)

- Event block (EVNT END ˜ EVNT)
  - The event block is a program block that starts its operation when a message is received. The contents to be executed when a switch is pressed are written in this block.
  - The event block cannot be written in the global screen program.

Note: A configuration block is not executed if a message is sent to a screen not displayed and an event block is executed (by the timer or a host command). Thus, initialization written in the configuration block is not executed. Write necessary initialization in an initialization block.

3-14 Devices and Communication

To reference and modify PLC devices, device names are written in K-Basic as follows: A station number and a device name are delimited by "˜".

VAR%=00˜D100: The contents of the device whose device name is D100 and whose station number is 00 are read.
00˜D200=40: 40 is written into the device whose device name is D200 and whose station number is 00.

Communication is used to read and write the contents of a device. Screen Creator 5 provides the following two communication methods:

- Cyclic communication
  - The OIP always communicates with the PLC to read the contents of the device to be used. A message is issued when the contents of the device to be used are modified.
  - Cyclic communication can be performed even if a K-Basic program is not executed.
  - Cyclic communication is enabled by declaring CYCLIC.
  - Cyclic write is inapplicable.

- Event communication
  - Event communication is performed when the contents of a device are read or modified.
  - Event communication is executed by a K-BASIC program.
  - Event communication can also be used to write data to a device.

In the OIP, a global screen and a local screen are displayed, overlapping each other. In this case, communication between the global and local screens is performed as follows:

- Global screen communication
  - Cyclic communication in a global screen is always executed irrespective of the local screen to be used.

- Local screen communication
  - Only the cycle communication declared in the current screen can be used.
  - Event communication is performed when the contents of a device are read or written during execution of the program being displayed on the current screen.
  - If a program of a screen not displayed currently is activated and device reading or writing is executed, data may be read or written from/into a device not specified in the program. To avoid such a trouble, write a program so that device reading or writing will never be executed in a program of a screen not displayed. For example, messages are sent to programs of non- displayed programs in timer, alarm or graph sampling. Thus, device reading or writing should be prevented in programs containing event blocks which process these messages. If device reading or writing is necessary for message processing, execute it in a global screen program.

3-15 Memory Tables

A memory table is used for communication between the host computer and memory link. This table is of word type (2 bytes). There are 2048 configuration elements (address 0 to address 2047).

The following explain how to access the memory table in K-Basic.

3-15-1 Describing memory table

00˜MTBL(0):	Memory table of 0th element
00˜MTBL(2047):	Memory table of 2047th element
00˜MTBL(NO%):	Memory table of element indicated by NO%

3-15-2 Reading and writing One element

- ABC=00˜MTBL (100)
  The contents of the 100th memory table are read into variable ABC.

- 00˜MTBL (200) = 23
  Data 23 is written to the 200th memory table.

- 00˜MTBL (ABC) = XYZ
  The contents of variable XYZ are written to the memory table indicated by variable ABC.

3-15-3 Reading and writing two or more elements

- BREAD 00˜MTBL (100), 20, ABCD (XY)

- BREAD 00˜MTBL (START), NUMS, ABCD (XY)
  In the first example, 20 configuration elements are read into the XY location of array variable ABCD, starting at address 100 of the memory table. In the second example, NUMS configuration elements are read into the XY location of array variable ABCD, starting at the address indicated by START of the memory table.

- BWRITE 00˜MTBL (100), 20, ABCD (XY)

- BWRITE 00˜MTBL (START), NUMS, ABCD (XY)
  In the first example, 20 data is written from the XY location of array variable ABCD to the memory table beginning with address 100.
  In the second example, NUMS data is written from the XY location of array variable ABCD to the memory table beginning with the address indicated by START.

3-16 File Systems

This section describes the features of the file systems and the commands for accessing the file systems.
In the OIP, the backup memory and external memory cards can be used as MS-DOS-compatible file systems. These are called "MSDOS file systems".

Specify a drive name.
Drive name Description
Drive A: A part of the backup memory is used as the MS-DOS file system.
Drive E: Memory card drive. Use a serially connected memory card.

In addition, "memory files" are available. In memory files, memory images are read and written from/into the system memory. To access a memory file, use the file name "MEMORY".

File systems or memory files created in the backup memory are also called RAM files. Only OIP units with built-in backup memory can use RAM files. The backup memory stores data in it even when the OIP is turned off. A model with no backup memory cannot use file systems or memory files in the backup memory.

Models	Backup memory sizes	RAM files
KDP5648CA	63KB	Available.
KDP5640EHA	63KB	Available.
KDP5320CA	None	Not available.
KDP5320LA	None	Not available.

None: Not available.

3-16-1 Precautions for file systems

- Memory
  Memory files are managed not in the form of file systems. Since the same system memory is used, it is impossible to use the drive A and MEMORY simultaneously.

- Precautions for using backup memory for RAM files
  To use the backup memory for RAM files (i.e., files in drive A or MEMORY files), it is necessary to specify the capacity to be assigned to the RAM files on the system mode screen of the OIP. Use "RAM File Setup" of "System Setup" on the system screen.
  A model with backup memory uses the backup memory for backup variables and RAM files. Therefore, the sum of the memory size used for backup variables and the memory size used for RAM files must be less than the total size of the built-in backup memory.
- Making backup
  Data in drive A and memory file is backed up and stored even after the power is turned off. However, the backup data is cleared to zero if the memory size is changed on the system mode screen.
- Formatting files
  Before using a file system, it is necessary to format the file. Use the K-Basic "FORMAT" command to format a file.
- Formatting memory card drive
  The OIP's memory card drive creates files in the MS-DOScompatible format, and data in the memory card can be read and written by the MS-DOS system running on a personal computer, etc. However, make a directory so that the sum of a file path name and a file name does not exceed 128 characters.

The OIP's memory card drive does not support long file names, which are supported by Windows 95, etc. Be careful not to give long names to files which are to be used on Windows 95, etc.

3-16-2 Specifying a file

The character A or E followed by a colon, : , indicates a drive.
Example: A:, E:

To show a directory, type ¥ or / as shown below.
Example: A:¥ABC, A:/ABC/DEF

Each file name consists of a file name (in eight characters) and an extension (in three characters). ASCII codes and Kanji codes can be used.
Example: ABCDE.DOC

3-17 Notes

Note the following points when writing K-Basic.

- Color and tiling numbers
  In K-Basic, numeric values (0 to 15) are used to change the display colors and tile figures of graphs and displays. These numbers are assigned like 0, 1, 2, starting at the left of the pallet color displayed by the tool and tile figures.

- Note 1 on screen transition
  When one OIP screen is switched to another, the momentary switch is forcibly turned OFF if it is ON. This is done irrespective of the mode (Input Enabled, Input Disabled, or Half Tone) of the switch. When the OFF message is issued, the BASIC program is also activated.

- Note 2 on screen transition
  When the screen for cyclic communication is displayed, messages are issued from all the devices that are performing cyclic communication.

- If a message is issued to a part of the undisplayed screen, the program is executed in background. If an attempt is made to execute an unexecutable instruction in background, however, an error occurs.

- If an infinite loop is created in a program, switching and communication cannot be performed.

- Parts on which switches are installed can be moved only in grid units.

CHAPTER 4

INSTRUCTION REFERENCE

4-1 Instruction Reference

4-2 Indexes by Functions

Control structure

Variable declaration

Messages

Arithmetic operation

Character string manipulation

Type conversion

Screen/part control

Switch control

Numeric displays

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Hardcopy

Drawing

Back light control

Buzzer control

Time/date

File control

System control

Function control

Compiler control

ABS

Function

■ Function

The ABS function calculates an absolute value.

■ Format

ABS (numerical-expression)

■ Example of Use

AA = ABS (-50)
AA = ABS (Var)

■ Description

The ABS function calculates the absolute value of the numerical expression (numeric constant, integer-type variable, or floating-point-type variable) enclosed in parentheses.

■ Related Item

None

■ Example of Program

```
evnt
  input type% , id@ , data%
  if data% < 0 then data% = abs(data%)
  numdsp ..num000 , data%
end evnt
```

ADDCYC

Statement

■ Function

The ADDCYC statement enables even BASIC of a part to read the device declared in control-name.

■ Format

ADDCYC control-name

■ Example of Use

ADDCYC ..NUM000

■ Description

- When a control in a part is used to validate an operation parameter, the ADDCYC statement enables even a part program to cyclically communicate with the PLC device/memory table set in the part operation parameter specification.
- The number of devices must match that of devices to be used by the control. (The devices placed in consecutive stages are used only the number of elements.)
- control-name must be the primitive in the local part.
- If the specified control is not using the PLC device/memory table, an error occurs.
- When the control is specified in a numeric display in a doubleword, the ADDCYC statement also reads it in a doubleword.

■ Related Item

CYCLIC, CYCLIC2, ADDCYCID

■ Example of Program

```
conf
   ADDCYC ..NUM000                      ' Uses 2X2 as a consecutive-stage display.
end conf
evnt
   input type% , id@ , data%            ' Displays data on the corresponding display.
   id1@ = addcycid ( ..NUM000)          ' Indicates the ID of the device being used.
   i% = getoffset (id1@, id@)+1         ' Indicates the device to be used relative to the first
device.
   id1@ = getid(..NUM000, i%)           ' Obtains the ID of the corresponding display.
   numdsp id1@, data%                   ' Displays the ID on the display.
end evnt
```

ADDCYC2

Statement

■ Function

The ADDCYC2 statement enables even BASIC of a part to read the device declared in primitive-name.

■ Format

ADDCYC2 primitive-name

■ Example of Use

ADDCYC2 ..NUM000

■ Description

- The ADDCYC2 statement is almost equivalent to the ADDCYC statement.
- The only difference between these two statements is that the PLC device declared in the ADDCYC2 statement can communicate to obtain data even if the screen showing the declared part is not being displayed (when another screen is being displayed). Usually, the declared PLC device communicates to obtain data only when the screen showing the declared part is being displayed.

■ Related Item

ADDCYC, ADDCYCID

■ Example of Program

```
conf
   ADDCYC2 ..NUM000                  ’ Uses 2X2 as a consecutive-stage display.
end conf
evnt
   input type% , id@ , data%         ’ Displays data on the corresponding display.
   id1@ = addcycid ( ..NUM000)       ’ Indicates the ID of the device being used.
   i% = getoffset (id1@, id@)+1      ’ Indicates the device to be used relative to the first
device.
   id1@ = getid(..NUM000, i%)        ’ Obtains the ID of the corresponding display.
   numdsp id1@, data%                ’ Displays the ID on the display.
end evnt
```

ADDCYCID

Function

■ Function

The ADDCYCID function obtains the ID of the device that was declared in control-name and enabled to be read by even part programs.

■ Format

ADDCYCID (control-name)

■ Example of Use

ID@ = ADDCYCID (..NUM000)

■ Description

- The ADDCYCID function obtains the ID of the device being used by the control enabled to be read by even part programs and returns the ID type. To enable this operation, however, the operation parameters of the control in the part must be set to "effective" and the PLC device must be set in the associated operation parameter in advance.
- control-name must be the primitive in the local part.
- If the specified primitive is not using the PLC device/memory table, an error occurs.

■ Related Item

ADDCYC, ADDCYC2

■ Example of Program

```
conf
   addcyc ..NUM000                     ' Uses 2X2 as a consecutive-stage display.
end conf
evnt
   input type% , id@ , data%           ' Displays data on the corresponding display.
   id1@ = ADDCYCID ( ..NUM000)         ' Indicates the ID of the device being used.
   i% = getoffset (id1@, id@)+1        ' Indicates the device to be used relative to the first
device.
   id1@ = getid(..NUM000, i%)          ' Obtains the ID of the corresponding display.
   numdsp id1@, data%                  ' Displays the ID on the display.
end evnt
```

ASC

Function

■ **Function**

The ASC function specifies the first 1-byte character code of a character string.

■ **Format**

ASC (character-string)

■ **Example of Use**

AA = ASC (“AABCD”)
AA = ASC (MOJI$)

■ **Description**

- The ASC function specifies the first character code of the character expression (character string constant or variable) enclosed in parentheses with a decimal number.
- The ASC function specifies only the initial 1-byte code of a character expression which begins with a Kanji character.

■ **Related Item**

CHR$

■ **Example of Program**

```
evnt
   input type, id@, data$
   num = ASC (data$)
   numdsp ..NUM000, num
end evnt
```

ATN

Function

■ **Function**

The ATN function calculates the inverse tangent for the numerical expression.

■ **Format**

ATN (numerical-expression)

■ **Example of Use**

ANGLE = ATN (X/Y)

■ **Description**

The ATN function calculates the inverse tangent value for the numerical expression. The result must be a value from -π/2 to π/2. The unit is radian.

■ **Related Item**

TAN

■ **Example of Program**

```
evnt
   ..........
   pi = 3.141592
   angle% = atn( pi/4)
   numdsp ..num000 , angle%
end evnt
```

AUTO

Statement

■ Function

The AUTO statement declares an auto variable.

■ Format

AUTO variable name [, variable name ...]

■ Example of Use

AUTO VAR, XYZ(2,3), MOJI$ * 20

■ Description

- The AUTO statement declares that the variable is an auto variable. An auto variable can be declared and referenced in a function only.
- The value of an auto variable stays valid only while the function of that variable is called and executed.
- The value of an auto variable is initialized when the function is called and execution starts.
- A variable name can be specified in a normal variable, arrangement variable or character string variable.
- DIM declaration or STRING declaration is not needed to declare an arrangement variable or character variable.
- The auto variable type is one of the new features of Screen Creator 5.

■ Related Item

■ Example of Program

```
function userfunc%(a%, b%)
  AUTO c%
  c% = a% + b%
  userfunc% = c% / 2
end function
```

BACKUP

Statement

■ Function

The BACKUP statement declares a backup variable.

■ Format

BACKUP variable-name [,variable-name ...]

■ Example of Use

BACKUP VAR, XYZ(2,3), MOJI$*20

■ Description

- The BACKUP statement declares a backup variable. Besides the characteristics of a global variable, a backup variable has a function to retain its value even if the power supply is turned off.
- A normal variable, an array variable, or a character string variable can be specified in variable-name.
- In order to declare arrays and character string type, no DIM and STRING declarations are required.

■ Related Item

AUTO, DIM, GLOBAL, LOCAL, STATIC, STRING

■ Example of Program

```
conf
   BACKUP a , x(2,3) , moji$ * 40
   ......
end conf
```

BARCOLOR

Statement

■ Function

The BARCOLOR statement changes the bar color and figure of the bar graph display.

■ Format

BARCOLOR display-name, bar-number, tile-1, display-color-1, background-color-1, tile-2, display-color-2, background-color-2

■ Example of Use

BARCOLOR ..BAR000, 2, 3, 1, 4, 5, 2, 1

■ Description

- The BARCOLOR statement changes the bar tiles and colors of the bar graph display and the background tiles and colors of the entire display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the name of a bar graph or the ID-type variable indicating the graph.
- The value indicating the bar number in the bar graph to be changed is set in bar-number. The bar number can be specified with a constant or variable. The bar number starts at 1.
- tile-1 indicates the tiling figure of the bar. Specify this tiling figure with a numeric value from 0 to 15.
- display-color-1 is a numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color-1 is a numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.
- tile-2 indicates the background tiling figure of the bar graph. Specify this tiling figure with a numeric value from 0 to 15.
- display-color-2 is a numeric value indicating the color number of the tile display section of the background. Specify this color number with a numeric value from 0 to 15.
- background-color-2 is a numeric value indicating the color number of the tile background section of the background. Specify this color number with a numeric value from 0 to 15.

■ Related Item

BARDSP, BARSHIFT

■ Example of Program

```
conf
  static name@
  name@ = ..BAR000
end conf
evnt
  input type%, id@, data%
  if type% = 3 then
    barcolor name@, 2, 2, 3, 1, 4, 5, 2
  end if
end evnt
```

BARDSP

Statement

■ Function

The BARDSP statement displays data in the bar graph display.

■ Format

BARDSP control-name, bar-number, display-value

■ Example of Use

BARDSP ..BAR000, 1, 30

■ Description

- The BARDSP statement displays bar data in the bar graph display.
- control-name is the name of a bar graph or the ID-type variable indicating the graph.
- The value indicating the bar number in the bar graph to be displayed is set in bar-number. The bar number starts at 1.
- display-value is the numeric data indicating the size of the bar graph.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

BARCOLOR, BARSHIFT

■ Example of Program

```
conf
   static name@
   name@ = ..BAR000
end conf
evnt
   input type%, id@, data%
   bardsp name@, 2, data%
end evnt
```

BARSET

Statement

■ **Function**

The BARSET statement sets data in the bar graph display.

■ **Format**

BARSET, control-name, bar-number, display-data

■ **Example of Use**

BARSET .BUHIN.GRAPH, 2, 30.0

■ **Description**

- The BARSET statement sets the data to be displayed in the bar graph display. The speed of executing the PRDSP (display) statement after setting data in each bar is faster than that of modifying all bar values after executing the BARDSP statement.
- control-name is the name of the bar graph display name or the ID-type variable indicating the bar graph display.
- bar-number indicates which bar data is to be modified when two or more bars are displayed in one bar graph display. The bar number is integer value data starting at 1.
- display-data is the numeric data indicating the size of the bar graph.

■ **Related Item**

BARDSP, PRDSP

■ **Example of Program**

```
evnt
   BARSET  .buhin.gpaph , 3 , 20.1
   var@ = .buhin.graph
   no = 4
   value = 23
   barset  var@ , no , value
   prdsp var@
end evnt
```

BARSHIFT

Function

■ **Function**

The BARSHIFT function shifts bar graph data left or right and displays it.

■ **Format**

DATA% = BARSHIFT (control-name, shift-direction, display-data)

■ **Example of Use**

DATA% = BARSHIFT (..BAR000, 1, 30)

■ **Description**

- When two or more bars are being displayed in one bar graph display, the BARSHIFT statement shifts the bars constituting the graph left or right by one bar and displays the bars.
- When the BARSHIFT function is executed, the values of the bars purged from the graph are returned as a result of the shifting.
- The variable indicating the graph name or ID is set in control-name.
- When shift-direction is 1, bar graph data is shifted left and above. When shift-direction is -1, bar graph data is shifted right and below.
- display-data indicates the data to be displayed in the vacant area produced as a result of the shifting.

■ **Related Item**

BARDSP, BARCOLOR

■ **Example of Program**

```
evnt
   input type%, id@, data%
   if data% > 0 then
      abc% = barshift ( ..BAR000, 1, 0)
   else
      abc% = barshift ( ..BAR000, -1, 100)
   endif
end evnt
```

BCD2BIN

Function

- **Function** The BCD2BIN function converts BCD data to binary data.
- **Format** BCD2BIN (numerical-expression)
- **Example of Use** BINDATA% = BCD2BIN (BCDDATA%)
- **Description** The BCD2BIN function converts the entered BCD data to binary data.
- **Related Item** BIN2BCD

■ Example of Program

```
conf
   cyclic 00~D10
end conf
evnt
   input type%, id@, data%
   if type% = 16 then
      data% = BCD2BIN(data%)
      numdsp ..NUM000, data%
   endif
end evnt
```

BEEP

Statement

■ **Function**

The BEEP statement performs buzzer ON/OFF control.

■ **Format**

BEEP command-value

■ **Example of Use**

BEEP 1

■ **Description**

- The BEEP statement is a command that sounds and stops the buzzer.
- When command-value is 1, the buzzer sounds; when 0, the buzzer stops.
- The SETBEEP statement can be used to set the buzzer ON/OFF time.

■ **Related Item**

SETBEEP

■ **Example of Program**

```
conf
  SETBEEP 50,20,3
end conf
evnt
  input type%, id@, data%
  if id@ = ..SWT000 then
    BEEP 1
  else
    BEEP 0
  endif
end evnt
```

BIN2BCD

Function

■ **Function**

The BIN2BCD function converts binary data to BCD data.

■ **Format**

BIN2BCD (numerical-expression)

■ **Example of Use**

BCDDATA% = BIN2BCD (BINDATA%)

■ **Description**

- The BIN2BCD function converts binary data to BCD data.
- If the binary data to converted to BCD data is greater than 99999999, it is fixed at 99999999.

■ **Related Item**

BCD2BIN

■ **Example of Program**

```
evnt
   input type%, id@, data%
   data% = BIN2BCD ( data% )
   00~D10 = data%
end evnt
```

BITSET

Statement

■ Function

The BITSET statement sets the specified bit of a variable to ON or OFF.

■ Format

BITSET variable-name, set-position, ON/OFF-value

■ Example of Use

BITSET VARIABLE%, 10, 1

■ Description

- The BITSET statement sets the specified bit of the specified variable to 0 or 1.
- variable-name specifies the name of the variable where the specified bit is set to 0 or 1; it must be an integer- or floating-point-type variable.
- set-position specifies where in the variable the specified bit is to be set with a value from 0 to 31; it must be a variable or constant.
- When 1 is set in the variable, ON/OFF-value also specifies 1. When 0 is set, ON/OFF-value also specifies 0. It must be a variable or constant.

■ Related Item

BITTEST

■ Example of Program

```
conf
end conf
evnt
   input type% , id@ , data%
   numdsp ..NUM000 , data%
   if bittest ( data% , 31 ) = 1 then
      bitset data% , 31 , 0
   else
      bitset data% , 31 , 1
   endif
   numdsp ..NUM000 , data%
end evnt
```

BITTEST

Function

■ Function The BITTEST function tests the specified bit of a variable.

■ Format BITTEST (variable-name, test-position)

■ Example of Use ONOFF% = BITTEST (VARIABLE%, 10)

■ Description

- The BITTEST function tests whether the value of the specified bit in the specified variable is 1 or 0. When the value of the specified bit is 1 as a result of the test, the function returns 1. When the value is 0, the function returns 0.
- variable-name specifies the name of the variable where the value of the specified bit is to be tested; it must be an integer- or floating-point-type variable.
- test-position specifies where in the variable the specified bit is to be tested with a value from 0 to 31; it must be a variable or constant.

■ Related Item BITSET

■ Example of Program

```
conf
end conf
evnt
   input type% , id@ , data%
   if bittest ( data% , 0 ) = 1 then
      strdsp ..STR000 , ‘‘bit is ON’’
   else
      strdsp ..STR000 , ‘‘bit is OFF’’
   endif
end evnt
```

BLCTL

Statement

■ **Function**

The BLCTL statement performs back light ON/OFF control.

■ **Format**

BLCTL status

■ **Example of Use**

BLCTL 1

■ **Description**

- The BLCTL statement performs back light ON/OFF control.
- status indicates whether to turn on or off the back light with the following numeric values:
  - 0: The back light is turned off.
  - 1: The back light is turned on.

■ **Related Item**

BLSTAT

■ **Example of Program**

```
evnt
   ret =blstat()
   if ret = 0 then BLCTL 1
end evnt
```

BLSTAT

Function

- **Function** The BLSTAT function reads the back light status.
- **Format** BLSTAT ()
- **Example of Use**
- **Description** The BLSTAT function reads the current back light status (ON/OFF). The return values of this function are as follows:
  0: The back light is off.
  1: The back light is on.
- **Related Item** BLCTL
- **Example of Program**

```
conf
   ret = BLSTAT()
   if ret = 0 then blctl 1
end conf
```

BLTCOLOR

Statement

■ Function

The BLTCOLOR statement changes the tile and color of a belt graph display.

■ Format

BLTCOLOR control-name, zone-position, tile, display-color, background-color

■ Example of Use

BLTCOLOR ..BLT000, 2, 1, 2, 3

■ Description

- The BLTCOLOR statement changes the tile and color of the specified zone of a belt graph display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the bar graph name or the ID-type variable indicating the bar graph.
- The value indicating the zone number to be changed is set in zone-position. The zone position can be specified with a constant or variable. The zone position starts at 1.
- tile indicates the tiling figure of the zone. Specify this tiling figure with a numeric value from 0 to 15.
- display-color is a numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is a numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

BLTDSP

■ Example of Program

```
evnt
   input type%, id@, zone%, tile%
   BLTCOLOR ..BLT000, zone%, tile%, -1, -1
end evnt
```

BLTDSP

Statement

■ Function

The BLTDSP statement displays data on a belt graph display.

■ Format

BLTDSP control-name, zone-number, display-value

■ Example of Use

BLTDSP ..BLT000, 1, 30

■ Description

- The BLTDSP statement displays data in the specified zone of a belt graph display.
- control-name is the name of the graph or the ID-type variable.
- The value indicating the zone number in the 100 percent bar chart to be displayed is set in zone-position. The zone position can be specified with a constant or variable. The zone position starts at 1.
- display-value is the numeric data indicating the size of the data to be displayed in the 100 percent bar chart.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

BLTCOLOR

■ Example of Program

```
conf
   static name@
   name@ = ..BLT000
end conf
evnt
   input type%, id@, zone%, data%
   BLTDSP ..BLT000, zone%, data%
end evnt
```

BLTSET

Statement

■ Function

The BLTSET statement sets data in a belt graph display.

■ Format

BLTSET control-name, zone-number, display-data

■ Example of Use

BLTSET .BUHIN.GRAPH, 2, 30.0

■ Description

- The BLESET statement sets the data to be displayed in the 100 percent bar chart display. The speed of executing the PRDSP (display) statement after setting data in each zone is faster than that of modifying all zone values after executing the BLTDSP statement.
- control-name is the name of the belt graph display or the ID-type variable.
- zone-number indicates which zone data is to be modified. The zone number is integer value data starting at 1.
- display-data is the numeric data indicating the size of each zone in the 100 percent bar chart.

■ Related Item

BLTDSP, PRDSP

■ Example of Program

```
evnt
  BLTSET  .buhin.gpaph , 3 , 20.1
  var@ = .buhin.graph
  no = 4
  value = 23
  BLTSET  var@ , no , value
  prdsp var@
end evnt
```

BREAD

Function

■ Function

The BREAD function reads the contents of the specified device or memory table in blocks.

■ Format

BREAD device-name, data-read-count, array-variable-to-which-read-data-is-written
BREAD memory-table-name, data-read-count, array-variable-to-which-read-data-is-written

■ Example of use

BREAD 00˜D0001, 10, VARI(2)
BREAD 00˜MTBL(5), NUMS, VARI(X)

■ Description

- The BREAD function reads the contents of the specified device or memory table in blocks.
- This function collectively reads data from the specified device by the specified data read count.
- device-name indicates the name of the device to be read (device name indicating the read start address).
- data-read-count specifies the number of data to be continuously read from the specified device.
- The data read from the specified device is set in array-variable-to-which-read-data-is-written. This variable must be a one-dimensional array-type variable. The data read from the specified device is continuously written, starting from the location specified by this variable.
- When the array variable is smaller than the data read count, the data that cannot be written to the array is discarded.
- The number of data that can be read depends on the type of PLC. (Refer to "Serial Communication Manual.")
- For memory link, a variable can be used as a table number.

■ Related Item

BWRITE

■ Example of Program

```
conf
   cyclic 00˜M01
   static PARAM%(10)
end conf

evnt
   input type%, id@, data%
   if id@ = 00˜M01 and data% = 1 then
      BREAD 00˜D10, 5, PAARAM%(3)
   endif
end evnt
```

BWRITE

Function

■ Function

The BWRITE function writes data to the specified device or memory table in blocks.

■ Format

BWRITE device-name, data-write-count, write-data-variable
BWRITE memory-table-name, data-write-count, write-data-variable

■ Example of use

BWRITE 00˜D0001, 10, VAR%(1)
BWRITE 00˜MTBL(20), NUM, VAA(1)

■ Description

- The BWRITE function writes data to the specified device or memory table in blocks.
- This function collectively write data to the specified device by the specified data write count.
- device-name indicates the name of the device to be written (device name indicating the write start address).
- data-write-count specifies the number of data to be continuously written to the specified device.
- write-data-variable is the variable containing the value to be written to the specified device. This variable must be a one-dimensional array-type variable. Data is continuously written to the specified device, starting from the location specified by this variable.
- When the array variable is smaller than the data write count, 0 is written to the remaining area. When the array variable is greater than the data write count, the larger part is ignored.
- The number of data that can be written depends on the type of PLC. (Refer to "Serial Communication Manual.")
- For memory link, a variable can be used as a table number.

■ Related Item

BREAD

■ Example of Program

```
conf
   cyclic 00˜M01
   static PARAM%(10)
end conf

evnt
   input type%, id@, data%
   if id@ = 00˜M01 and data% = 1 then
      BWRITE 00˜D10, 5, PAARAM%(3)
   endif
end evnt
```

CHDIR

Statement

■ Function

The CHDIR statement changes a directory and/or a drive.

■ Format

CHDIR directory-name

■ Example of Use

CHDIR “C:TEST”

■ Description

- The CHDIR statement is an instruction that changes the current directory and a drive.
- Specify the directory to be changed with a character string constant or variable.
- directory-name can be specified, starting from a drive name.

■ Related Item

MKDIR, RMDIR

■ Example of Program

```
conf
end conf
evnt
   ......
   CHDIR ``C:''          ' Changes the drive.
   CHDIR ``TEST''        ' Changes the directory.
   CHDIR ``E:ABC''       ' Changes both the drive and directory.
   ......
end evnt
```

CHKTIM

Function

■ **Function**

The CHKTIM function checks the status of the specified timer.

■ **Format**

RET = CHKTIM (timer-number)

■ **Example of Use**

RET = CHKTIM (14)

■ **Description**

- The CHKTIM function checks whether the specified timer is being used (opened).
- timer-number indicates the number of the timer to be checked; it must be an integer-type value from 0 to 15.
- As a result of executing this function, any of the following values is returned:
  - 0: The timer is not being used.
  - 1: The timer is being used by the local program.
  - 2: The timer is being used by a remote program.

■ **Related Item**

CLOSETIM, STARTTIM, STOPTIM, CONTTIM, SETTIM, READTIM, OPENTIM, OPENTIM2

■ **Example of Program**

```
evnt
   for i = 0 to 15
      ret = CHKTIM (i)
      if ret = 0 then i = 15
   next
end evnt
```

CHR$

Function

■ **Function**

The CHR$ function assigns the character corresponding to the specified numeric value (character code).

■ **Format**

CHR$ (character-code)

■ **Example of Use**

MOJI$ = CHR$(&H30)

■ **Description**

- The CHR$ function assigns the character (1-byte character) corresponding to the character specified by character-code.
- character-code must be an integer from 1 to 255.
- As a result of executing this function, the character corresponding to character-code is returned.

■ **Related Item**

ASC

■ **Example of Program**

```
evnt
   input type%, id@ data%
   moji$ = CHR$(data%)
   strdsp ..STR000, moji$
end evnt
```

CINT

Function

■ Function

The CINT function rounds off a real number and converts it to an integer.

■ Format

CINT (numerical-expression)

■ Example of Use

A% = CINT (FLOAT)

■ Description

- The CINT function rounds off the value indicated by numerical-expression and converts it to an integer.
- The conversion result range becomes the integer range.

■ Related Item

INT

■ Example of Program

```
evnt
   input type%, id@, data
   intvar% = CINT ( data )
   numdsp ..NUM000, intvar%
end evnt
```

CIRCOLOR

Statement

■ Function

The CIRCOLOR statement changes the tile and colors of the pie chart display.

■ Format

CIRCOLOR control-name, zone-position, tile, display-color, background-color

■ Example of Use

CIRCOLOR ..CIR000, 2, 1, 2, 3

■ Description

- The CIRCOLOR statement changes the tile and colors of the the pie chart display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the pie chart name or the ID-type variable indicating the pie chart.
- The value indicating the number of the zone in the pie chart to be changed is set in zone-position. The zone position starts at 1.
- tile indicates the tiling figure of the zone. Specify this tiling figure with a numeric value from 0 to 15.
- display-color is a numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is a numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

CIRDSP

■ Example of Program

```
evnt
   input type%, id@, zone%, tile%
   CIRCOLOR ..CIR000, zone%, tile%, -1, -1
end evnt
```

CIRDSP

Statement

■ Function

The CIRDSP statement displays data in the zone where the pie chart display was specified.

■ Format

CIRDSP control-name, zone-number, display-value

■ Example of Use

CIRDSP ..CIR000, 1, 30

■ Description

- The CIRDSP statement displays data in the zone where the pie chart display was specified.
- control-name is the pie chart name or the ID-type variable indicating the pie chart.
- The value indicating the zone number in the pie chart to be displayed is set in zone-number. The zone number can be specified with a constant or variable. The zone number starts at 1.
- display-value is the numeric data indicating the size of the pie chart to be displayed.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

CIRCOLOR

■ Example of Program

```
conf
  static name@
  name@ = ..CIR000
end conf
evnt
  input type%, id@, zone%, data%
  CIRDSP ..CIR000, zone%, data%
end evnt
```

CIRSET

Statement

■ Function

The CIRSET statement sets data in the pie chart display.

■ Format

CIRSET control-name, zone-number, display-data

■ Example of Use

CIRSET .BUHIN.GRAPH, 2, 30.0

■ Description

- The CIRSET statement sets the data to be displayed in the pie chart display. The speed of executing the PRDSP (display) statement after setting data in each zone is faster than that of modifying all zone values after executing the CIRDSP statement.
- control-name is the name of the pie chart display or the ID-type variable indicating the pie chart display.
- zone-number indicates which zone data is to be modified. The zone number is integer value data starting at 1.
- display-data is the numeric data indicating the size of each zone of the pie chart.

■ Related Item

CIRDSP, PRDSP

■ Example of Program

```
evnt
  CIRSET  .buhin.gpaph , 3 , 20.1
  var@ = .buhin.graph
  no = 4
  value = 23
  CIRSET  var@ , no , value
  prdsp var@
end evnt
```

CLEAR

Statement

■ Function

The CLEAR statement clears the display of the specified display.

■ Format

CLEAR control-name

■ Example of Use

CLEAR ..NUM000

■ Description

- The CLEAR statement clears the display of the specified display, leaving only the background color.
- When the slide display is specified, the CLEAR statement clears the pointer graphic.
- When the meter display is specified, the CLEAR statement clears the needle.
- When the clock display is specified, the CLEAR statement clears nothing.
- control-name is the graph name or the ID-type variable indicating the graph. display-name.

■ Related Item

NUMDSP, STRDSP, FIGDSP, SLDDSP, MTRDSP, FREDSP, PLTDSP, BARDSP, BLTDSP, CIRDSP, LNEDSP

■ Example of Program

```
evnt
   input type%, id@, data%
   if data% = 1 then
      CLEAR ..NUM000
   end if
end evnt
```

CLOSE

Statement

■ Function

The CLOSE statement closes the specified part.

■ Format

CLOSE part-name

■ Example of Use

CLOSE .B000.

■ Description

- The CLOSE statement closes the part displayed on the screen. The undisplayed status is called the close status.
- Nothing is performed even if the CLOSE statement is executed for the closed part.
- The program is started if the closed part receives a message.
- part-name is the name or ID of the part to be closed.

■ Related Item

OPEN

■ Example of Program

```
evnt
   input type% , id@ , data%
   if pstat(..) = 0 then
      close ..
   endif
end evnt
```

CLOSECOM

Statement

■ Function

The CLOSECOM statement temporarily stops the use of a serial line.

■ Format

CLOSECOM device-name

■ Example of Use

CLOSECOM HST

■ Description

- The CLOSECOM statement is a command that temporarily inhibits a program from receiving data from an external connecting device using the OPENCOM instruction.
- HST (host computer), BCR (bar code reader), or TKY (ten-key pad) can be specified in device-name.

■ Related Item

OPENCOM

■ Example of Program

```
conf
  OPENCOM HST
end conf
evnt
  input type% , id@ , data%
  if type% = 3 and data% = 1 then
    CLOSECOM HST
  else if type% = 3 and data% = 0 then
    REOPENCOM HST
  endif
end evnt
```

CLOSEPARALLEL

Statement

■ Function

The CLOSEPARALLEL statement temporarily stops data input from a parallel port.

■ Format

CLOSEPARALLEL input-bit

■ Example of Use

CLOSEPARALLEL 3

■ Description

- The CLOSEPARALLEL statement is an instruction that temporarily inhibits a program from receiving data as a message from the parallel port specification bit using the OPENPARALLEL instruction.
- input-bit specifies the bit for inhibiting data reception.

■ Related Item

OPENPARALLEL, REOPENPARALLEL

■ Example of Program

```
conf
   OPENPARALLEL 3
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and data% = 1 then
      CLOSEPARALLEL 3
   else if type% = 3 and data% = 0 then
      REOPENPARALLEL 3
   endif
end evnt
```

CLOSESIO

Statement

■ Function The CLOSESIO statement closes a non-procedual communication port.

■ Format CLOSESIO port-number

■ Example of Use CLOSESIO 2

■ Description

- The CLOSESIO statement closes the port for stopping non-procedual communication.
- port-number specifies a channel for stopping non-procedual communication. CH1 to CH3 correspond to 1 to 3, respectively.
- The port to be closed must be opened in advance by the OPENSIO statement to be explained later.

■ Related Item OPENSIO, SETSIO, WRITESIO, WRITWSIOB, FLUSH

■ Example of Program

```
conf
   global buf$ * 200
   opensio 2 , 1 , buf$
   setsio 2 , &HD
end conf
evnt
   strdsp ..STR000 , buf$
   CLOSESIO 2
end evnt
```

CLOSETIM

Statement

■ **Function**

The CLOSETIM statement stops the user of the specified timer.

■ **Format**

CLOSETIM timer-number

■ **Example of Use**

CLOSETIM TIMID@
CLOSETIM VAR

■ **Description**

- The CLOSETIM statement returns the timer allocated by the OPENTIM, OPENTIM2, or OPENTIM3 function to the system.
- The system can use up to 16 timers. The timers not to be used must be returned to the system. If allocating more than 16 timers is attempted, an error occurs.
- timer-number indicates the number of the timer to be stopped and returned to the system. Whether the timer number is an ID- or integer-type value depends on how the timer is opened. (See "OPENTIM", "OPENTIM2", and "OPENTIM3.")

■ **Related Item**

OPENTIM, OPENTIM2, OPENTIM3, STARTTIM, STOPTIM, CONTTIM, SETTIM, READTIM

■ **Example of Program**

```
conf
   static timid@
   timid@ = opentim()
   setim timid@, 20, 0
   starttim timid@
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and id@ = ..SWT000 then
      stoptim timid@
   else if id@ = ..SWT001 then
      closetim timid@
   end if
end evnt
```

COLOR

Statement

■ Function

The COLOR statement sets the color, type, and size of a straight line or a dot.

■ Format

COLOR display-color, line-type, line-thickness or dot-size

■ Example of Use

COLOR 1, 0, 2

■ Description

- The COLOR statement sets the colors, types, and sizes of a straight line and a dot. The values specified in the LINE and DOT statements have priority over those to be specified in this statement.
- display-color indicates the display color of the straight line or dot. Specify this display color with a numeric value from 0 to 15. The specified display color becomes the color pallet number of the tool.
- line-type indicates the type of line to be drawn (for example, solid line and dotted line). Specify this line type with a numeric value from 0 to 3. For the types of line, see “Plotting” to “Straight Line” of the tool.
- line-thickness indicates the thickness of the line. dot-size indicates the size of the dot. Specify both the line thickness and dot size with a numeric value from 0 to 2.

■ Related Item

LINE, DOT

■ Example of Program

```
conf
   color 1 , 0 , 3
end conf
evnt
      ....
   dot 100,200
   dot 100,300
   color 1 , 0 , 0
   line 100,200,100,300
      ....
end evnt
```

CONF ... END CONF

Statement

■ Function

The CONF ... END CONF statements declare the configuration block area.

■ Format

CONF
.....
.....
END CONF

■ Example of Use

CONF
static VAR%
END CONF

■ Description

- The configuration block written in a screen and a part is executed only once when the screen is displayed. This block is not executed when the screen is being displayed. It is executed once again when the screen is redisplayed after another screen has been displayed.
- The configuration block for global screens and parts is executed only once when the system is started.
- Initialization blocks (INIT) are used to write processing such as initialization.
- Only the configuration block for closed parts is not executed even if a screen is displayed. This configuration block is executed when a part is opened. (See “OPEN Instruction.”)

■ Related Item

EVNT ... END EVNT, INIT ... END INIT

■ Example of Program

```
CONF
   static moji$
END CONF
evnt
   input ty%, id@, dat$
end evnt
```

CONST

Statement

■ Function

The CONST statement declares a constant.

■ Format

CONST constant name = constant

■ Example of Use

CONST #MAX#=10

■ Description

- The constant name should be enclosed in a pair of # marks according to the variable name generation rule.
- If a constant is declared in a program, the constant name is replaced with a declared constant value.
- The CONST statement cannot be used in a global screen program.
- Constant declaration is one of the new features of Screen Creator 5.

■ Related Item

■ Example of Program

```
conf
   global L%
   const #MAXLENGTH#=100
   if L > #MAXLENGTH# then
      L = #MAXLENGTH#
   end if
end conf
```

CONTTIM

Statement

■ Function

The CONTTIM statement restarts the stopped timer.

■ Format

CONTTIM timer-number

■ Example of Use

CONTTIM TIMID@
CONTIM 4

■ Description

- The CONTTIM statement restarts the timer stopped by the STOPTIM instruction. The internal counter in the timer is continued from the timer stop status.
- timer-number indicates the number of the timer to be restarted. Whether the timer number is an ID- or integer-type value depends on how the timer is opened. (See “OPENTIM”, “OPENTIM2”, and “OPENTIM3.”)

■ Related Item

OPENTIM, OPENTIM2, OPENTIM3, STARTTIM, STOPTIM, CLOSETIM,
SETTIM, READTIM

■ Example of Program

```
conf
   static timid@
   opentim2(3)
   settim 3, 20, 0
   starttim 3
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and id@ = ..SWT000 then
      stoptim 3
   else if id@ = ..SWT001 then
      conttim 3
   end if
end evnt
```

COPY

Statement

■ Function

The COPY statement makes a hardcopy of a screen.

■ Format

COPY color-number

■ Example of use

COPY 5

■ Description

- The COPY statement makes a hard copy of a displayed screen. In the "Color Number" field, a color specified on the color palette of Screen Creator 5 is printed black.
- If color palette number 16 is specified, in addition to color palette numbers from 0 and 15, colors of even color palette numbers are printed black. If 17 is selected, the print colors of number 16 are inversed, i.e., colors of odd color palette numbers are printed black.
- If an even color palette number is specified in monochrome printing, the print color is the same as in the case where color palette number 2 is selected. If an odd color palette number is specified, the print color is the same as in the case where color palette number 1 is selected.
- The "Color Number" can be specified only when "Select Color" is selected in "Screen Print Mode" of "Printer Setup" of "System Setup" on the OIP system screen.

■ Related Item

■ Example of Program

```
evnt
   input ty%,id@
   if id@ = ..SWT000 then COPY 8
end evnt
```

COS

Function

- **Function** — The COS function calculates a cosine for the specified numerical expression.

- **Format** — COS (numerical-expression)

- **Example of Use** — X = COS (ANGLE)

- **Description** — The COS function calculates a cosine value for the specified numerical expression. The unit for the numerical expression is radian.

- **Related Item** — ATN, SIN, TAN

- **Example of Program**

```
evnt
   angle = 3.141592/3
   x = COS ( angle )
end evnt
```

CURDIR

Statement

■ **Function**

The CURDIR statement makes a character string indicating the current directory path name into a character string variable.

■ **Format**

CURDIR character string variable

■ **Example of Use**

CURDIR PATH$

■ **Description**

A full path name including a drive name should be written.

■ **Related Item**

DIR,CHDIR,MKDIR,RMDIR

■ **Example of Program**

```
conf
  strdsp ..str, "curdir"
end conf
evnt
  input type%, id@, data%
  if data% = 1 then
    curdir path$
    strdsp .dsp.str, path$
  end if
end evnt
```

CVB

Function

■ **Function**

The CVB function allocates data from any position of a character string variable.

■ **Format**

CVB (character-string-variable-name, allocation-position)

■ **Example of Use**

VAR% = CVB (MOJI$, 5)

■ **Description**

- The CVB function allocates data one byte from the specified allocation- position of the specified character variable name. The allocated data is regarded as an integer value.
- allocation-position must be an integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.

■ **Related Item**

MKS, MKB, MKW, MKI, MKF, MKID, CVW, CVI, CVF, CVID

■ **Example of Program**

```
conf

end conf
evnt
   org$ = ‘‘1234567’’
   data% = CVB ( org$, 3 )
   numdsp ..NUM000, data%    ’ Displays 51(&H33).
end evnt
```

CVF

Function

■ Function

The CVF function allocates data from any position of a character string variable.

■ Format

CVF (character-string-variable-name, allocation-position)

■ Example of Use

VAR = CVF (MOJI$, 5)

■ Description

- The CVF function allocates data four bytes from the specified allocation- position of the specified character variable name. The allocated data is regarded as a real value.
- allocation-position must be an integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- The CVF function returns a real number.
- A cut-out value is converted into a 86 series boundary.

■ Related Item

MKS, MKB, MKW, MKI, MKF, MKID, CVB, CVW, CVI, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ``1234567''
   strdsp ..STR000, org$
   mkf org$, 2, 1.23
   strdsp ..STR001, org$     ' The character string will not be displayed correctly.
   data% = CVF ( org$, 2 )
   numdsp ..NUM000, data%    ' Displays 1.23.
end evnt
```

CVI

Function

■ Function

The CVI function allocates data from any position of a character string variable.

■ Format

CVI (character-string-variable-name, allocation-position)

■ Example of Use

VAR% = CVI (MOJI$, 5)

■ Description

- The CVI function allocates data four bytes from the specified allocation- position of the specified character variable name. The allocated data is regarded as an integer value.
- allocation-position must be an integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- A cut-out value is converted into a 86 series boundary.

■ Related Item

MKS, MKB, MKW, MKI, MKF, MKID, CVB, CVW, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ‘‘1234567’’
   data% = CVI ( org$, 3 )
   numdsp ..NUM000, data%     ’ Displays &H36353433.
end evnt
```

CVID

Function

■ Function

The CVID function allocates data from any position of a character string variable.

■ Format

CVID (character-string-variable-name, allocation-position)

■ Example of Use

VAR@ = CVID (MOJI$, 5)

■ Description

- The CVID function allocates data six bytes from the specified allocation- position of the specified character variable name. The allocated data is regarded as an ID value.
- allocation-position must be an integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- The CVID function returns an ID-type value.
- A cut-out value is converted into a 86 series boundary (by 2 bytes).

■ Related Item

MKS, MKB, MKW, MKI, MKF, MKID, CVB, CVW, CVI, CVIF

■ Example of Program

```
conf

end conf
evnt
   org$ = ‘‘1234567’’
   data@ = CVID ( org$, 1 )
end evnt
```

CVW

Function

■ Function

The CVW function allocates data from any position of a character string variable.

■ Format

CVW (character-string-variable-name, allocation-position)

■ Example of Use

VAR% = CVW (MOJI$, 5)

■ Description

- The CVW function allocates data two bytes from the specified allocation-position of the specified character variable name. The allocated data is regarded as an integer value.
- allocation-position must be an integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- A cut-out value is converted into a 86 series boundary.

■ Related Item

MKS, MKB, MKW, MKI, MKF, MKID, CVB, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ‘‘1234567’’
   data% = CVW ( org$, 3 )
   numdsp ..NUM000, data%     ’ Displays &H3433.
end evnt
```

CYCLIC

Statement

■ Function

The CYCLIC statement declares that the contents of the specified device or memory table are periodically read.

■ Format

CYCLIC device-name, device-name, device-name, *number CYCLIC memory-table-name, memory-table-name, memory-table-name, *number

■ Example of Use

CYCLIC 00˜D01, 00˜D10 * 5
CYCLIC 00˜MTBL(100), 00˜MTBL(200) * 10

■ Description

- The CYCLIC statement periodically reads the contents of the declared PLC device through communication. If the previously read contents do not match the contents read by this statement (change of contents), a messages is transmitted to the declaring operation program. This statement never operates during execution of the operation program because it makes a declaration.
- This declaration must be made before the device is used in the program.
- Communication occurs when data is read from the device (example: A=00˜D0001) for which CYCLIC is not declared.
- To declare CYCLIC for the memory table, the table number must be specified with an integer value.
- In the cyclic operation of the memory table, a message is issued when data is written from the host computer or operation program to the memory table. (This message is issued even if the contents do not change.)
- Specifying “*number” following device-name or memory-table-name enables CYCLIC to be continuously declared.
- When the screen is switched, a message is issued to all the parts for which CYCLIC is declared.

■ Related Item

INPUT

■ Example of Program

```
conf
   cyclic  00~d01 , 00~d4 * 3
   cyclic  00~mtbl(20), 00~mtbl(100)
end conf
evnt
   input ty%,id@,dat%
   if id@ = 00~mtbl(20) then
     numdsp ..num , dat%
   end if
   ......
end evnt
```

CYCLIC2

Statement

■ Function

The CYCLIC2 statement declares that the contents of the specified device are periodically read as a doubleword.

■ Format

CYCLIC2 device-name, device-name, device-name, *number

■ Example of Use

CYCLIC2 00˜D01, 00˜D10 * 5

■ Description

- The CYCLIC2 statement is the same as the CYCLIC statement except that the contents of the device are read as a doubleword.
- The word having a larger device number is the high-order word.
- No memory table can be declared.
- When the screen is switched, a message is issued to all the parts for which CYCLIC2 is declared.

■ Related Item

INPUT, CYCLIC

■ Example of Program

```
conf
  cyclic2  00~d01 , 00~d7 * 3
end conf
evnt
  input ty%,id@,dat%
  if id@ = 00~d01 then
    numdsp ..num , dat%
  end if
  ......
end evnt
```

DATE$

Function

■ **Function** The DATE$ function reads the current date.

■ **Format** DATE$

■ **Example of Use** MOJI$ = DATE$

■ **Description**

- The year, month, and day of the current date to be read are each represented in two digits like YY/MM/DD.
- The DATE$ function cannot be used to set a date.
- Once date is set using the SETDATE command in a model with a battery backup calendar IC (GC56LC or GC55EM), the date is updated even while the power is off. If a model with no calendar IC (GC53LC or GC53LM) is turned off, the date is initialized to 98-01-01 and the time to 00:00:00 when it is turned on again. The date and time are updated while the power is on.

■ **Related Item** GETDATE,GETTIME,SETDATE,SETTIME,TIME$

■ **Example of Program**

```
conf
  moji$ = DATE$
  strdsp ..STR000 , moji$
end conf
```

DECLARE

Statement

■ Function

The DECLARE statement declares a function.

■ Format

DECLARE function name [type declaration character](variable declaration[, variable declaration] ...)

■ Example of Use

DECLARE ADD\%(A\%,B\%)

■ Description

- The DECLARE statement declares a type of a function used in a program. (Such declaration is called prototype declaration.)
- A function itself is declared in one of the three manners as shown below:
  - Local function: Defined in a program other than a global screen program.
  - Global function: Defined in a global screen program.
  - Library function: Defined in a library.
- The declared type of a function (in the prototype declaration) must be the same as the type of the function itself.
- This is one of the new features of Screen Creator 5.

■ Related Item

FUNCTION, FUNCTIONCHECK

■ Example of Program

```
DECLARE my_add(a%,b%)
conf
   global x%,y%
   local sum%
   sum% = my_add(x%,y%)
end conf
```

DEVRD

Statement

■ Function

The DEVRD statement reads the contents of the specified device.

■ Format

DEVRD device-name, offset-value, variable-name

■ Example of Use

DEVRD 00˜D10, 10, VALUE%

■ Description

- The DEVRD statement reads data from the device that is offset-value away from the device specified in device-name.
- offset-value specifies the distance from the device specified in device-name. The DEVRD statement reads data from the device corresponding to the specified distance. offset-value must be an integer- or floating-point-type variable or constant.
- variable-name specifies the variable that stores the read data; it must be an integer- or floating-point-type variable.
- The DEVRD statement is used for the device (e.g., CYCLIC 00˜D10 * 10) where “continuous cycle” is declared in the CYCLIC or CYCLIC2 statement.
- If the device from which data is to be read does not exist, an error occurs.
- Be sure to use this command in an event block. The value 0 is set in the variable, since an initialization block or configuration block is executed before reading device data.

■ Related Item

CYCLIC, EVENTWR, DEVWR

■ Example of Program

```
conf
   cyclic  00~D10 * 5        ’ Declares that data is read from the device that is 5
end conf                     ’ away from D10.
evnt
   input type% , id@ , data%                 ’ Reads and displays the continu-
   if id@ = ..SWT000 and data% = 1 then      ’ ous device value when a switch
      for i% = 0 to 4                        ’ is pressedfor the continuous-
         id@ = getid ( ..NUM000, i%+1)       ’ stage numeric display.
         DEVRD 00~D10, i% , data%
         numdsp ..NUM000, data%
      next
   endif
end evnt
```

DEVWR

Statement

■ Function

The DEVWR statement writes data to the specified device.

■ Format

DEVWR device-name, offset-value, write-value

■ Example of Use

DEVWR 00˜D10, 10, 5

■ Description

- The DEVWR statement writes data to the device that is offset-value away from the device specified in device-name.
- offset-value specifies the distance from the device specified in device-name. The DEVWR statement writes data to the device corresponding to the specified distance. offset-value must be an integer- or floating-point-type variable or constant.
- write-value specifies the data to be written to the specified device; it must be an integer- or floating-point-type variable or constant.
- The DEVWR statement is used for the device (e.g., EVENTWR 00˜ D10 * 10) where "continuous write" is declared in the EVENTWR statement.
- If the device to which data is to be written does not exist, an error occurs.

■ Related Item

CYCLIC, EVENTWR, DEVRD

■ Example of Program

```
conf
   eventwr  00˜D10 * 5       ' Declares that data is to be written to the device that is
end conf                     ' 5 away from D10.
evnt
   input type% , id@ , data%                  '        Writes 10 to the
device whose
   DEVWR 00˜D10, data% , 10                   '        offset value is
data%.

end evnt
```

DIM

Statement

■ Function

The DIM statement defines an array.

■ Format

DIM variable-name (maximum-subscript-value [, maximum-subscript-value] ...)

■ Example of Use

DIM ABC$(20), XYZ%(4,4,3), LOC!

■ Description

- The DIM statement defines the variable defined in variable-name as an local variable.
- A local variable can be read and written only in a program where it is declared. The compiler gives a warning if an undefined local variable is used. Each local variable is initialized every time the block is executed.
- If a variable has a subscript enclosed in parentheses, an arrangement variable is declared.
- The number of maximum subscript values in parentheses indicates that of array dimensions. In arrays of two dimensions or higher, subscripts are specified, delimited by a comma (,).
- maximum-subscript-value indicates the maximum value of subscript that can be specified. The subscript starts at 0.
- A variable can be used as an array variable even if it is not declared in the DIM statement. In this case, the maximum value of the subscript is 10.
- When a character variable is declared in an array, the element size can be declared.
- Defining many arrays makes it impossible to display many screens because the OIP work area becomes small.
- Screen Creator 5 has a new function for declaring local variables other than arrangement variables distinctively.
- The DIM statement is provided to maintain the compatibility with GCSGP3. Use LOCAL, instead of DIM, to declare a local variable.
- When a DIM statement is used to declare an arrangement variable, compatibility with GCSGP3 is maintained.

■ Related Item

AUTO, BACKUP, GLOBAL, LOCAL, STATIC, STRING

Example of Program

```
conf
   DIM FLOAT(10),ID@(5),MOJI$(10) * 40
   for i% = 1 to 5
      FLOAT(i%) = i*3
   next
end conf
```

DIR

Function

■ Function

The DIR function makes a list of directory or file data into character string variables and returns the number of created data (i.e., the number of entries in the directory or file).

■ Format

DIR (directory name, file attribute value, offset value, and character string variable)

■ Example of Use

NUM% = DIR("A:SUBDIR", &H20, 6, LIST$)

■ Description

- A directory name can be specified in a full path name including a drive name or in an abbreviated name beginning with a current directory name.
  Example: A:\SUBDIR1\SUBDIR2 SUBDIR2\SUBDIR3
- A file name, instead of a directory name, should be specified to create data of a single file.
- A file attribute value for selecting data to be created should be specified in a logical OR of the flags shown below:
  &H01: Read-only file
  &H02: Hidden file
  &H04: System file
  &H08: Volume label
  &H10: Sub-directory
  &H20: Standard file
- An offset value is specified in order to exclude the first "n" data from data to be created.
- Each created data consists of a 40-byte record of the fixed length. It is followed by detailed data as shown below:

Name	Extension	Size	Day of updating	Time of updating
DISK_1	.	<VOL>	87-01-15	15:25
SAMPLE	.EXE	98765	92-11-03	9:12
ABCDEFG	.	123456	94-03-21	11:34
TEST2	.C	256	93-05-05	12:07
DOWNLOAD	.OIP	<DIR>	87-02-14	21:13
KBASIC	.	<DIR>	93-12-24	8:25
DATA_007	.	32	89-10-10	10:42

In this example, seven data are created in character strings of 280 bytes in all. The label is shown for convenience only.
The number of data to be created depends on the size of the character string variable. As much data as possible is created.

■ Related Item

DIR,CHDIR,MKDIR,RMDIR

■ Example of Program

```
conf
   global dname$(13), pname1$(13), pname2$(13)
   global dsel%, p1sel%, p2sel%
   static list$*2000
   strdsp ..str, "dir"
end conf
evnt
   input type%, id@, data%
   if data% = 1 then
      path$ = dname$(dsel%) + pname1$(p1sel%) + pname2$(p2sel%)
      strdsp .dsp.str, path$
      num% = dir(path$, &H3F, 0, list$)
      strdsp .dsp.str, list$
      numdsp ..num000,num%
   end if
end evnt
```

DINV

Statement

■ Function

Inverses the color in a specified screen area.

■ Format

DINV upper-left-X-coordinate, upper-left-Y-coordinate, lower-right-X-coordinate, lower-right-Y-coordinate

■ Example of Use

DINV 10, 10, 30, 30

■ Description

- Inverses the color in a rectangular area having opposite points of specified coordinates.
- The upper left corner of the panel has the coordinates (0, 0). The horizontal direction (toward the right) corresponds to the X axis, and the vertical direction (toward below) corresponds to the Y axis.
- Color is inversed as shown below.
  In color display, the palette values (0 to 15) are inversed. In other words, 0 is changed into 15, 1 is changed into 14, 7 is changed into 8, and so forth.
  In monochrome display, activated color is changed into deactivated color, deactivated color is changed into activated color, and transparent color is changed into activated color.
- If this is used in an initialization block or configuration block, drawing is executed after executing this block and accordingly color is not inversed.
  Be sure to use this in an event block.

■ Related Item

None

■ Example of Program

```
evnt
   input ty,id@,dat
   if ty = 3 and id@ = ..SWT000 then
      DINV 0,0,639,399
   endif
end evnt
```

DOT

Statement

■ Function

The DOT statement displays dots on a screen.

■ Format

DOT X1, Y1

■ Example of Use

DOT 20,300

■ Description

- The DOT statement displays a dot in the specified coordinate (X1,Y1).
- X1 must be a numeric value from 0 to 639. Y1 must be a numeric value from 0 to 399 (GC55EM) or 0 to 479 (GC56LC).
- Dots are directly displayed as the background of a screen. When a part is opened or closed in the area where dots are displayed or when a control is displayed, the dots may be cleared. The cleared dots are not redisplayed.
- The size and color of a dot are specified by the COLOR statement.
- If this is used in an initialization block or configuration block, drawing is executed after executing this block and accordingly points are not plotted.
  Be sure to use this in an event block.

■ Related Item

COLOR

■ Example of Program

```
conf
  color 1 , 0 , 3
end conf
evnt
    ....
  dot 100,200
  dot 100,300
  color 1 , 0 , 0
  line 100,200,100,300
     ....
end evnt
```

DSPMODE

Statement

■ **Function**

The DSPMODE statement changes the display mode of the control.

■ **Format**

DSPMODE control-name, display-mode

■ **Example of Use**

DSPMODE ..NUM000, 2

■ **Description**

- The DSPMODE statement is a command that changes the display mode of the control.
- control-name is the control name or the ID-type variable indicating control name.
- control-mode specifies the mode in which the control is displayed. The display mode is specified with any of the following numeric values:
  - 0: Normal display mode
  - 1: Inverse display mode
  - 2: Blink display mode. (The display color is replaced with the background color.)
  - 3: On-and-off display mode. (The display status and nondisplay status are repeatedly displayed.)

■ **Related Item**

NUMDSP, STRDSP, FIGDSP, SLDDSP, MTRDSP, FREDSP, PLTDSP, BARDSP, BLTDSP, CIRDSP, LNEDSP

■ **Example of Program**

```
evnt
   input ty,id@,data
   if id@ = ..SWT000 then
      DSPMODE ..NUM000 , 3
   endif
end evnt
```

EOF

Function

■ Function

The EOF function checks whether the end of the file was reached.

■ Format

EOF (file-number)

■ Example of Use

AAA = EOF (file-number)

■ Description

- file-number specifies the number of the file for which whether the end of the file was reached is to be checked. This file number must match the number of the file opened by the FOPEN statement.
- Return value 1 indicates that the end of the file was reached. Return value 0 indicates that the end of the file is not reached.

■ Related Item

FOPEN, FIELD, FCLOSE, FPUT, FGET

■ Example of Program

```
conf
  field  5
    global no%
    global moji1$ , moji2$
  end field
  global sum%
  fopen  ``C:TEST'', 2 , 5
  ......
end conf
evnt
  while EOF(5) = 0
    fget 5, i
    numdsp ..NUM000, no%
    strdsp ..STR000, moji1$
    strdsp ..STR001, moji2$
  wend
  fclose (5)
end evnt
```

ERRCTL

Statement

■ **Function**

The ERRCTL statement controls the error number display position.

■ **Format**

ERRCTL mode

■ **Example of Use**

ERRCTL 0

■ **Description**

- The ERRCTL statement controls the error number display position.
- The error display position conforms with the value specified in mode.
  When mode is 0: An error number is displayed below a screen.
  When mode is 1: A message is issued to the error display.
  - When mode is 1, messages of error numbers 4000 to 4499 and 5000 to 5999 are issued to the error display (part ERRPTS on global screen).
  - Messages of error numbers 2000 to 2999 are issued only to the error display.
  - Following the type and issuer ID of an error, the error code, the number of the screen where the error occurred, and the number of the part where the error occurred are issued to the error display. (If a screen program error occurs, -1 is set as the part number.)
  - If part ERRPTS does not exist in the global screen, the error is displayed in the lowest line of the window screen.

■ **Related Item**

ERRSTAT

■ **Example of Program**

```
evnt
   input ty%,id@,dat%
   if id@ = ..sw1 then
      if errstat () = 1 then
         errctl 0
      else
         errctl 1
      endif
   endif
end evnt
```

ERRSTAT

Function

■ Function
The ERRSTAT function reads the error display position.

■ Format
ERRSTAT

■ Example of Use
ERRSTAT()

■ Description
- The ERRSTAT function reads the current error display position.
- When this function is executed, any of the following numeric values indicating the display position is returned:
  When 0 is returned, the error is displayed below the screen.
  When 1 is returned, the error is displayed in the error display.

■ Related Item
ERRCTL

■ Example of Program

```
evnt
   input ty%,id@,dat%
   if id@ = ..sw1 then
      if errstat () = 1 then
         errctl 0
      else
         errctl 1
      endif
   endif
end evnt
```

EVENTWR

Statement

■ Function

The EVENTWR statement declares the device(s) to which data is to be written.

■ Format

EVENTWR device-name, device-name, device-name *number,,,

■ Example of Use

EVENTWR 00˜D01, 00˜D10 * 5

■ Description

- The EVENTWR statement declares the device(s) in a part or screen to which data is to be written. This statement only declares the devices to which data is to be written; it does not actually write data to the devices.
- Specifying *number enables two or more devices to be continuously declared. This continuous declaration, however, does not mean that data is written to all the declared devices at a time.
- The DEVWR statement is used to actually write data to the declared devices.
- The devices to which data is to be written must be declared before the DEVWR statement is executed.

■ Related Item

CYCLIC, DEVRD, DEVWR

■ Example of Program

```
conf
   EVENTWR  00˜D10 * 5                  ' Declares that data is to be written to
end conf                                ' five devices from D10.
evnt
   input type% , id@ , data%            ' Writes 10 to the device whose offset
   devwr 00˜D10, data% , 10             ' value is data%.

end evnt
```

EVNT ... END EVNT

Statement

■ Function

The EVNT...END EVNT statements declares the event block area.

■ Format

```
EVNT
   .....
   .....
END EVNT
```

■ Example of Use

```
EVNT
   input ty,id@,data
   .....
END EVNT
```

■ Description

- The event block is a program block that operates when it receives a message. The contents executed when a switch is pressed or a message is received are written in these statements.

■ Related Item

CONF ... END CONF, INIT ... END INIT

■ Example of Program

```
conf
  static moji$
end conf
evnt
  input ty%, id@, dat$
end evnt
```

EXECPRCODE

Statement

■ Function

The EXECPRCODE statement executes primitive data operation.

■ Format

EXECPRCODE control-name, type, operation-data, variable-name

■ Example of Use

EXECPRCODE ..NUM000, 0, 20, VAR%

■ Description

- When a control in a part is used to validate an operation parameter, the EXECPRCODE statement executes data operation set in the part operation parameter specification.
- type is usually 0. When the specified primitive is the plot display and type is 0, the EXECPRCODE statement executes X data operation. When type is 1, the statement executes Y data operation.
- control-name must be the control in the local part.
- operation-data specifies the value to be operated; it must be an integer- or floating-point-type variable or constant.
- variable-name specifies the variable to which the operation result is to be written; it must be an integer- or floating-point-type variable.
- If no operation code is written in the specified control, the value specified in operation-data is set in the specified variable.

■ Related Item

None

■ Example of Program

```
conf

end conf
evnt
   input type% , id@ , data%
   EXECPRCODE ..NUM000, 0, data%, data1%
   numdsp ..NUM001, data1%
end evnt
```

EXIT FUNCTION

Statement

■ Function

The EXIT FUNCTION statement exits a function forcedly.

■ Format

EXIT FUNCTION

■ Example of Use

FUNCTION DIV%(A%,B%)
IF B%=0 THEN EXIT FUNCTION
DIV%=A%/B%
END FUNCTION

■ Description

- The EXIT FUNCTION statement gives an instruction to exit a function forcedly in a function block where the function itself is defined and returns the control to the side which called the function.
- This statement is one of the new features of Screen Creator 5.

■ Related Item

DECLARE, FUNCTION, FUNCTIONCHECK

■ Example of Program

```
declare my_div%(a%,b%)
conf
   global x%,y%
   local share%
   share% = my_div(x%,y%)
end conf
function my_div%(a%,b%)
   if b%=0 then EXIT FUNCTION
   my_div%=a%/b%
end function
```

EXP

Function

■ Function

The EXP function calculates the value of an exponential function for the base of a natural logarithm.

■ Format

EXP (numerical-expression)

■ Example of Use

VAR = EXP (A/2)

■ Description

The EXP function returns the result of exponent operation for the base (E) of the natural logarithm.

■ Related Item

LOG

■ Example of Program

```
evnt
   input ty,id@,data
   if ty = 3 then
      numdsp ..NUM000, EXP(10)
   else
      numdsp ..NUM000, EXP(5)
   endif
end evnt
```

FCLOSE

Statement

■ **Function**

The FCLOSE statement closes the specified file.

■ **Format**

FCLOSE file-number

■ **Example of Use**

FCLOSE 5

■ **Description**

- The FCLOSE statement closes the file specified by file-number.
- file-number must match the number of the file opened by the FOPEN statement to be explained later. If another file number is specified, an error occurs. Specify file-number directly with a numeric value from 1 to 16.

■ **Related Item**

FOPEN, FIELD, FPUT, FGET

■ **Example of Program**

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   fopen  ''MEMORY'', 2 , 5
   ......
end conf
evnt
   ......

   FCLOSE 5
end evnt
```

FGET

Statement

■ **Function**

The FGET statement reads data from the specified file.

■ **Format**

FGET file-number, record-number

■ **Example of Use**

FGET 5, 3

■ **Description**

- The FGET statement reads the contents of the specified record (record-number) in the specified file (file-number) into the variable group declared by FIELD...END FIELD.
- file-number specifies the number of the file to be read. This file number must match the number of the file opened by the FOPEN statement.
- record-number specifies which record in the file is to be read first. In this case, the variable group included in FIELD declared in file-number is used as one unit. record-number is 1 when data is read from the beginning of the file.

■ **Related Item**

FOPEN, FIELD, FCLOSE, FPUT

■ **Example of Program**

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   fopen  ‘‘MEMORY’’, 2 , 5
   ......
end conf
evnt
   FGET 5 , 3
   numdsp ..NUM000 , no%
   strdsp ..STR000 , moji1$
   strdsp ..STR001 , moji2$
   fclose 5
end evnt
```

FIELD ... END FIELD

Statement

■ **Function**

FIELD ... END FIELD sets a file read/write unit.

■ **Format**

FIELD file-number
variable-list
variable-list
END FIELD

■ **Example of Use**

FIELD 5
global abcd , xyz%
static dddd(10,10)
backup moji$
END FIELD

■ **Description**

- FIELD ... END FIELD declares the unit for reading the file by the FGET statement or that for writing the file by the FPUT statement.
- file-number specifies the number of the file onto or into which the variable group in the field is to be written or read. This file number must match the number of the file opened by the FOPEN statement; it is a value from 1 to 16.
- The variable list that can be written between FIELD and END FIELD must be the GLOBAL, STATIC, or BACKUP variable. The method for declaring variable lists is the same as that for declaring the GLOBAL, STATIC, and BACKUP variables.
- The FIELD declared in the program where the FOPEN statement was executed is the default read/write unit.
- When a file is read or written by a part that differs from the part opened by the FOPEN statement, the FIELD declared in that part is used. If this FIELD is not declared, the default FIELD is used.
- If two or more FIELDs are declared in the same file-number in one program, the last declared FIELD is valid.
- FIELD ... END FIELD cannot be written in the global screen program.

■ **Related Item**

FOPEN, FCLOSE, FPUT, FGET

■ **Example of Program**

```
conf
  field  5
    global no%
    global moji1$ , moji2$
  end field
  fopen  ‘‘MEMORY’’, 2 , 5
```

```
   ......
end conf
evnt
   no% = 1
   moji1$ = ''product-name''
   moji2$ = ''product-number''
   fput 5 , 3
   fclose 5
end evnt
```

FIGCOLOR

Statement

■ Function

The FIGCOLOR statement changes the tile and colors of the graphic display.

■ Format

FIGCOLOR control-name, tile, display-color, background-color

■ Example of Use

FIGCOLOR .B000.FIG000, 1, 2, 3

■ Description

- The FIGCOLOR statement changes the tile and colors of the the graphic display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the graphic display name or the ID-type variable indicating the graphic display.
- tile indicates a tiling figure. Specify this tiling figure with a numeric value from 0 to 15.
- display-color is a numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is a numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

FIGDSP

■ Example of Program

```
evnt
   input type%, id@, tile%
   FIGCOLOR ..FIG000, tile%, -1, -1
end evnt
```

FIGDSP

Statement

■ Function

The FIGDSP statement texture the graphic specified in the graphic display.

■ Format

FIGDSP control-name, texture-name

■ Example of Use

FIGDSP .B000.FIG000, SWFIG

■ Description

- The FIGDSP statement displays the texture specified in the texture display. This texture name must be the one created by the plotting tool.
- control-name is the graphic display name or the ID-type variable indicating the graphic display.
- texture-name is the variable indicating the name or ID of the texture to be displayed in the texture display or the registered graphic number (integer type).
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

FIGCOLOR, FIGFORM

■ Example of Program

```
evnt
   input ty , id@, figno%
   FIGDSP ..FIG000 , figno%
end evnt
```

FIGFORM

Statement

■ Function

The FIGFORM statement changes the display format of the texture display.

■ Format

FIGFORM control-name, resize-specification

■ Example of Use

FIGFORM ..HYOJIKI, 0

■ Description

- When the size of the texture display differs from that of the texture to be control in the control, the FIGFORM statement specifies whether to perform resize (magnification/reduction). Resize is performed to make the size of the texture to be displayed match that of the texture display.
- control-name is the graphic display name or the ID-type variable indicating the graphic display.
- The integer-type value indicating whether to perform resize is set in resize-specification.
  - 0: Resize is not performed.
  - 1: Resize is performed.

■ Related Item

FIGCOLOR, FIGDSP

■ Example of Program

```
evnt
   input ty , id@, data
   if ty = 3 and data = 1 then
      FIGFORM ..FIG000, 1
   else
      FIGFORM ..FIG000, 2
   endif
   figdsp ..FIG000, figno
end evnt
```

FINPUT

Statement

■ **Function** The FINPUT statement reads data from the specified file.

■ **Format** FINPUT file-number, variable, variable, ...

■ **Example of Use** FINPUT 12, VAR% , STRING$

■ **Description**

- The FINPUT statement reads data from the file specified by file-number into the specified variable.
- A numeric or character string variable can be specified in variable.
- The following delimiters can be used when data is read into the specified variable. They are not included in the variable.
  - Only comma "," and carriage return (CR) can be used as delimiters. Line feed (LF) following CR is ignored.
  - When a numeric variable is specified, a blank can also be used as a delimiter.
  - When a character string variable is specified, the character string between double quotation marks (") is to be read.
  - If the type of data written to the specified file does not match that of the specified read variable, the contents of the variable are undefined.
- file-number must match the number of the file opened by the FOPEN statement.

■ **Related Item** FOPEN, FCLOSE, FPRINT, FWRITE, LINPUT

■ **Example of Program**

```
conf
  fopen  ''C:TEST'', 2 , 5
end conf
evnt
  var% = -2
  fwrite 5, 123, var%, ''ABCD'', ''XYZ''
  fseek(5, 0, 0)
  finput 5, VAR1%, VAR2%, VSTR1$, VSTR2$
end evnt
```

Data is written to the specified file as follows:

```
123,-2,''ABCD'',''XYZ'' CR/LF
```

When data is read, the variables change as follows:

```
VAR1%   123          VSTR1$   ABCD
VAR2%    -2          VSTR2$    XYZ
```

FLUSH

Statement

■ Function

The FLUSH statement returns the write position of a non-procedual communication reception buffer to the beginning of the variable.

■ Format

FLUSH port-number

■ Example of Use

FLUSH 2

■ Description

- The FLUSH statement enables received data to be written from the beginning of the variable to which the write position of the non-procedual communication reception buffer was returned.
- port-number specifies the port (CH1 to CH3) to be flushed with a value from 1 to 3.
- Execute the FLUSH statement when a reception completion message is received. Unless the FLUSH statement is executed, the reception buffer may become full. This statement only returns the write position of the reception buffer to the beginning of the variable; it does not clear data in the buffer.
- The port to be flushed must be opened in advance by the OPENSIO statement to be explained later.

■ Related Item

OPENSIO, CLOSESIO, WRITESIO, WRITWSIOB, SETSIO

■ Example of Program

```
conf
   global buf$ * 200
   opensio 2 , 1 , buf$
   setsio  2 , &HD
end conf
evnt
   strdsp ..STR000 , buf$
   FLUSH 2
   closesio 2
end evnt
```

FOPEN

Statement

■ Function

The FOPEN statement opens the specified file.

■ Format

FOPEN file-name, mode, file-number

■ Example of Use

FOPEN “MEMORY”, 2, 5

■ Description

- The FOPEN statement opens the file to be read or written.
- file-name specifies the name of the file to be opened. The file having the name enclosed in double quotation marks is to be opened. Specify the name of the file to be opened with up to eight characters. When MEMORY is specified in file-name, internal memory is handled as a file. (Currently, only “MEMORY” can be specified in file-name.)
- mode specifies the type of the file to be opened with one of the following numeric values:
  - 0: Read-only file
  - 1: Write-only file
  - 2: Read/write file

  When file-name is “MEMORY”, the read/write file is opened regardless of what value is specified in mode.
- file-number is used when a file is read or written or when a record is set. Specify file-number directly with a numeric value from 1 to 16; it cannot be specified by a variable.
- To handle internal memory as a file, the capacity of that memory must be set on the system mode screen in advance.
- Attempting to execute the FOPEN statement for an unformatted file causes an error.

■ Related Item

FCLOSE, FIELD, FPUT, FGET, FORMAT

■ Example of Program

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   FOPEN  ‘‘MEMORY’’, 2 , 5
   ......
end conf
evnt
   ......
end evnt
```

FOR ... TO ... NEXT

Statement

■ Function

The instructions between the FOR statement and NEXT statements are repeatedly executed by the specified count.

■ Format

FOR variable-name = start-value TO end-value [STEP increment] ...
NEXT

■ Example of Use

FOR I = 1 TO 10
A(I) = 3
NEXT

■ Description

- variable-name after the FOR statement specifies the variable used to count how many times the FOR to NEXT loop is repeated. variable-name must be an integer- or floating-point-type variable.
- start-value indicates the initial value. The value of the variable increases by the value specified in increment each time the FOR to NEXT loop is repeated. (No negative value can be specified in increment.) When the increased value of the variable is greater than end-value, the statement following the NEXT statement is executed.
- One FOR to NEXT loop can be nested.

■ Related Item

WHILE ... WEND, SELECT CASE

■ Example of Program

```
conf
   static VAR%(10)
   for i% = 0 to 10
      VAR%(i%) = i% * 3
   next
end conf
```

FORMAT

Statement

■ **Function**

The FORMAT statement initializes (formats) the specified file.

■ **Format**

FORMAT file-name

■ **Example of Use**

FORMAT “A:”

■ **Description**

- file-name specifies the name of the file to be initialized.
- "A:", "E:" or "MEMORY" can be specified as the drive name.
- When “MEMORY” is specified in drive-name, the contents of the file are filled with 0.
- Be sure to execute the FORMAT statement when using the file for the first time.

■ **Related Item**

FOPEN, FIELD, FCLOSE, FPUT, FGET

■ **Example of Program**

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   global sum%
   FORMAT ``MEMORY''
   fopen  ``MEMORY'', 2 , 5
   ......
end conf
evnt
   no% = 1
   moji1$ = ``product-name''
   moji2$ = ``product-number''
   fput 5 , 3
   fclose 5
end evnt
```

FPRINT

Statement

■ **Function**

The FPRINT statement writes data to the specified file.

■ **Format**

FPRINT file-number, expression, expression, ...

■ **Example of Use**

FPRINT 12, 100, “ABCD”, VAR%, STRING$

■ **Description**

- The FPRINT statement writes the numeric value, variable or character defined in expression to the file specified by file-number.
- A numeric value, a character, or a numeric or character variable can be specified in expression.
- A numeric expression is converted to a numeric string and written to the specified file. When the data to be written is positive, a blank is written before it. When the data is negative, a minus sign (-) is written before it. A blank is also written after the written numeric string.
- When a character string is written, no delimiter is inserted.
- file-number must match the number of the file opened by the FOPEN statement.

■ **Related Item**

FOPEN, FCLOSE, FPUT, WRITE

■ **Example of Program**

```
conf
   fopen  ``C:TEST'', 2 , 5
end conf
evnt
   var% = -2
   fprint 5, 123, 45, var%, ``ABCD'', ``XYZ''
end evnt
```

Data is written to the specified file as follows:

△123△△45△-2△ABCDXYZ (△ indicates a blank.)

FPUT

Statement

■ **Function**

The FPUT statement writes data to the specified file.

■ **Format**

FPUT file-number, record-number

■ **Example of Use**

FPUT 5, 3

■ **Description**

- The FPUT statement writes the contents of the variable group declared by FIELD...END FIELD to the specified record (record-number) in the specified file (file-number).
- file-number specifies the number of the file to be written. This file number must match the number of the file opened by the FOPEN statement.
- record-number specifies the record in the file to which the contents of the declared variable group is to be written. In this case, the variable group included in FIELD is used as one unit. record-number is 1 when data is written to the beginning of the file.

■ **Related Item**

FOPEN, FIELD, FCLOSE, FGET

■ **Example of Program**

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   fopen  ``MEMORY'', 2 , 5
   ......
end conf
evnt
   no% = 1
   moji1$ = ``product-name''
   moji2$ = ``product-number''
   FPUT 5 , 3
   fclose 5
end evnt
```

FRECOLOR

Statement

■ Function

The FRECOLOR statement changes the tiles and colors of the free graph display.

■ Format

FRECOLOR cotrol-name, tile-1, display-color-1, background-color-1, tile-2, display-color-2, background-color-2

■ Example of Use

FRECOLOR ..FRE000, 2, 1, 4, 5, 2, 1

■ Description

- The FRECOLOR statement changes the tiles and colors of the free graph display and the background tiles and colors of the entire display. tile-1 indicates that the color and tile for which 1 was specified remain unchanged.
- control-name is the free graph name or the ID-type indicating the free graph name.
- tile-1 indicates the tiling figure of the tile display section. Specify this tiling figure with a numeric value from 0 to 15.
- display-color-1 is a numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color-1 is a numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.
- tile-2 indicates the background tiling figure of the free graph. Specify this tiling figure with a numeric value from 0 to 15.
- display-color-2 is a numeric value indicating the color number of the tile display section of the background. Specify this color number with a numeric value from 0 to 15.
- background-color-2 is a numeric value indicating the color number of the tile background section of the background. Specify this color number with a numeric value from 0 to 15.

■ Related Item

FREDSP

■ Example of Program

```
conf
   static name@
   name@ = ..FRE000
end conf
evnt
   input type%, id@, data%
   if type% = 3 then
      FRECOLOR name@, 2, 3, 1, 4, 5, 2
   endif
end evnt
```

FREDSP

Statement

■ Function

The FREDSP statement specifies the value to be displayed in the free graph display.

■ Format

FREDSP control-name, display-value

■ Example of Use

FREDSP .B000.FRE000, 50

■ Description

- The FREDSP statement specifies the value to be displayed in the free graph.
- control-name is the name of the free graph display or the ID-type variable indicating the free graph display.
- display-value is the value specifying the filling range in the free graph display.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the primitive.

■ Related Item

FRECOLOR

■ Example of Program

```
conf
   static name@
   name@ = ..FRE000
end conf
evnt
   input type%, id@, data%
   FREDSP name@, data%
end evnt
```

FSEEK

Function

- **Function**

The FSEEK function changes the read/write position of a file.

- **Format**

FSEEK (file-number, reference-position, offset)

- **Example of Use**

AAA% = FSEEK (12, 0, 0)

- **Description**

• The FSEEK function moves the read/write position of the file by the value specified by offset, starting from reference-position.
• file-number specifies the number of the file opened by the FOPEN statement.
• 0, 1, and 2 can be specified in reference-position. When 0 is specified, the FSEEK function moves the read/write position, starting from the beginning of the file. When 1 is specified, the function moves the read/write position, starting from the current position. When 2 is specified, it moves the read/write position, starting from the end of the file.
• Specify offset in bytes. Specify a positive value in offset when moving the read/write position to the end of the file.
• The read/write position obtained as a result of executing the FSEEK function is returned.

- **Related Item**

FOPEN, FCLOSE, FPRINT, FWRITE, FINPUT

- **Example of Program**

```
conf
   fopen  ``C:TEST'', 2 , 5
end conf
evnt
   AAA$ = ``12345''
   fwrite 5, AAA$, ``ABCD''
   fseek(5, 0, 0)
   finput 5, VSTR$
end evnt
```

FSUM

Function

■ Function

The FSUM function calculates the sum of the variable group in the specified field.

■ Format

FSUM (file-number)

■ Example of Use

SUM = FSUM (5)

■ Description

- The FSUM function calculates the sum (eight low-order bits) of the variable group included in the FIELD specified by file-number by incrementing the contents of the group for each byte. The function calculates the area where no character code is defined in the character string variable as 0.
- The FSUM function returns the calculation result as an integer-type value within the range from 0 to 255.
- If the FIELD specified by file-number does not exist, an error occurs.

■ Related Item

FOPEN, FIELD, FCLOSE, FPUT, FGET

■ Example of Program

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   global sum%
   fopen  ‘‘MEMORY’’, 2 , 5
   ......
end conf
evnt
   fget 5 , 3
   if sum% = FSUM(5) then
      numdsp ..NUM000 , no%
      strdsp ..STR000 , moji1$
      strdsp ..STR001 , moji2$
   else
      strdsp ..STR002 , ‘‘SUM-error’’
   fclose 5
end evnt
```

FUNCTION ... END FUNCTION

Statement

■ Function

The FUNCTION ... END FUNCTION statement declares a function block.

■ Format

FUNCTION function name [type declaration character](variable declaration[, variable declaration] ...)
...
END FUNCTION

■ Example of Use

```
FUNCTION ADD%(A%,B%)
ADD%=A%+B%
END FUNCTION
```

■ Description

- The FUNCTION ... END FUNCTION statement declares a function block where the function itself is defined.
- A defined function can be referenced in three ways as shown below according to the position where it is declared:
  - Local function: Defined in a program other than a global screen program.
  - Global function: Defined in a global screen program.
  - Library function: Defined in a library.
- The declared type of a function (in the prototype declaration) must be the same as the defined type of the function itself.
- Like a variable, a function has a return value of a type determined by the type declaration character ($, % or !).
  A function with no type declaration character is a real number function.
- The return value of a function depends on a value substituted for the function name including the type declaration character.
- Variable declaration is an argument of a function.
  A variable with no argument declaring a variable type is regarded as a real number variable.
- An argument of a function is given when referenced. Therefore, if a value is changed by substituting it for an argument in the function or the like, the variable itself given as the argument by the caller is also changed.
- Type declaration using DECLARE is needed to call a function declared in a function block.
- To exit a function in a function block forcedly, use EXIT FUNCTION.
- This is one of the new features of Screen Creator 5.

■ Related Item

DECLARE, EXIT FUNCTION, FUNCTIONCHECK

■ Example of Program

```
declare my_add%(a%,b%)
conf
  global x%,y%
  local sum%
  sum% = my_add(x%,y%)
end conf
FUNCTION my_add%(a%,b%)
  my_add%=a%+b%
END FUNCTION
```

FWRITE

Statement

■ Function

The FWRITE statement writes data to the specified file.

■ Format

FWRITE file-number, expression, expression, ...

■ Example of Use

FWRITE 12, 100, “ABCD”, VAR%, STRING$

■ Description

- The FWRITE statement writes the numeric value or character defined in expression to the file specified by file-number.
- A numeric value, a character, or a numeric or character variable can be specified in expression.
- When writing two or more expressions to the file, delimit them with a comma (,). Add the code indicating carriage return (CR) or line feed (LF) to the end of expression description.
- A numeric expression is converted to a numeric string and written to the specified file. When the numeric string is negative, a minus sign (-) is inserted before it.
- When writing a character string, enclose it in double quotation marks (”).
- file-number must match the number of the file opened by the FOPEN statement.

■ Related Item

FOPEN, FCLOSE, FPUT, FPRINT

■ Example of Program

```
conf
   fopen  ``C:TEST'', 2 , 5
end conf
evnt
   var% = -2
   fwrite 5, 123, var%, ``ABCD'', ``XYZ''
end evnt
```

Data is written to the specified file as follows:

```
123,-2,''ABCD'',''XYZ'' CR/LF
```

GETBLIGHT

Statement

■ Function

The GETBLIGHT statement reads the time that lasts till the back light is turned off.

■ Format

GETBLIGHT variable-name

■ Example of Use

GETBLIGHT VAR

■ Description

variable-name specifies the variable used to write the time that lasts till the back light is turned off. The unit for the read values is minute. When 0 is specified, the back light is not turned off.

■ Related Item

SETBLIGHT

■ Example of Program

```
conf
   GETBLIGHT var
   var = var*2
   setblight var
end conf
```

GETDATE

Statement

■ **Function**

The GETDATE statement obtains the data representing a date.

■ **Format**

GETDATE year-read-variable, month-read-variable, day-read-variable, day-of-week-read-variable

■ **Example of Use**

GETDATE YEAR%, MONTH%, DATE%, DAY%

■ **Description**

- The GETDATE statement writes the current date value to year-read-variable, month-read-variable, day-read-variable, and day-of-week-read-variable.
- Year is the low-order two digits of A.D. Month is a numeric value from 1 to 12. Day is a numeric value from 1 to 31. The day of the week is a numeric value from 0 to 6 (Sunday to Saturday).
- Read variables must be integer-type variables.
- Once date is set using the SETDATE command in a model with a battery backup calendar IC (GC56LC or GC55EM), the date is updated even while the power is off. If a model with no calendar IC (GC53LC or GC53LM) is turned off, the date is initialized to January 1, 1998 (Thursday) and the time to 00:00:00 when it is turned on again. The date and time are updated while the power is on.

■ **Related Item**

DATE$, GETTIME, SETDATE, SETTIME, TIME$

■ **Example of Program**

```
conf
   GETDATE yr%, mt%, d%, dd%
   numdsp ..NUM000, yr%
   numdsp ..NUM001, mt%
   numdsp ..NUM002, d%
end conf
```

GETGID

Function

■ Function

The GETGID function obtains the ID of the local screen currently being displayed.

■ Format

GETGID()

■ Example of Use

VAR@ = GETGID()

■ Description

- The GETGID function obtains the ID of the local screen currently being displayed.
- This function cannot be used to obtain the ID of a global screen.

■ Related Item

GETGNO

■ Example of Program

```
evnt
    input type%, id@, data%
    if type% = 3 then
        VAR@ = GETGID()
        NO% = GETGNO(VAR@)
        00~D100 = NO%
    end if
end evnt
```

GETGNO

Function

■ Function

The GETGNO function obtains the registration number of the screen currently being displayed.

■ Format

GETGNO (screen-ID)

■ Example of Use

NO = GETGNO (ID@)

■ Description

- The GETGNO function obtains the registration number of the screen specified in screen-ID.
- screen-ID specifies a screen name or an ID-type variable.

■ Related Item

GETGID

■ Example of Program

```
evnt
   input type%, id@, data%
   if type% = 3 then
      VAR@ = GETGID()
      NO% = GETGNO(VAR@)
      00~D100 = NO%
   end if
end evnt
```

GETID

Function

■ Function

The GETID function obtains the value of the ID separate from the reference ID by offset.

■ Format

GETID (object-indicated-by-reference-ID, offset-value)

■ Example of Use

ID@ = GETID (VARID@, 10)

■ Description

- The GETID function obtains the ID-type value separate from the reference ID-type value by the specified offset value.
- object-indicated-by-reference-ID specifies an ID-type variable name, a screen name, a part name, a registration character string/graphic name, or a device name.
- offset-value is the integer or real value indicating the offset from the reference ID to the ID to be obtained. When 0 is specified in offset-value, the reference ID value is obtained.
- When 1 is specified in offset-value, the ID of the first element of a continuous-stage-type control is obtained.

■ Related Item

GETOFFSET

■ Example of Program

```
conf
   cyclic 00~d0001 * 30
end conf
evnt
   input ty%,id@,dat%
   offset = getoffset(00~d0001,id@)
     ...
     Error processing corresponding to the offset value, etc.
     ...
   id@ = getid (00~d0001,offset)
     ....
end evnt
```

GETOFFSET

Function

■ Function

The GETOFFSET function calculates the offset between the reference ID and specified ID.

■ Format

GETOFFSET (reference-ID, ID-to-be-specified)

■ Example of Use

OFFSET% = GETOFFSET (00˜D0001, ID@)

■ Description

- The GETOFFSET function calculates the offset indicating how long the specified ID is separate from the reference ID.
- reference-ID specifies the ID-type variable, screen name, part name, registration character string/graphic name, or device name used as the reference offset.
- ID-to-be-specified specifies the ID-type variable, screen name, part name, registration character string/graphic name, or device name used to calculate the offset.
- When the GETOFFSET function applies to the device declared in CYCLIC2, the offset value is a multiple of 2.

■ Related Item

GETID

■ Example of Program

```
conf
   cyclic 00˜d0001 * 30
end conf
evnt
   input ty%,id@,dat%
   offset = GETOFFSET(00˜d0001,id@)
     ...
     Error processing corresponding to the offset value, etc.
     ...
   id@ = getid (00˜d0001,offset)
     ....
end evnt
```

GETTIME

Statement

■ **Function**

The GETTIME statement obtains the data indicating time.

■ **Format**

GETTIME hour-read-variable, minute-read-variable, second-read-variable

■ **Example of Use**

GETTIME HOUR%, MIN%, SEC%

■ **Description**

- The GETTIME statement writes the current value (time) to hour-read-variable, minute-read-variable, and second-read-variable.
- Hour is a numeric value from 0 to 23. Minute is a numeric value from 0 to 59. Second is a numeric value from 0 to 59.
- Read variables must be integer-type variables.
- Once date is set using the SETDATE command in a model with a battery backup calendar IC (GC56LC or GC55EM), the date is updated even while the power is off. If a model with no calendar IC (GC53LC or GC53LM) is turned off, the date is initialized to January 1, 1998 (Thursday) and the time to 00:00:00 when it is turned on again. The date and time are updated while the power is on.

■ **Related Item**

DATE$, GETDATE, SETDATE, SETTIME, TIME$

■ **Example of Program**

```
conf
   GETTIME H%,M%,S%
   numdsp ..NUM000, H%
   numdsp ..NUM001, M%
   numdsp ..NUM002, S%
end conf
```

GLOBAL

Statement

■ **Function**

The GLOBAL statement declares that global variables are to be used.

■ **Format**

GLOBAL variable-name [, variable-name ...]

■ **Example of Use**

GLOBAL VAR, XYZ(2,3), MOJI$ * 20

■ **Description**

- The GLOBAL statement declares that global variables are to be used. Global variables can be read and written from all programs. Global variables must be declared before they are used in a program. These variables are initialized once when the power supply is turned on. The values of global variables used after the power supply has been turned on are retained.
- A normal variable, an array variable, or a character string variable can be written in variable-name.
- When an array or character variable is declared, the DIM and STRING statements need not be declared.
- Use the DIM or STRING statement to specify a non-global array and a character string type.

■ **Related Item**

AUTO, BACKUP, DIM, LOCAL, STATIC, STRING

■ **Example of Program**

```
conf
   GLOBAL var%, float
   GLOBAL moji$ * 50
   GLOBAL xyz@(10,10)
end conf
```

GOSUB

Statement

■ Function

The GOSUB statement executes the specified subroutine.

■ Format

GOSUB subroutine-name

■ Example of Use

GOSUB SUB001

■ Description

- Control is transferred to the subroutine specified after the GOSUB statement.
- Subroutine names written in the global screen and those in the program containing the GOSUB statement can be specified. Use the RETURN statement to return control.
- If the same name exists both in the global and local subroutines, the global subroutine is called.

■ Related Item

RETURN

■ Example of Program

```
evnt
   X = 10
   GOSUB SUB001
   numdsp ..NUM000, X
end evnt
SUB001:
   ab = X+3
   RETURN
```

GOTO

Statement

■ **Function**

The GOTO statement unconditionally moves control to the specified line.

■ **Format**

GOTO label-name

■ **Example of Use**

GOTO LABEL1

■ **Description**

The GOTO statement unconditionally moves control to the line specified by label-name. Execution is continued from the line to which control was moved.

■ **Related Item**

None

■ **Example of Program**

```
evnt
   if a = 1 then goto L1
   a = 3
 L1: numdsp ..NUM000 , a
end evnt
```

HEX$

Function

■ Function

The HEX$ function converts a decimal character string to a hexadecimal character string.

■ Format

HEX$ (numerical-expression)

■ Example of Use

HEX$ (123)

■ Description

- The HEX$ function converts a decimal character string to a hexadecimal character string.
- When a floating-point type is specified in numerical-expression, the decimal character string (numeric value) is converted to an integer type, then converted to a hexadecimal character string.
- Specify the decimal character string (numeric value) within the range from -2147483648 to 2147483647.

■ Related Item

OCT$, VAL

■ Example of Program

```
evnt
   input type , id@ , data
   moji$ = HEX$(data)
   strdsp ..STR000, moji$
end evnt
```

IF ... THEN ... ELSE

Statement

■ Function

Condition judgment is performed to select the next program to be executed.

■ Format

IF conditional expression THEN statement [ELSE statement]
IF conditional-expression THEN
    statement-list
[ELSEIF conditional-expression THEN
    statement-list]
[ELSE
    statement-list]
END IF

■ Example of Use

IF TYPE% = 1 THEN VALUE = 10

■ Description

- conditional-expression is the relational operation expression obtained when the operation result is true (other than 0) or false (0).
- When the operation result is true as a result of executing a conditional expression, the THEN and subsequent statements are executed. When the operation result is false, the ELSE and subsequent statements are executed.
- The ELSE, ELSEIF and subsequent statements can also be omitted.
- Up to 50 ELSEIF statements can be used in IF THEN...END IF.

■ Related Item

None

■ Example of Program

```
evnt
   if a = 2 then x = 3
   if x = 5 then
      a = 1
   elseif x = 6 then
      a = 2
   else
      a = 3
   end if
end evnt
```

INIT ... END INIT

Statement

■ Function

The INIT ... END INIT statement declares an area of an initialization block.

■ Format

INIT
.....
....
END INIT

■ Example of Use

INIT
static VAR\%
END INIT

■ Description

- An initialization block written in a screen program or part program is executed first only once when the program including the block is executed.
- Write processing which should be executed first only once such as initialization or the like.

■ Related Item

CONF .... END CONF,EVNT .... END EVNT

■ Example of Program

```
INIT
   global moji$
   moji$="initial value"
END INIT
```

INP

Function

■ **Function**

The INP function reads 2-byte data from the specified parallel I/O port.

■ **Format**

INP (port-number)

■ **Example of Use**

VAR = INP (0)

■ **Description**

- The INP function reads data from the specified parallel I/O port.
- The port-number to be specified depends on the option board inserted into the option bus. A numeric value from 0 to 3 can be specified in port-number.

■ **Related Item**

OUT

■ **Example of Program**

```
evnt
   var% = inp (0)
   if (var% and 1) = 1 then var% = 0
   OUT 0,var%
end evnt
```

INPBIT

Function

■ Function

The INPBIT function reads the specified BIT number from the specified input port.

■ Format

INPBIT (port-number, BIT-number)

■ Example of Use

DATA% = INPBIT (0,10)

■ Description

- The INPBIT function reads the specified BIT number from the specified input port.
- Specify port-number and BIT-number with an integer value relative to 0.
- The lowest-order bit number of the parallel IO is 0 and the next lowest-order bit number is 1. That is, the BIT number is sequentially incremented.
- If an unexisting port or BIT number is specified, 0 is returned.

■ Related Item

INP, OUT, OUTBIT, OUTBITSTAT, OUTSTAT

■ Example of Program

```
evnt
   data% = INPBIT(0,3)
   if data% = 0 then
      outbit 0,3,1
   endif
end evnt
```

INPUT

Statement

■ Function

The INPUT statement reads the data transmitted to a screen or part into the specified variable(s).

■ Format

INPUT variable-name [, variable-name] .....

■ Example of Use

INPUT V1, ID@, DATA

■ Description

- The INPUT statement reads the data transmitted to a screen or part.
- The integer value indicating the type of the sender that transmitted data is set in the first variable-name. The value indicating the ID of the sender is set in the second variable-name, which is followed by data.

Sender	Type	ID	Contents of data
Screen	1	Optional	Item written in the PRINT statement
Part	2		Item written in the PRINT statement
Switch (single)	1		1 when ON, 0 when OFF
Switch (multi)			Switch number: 1 when ON, 0 when OFF
Selector switch			Number of activated switch
Timer	4		Value indicating the ON (1) or OFF (0) status
Alarm	5		Value indicating the ON (1) status
Parallel port	6		BIT number, BIT value, or channel number satisfying the condition
Non-procedual	7		The port number, status, and number of received bytes are set in this order.
Sampling	9	Control	Sampled data
PLC	16		Integer value indicating the device value
Bar code reader	18		Bar code value
Magnetic card	19		
Ten-key pad	20		Code of pressed key
Memory card	21		
Host	22		Optional data to be determined by the user

bytes written to the reception buffer). For the text mode, a terminator code is also read. (When the status is 1 or -1, the number of received data is read.)

- The numbers of multi-switches and selector switches are counted as 1, 2, 3 and so forth from the upper left switch. When all switches are counted in the X direction, the switches on the lower Y line are counted in the same way. They are integers.

■ Related Item

PRINT, CYCLIC, OPENPARALLEL, OPENCOM, OPENSIO

■ Example of Program

```
conf
  global  buffer$
   opensio 2 , 0, buffer$
   setsio  2, 10
end conf
evnt
   input type, id@, port%, status%, bytes%
   if type = 7 then
     moji$ = left(buffer$, bytes% - 1)
     strdsp ..STR000 , moji$
   end if
end evnt
```

INSTR

Function

■ Function

The INSTR function retrieves character strings to find the specified character string. When the specified character string is found, the function notifies the system of the start position of the character string.

■ Format

INSTR (start-position, character-strings-to-be-retrieved, character-string-to-be-found)

■ Example of Use

A = INSTR (10. MOJI1$, MOJI2$)

■ Description

- The INSTR function retrieves the character strings specified in character-strings-to-be-retrieved to find the character string specified in character-string-to-be-found. This retrieval starts at the start position specified in start-position. When the specified character string is found, the function notifies the system of the position in a number of bytes relative to the beginning of the character strings to be retrieved. If the specified character string is not found, 0 is set.
- start-position is 1 when retrieval starts at the beginning of character strings.
- Character string variables, direct character strings, registration character string names, and registration character string numbers can be specified in character-strings-to-be-retrieved.

■ Related Item

None

■ Example of Program

```
evnt
   a$ = “this is oip.”
   p = instr (1, a$, “company”)      ’  When a character string variable is
specified
   p = instr (1, num,”ab”)           ’  When a registration character
string number
end evnt                                        is specified
```

INT

Function

■ Function

The INT function omits the fraction of the value specified in numerical-expression to create an integer.

■ Format

INT (numerical-expression)

■ Example of Use

A = INT (30.1)

■ Description

- The INT function omits the fraction of the numerical-expression enclosed in parentheses in the negative direction.
- The INT function calculates the maximum integer that does not exceed the value specified in numerical-expression when omitting the decimal point.
- When the value specified in numerical-expression is negative, the INT function omits the figures below the decimal point as follows:
  INT (1.4) → 1
  INT (-1.4) → -2

■ Related Item

CINT

■ Example of Program

```
evnt
   input type%, id@, data
   intvar% = INT ( data )
   numdsp ..NUM000, intvar%
end evnt
```

INTERLOCK

Statement

■ Function

The INTERLOCK statement controls transition to the system mode screen.

■ Format

INTERLOCK mode

■ Example of Use

INTERLOCK 1

■ Description

- When mode is 1, the INTERLOCK statement sets the interlock to ON. When 0, the INTERLOCK statement sets the interlock to OFF.
- When the interlock is ON, the system mode screen is not displayed even if two dots on a diagonal line are pressed. When power is ON, the system mode screen is not displayed even if the upper left edge on the screen is pressed.
- When lock is activated, it must be reset by a program. Make a program so that it resets lock securely.
- A mode specified using the INTERLOCK command in a model with a battery backup calendar IC (GC56LC or GC55EM) is maintained even while the power is off. A mode specified using the INTERLOCK command in a model with no calendar IC (GC53LC or GC53LM) is lost when the power is turned off. Therefore, a mode must be specified in a program which is always executed when the power is turned on.

■ Related Item

None

■ Example of Program

```
conf
   INTERCLOCK 1
   end conf
evnt
   input tp%,id@,dat%
   if id@ = ..sw the interlock 0
   .....
end evnt
```

IOCTL

Statement

■ **Function**

The IOCTL statement controls the I/O device connected to the OIP.

■ **Format**

IOCTL I/O-type, mode

■ **Example of Use**

IOCTL 0, 0

■ **Description**

- Write the integer value indicating the I/O device to be controlled in I/O-type. Currently, the type of I/O device that can be controlled are the PLC, switch, and non-procedure transmission buffer.
- mode is the integer value indicating how the I/O device is controlled.
- When controlling the PLC, specify one of the following values indicating how the PLC is controlled in mode. The value used to determine the IO type is 0.
  - 0: The PLC is write- and read-enabled.
  - 1: The PLC is write-inhibited.
  - – If write is executed when the PLC is write-inhibited, an error will occur.
- Switches are controlled as follows: The value used to determine the IO type is &H60.
  - – When switches are simultaneously pressed, the number of switches to be assumed ON can be controlled.
  - – Specify the number of switches that can be simultaneously recognized in mode with a numeric value from 0 to 640.
  - – Specifying 0 inhibits switch input. The switch cannot be used in this case. Thus, be sure to make a program in another way so that it resets prohibition of turning on the switch.
  - – The number of switches specified using this command in a model with a battery backup calendar IC (GC56LC or GC55EM) is maintained even while the power is off. The number of switches specified using this command in a model with no calendar IC (GC53LC or GC53LM) is lost when the power is turned off. Therefore, the number of switches must be specified in a program which is always executed when the power is turned on.
- A non-procedure type send buffer is cleared as shown below. The value for deciding the I/O type is &H41.
  - - Specify a port (CH1 to CH3) for clearing the send buffer in "mode". Input a number between 1 and 3.

■ **Related Item**

IOSTAT

■ Example of Program

```
evnt
   input ty%,id@,dat%
   if id@ = ..sw1 and dat% = 1 then
      ioctl 0,0
   else
      ioctl 0,1
   endif
end evnt
```

IOCTL2

Statement

■ Function

The IOCTL2 statement controls PLC cyclic communication.

■ Format

IOCTL2 device-name, code, data

■ Example of Use

IOCTL2 00˜D10, 0, 0

■ Description

- Executing the IOCTL2 statement executes the cyclic communication specified by device-name. The cyclic communication to be specified by device-name must be declared in the CYCLIC or CYCLIC2 statement in advance.
- Set 0 in code and data.

■ Related Item

None

■ Example of Program

```
conf
   cyclic 00˜D10
end conf
evnt
   input ty%,id@,dat%
   if id@ = ..sw1 then
      00˜D11 = 1
      ioctl2 00˜D10 ,0 ,0
   endif
end evnt
```

IOSTAT

Function

■ Function

The IOSTAT function reads the status of the I/O device connected to the OIP.

■ Format

IOSTAT (I/O-type)

■ Example of Use

IOSTAT (0)

■ Description

- Write the integer value indicating the I/O device whose status is to be read in I/O-type. Currently, the type of I/O device that can be controlled are the PLC and switch.
- To read the PLC status, specify 0 in I/O-type.
  - 0: The PLC is write- and read-enabled.
  - 1: The PLC is write-inhibited.
- To read the switch status, specify &H60 in I/O-type.
  - – The number of switches that can be recognized when they are pressed simultaneously is returned (0 to 640).

■ Related Item

IOCTL

■ Example of Program

```
evnt
   input ty%,id@,dat%
   if id@ = ..sw1 then
      if iostat(0) then
         ioctl 0,0
      else
         ioctl 0,1
      end if
   endif
end evnt
```

JUMP

Statement

■ Function

The JUMP statement displays the specified screen.

■ Format

JUMP screen-name

■ Example of Use

JUMP 10

■ Description

- The JUMP statement displays the screen specified in screen-name.
- screen-name is the name of the screen to be displayed or the ID-type variable indicating the screen to be displayed. Alternatively, screen-name specifies the screen number stored in screen registration.
- When this statement is executed, the subsequently coded program is not executed.
- If a non-extant screen is specified, a system error occurs.

■ Related Item

None

■ Example of Program

```
evnt
   input type , id@ , data
   if type = 3 and id@ = ..SWT000 then
      JUMP GAMEN..
   end if
end evnt
```

KILL

Statement

■ Function

The KILL statement deletes the specified file.

■ Format

KILL file-name

■ Example of Use

KILL “C:ABC.DOC”

■ Description

- The KILL statement deletes the file specified by file-name.
- A wild card (*) can be specified in file-name.

■ Related Item

■ Example of Program

```
conf
end conf

evnt
   .......
   KILL ''ABC.*''
   .......
end evnt
```

LAMPCOLOR

Statement

■ Function

The LAMPCOLOR statement changes the ON display color of the lamp display.

■ Format

LAMPCOLOR display-name, color-number

■ Example of Use

LAMPCOLOR .BUHIN.GRAPH, 5

■ Description

The LAMPCOLOR statement changes the ON display color of the lamp display.

- display-name is the name of lamp display or the ID-type variable indicating the lamp display.
- color-number indicates the color displayed when the lamp display is ON. Specify this color number with a numeric value from 0 to 15.

■ Related Item

LAMPDSP

■ Example of Program

```
conf
   lampdsp .buhin.gpaph , 0
   LAMPCOLOR .buhin.gpaph , 7
   lampdsp .buhin.gpaph , 1
end conf
```

LAMPDSP

Statement

■ Function

The LAMPDSP statement indicates whether the lamp display is ON or OFF.

■ Format

LAMPDSP control-name, lamp-mode

■ Example of Use

LAMPDSP .BUHIN.GRAPH, 1

■ Description

The LAMPDSP statement indicates whether the lamp display is ON or OFF.

- control-name is the name of lamp display or the ID-type variable indicating the lamp display.
- lamp-mode indicates whether the lamp display is ON or OFF. When lamp-mode is 0, the lamp display is OFF. When 1, the lamp display is ON.
- display-value cannot be changed even if this statement is issued to the control for which operation parameters are set to “effective” in the control.

■ Related Item

LAMPCOLOR

■ Example of Program

```
evnt
   input type,id@,data
   var@ = .buhin.graph
   LAMPDSP  var@ , data
end evnt
```

LEFT$

Function

■ Function

The LEFT$ function returns a character string the specified number of characters, starting from the left of the specified character string.

■ Format

LEFT$ (character-string, number-of-characters)
LEFT$ (registered-character-string-number, number-of-characters)
LEFT$ (registered-character-string-name, number-of-characters)

■ Example of Use

A$ = LEFT$ (MOJI$, 5)
A$ = LEFT$ (4, 10)
A$ = LEFT$ (TOROKU, 8)

■ Description

- The LEFT$ function returns a character string the number of bytes specified in number-of-characters, starting from the left of the specified character string.
- number-of-characters specifies the number of bytes of the character string to be fetched with a numeric value from 0 to 255. When number-of-characters is 0, a null character string is returned.
- character-string is a direct character string or a character string variable.
- registered-character-string-number is the numerical expression indicating the number registered by GCSGP3.
- registered-character-string-name is the name of the character string created by GCSGP3 or the ID-type variable indicating the name of the character string.

■ Related Item

MID$, RIGHT$

■ Example of Program

```
evnt
  b$ = "12345678"
  a$ = LEFT$(b$ , 3)
  c$ = LEFT$ (no , 3)
  c$ = LEFT$ (id@ , 4)
end evnt
```

LEN

Function

■ Function

The LEN function returns the length of the specified character string in a number of bytes.

■ Format

LEN (character-string)
LEN (registered-character-string-number)
LEN (registered-character-string-name)

■ Example of Use

A = LEN (B$)
A = LEN (MOJI)

■ Description

- The LEN function returns the length of the character string specified by character-string, registered-character-string-number, or registered-character-string-name in a number of bytes.
- character-string is a direct character string or a character string variable.
- registered-character-string-number is the numerical expression indicating the number registered by GCSGP3.
- registered-character-string-name is the name of the character string created by GCSGP3 or the ID-type variable indicating the name of the character string.

■ Related Item

None

■ Example of Program

```
conf
   a = len (b$)
   a = len (“abcdefg”)
   a = len ( toroku )
   a = le  (1)
end conf
```

LINE

Statement

■ Function

The LINE statement draws a straight line on a screen.

■ Format

LINE X1, Y1, X2, Y2

■ Example of Use

LINE 20,30,100,200

■ Description

The LINE statement draws a straight line between the specified two coordinates ((X1,Y1) and (X2,Y2)).

- X1 and X2 must be a numeric value from 0 to 639. Y1 and Y2 must be a numeric value from 0 to 399 (GC55EM) or 0 to 479 (GC56LC).
- A straight line is directly displayed as the background of a screen. When a part is opened or closed in the area where a straight line was displayed or when a primitive is displayed, the straight line may be cleared. The cleared straight line is not redisplayed.
- The type and color of the straight line are specified by COLOR.
- If this is used in an initialization block or configuration block, drawing is executed after executing this block and accordingly lines are not drawn.
  Be sure to use this in an event block.

■ Related Item

COLOR

■ Example of Program

```
conf
   color 1 , 0 , 3
end conf
evnt
....
   dot 100,200
   dot 100,300
   color 1 , 0 , 0
   line 100,200,100,300
....
end evnt
```

LINPUT

Statement

■ **Function**

The LINPUT statement reads data from the specified file.

■ **Format**

LINPUT file-number, character-string-variable

■ **Example of Use**

LINPUT 12, STRING$

■ **Description**

- The LINPUT statement reads data from the file specified by file-number into the character string defined by character-string-variable.
- The data between the current file position and carriage return (CR) or line feed (LF) is assigned to character-string-variable. (CR and LF, however, are not assigned.)
- file-number must match the number of the file opened by the FOPEN statement.

■ **Related Item**

FOPEN, FCLOSE, FPRINT, FWRITE, FINPUT

■ **Example of Program**

```
conf
   fopen  ``C:TEST'', 2 , 5
end conf
evnt
   AAA$ = ``12345''
   fwrite 5, AAA$, ``ABCD''
   fseek(5, 0, 0)
   linput 5, VSTR$
end evnt
```

The file is written as follows:

```
``12345'',''ABCD'' CR/LF
```

When data is read, the variables change as follows:

```
VSTR$   ``12345'',''ABCD''
```

LNECOLOR

Statement

■ Function

The LNECOLOR statement changes the line colors and figure of the line chart display.

■ Format

LNECOLOR control-name, line-number, line-type, line-color, tile, display-color, background-color

■ Example of Use

LNECOLOR ..LNE000, 1, 2, 1, 4, 5, 2

■ Description

- The LNECOLOR statement changes the line colors and figure of the line chart display and the background tile and color of the entire display.
- control-name is the name of a line chart or the ID-type variable indicating the chart.
- line-number is the integer value indicating the number of the line to be changed. The line number starts at 1.
- line-type is the numeric value indicating the type of the line. Specify this line type with a numeric value from 0 to 3.
- tile indicates the tiling figure of the bar. Specify this tiling figure with a numeric value from 0 to 15.
- display-color is the numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is the numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

LNEDSP, LNESHIFT

■ Example of Program

```
conf
   static name@
   name@ = ..LNE000
end conf
evnt
   input type%, id@, data%
   if type% = 3 then
      LNECOLOR name@, 2, 3, 1, 4, 5, 2
   endif
end evnt
```

LNEDSP

Statement

■ Function

The LNEDSP statement displays data in the line chart display.

■ Format

LNEDSP control-name, line-number, point-number, display-data

■ Example of Use

LNEDSP .BUHIN.GRAPH, 2, 2, 30.0

■ Description

- The LNEDSP statement displays line data in the line chart display.
- control-name is the name of a line chart or the ID-type variable indicating the chart.
- line-number is the value indicating the line number in the line chart to be displayed. The line number starts at 1.
- point-number specifies the data point to be changed in the line chart; it is the integer-type value starting at 1. The maximum point value depends on what line chart is placed.
- display-value is the numeric data indicating the size of the specified line chart point.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

LNECOLOR, LNESHIFT

■ Example of Program

```
conf
   static name@
   name@ = ..LNE000
end conf
evnt
   input type%, id@, data%
   lnedsp name@, 2, 2, data%
end evnt
```

LNESET

Statement

■ **Function**

The LNESET statement sets data in the line chart display.

■ **Format**

LNESET control-name, line-number, point-number, display-data

■ **Example of Use**

LNESET .BUHIN.GRAPH 2, 4, 30.0

■ **Description**

- The LNESET statement sets the data to be displayed in the line chart display. The speed of executing the PRDSP (display) statement after setting data in two or more points is faster than that of modifying all the line point values after executing the LNEDSP statement.
- control-name is the name of the line chart display or the ID-type variable indicating the line chart display.
- line-number specifies which line data is to be displayed when two or more lines are displayed in one line chart display. This line number is the integer value data starting at 1.
- point-number specifies which point value on the specified line is to be changed. This point number is the integer value data starting at 1.
- display-data is the numeric data indicating the size of the line chart.

■ **Related item**

LNEDSP, PRDSP

■ **Example of Program**

```
evnt
   lneset  .buhin.graph , 3 , 8 , 20.1
   var@ = .buhin.graph
   no = 4
   value = 23
   point = 4
   LNESET  var@ , no , point, value
   prdsp var@
end evnt
```

LNESHIFT

Statement

■ Function

The LNESHIFT statement shifts the display data of a line chart left or right.

■ Format

LNESHIFT (cotrol-name, line-number, shift-direction, display-data)

■ Example of Use

A = LNESHIFT (..LNE000, 1, 1, 30)

■ Description

- The LNESHIFT statement is a function that shifts each of the points constituting the line chart in the line chart display left or right by one point and displays the points.
- When this statement is executed, the values of the points purged from the line chart are returned as a result of the shifting.
- control-name is the line chart name or the ID-type variable indicating the line chart.
- line-number is the value indicating which line in the line chart display is to be shifted. This line number starts at 1.
- When shift-direction is 1, line chart data is shifted left and above. When shift-direction is -1, line chart data is shifted right and below.
- display-data indicates the data to be displayed in the vacant area produced as a result of the shifting.

■ Related Item

LNEDSP, LNECOLOR, LNESHIFT2

■ Example of Program

```
evnt
   input type%, id@, data%
   if data% > 0 then
      abc% = lneshift ( ..LNE000, 1, 1, 0)
   else
      abc% = lneshift ( ..LNE000, 1, -1, 100)
   endif
end evnt
```

LNESHIFT2

Statement

■ **Function**

The LNESHIFT2 statement shifts the display data of a line chart left or right.

■ **Format**

LNESHIFT2 (control-name, line-number, shift-direction, display-data)

■ **Example of Use**

A = LNESHIFT2 (..LNE000, 1, 1, 30)

■ **Description**

- Different from the LNESHIFT statement, the LNESHIFT2 statement shifts line chart data but does not display it. To display line chart data, execute the PRDSP statement.
- The LINESHIFT2 statement is a function that shifts each of the points constituting the line chart in the line chart display left or right by one point.
- When this statement is executed, the values of the points purged from the line chart are returned as a result of the shifting.
- control-name is the line chart name or the ID-type variable indicating the line chart.
- line-number is the value indicating which line in the line chart display is to be shifted. This line number starts at 1.
- When shift-direction is 1, line chart data is shifted left and above. When shift-direction is -1, line chart data is shifted right and below.
- display-data indicates the data to be displayed in the vacant area produced as a result of the shifting.

■ **Related Item**

LNEDSP, LNECOLOR, LNESHIFT, PRDSP

■ **Example of Program**

```
evnt
   input type%, id@ data%
   if data% > 0 then
      abc% = lneshift2 ( ..LNE000, 1, 1, 0)
   else
      abc% = lneshift2 ( ..LNE000, 1, -1, 100)
   endif
   prdsp ..LNE000
end evnt
```

LOCAL

Statement

■ Function

The LOCAL statement defines a local variable.

■ Format

LOCAL variable name [, variable name ...]

■ Example of Use

LOCAL VAR , XYZ(2,3) , MOJI$ * 20

■ Description

- The LOCAL statement defines a variable defined in "variable name" as a local variable.
- A local variable can be read and written only in a program where it is declared. The compiler gives a warning if an undefined local variable is used. Each local variable is initialized every time the block is executed.
- A variable name can be specified in a normal variable, arrangement variable or character string variable.
- DIM declaration or STRING declaration is not needed to declare an arrangement variable or character variable.
- The LOCAL statement is one of the new features of Screen Creator 5 added for distinctive declaration of local variables.
- DIM can substitute for LOCAL. However, use LOCAL as far as possible in Screen Creator 5.
- STRING can be used, instead of LOCAL, to specify a size of a character string variable. However, use LOCAL as far as possible in Screen Creator 5.

■ Related Item

AUTO,BACKUP,DIM,FUNCTION,GLOBAL,STATIC,STRING

■ Example of Program

```
conf
  global float(5)
  LOCAL i%
  for i% = 0 to 5
    float(i%) = i%*3
  next
end conf
```

LOCALCHECK

Statement

■ Function

The LOCALCHECK statement controls the level of warning messages output by the compiler.

■ Format

LOCALCHECK warning level

■ Example of Use

LOCALCHECK 1

■ Description

- The LOCALCHECK statement specifies whether or not to output a warning if local and global variables, functions and/or subroutines are used vaguely in a program.
- Two warning levels are available as shown below:
  1: A warning is output.
  0: No warning is output.
- Three types of warnings are available as shown below:
  (1) If a variable not declared is used in a program
  In this case, the compiler regards such a variable as a local variable. It regards such a variable as a global variable in a global screen program.
  (2) If global and local variable names or subroutine names are duplicate
  In this case, such variables or subroutines are regarded as global variables or subroutines.
  (3) If two or more global, local and/or library function names are duplicate
  In this case, the priority is given to a library function, if any. If no library functions are used, the functions are regarded as global functions.
- The warning level is set to 0 unless the LOCALCHECK statement is written.
- The warning level is changed from the position where the LOCALCHECK statement is written in the program.
- The LOCALCHECK statement is one of the new features of Screen Creator 5.

■ Related Item

BACKUP,DECLARE,DIM,FUNCTION,GLOBAL,LOCAL

■ Example of Program

```
conf
   local newvar3$
   newvar1$ = "no warning"
   LOCALCHECK 1
   newvar2$ = "warning is given!"
   newvar3$ = "no warning"
end conf
```

LOF

Function

■ Function

The LOF function calculates the size of the specified file.

■ Format

LOF (file-number)

■ Example of Use

AAA = LOF (file-number)

■ Description

- file-number specifies the number of the file whose size is to be calculated. This file number must match the number of the file opened by the FOPEN statement.
- The size of the specified file is calculated in bytes.

■ Related Item

FOPEN, FIELD, FCLOSE, FPUT, FGET, EOF

■ Example of Program

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   global sum%
   fopen  ‘‘MEMORY’’, 2 , 5
   ......
end conf
evnt
   no% = 1
   moji1$ = ‘‘product-name’’
   moji2$ = ‘‘product-number’’
   fput 5 , 3
   if  LOF(5) > 100 then
       fclose 5
   end if
end evnt
```

LOG

Function

■ Function

The LOG function calculates the natural logarithm specified in numerical-expression.

■ Format

LOG (numerical-expression)

■ Example of Use

A = LOG (B*C)

■ Description

- numerical-expression must be a numeric value greater than 0.

■ Related Item

EXP

■ Example of Program

```
conf
  la = log ( 10 )
  lb = log ( a * b )
end conf
```

MCPY

Statement

■ Function

The MCPY statement copies the contents of a field to a character string variable.

■ Format

1:MCPY file-number, character-string-variable
2:MCPY character-string-variable, file-number

■ Example of Use

MCPY 5, moji$

■ Description

- The MCPY statement copies the contents of the variable group in a field to a character string variable or the contents of a character string variable to the variable group in a field. That is, the MCPY statement in the first example (1:MCPY) copies the contents of the character string variable to the variable group in the field specified by file-number. The MCPY statement in the second example (2:MCPY) copies the contents of the variable group in the specified field to the character string variable.
- file-number specifies the file number defined in the FIELD declaration.
- When the contents of the variable group or character string variable are copied, the size is used, whichever is smaller.

■ Related Item

FOPEN, FIELD, FCLOSE, FPUT, FGET, EOF, SOF

■ Example of Program

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   global buff$ * 50
   opensio 1 , 0 , buff$
   fopen  ‘‘MEMORY’’, 2 , 5
end conf
evnt
   no% = 1
   moji1$ = ‘‘product-name’’
   moji2$ = ‘‘product-number’’
   size% = sof(5)
   MCPY 5 , buff$
   writesiob 1 , size% , buff$
end evnt
```

MEDIACHK

Function

■ **Function**

The MEDIACHK function checks whether a medium exists in the drive and returns the check result.

■ **Format**

MEDIACHK (drive name)

■ **Example of Use**

STATUS\% = MEDIACHK("E:")

■ **Description**

- The return value is as shown below:
  - 0: No medium
  - 1: Medium exists.

■ **Related Item**

MEDIASIZE

■ **Example of Program**

```
conf
   global dname$(13)
   global dsel%
   strdsp ..str, "mediachk"
end conf
evnt
   input type%, id@, data%
   if data% = 1 then
      strdsp .dsp.str, dname$(dsel%)
      num% = mediachk(dname$(dsel%))
      if num% = 1 then
         strdsp ..str, "valid"
      else
         strdsp ..str, "invalid"
      end if
   end if
end evnt
```

MEDIASIZE

Function

■ **Function**

The MEDIASIZE function checks the size of a medium in the drive and returns the number of bytes.

■ **Format**

MEDIASIZE (drive name, calculation method)

■ **Example of Use**

SIZE% = MEDIASIZE("E:", 0)

■ **Description**

- The calculation method is as shown below:
  - 0: Full space
  - 1: Free space

  When the full space is specified, the medium size is calculated from the number of all clusters.

  When the free space is specified, free clusters are checked and the medium size is calculated from the total number of free clusters.

■ **Related Item**

MEDIACHK

■ **Example of Program**

```
conf
   global dname$(13)
   global dsel%
   static mode%
   mode% = 0
   strdsp ..str, "mediasize"
   numdsp ..num001, mode%
end conf
evnt
   input type%, id@, data%
   if data% = 1 then
      if mode% = 1 then
         mode% = 0
      else
         mode% = 1
      end if
      numdsp ..num001,mode%
      strdsp .dsp.str, dname$(dsel%)
      num% = mediasize(dname$(dsel%),mode%)
      numdsp ..num000,num%
   end if
end evnt
```

MID$

Statement

■ Function

The MID$ statement replaces part of a character string with another character string.

■ Format

MID$ (character-string-variable, start-position, number-of-characters) = replacing-character-string

■ Example of Use

MID$ (x$, 1, 1) = “A”

■ Description

- The MID$ statement replaces the character string specified in character-string-variable with the character string specified in replacing-character-string the specified number-of-characters (bytes), starting from the specified start-position.
- If the specified number-of-characters is greater than the specified character-string-variable, the character string is replaced only by the size of the variable. For this reason, the size of the character string variable remains unchanged even if the character string is replaced.
- The start position of the character string to be replaced starts at 1.
- When number-of-characters is negative and start-position is 0 or negative, an error occurs.

■ Related Item

LEFT$, RIGHT$, MID$

■ Example of Program

```
conf
   static moji$
   moji$ =”ABCDEFG”
end conf
evnt
   input type, id@, data$
   mid$(moji$, 4, 3) = data$
end evnt
```

MID$

Function

■ **Function**

The MID$ function returns a character string the specified number of characters.

■ **Format**

MID$ (character-string, start-position, number-of-character)
MID$
(registered-character-string-number, start-position, number-of-characters)
MID$
(registered-character-string-name, start-position, number-of-characters)

■ **Example of Use**

A$ = MID$ (X$, 2, 3)
A$ = MID$ (10, 2, 3)
A$ = MID$ (NAME, 2, 3)

■ **Description**

- The MID$ function fetches the specified number-of-characters (bytes) from the specified character-string, starting from the position specified in start-position.
- character-string is a direct character string or a character string variable.
- registered-character-string-number is the numerical expression indicating the number registered by GCSGP3.
- registered-character-string-name is the name of the character string created by GCSGP3 or the ID-type variable indicating the name of the character string.
- When number-of-characters is 0 or when start-position is greater than the number of bytes of the specified character string, a null character string is returned.

■ **Related Item**

LEFT$, RIGHT$

■ **Example of Program**

```
evnt
   input type,id@,data$
   a$ = mid$(data$ , 3 , 3)
   strdsp ..STR000,a$
end evnt
```

MKB

Statement

■ Function

The MKB statement stores data in any position of a character string variable.

■ Format

MKB character-string-variable-name, storage-position, integer-value

■ Example of Use

MKB MOJI$, 5, VAR

■ Description

- The MKB statement stores one low-order byte of integer-value in the position specified by storage-position, starting from the beginning of the specified character-string-variable-name.
- storage-position must be a integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- integer-value specifies an overwriting value; it must be an integer- or floating-point-type variable or constant. When specified in integer-value, a floating-point-type variable or constant is converted to an integer. One low-order byte of this value overwrites the specified character-string-variable-name.

■ Related Item

MKS, MKW, MKI, MKF, MKID, CVB, CVW, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
  org$ = ``1234567''
  strdsp ..STR000, org$
  MKB org$, 2, &H39
  strdsp ..STR001, org$
end evnt
```

MKDIR

Statement

■ **Function**

The MKDIR statement creates a directory.

■ **Format**

MKDIR directory-name

■ **Example of Use**

MKDIR “TEST”

■ **Description**

- The MKDIR statement is an instruction for creating a subdirectory.
- Specify the directory to be created with a character string constant or variable.
- The directory to be created can be specified in directory-name together with a drive name.

■ **Related Item**

RMDIR, CHDIR, DIR

■ **Example of Program**

```
conf
end conf
evnt
   ......
   MKDIR ``C:TEST''
   ......
end evnt
```

MKF

Statement

■ Function

The MKF statement stores data in any position of a character string variable.

■ Format

MKF character-string-variable-name, storage-position, real-value

■ Example of Use

MKF MOJI$, 5, VAR

■ Description

- The MKF statement stores fours bytes of real-value in the position specified by storage-position, starting from the beginning of the specified character-string-variable-name.
- storage-position must be a integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- real-value specifies an overwriting value; it must be an integer- or floating-point-type variable or constant. When specified in real-value, an integer-type variable or constant is converted to a real number. This value overwrites the specified character-string-variable-name.
- The value is converted into a 86 series boundary and saved.

■ Related Item

MKS, MKB, MKW, MKI, MKID, CVB, CVW, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ``1234567''
   strdsp ..STR000, org$
   MKF org$, 2, 1.23
   strdsp ..STR001, org$        ' The character string will not be displayed
end evnt                        ' correctly.
```

MKI

Statement

■ Function

The MKI statement stores data in any position of a character string variable.

■ Format

MKI character-string-variable-name, storage-position, integer-value

■ Example of Use

MKI MOJI$, 5, VAR

■ Description

- The MKI statement stores four bytes of integer-value in the position specified by storage-position, starting from the beginning of the specified character-string-variable-name.
- storage-position must be a integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- integer-value specifies an overwriting value; it must be an integer- or floating-point-type variable or constant. When specified in integer-value, a floating-point-type variable or constant is converted to an integer. This value overwrites the specified character-string-variable-name.
- The value is converted into a 86 series boundary and saved.

■ Related Item

MKS, MKB, MKW, MKF, MKID, CVB, CVW, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ‘‘1234567’’
   strdsp ..STR000, org$
   MKI org$, 2, &H39404142
   strdsp ..STR001, org$
end evnt
```

MKID

Statement

■ Function

The MKID statement stores data in any position of a character string variable.

■ Format

MKID character-string-variable-name, storage-position, ID-value

■ Example of Use

MKID MOJI$, 5, VAR

■ Description

- The MKID statement stores six bytes of ID-value in the position specified by storage-position, starting from the beginning of the specified character-string-variable-name.
- storage-position must be a integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- ID-value specifies an overwriting value; it must be an ID-type variable or constant. If an integer or constant of non-ID type is specified, an error occurs. This value overwrites the specified character-string-variable- name.
- The value is converted into a 86 series boundary (by 2 bytes) and then saved.

■ Related Item

MKS, MKB, MKW, MKI, MKF, CVB, CVW, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   input type%, id@, data%
   org$ = ‘‘1234567’’
   strdsp ..STR000, org$
   MKF org$, 2, id@
   strdsp ..STR001, org$        ’ The character string will not be displayed
end evnt                        ’ correctly.
```

MKS

Statement

■ Function

The MKS statement stores data in any position of a character string variable.

■ Format

MKS character-string-variable-name, storage-position, character-string

■ Example of Use

MKS MOJI$, 5, “ABCD”

■ Description

- The MKS statement stores a character string (character-string) in the position specified by storage-position, starting from the beginning of the specified character-string-variable-name.
- storage-position must be a integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- character-string specifies an overwriting character string; it must be a variable or constant.

■ Related Item

MKB, MKW, MKI, MKF, MKID, CVB, CVW, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ``1234567''
   strdsp ..STR000, org$
   MKS org$, 2, ``76543''
   strdsp ..STR001, org$
end evnt
```

MKW

Statement

■ Function

The MKW statement stores data in any position of a character string variable.

■ Format

MKW character-string-variable-name, storage-position, integer-value

■ Example of Use

MKW MOJI$, 5, VAR

■ Description

- The MKW statement stores two bytes of integer-value in the position specified by storage-position, starting from the beginning of the specified character-string-variable-name.
- storage-position must be an integer- or floating-point-type variable or constant. 1 specifies the beginning of the character string variable.
- integer-value specifies an overwriting value; it must be an integer- or floating-point-type variable or constant. When specified in integer-value, a floating-point-type variable or constant is converted to an integer. The two low-order bytes of this value overwrites the specified character-string-variable- name.
- The value is converted into a 86 series boundary and saved.

■ Related Item

MKS, MKB, MKI, MKF, MKID, CVB, CVW, CVI, CVF, CVID

■ Example of Program

```
conf

end conf
evnt
   org$ = ``1234567''
   strdsp ..STR000, org$
   MKW org$, 2, &H3940
   strdsp ..STR001, org$
end evnt
```

MOVE

Statement

■ Function

The MOVE statement moves the specified part.

■ Format

MOVE part-name, X-direction-move-quantity, Y-direction-move-quantity, move-method

■ Example of Use

MOVE .BUHIN., 100, 20, 0

■ Description

- part-name is the name of the part to be moved or the ID-type variable indicating the part to be moved.
- X-direction-move-quantity and Y-direction-move-quantity are the values indicating the distance in which the part is moved. When the upper left end on the display screen is (0,0), the coordinates in the right direction are X coordinates and those in the downward direction are Y coordinates. The move unit is specified in dots. X must be a numeric value from 0 to 639. Y must be a numeric value from 0 to 399 (GC55EM) or 0 to 479 (GC56LC).
- For absolute move, move-method is 0. For relative move, move-method is 1. Absolute move is referenced to the upper left end on the display screen. Relative move is referenced to the position of the current part.

■ Related Item

None

■ Example of Program

```
evnt
   input type,id@,data
   if type = 3 then
      buhin@ = .buhin2.
      MOVE buhin@ , 10 , 10 , 0
   endif
end evnt
```

MTRCOLOR

Statement

■ **Function**

The MTRCOLOR statement changes the needle color of the meter display.

■ **Format**

MTRCOLOR display-name, color-number

■ **Example of Use**

MTRCOLOR ..MTR000, 1

■ **Description**

- The MTRCOLOR statement changes the needle color of the meter display.
- control-name is the meter display name or the ID-type variable indicating the meter display.
- color-number is the number indicating the needle color. Specify this color number with a numeric value from 0 to 15.

■ **Related Item**

MTRDSP

■ **Example of Program**

```
evnt
  input type%, id@,  mcolor%
  MTRCOLOR ..MTR000, mcolor%
end evnt
```

MTRDSP

Statement

■ Function

The MTRDSP statement displays data in the meter display.

■ Format

MTRDSP control-name, display-data

■ Example of Use

MTRDSP .BUHIN.GRAPH, 30.0

■ Description

- The MTRDSP statement displays data (value) in the meter display.
- control-name is the meter display name or the ID-type variable indicating the meter display.
- display-data is the numeric data to be displayed in the meter display.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to "effective" in the primitive.

■ Related Item

MTRCOLOR

■ Example of Program

```
conf
   static name@
   name@ = ..MTR000
end conf
evnt
   input type%, id@, data%
   MTRDSP name@, data%
end evnt
```

NUMCOLOR

Statement

■ Function

The NUMCOLOR statement changes the colors and background figure of the numeric display.

■ Format

NUMCOLOR control-name, numeric-value-display-color, tile, display-color, background-color

■ Example of Use

NUMCOLOR ..GRAPH, 1, 2, 5, 2

■ Description

- The NUMCOLOR statement changes the display and background colors and tile in the numeric display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the numeric display name or the ID-type variable indicating the numeric display.
- numeric-value-display-color is the numeric value indicating the color number of the numeric value display section. Specify this color number with a numeric value from 0 to 15.
- tile indicates the tiling figure. Specify this tiling figure with a numeric value from 0 to 15.
- display-color is the numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is the numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

NUMDSP, NUMFORM

■ Example of Program

```
conf
   static name@
   name@ = ..NUM000
end conf
evnt
   input type%, id@, data%
   if type% = 3 then
      NUMCOLOR name@, 2, -1,-1,-1
   endif
end evnt
```

NUMDSP

Statement

■ Function

The NUMDSP statement displays data in the numeric display.

■ Format

NUMDSP control-name, display-data

■ Example of Use

NUMDSP .BUHIN.GRAPH, 30.0

■ Description

- The NUMDSP statement displays data (value) in the numeric display.
- control-name is the numeric display name or the ID-type variable indicating the numeric display.
- display-data is the numeric data to be displayed in the numeric display.
- Specifying a primitive name in display-name when the numeric display is of continuous stage type enables the same data to be displayed for all the elements. When setting a value for each element, use the *GETID* function to obtain the control ID and specify this ID in control-name.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to "effective" in the control.

■ Related Item

NUMCOLOR, NUMFORM

■ Example of Program

```
conf
   static name@
   name@ = ..NUM000
end conf
evnt
   input type%, id@, data%
   NUMDSP name@, data%
end evnt
```

NUMFORM

Statement

■ **Function**

The NUMFORM statement changes the display format of the numeric display.

■ **Format**

NUMFORM control-name, display-method, decimal-point-position

■ **Example of Use**

NUMFORM ..HYOJIKI, 0, 0

■ **Description**

- The NUMFORM statement changes the display method of the numeric display. This statement can also specify a display method and a decimal-point display position.
- control-name is the numeric display name or the ID-type variable indicating the numeric display.
- display-method is the numeric value indicating any of the following seven display methods:
  - 0: Floating-point display method
  - 1: Integer display method
  - 2: Fixed-point display method
  - 3: Binary fixed-point representation
  - 4: Binary representation
  - 5: Octal representation
  - 6: Hexadecimal representation
- decimal-point-position specifies where the decimal point is displayed when display-method is 2 (fixed-point display method). To display the decimal point in the first position from the right, specify 1. To display it in the second position from the right, specify 2.
- Binary fixed-point representation is the method for writing a decimal point in the specified integer data position.
- Be sure to execute the NUMDSP statement after executing this statement. Otherwise, display may be disordered.

■ **Related Item**

NUMCOLOR, NUMDSP

■ **Example of Program**

```
evnt
   input type , id@,data
   var@ = .buhin.gamen
   NUMFORM var@ , data , 2
   numdsp  var@ , 30.1
end evnt
```

OCT$

Function

■ Function

The OCT$ function converts a decimal character string to an octal character string.

■ Format

OCT$ (numerical-expression)

■ Example of Use

OCT$ (134)

■ Description

- The OCT$ function converts a decimal character string to an octal character string.
- When a floating-point type is specified in numerical-expression, the decimal character string (numeric value) is converted to an integer type, then converted to an octal character string.
- Specify the decimal character string (numeric value) within the range from -2147483648 to 2147483647.

■ Related Item

HEX$, VAL

■ Example of Program

```
evnt
   input type , id@ , data
   moji$ = OCT$(data)
   strdsp ..STR000, moji$
end evnt
```

ONFERR

Statement

■ Function

The ONFERR statement specifies the destination to which error messages are to be transmitted.

■ Format

ONFERR destination

■ Example of Use

ONFERR .B000.

■ Description

- The ONFERR statement specifies the destination to which file operation function error messages are to be transmitted.
- destination is a screen or part name or the ID-type variable indicating the screen or part name.
- When data is received by INPUT, the screen or part to which a file operation function error message was transmitted can receive information such as a type (8) and data (error number).

■ Related Item

FOPEN, FCLOSE, FPRINT, FWRITE, FINPUT

■ Example of Program

```
conf
   ONFERR ..
end conf
evnt
   input ty%, id@, dat1%
   ......
end evnt
```

When an error occurs, 8 is set in ty% and an error code (number) is set in dat1%.

OPEN

Statement

■ Function

The OPEN statement opens (displays) the specified part.

■ Format

OPEN part-name, mode

■ Example of Use

OPEN .BUHIN., 1

■ Description

- The OPEN statement opens (displays) the closed part on the screen.
- part-name is the name of the part to be opened or the variable indicating the ID of the part to be opened.
- mode specifies whether to execute the configuration block of the program attached to the part when the part is opened.
  - 0: The configuration block is not executed.
  - 1: The configuration block is executed.

■ Related Item

CLOSE

■ Example of Program

```
evnt
   input type% , id@ , data%
   if pstat(.BUHIN.) = 3 then
      OPEN .BUHIN., 0
   endif
end evnt
```

OPENCOM

Statement

■ **Function**

The OPENCOM statement declares that the program receives data from a serial line.

■ **Format**

OPENCOM logical-device-name

■ **Example of Use**

OPENCOM HST

■ **Description**

- The OPENCOM statement declares that the program receives data from the specified external connecting device. (When the host computer transmits data, this statement need not be declared.)
- logical-device-name specifies any of the following external connecting devices:
  - HST: Host computer
  - BCR: Bar code reader
  - TKY: Ten-key pad

■ **Related Item**

CLOSE COM, REOPENCOM

■ **Example of Program**

```
conf
   OPENCOM HST
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and data% = 1 then
      CLOSECOM HST
   else if type% = 3 and data% = 0 then
      REOPENCOM HST
   endif
end evnt
```

OPENPARALLEL

Statement

■ Function

The OPENPARALLEL statement declares that the program receives data from a parallel port.

■ Format

OPENPARALLEL input-bit, mode

■ Example of Use

OPENPARALLEL 3, 1

■ Description

- The OPENPARALLEL statement declares that the program receives data when the bit for specifying a parallel input port changes.
- input-bit indicates the bit used to transmit data when the value changes. Specify this input bit with a numeric value from 0 to 15.
- mode specifies the time when data is transmitted. The time when data is transmitted depends on how the bit changes.
  - 1: Data is transmitted when the bit goes High.
  - 2: Data is transmitted when the bit goes Low.
  - 3: Data is transmitted when the bit goes High or Low.

■ Related Item

CLOSEPARALLEL, REOPENPARALLEL

■ Example of Program

```
conf
  OPENPARALLEL 3
end conf
evnt
  input type% , id@ , data%
  if type% = 3 and data% = 1 then
    CLOSEPARALLEL 3
  else if type% = 3 and data% = 0 then
    REOPENPARALLEL 3
  endif
end evnt
```

OPENSIO

Statement

■ **Function**

The OPENSIO statement opens a non-protocol communication port.

■ **Format**

OPENSIO port-number, mode, reception-buffer

■ **Example of Use**

OPENSIO 1, 1, moji$

■ **Description**

- The OPENSIO statement opens a port for starting non-procedual communication.
- port-number specifies a channel that performs non-procedual communication. CH1 to CH3 correspond to 1 to 3, respectively.
- mode specifies the type of non-procedual communication. Specify 0 (binary mode) or 1 (text mode).
- reception-buffer specifies the name of the variable to which the data to be received from an external device is to be written. The variable to be specified must be a global or static character string variable.
- When the condition is satisfied after data has been received from a connecting device, a reception completion message is issued to the part or screen that executed this statement. Two or more parts cannot execute the OPENSIO statement for the same port.

  Binary mode: In the binary mode, all codes from 0 to 0FFh can be transmitted and received. In this mode, read and write are also enabled by specifying the length of received data.

  Text mode: In the text mode, codes from 1 to 0FFh can be transmitted and received. In this mode, the end codes of texts are also set and used. The end codes are used to judge the data to be received.

■ **Related Item**

CLOSESIO, SETSIO, WRITESIO, WRITWSIOB, FLUSH, IOCTL

■ **Example of Program**

```
conf
   global buf$ * 200
   OPENSIO 2 , 1 , buf$
   setsio  2 , &HD
end conf
evnt
   strdsp ..STR000 , buf$
   closesio 2
end evnt
```

OPENTIM

Function

■ Function

The OPENTIM function allocates timer resources.

■ Format

OPENTIM ()

■ Example of Use

VAR@ = OPENTIM ()

■ Description

- The OPENTIM function allocates the resources necessary to use a timer.
- The OPENTIM function must be an ID-type variable because it returns the ID of the timer to be used.
- The allocated ID can be used to set the timer.
- The system can use up to 16 timers. The timers not to be used must be returned to the system. (See “CLOSETIM.”)
- The OPENTIM function can be used by the screen or part program being displayed. (If this function is executed on an undisplayed rear screen, an error occurs.)
- The allocated timer is not deallocated even if one screen changes to another. If the timer is being used by the event type, a message is also issued to the rear screen.

■ Related Item

CLOSETIM, STARTTIM, STOPTIM, CONTTIM, WRITETIM, READTIM

■ Example of Program

```
conf
   static timid@
   timid@ = OPENTIM()
   settim timid@, 20, 0
   starttim timid@
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and id@ = ..SWT000 then
      stoptim timid@
   else if id@ = ..SWT001 then
      closetim timid@
   end if
end evnt
```

OPENTIM2

Function

■ Function

The OPENTIM2 function allocates (opens) the timer to be used.

■ Format

RET = OPENTIM2 (timer-number)

■ Example of Use

RET = OPENTIM2 (14)

■ Description

- The OPENTIM2 function opens the timer specified in timer-number.
- timer-number specifies the number of the timer to be used. Specify this timer number with an integer-type value from 0 to 15.
- When the OPENTIM2 function is executed, any of the following value is returned:
  - 0: The timer could be opened.
  - 1: The timer could not be opened.
- The OPENTIM2 function can be used by the screen or part program being displayed. (If this function is executed on an undisplayed rear screen, an error occurs.)
- The allocated timer is not deallocated even if one screen changes to another. If the timer is being used by the event type, a message is also issued to the rear screen.

■ Related Item

CLOSETIM, STARTTIM, STOPTIM, CONTTIM, SETTIM, READTIM, OPENTIM

■ Example of Program

```
conf
   static timid@
   ret=OPENTIM2(5)
   setim 5, 20, 0
   starttim 5
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and id@ = ..SWT000 then
      stoptim 5
   else if id@ = ..SWT001 then
      closetim 5
   end if
end evnt
```

OPENTIM3

Function

■ Function

The OPENTIM3 function allocates (opens) the timer to be used.

■ Format

RET = OPENTIM3 (timer-number)

■ Example of Use

RET = OPENTIM3 (14)

■ Description

- The OPENTIM3 function opens the timer specified in timer-number.
- timer-number specifies the number of the timer to be used. Specify this timer number with an integer-type value from 0 to 15.
- When the OPENTIM2 function is executed, any of the following value is returned:
  - 0: The timer could be opened.
  - 1: The timer could not be opened.
- When the screen for which "open" was declared changes to another, the opened timer is automatically closed.
- The OPENTIM3 function can be used by the screen or part program being displayed. (If this function is executed on an undisplayed rear screen, an error occurs.)

■ Related Item

CLOSETIM, STARTTIM, STOPTIM, CONTTIM, SETTIM, READTIM, OPENTIM

■ Example of Program

```
conf
  ret = opentim3 (3)
  settim 3 , 20, 1
  stoptim 3
  closetim 3
end conf
```

OUT

Statement

■ Function

The OUT statement writes 2-byte data to an I/O port.

■ Format

OUT port-number, output-data

■ Example of Use

OUT 0, &H20

■ Description

- Currently, data can be written only to parallel I/O ports.
- port-number specifies the number of the I/O port inserted into the option bus. (For the color/plasma, this port number is fixed at 0.)

■ Related Item

INP

■ Example of Program

```
evnt
   input type,id@,data
   out 0, data
end evnt
```

OUTBIT

Statement

■ Function

The OUTBIT statement rewrites the specified BIT number of the specified output port.

■ Format

OUTBIT port-number, BIT-number, write-data

■ Example of Use

OUTBIT 0, 10, 1

■ Description

- The OUTBIT statement rewrites the specified BIT number of the specified output port.
- Specify port-number and BIT-number with an integer value relative to 0.
- When write-data is 0, the output is set to OFF. When 1, the output is set to ON.
- The lowest-order bit number of the parallel IO is 0 and the next lowest-order bit number is 1. That is, the BIT number is sequentially incremented.
- If an unexisting port or BIT number is specified, an error occurs.

■ Related Item

INP, OUT, INPBIT, OUTBITSTAT, OUTSTAT

■ Example of Program

```
evnt
DATA% = INPBIT(0,3)
   if data% = 0 then
      outbit 0,3,1
   endif
end evnt
```

OUTBITSTAT

Function

■ **Function**

The OUTBITSTAT function reads the specified BIT number of the specified output port.

■ **Format**

OUTBITSTAT (port-number, BIT-number)

■ **Example of Use**

DATA% = OUTBITSTAT (0,10)

■ **Description**

- The OUTBITSTAT function reads the specified BIT number of the specified output port.
- Specify port-number and BIT-number with an integer value relative to 0.
- The lowest-order bit number of the parallel IO is 0 and the next lowest-order bit number is 1. That is, the BIT number is sequentially incremented.
- If an unexisting port or BIT number is specified, 0 is returned.

■ **Related Item**

INP, OUT, INPBIT, OUTBIT, OUTSTAT

■ **Example of Program**

```
evnt
   data% = outbitstat(0,3)
   if data% = 0 then
      outbit 0,3,1
   endif
end evnt
```

OUTSTAT

Function

■ Function

The OUTSTAT function reads the value of the specified output port.

■ Format

OUTSTAT (port-number)

■ Example of Use

DATA% = OUTSTAT (0)

■ Description

- The OUTSTAT function reads the value of the specified output port.
- Specify port-number with an integer value relative to 0.
- If an unexisting port number is specified, 0 is returned.

■ Related Item

INP, OUT, INPBIT, OUTBIT, OUTBITSTAT

■ Example of Program

```
evnt
   data% = outstat(0)
   if data% = 0 then
      out 0,&hffff
   endif
end evnt
```

PIPCOLOR

Statement

■ Function

The PIPCOLOR statement changes the OFF, ON1, and ON2 colors of the pipe display.

■ Format

LAMPCOLOR display-name, ON-OFF-number, color-number

■ Example of Use

LAMPCOLOR .BUHIN.GRAPH, 5

■ Description

The PIPCOLOR statement changes the OFF, ON1, and ON2 colors of the pipe display.

- display-name is the name of the pipe display or the variable indicating the ID of the pipe display.
- ON-OFF-number specifies 0, 1, or 2 for OFF, ON1, or ON2.
- color-number specifies the color to be displayed when the lamp display is on with a numeric value from 0 to 15.

■ Related Item

PIPDSP

■ Example of Program

```
conf
   pipdsp .buhin.graph , 0
   PIPCOLOR .buhin.graph ,1 ,7
   lampdsp .buhin.graph , 1
end conf
```

PIPDSP

Statement

■ Function

The PIPDSP statement displays data in the pipe display.

■ Format

PIPDSP control-name, pipe-mode

■ Example of Use

PIPDSP .BUHIN.GRAPH, 1

■ Description

The PIPDSP statement sets the pipe display to OFF, ON1, or ON2 for data display.

- control-name is the name of the pipe display or the variable indicating the ID of the pipe display.
- pipe-mode sets the pipe display to OFF, ON1, or ON2; it specifies 0, 1, or 2 for OFF, ON1, or ON2.
- Display cannot be changed even if the PIPDSP statement is issued to the display for which the operation parameters of the control are set to "effective."

■ Related Item

PIPCOLOR

■ Example of Program

```
conf
   pipdsp .buhin.pip , 0
   PIPCOLOR .buhin.pip ,1 ,7
   pipdsp .buhin.pip , 1
end conf
```

PLTCOLOR

Statement

■ Function

The PLTCOLOR statement changes the colors and background figure of the plot display.

■ Format

PLTCOLOR control-name, plot-color, tile, display-color, background-color

■ Example of Use

PLTCOLOR ..GRAPH, 1, 1, 2, 1

■ Description

- The PLTCOLOR statement changes the background tile and colors of the plot display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the plot display name or the ID-type variable indicating the plot display.
- plot-color indicates the display color of a dot. Specify this plot color with a numeric value from 0 to 15.
- tile indicates the background tiling figure of the graph.
- Specify this tiling figure with a numeric value from 0 to 15.
- display-color is the numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is the numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

PLTDSP

■ Example of Program

```
conf
  static name@
  name@ = ..PLT000
end conf
evnt
  input type%, id@, data%
  if type% = 3 then
    PLTCOLOR name@, 2, 3, 1, 4
  endif
end evnt
```

PLTDSP

Statement

■ Function

The PLTDSP statement displays data in the plot display.

■ Format

PLTDSP control-name, display-coordinate-X, display-coordinate-Y

■ Example of Use

PLTDSP .BUHIN.GRAPH, 15, 30

■ Description

- The PLTDSP statement displays data in the plot display.
- display-name is the plot display name or the ID-type variable indicating the plot display.
- display-coordinate-X and display-coordinate-Y are the numeric data indicating the coordinates to be displayed in the plot display.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

PLTCOLOR

■ Example of Program

```
conf
   static name@
   name@ = ..PLT000
end conf
evnt
   input type%, id@, x%,y%
   if type% = 3 then
      PLTDSP name@, x%, y%
   endif
end evnt
```

PMODE

Statement

■ Function

The PMODE statement changes the status of the specified part.

■ Format

PMODE part-name, mode

■ Example of Use

PMODE .BUHIN., 3

■ Description

- part-name is the name of the part whose status is to be modified or the ID-type variable indicating the part.
- mode indicates the status to be modified.
  - 0: Normal status
  - 1: Switch input disable status
  - 2: Half tone status

■ Related Item

PSTAT

■ Example of Program

```
evnt
   input type% , id@ , data%
   if pstat(.BUHIN.) = 0 then
      PMODE .BUHIN., 1
   endif
end evnt
```

PRDSP

Statement

■ Function

The PRDSP statement redisplays the specified control.

■ Format

PRDSP control-name

■ Example of Use

PRDSP .BUHIN.PRIM

■ Description

- control-name is the name of the control to be redisplayed or the ID-type variable indicating the control.

■ Related Item

BARSET, CIRSET, BLTSET, LNESET

■ Example of Program

```
evnt
   lneset  .buhin.graph , 3 , 8 , 20.1
   lneset  .buhin.graph , 3 , 8 , 20.1
   PRDSP .buhin.graph
end evnt
```

PREVJUMP

Statement

■ **Function**

The PREVJUMP statement jumps to the immediately preceding screen.

■ **Format**

PREVJUMP

■ **Example of Use**

PREVJUMP

■ **Description**

- The PREVJUMP statement jumps to the screen displayed before the current screen according to the recorded screen transition path.
- Up to 30 screens can be recorded. The PREJUMP statement cannot jump to a screen before the recorded 30 screens.

■ **Related Item**

JUMP

■ **Example of Program**

```
conf
end conf
evnt
   input type% , id@ , data%
   if id@ = ..SWT000 then PREVJUMP
end evnt
```

PRINT

Statement

■ **Function**

The PRINT statement writes messages.

■ **Format**

PRINT expression [, expression] ......

■ **Example of Use**

PRINT 23, “ABCD”, XYZ, MOJI$

■ **Description**

- The PRINT statement writes the messages to be output the screen, part, serial port, or paralle port.
- When two or more messages are written, delimit them in commas (,).
- Messages are not output when the PRINT statement is executed; they are output for the first time when the SEND command is executed.
- When messages are output to the host computer, commas (,) are inserted to delimit data.

■ **Related Item**

INPUT, SEND

■ **Example of Program**

```
evnt
  input type% , id@ , data%
  if type% = 3 then
    PRINT "ABCD", data%
    send .B000.
  endif
end evnt
```

PRMCTL

Statement

■ Function

The PRMCTL statement changes the attributes of the specified primitive.

■ Format

PRMCTL1 control-name, request-code, control-value-1
PRMCTL2 control-name, request-code, type-1, control-value-1
PRMCTL3 control-name, request-code, type-1, control-value-2
PRMCTL4 control-name, request-code, type-1, type-2, control-value-1

■ Example of Use

PRMCTL1 ..NUM000, _PD_STAT, 3
PRMCTL2 ..NUM000, _PD_DCOLOR, 3, 4
PRMCTL3 ..LNE000, _PD_RANGE, 0, 2.5
PRMCTL4 ..BAR000, _PD_PTRN, 1, 0, 12

■ Description

- The PRMCTL statement changes the attributes of the specified control. This statement is classified into four types: PRMCTL1, PRMCTL2, PRMCTL3, and PRMCTL4.
- control-name is the constant indicating the control to be changed or the ID-type variable indicating the ID of the control.
- request-code specifies what attribute changes is to be performed. The types of request codes are shown on the next and subsequent pages.
- type-1 and type-2 depend on the request code to be specified.
- control-value-1 specifies the value corresponding to the specified request code; it must be an integer-type constant or variable.
- control-value-2 specifies the value corresponding to the specified request code; it must be a floating-point constant or variable.

■ Related Item

PRMCTL1, PRMCTL2, PRMCTL3, PRMCTL4, PRMSTAT1, PRMSTAT2, PRMSTAT3, PRMSTAT4

■ Example of Program

```
conf
end conf
evnt
   status% = prmstat1(..NUM000, _PD_STAT)
   if status% = 0 then
      PRMCTL1 ..NUM000, _PD_STAT, 2
   endif
end evnt
```

- The types and usage of the request codes that can be used by PRMCTL1 are explained below.

1._PD_STAT

Function: _PD_STAT changes the display format (normal/reversal video/blinking/on-and-off) of a control.

Range: _PD_STAT is applicable to all controls.

Control-value: Set one of the following numeric values indicating the display format:

0: Normal display
1: Reversal video display
2: Blinking
3: On-and-off display

2._PD_DSPFMT

Function: _PD_DSPFMT changes the display format of a control.

Range: _PD_DSPFMT is applicable to numeric and character displays.

Control-value: The control value depends on whether the numeric or character display is used.

3._PD_PTPOS

Function: _PD_PTPOS changes the position of a decimal point.

Range: _PD_PTPOS is applicable only to numeric displays.

Control-value: Set a value indicating the position of a decimal point. If a negative value is set, PRMCTL1 forcibly changes it to 0.

4._PD_ZSPRS

Function: _PD_ZSPRS sets zero suppression operation.

Range: _PD_ZSPRS is applicable only to numeric displays.

Control-value: When not perform zero suppression, set 0. When performing zero suppression, set 1.

5._PD_FIGMD

Function: _PD_FIGMD sets whether to match the size of the graphic to be displayed on a graphic display with that of the display.

Range: _PD_FIGMD is applicable only to graphic displays.

Control-value: When not matching the size of the graphic with that of the graphic display, set 0. When matching the size of the graphic with that of the graphic display, set 1.

6._PD_WSIZ

Function: _PD_WSIZ changes the dot size or line width of a display.

Range: _PD_WSIZ is applicable to plot, meter, and pipe displays.

Control-value: For a plot display, set the dot size (small to large) with a numeric value from 0 to 2. For a meter display, set the line width (narrow to wide) with a numeric value from 0 to 2. For a pipe display, set the thickness (1, 3, 5, or 7) with a numeric value from 0 to 3.

7._PD_PIPSTAT

Function: _PD_PIPSTAT changes the ON or OFF status of a lamp or pipe display.

Range: _PD_PIPSTAT is applicable to lamp and pipe displays.

Control-value: Set the ON and OFF statuses of the lamp and pipe displays as follows:

8._PL_FIRST

Function: _PL_FIRST changes the start registration number of the registration graphic or character string to be displayed.

Range: _PL_FIRST is applicable to character and graphic displays.

Control-value: Set the value you want to use as the start registration number.

9._PL_SMPMSG

Function: _PL_SMPMSG specifies whether to issue messages to the part on which the control is placed when sampling is performed by the control.

Range: _PL_SMPMSG is applicable to plot, bar graph, and line chart displays.

Control-value: When issuing messages to the part, set 1. When not issuing messages, set 0.

10._PL_SMPCTL

Function: _PL_SMPCTL controls sampling. (“Stop”, “start”, and “reset”)

Range: _PL_SMPCTL is applicable to plot, bar graph, and line chart displays.

Control-value: “Stop” stops sampling. “Start” starts sampling from the stop status. “Reset” clears display and starts sampling from the beginning.

0: Sampling is stopped.
1: Sampling is started.
2: Sampling is reset.

11._PL_SMPTME

Function: _PL_SMPTME changes a sampling time.

Range: _PL_SMPTME is applicable to plot, bar graph, and line chart displays.

Control-value: Set a value indicating the sampling time (setting value* 0.5 second). When the sampling time is changed, sampling is started after it has been reset (see “_PL_SMPCLT”).

12._PL_DIRECT

Function: _PL_DIRECT changes the display direction of a line chart.

Range: _PLl_DIRECT is applicable only to line chart displays.

Control-value: When changing the display direction of the line chart from right to left, set 0. When changing the display direction from left to right, set 1. This direction change is meaningless if sampling is not performed. When the display direction is changed, sampling is started after it has been reset (see “_PL_SMPCLT”).

13._SW_RACT

Function: _SW_RACT sets whether to perform reverse operation when a switch is ON.

Range: _SW_RACT is applicable to switches and selector switches.

Control-value: To perform reverse operation when a switch is ON, set 1. Not to perform reverse operation, set 0.

14._SW_BZER

Function: _SW_BZER sets whether to sound the buzzer when a switch is ON.

Range: _SW_BZER is applicable to switches and selector switches.

Control-value: To sound the buzzer when a switch is pressed, set 1. Not to sound the buzzer, set 0.

15._SW_STAT

Function: _SW_STAT changes the status (normal operation/ input disable/halftone) of a switch.

Range: _SW_STAT is applicable to switches and selector switches.

Control-value: Set one of the following numeric values indicating the switch status:

- 0: Normal operation status
- 1: Input disable status
- 2: Halftone status

16._SW_BMODE

Function: _SW_BMODE changes the switch background color display method.

Range: _SW_BMODE is applicable to switches and selector switches.

Control-value: When changing the switch background color display method to “direct display”, set 0. When changing the display method to “replacement display”, set 1.

17._SW_ONCOLOR

Function: _SW_ONCOLOR sets a switch-ON background color.

Range: _SW_ONCOLOR is applicable to switches and selector switches.

Control-value: Set the number of the switch-ON background color to be used with a numeric value from 0 to 15.

18._SW_OFFCOLOR

Function: _SW_OFFCOLOR sets a switch-OFF background color.

Range: _SW_OFFCOLOR is applicable to switches and selector switches.

Control-value: Set the number of the switch-OFF background color to be used with a numeric value from 0 to 15.

19._SW_ONOFF

Function: _SW_ONOFF changes the ON/OFF status of a switch. (Executing _SW_ONOFF for the switch for synchronous operation causes an error.)

Range: _SW_ONOFF is applicable to switches and selector switches.

Control-value: When changing a switch to the OFF status, set 0. When changing a switch to the ON status, set 1. When changing all selector switches to the OFF status, set 0. When changing one of the selector switches to the ON status, set the corresponding element number.

- The types and usage of the request codes that can be used by PRMCTL2 are explained below.

1. _PD_DCOLOR

Function: _PD_COLOR changes the display color of a display.

Range: _PD_DCOLOR is applicable to the ON color specification of numeric, character, clock, plot, free graph, meter, and lamp displays.

Type: Specify one of the following:
0: Figure change
1: Fore color change
2: Back color change
3: Display color change

Control-value: Set the number of the display color to be changed with a numeric value from 0 to 15.

2. _PD_BCOLOR

Function: _PD_BCOLOR changes the background color of a control.

Range: _PD_BCOLOR is applicable to numeric, character, clock, plot, bar graph, line chart, and free graph displays.

Type: Specify one of the following:
0: Figure change
1: Fore color change
2: Back color change

Control-value: Set the number of the background color to be changed with a numeric value from 0 to 15.

3. _PD_PIPCOLOR

Function: _PD_PIPCOLOR changes the internal color of a pipe or lamp display.

Range: _PD_PIPCOLOR is applicable to pipe and lamp displays.

Type: Specify one of the following:
0: Change of OFF display color (valid for pipe and lamp displays)
1: Change of ON1 display color (valid for pipe and lamp displays)
2: Change of ON2 display color (valid for pipe displays)

Control-value: Set the number of the internal color to be changed with a numeric value from 0 to 15.

4. _PD_BSLNE

Function: _PD_BSLNE changes the type of a base line or a reference line.

Range: _PD_BSLNE is applicable to bar graphs and line charts.

Type: Specify one of the following:

- 0: Change of base line type
- 1: Change of reference line 1 type
- 2: Change of reference line 2 type

Control-value: Set the number of the line type to be changed with a numeric value from 0 to 3.

5. _PD_BSCOLOR

Function: _PD_BSCOLOR changes the color of a base line or a reference line.

Range: _PD_BSCOLOR is applicable to bar graphs and line charts.

Type: Specify one of the following:

- 0: Change of base line color
- 1: Change of reference line 1 color
- 2: Change of reference line 2 color

Control-value: Set the number of the line color to be changed with a numeric value from 0 to 15.

6. _SW_ONFIG

Function: _SW_ONFIG changes a switch-ON display graphic.

Range: _SW_ONFIG is applicable to switches and selector switches.

Type: For a switch, specify 1. For a selector switch, specify the element number of the switch whose ON graphic is to be changed. The element number starts at 1.

Control-value: Specify the registration graphic number displayed when a switch is ON.

7. _SW_OFFFIG

Function: _SW_OFFFIG changes a switch-OFF display graphic.

Range: _SW_OFFFIG is applicable to switches and selector switches.

Type: For a switch, specify 1. For a selector switch, specify the element number of the switch whose OFF graphic is to be changed. The element number starts at 1.

Control-value: Specify the registration graphic number displayed when a switch is OFF.

- The types and usage of the request codes that can be used by PRMCTL3 are explained below.

1. _PD_RANGE
   - Function: _PD_RANGE sets the display range of a display.
   - Range: _PD_RANGE is applicable to bar graph, line chart, free graph, slide, meter, and plot displays.
   - Type: When the plot display is used, specify 0 (Xmin change), 1 (Xmax change), 2 (Ymin change), or 3 (Ymax change). When the bar graph, line chart, free graph, slide, or meter display is used, specify 2 (minimum change) or 3 (maximum change).
   - Control-value: Set the value (display range) to be changed.

2. _PD_BSVAL
   - Function: _PD_BSVAL changes the setting value of a base or reference line.
   - Range: _PD_BSVAL is applicable to bar graph and line chart displays.
   - Type: Specify 0 (base line change), 1 (change of reference line 1), or 2 (change of reference line 2).
   - Control-value: Set the value to be changed.

- The types and usage of the request codes that can be used by PRMCTL4 are explained below.

1. _PD_PTRN
   - Function: _PD_PTRN changes the display color of a control.
   - Range: _PD_PTRN is applicable to bar graph, 100 percent bar chart, and pie chart displays.
   - Type-1: Specify the number of the bar or zone whose display color is to be changed.
   - Type-2: Specify one of the following:
     - 0: Figure change
     - 1: Fore color change
     - 2: Back color change
   - Control-value: Set the number of the display color to be changed with a numeric value from 0 to 15.

2. _PD_LNE
   - Function: _PD_LNE changes the display color of a line chart.
   - Range: _PD_LNE is applicable only to line charts.
   - Type-1: Specify the number of the line whose display color is to be changed.
   - Type-2: Specify one of the following:
     - 0: Line type change
     - 1: Line color change
   - Control-value: Set the number of the display color to be changed with a numeric value from 0 to 15.

PRMSTAT

Function

■ Function

The PRMSTAT function reads the attributes of the specified primitive.

■ Format

return-value-1 = PRMSTAT1 (control-name, request-code)
return-value-1 = PRMSTAT2 (control-name, request-code, type-1)
return-value-2 = PRMSTAT3 (control-name, request-code, type-1)
return-value-1 = PRMSTAT4 (control-name, request-code, type-1, type-2)

■ Example of Use

VAL% = PRMSTAT1 (..NUM000, _PD_STAT)
VAL% = PRMSTAT2 (..NUM000, _PD_DCOLOR, 3)
VALF! = PRMSTAT3 (..LNE000, _PD_RANGE, 0)
VAL% = PRMSTAT4 (..BAR000, _PD_PTRN, 1, 0)

■ Description

- The PRMSTAT function reads the attributes of the specified primitive. This function is classified into four types: PRMSTAT1, PRMSTAT2, PRMSTAT3, and PRMSTAT4.
- control-name is the constant indicating the primitive to be read or the ID-type variable indicating the ID of the control.
- request-code specifies the attributes to be read. The types of request codes are shown on the next and subsequent pages.
- type-1 and type-2 depend on the request code to be specified.
- return-value-1 is the return value of the function corresponding to the specified request code; it must be an integer-type constant or variable.
- return-value-2 is the return value of the function corresponding to the specified request code; it must be a floating-point constant or variable.

■ Related Item

PRMCTL1, PRMCTL2, PRMCTL3, PRMCTL4, PRMSTAT1, PRMSTAT2, PRMSTAT3, PRMSTAT4

■ Example of Program

```
conf
end conf
evnt
   status% = prmstat1(..NUM000, _PD_STAT)
   if status% = 0 then
      PRMCTL1 ..NUM000, _PD_STAT, 2
   endif
end evnt
```

- The types and usage of the request codes that can be used by PRMSTAT1 are explained below.

1. _PD_NUMS
   Function: _PD_NUMS reads the number of control elements.
   Range: _PD_NUMS is applicable to all display controls.
   Return-value-1: The value indicating the display format is set. When the display format is not "continuous-stage type", 1 is always set.

2. _PD_ROTATE
   Function: _PD_ROTATE reads the rotation direction of a control .
   Range: _PD_ROTATE is applicable to all display controls.
   Return-value-1: For 0 degree, 0 is returned. For 90 degrees, 1 is returned. For 180 degrees, 2 is returned. For 270 degrees, 3 is returned. For pie chart, meter, lamp, and pipe displays, 0 is always returned.

3. _PD_STAT
   Function: _PD_STAT reads the display format (normal/reverse video display/blinking/on-and-off display) of a control.
   Range: _PD_STAT is applicable to all controls.
   Return-value: One of the following values is returned:
   0: Normal display
   1: Reverse video display
   2: Blinking
   3: On-and-off display

4. _PD_DSPFMT
   Function: _PD_DSPFMT reads the display format of a control.
   Range: _PD_DSPFMT is applicable to numeric and character controls.
   Return-value-1: The value to be returned depends on whether the numeric or character display is used.

5. _PD_DATFMT
   Function: _PD_DATFMT reads the display data format.
   Range: _PD_DATFMT is applicable to all controls except for clock displays.
   Return-value: For a real number, 0 is returned. For an integer, 1 is returned. For an unsigned integer, 2 is returned. For a BCD, 3 is returned. (For the lamp primitive, 2 is always returned.)

6. _PD_FONT
   Function: _PD_FONT reads the type of the font displayed on the control.
   Range: _PD_FONT is applicable to numeric and clock displays.
   Return-value: For half-size character display, 0 is returned. For full-size character display, 1 is returned.
7. _PD_XFSZ
   Function: _PD_XFSZ reads the horizontal-direction size of the font displayed on the control.
   Range: _PD_XFSZ is applicable to numeric, character, and clock displays.
   Return-value: For 1 magnification, 0 is returned. For 2 magnifications, 1 is returned. For 4 magnifications, 2 is returned. For 8 magnifications, 3 is returned. For 16 magnifications, 4 is returned.

8. _PD_YFSZ
   Function: _PD_YFSZ reads the vertical-direction size of the font displayed on the control.
   Range: _PD_YFSZ is applicable to numeric, character, and clock displays.
   Return-value: For 1 magnification, 0 is returned. For 2 magnifications, 1 is returned. For 4 magnifications, 2 is returned. For 8 magnifications, 3 is returned. For 16 magnifications, 4 is returned. For 32 magnifications, 5 is returned.
9. _PD_PTPOS
   Function: _PD_PTPOS reads the position of a decimal point.
   Range: _PD_PTPOS is applicable only to numeric displays.
   Return-value: The position of the decimal point is returned.

10. _PD_ZSPRS
   Function: _PD_ZSPRS reads whether to perform zero suppression.
   Range: _PD_ZSPRS is applicable only to numeric displays.
   Return-value: When zero suppression is not performed, 0 is returned. When zero suppression is performed, 1 is returned.

11. _PD_XNUM
   Function: _PD_XNUM reads the number of horizontal-direction display digits.
   Range: _PD_XNUM is applicable to numeric and character displays.
   Return-value: The number of characters that can be displayed when horizontal-direction half-size conversion is performed is returned.

12. _PD_YNUM
   Function: _PD_YNUM reads the number of vertical-direction display digits.
   Range: _PD_YNUM is applicable only to character displays.
   Return-value: The number of characters that can be displayed in the vertical direction is returned.

13. _PD_DIRECT
   Function: _PD_DIRECT reads the display direction of a character display.
   Range: _PD_DIRECT is applicable only to character displays.
   Return-value: For horizontal writing, 0 is returned. For columnar writing, 1 is returned.

14. _PD_PLTNUM

Function: _PD_PLTNUM reads the maximum number of plots that can be displayed on the control.

Range: _PD_PLTNUM is applicable to plot and line chart displays.

Return-value: The maximum number of plots that can be displayed is returned.

15. _PD_LNENUM

Function: _PD_LNENUM reads the number of bars and lines that can be displayed on the control.

Range: _PD_LNENUM is applicable to plot and line chart displays.

Return-value: The maximum number of bars and lines that can be displayed is returned.

16. _PD_ZNNUM

Function: _PD_ZNNUM reads the number of zones that can be displayed on the control.

Range: _PD_ZNNUM is applicable to pie chart and 100 percent bar chart displays.

Return-value: The number of zones that can be displayed is returned.

17. _PD_FIGMD

Function: _PD_FIGMD reads whether to match the size of the graphic to be displayed on a graphic display with that of the display.

Range: _PD_FIGMD is applicable only to graphic displays.

Return-value: When matching the size of the graphic with that of the graphic display, set 1. When not matching the size of the graphic with that of the graphic display, set 1.

18. _PD_WSIZ

Function: _PD_WSIZ reads the dot size or line width of a control.

Range: _PD_WSIZ is applicable to plot, meter, and pipe displays.

Return-value: For a plot display, the numeric value (0 to 2) indicating the dot size (small to large) is returned. For a meter display, the numeric value (0 to 2) indicating the line width (narrow to wide) is returned. For a pipe display, the numeric value (0 to 3) indicating the thickness (1, 3, 5, or 7) is returned.

19. _PD_PIPSTAT

Function: _PD_PIPSTAT reads the ON or OFF status of a lamp or pipe display.

Range: _PD_PIPSTAT is applicable to lamp and pipe displays.

Return-value: Any of the following values indicating the ON or OFF status of the lamp or pipe display is returned:

20. _PL_NUMS
    - Function: _PL_NUMS reads the number of devices being used.
    - Range: _PL_NUMS is applicable to all controls except for clock displays.
    - Return-value: The number of devices being used is returned. (When a doubleword is specified for a numeric display, the number of devices is doubled.)

21. _PL_FIRST
    - Function: _PL_FIRST reads the start registration number of the registration graphic or character string to be displayed.
    - Range: _PL_FIRST is applicable to character and graphic displays.
    - Return-value: The start registration number to be displayed is returned.

22. _PL_DVTYP
    - Function: _PL_DVTYP reads the type of the device being used by the control.
    - Range: _PL_DVTYP is applicable only to numeric displays.
    - Return-value: For a doubleword, 0 is returned. For a single word, 1 is returned.

23. _PL_ENDI
    - Function: _PL_ENDI reads the doubleword display method.
    - Range: _PL_ENDI is applicable only to numeric displays.
    - Return-value: When doublewords are displayed from downward to upward, 0 is returned. When doublewords are displayed from upward to downward, 1 is returned.

24. _PL_SMPMSG
    - Function: _PL_SMPMSG reads whether to issue messages to the part on which the control is placed when sampling is performed by the control.
    - Range: _PL_SMPMSG is applicable to plot, bar graph, and line chart displays.
    - Return-value: When messages are issued to the part, 1 is returned. When no message is issued, 0 is returned.

25. _PL_SMPTME
    - Function: _PL_SMPTME reads a sampling time.
    - Range: _PL_SMPTME is applicable to plot, bar graph, and line chart displays.
    - Return-value: A value indicating the sampling time (read value* 0.5 second) is returned.

26. _PL_DIRECT
    - Function: _PL_DIRECT reads the display direction of a line chart.
    - Range: _PLl_DIRECT is applicable only to line chart displays.
    - Return-value: When line charts are displayed from right to left, 0 is returned. When they are displayed from left to right, 1 is returned.

27. _SW_NUMS
    - Function: _SW_NUMS reads the number of switch elements.
    - Range: _SW_NUMS is applicable to switches and selector switches.
    - Return-value: For a switch, 1 is always returned. For a selector switch, the number of elements is returned.

28. _SW_TYPE

Function: _SW_TYPE reads a switch type.

Range: _SW_TYPE is applicable to switches and selector switches.

Return-value: For the momentary switch, 0 is returned. For the alternate switch, 1 is returned. For the auto-repeat switch, 2 is returned. For a selector switch, 3 is returned.

29. _SW_ONCOLOR

Function: _SW_ONCOLOR reads a switch-ON background color.

Range: _SW_ONCOLOR is applicable to switches and selector switches.

Return-value: The number (0 to 15) of the read switch-ON background color is returned.

30. _SW_OFFCOLOR

Function: _SW_OFFCOLOR reads a switch-OFF background color.

Range: _SW_OFFCOLOR is applicable to switches and selector switches.

Return-value: The number (1 to 15) of the read switch-OFF background color is returned.

31. _SW_BMODE

Function: _ SW_BMODE reads the switch background color display method.

Range: _SW_BMODE is applicable to switches and selector switches.

Return-value: When the switch background color display method is “direct display”, 0 is returned. When the display method is “replacement display”, 1 is returned.

32. _SW_RACT

Function: _SW_RACT reads whether to perform reverse operation when a switch is ON.

Range: _SW_RACT is applicable to switches and selector switches.

Return-value: If reverse operation is performed when a switch is ON, 1 is returned. If reverse operation is not performed, 0 is returned.

33. _SW_BZER

Function: _SW_BZER reads whether to sound the buzzer when a switch is ON.

Range: _SW_BZER is applicable to switches and selector switches.

Return-value: If the buzzer is sounded when a switch is pressed, 1 is returned. If the buzzer is not sounded, 0 is returned.

34. _SW_STAT

Function: _SW_STAT reads the status (normal operation/ input disable/halftone) of a switch.

Range: _SW_STAT is applicable to switches and selector switches.

Return-value: One of the following numeric values indicating the switch status is returned:

0: Normal operation status

1: Input disable status

2: Halftone status

35. _SW_ONOFF
    - Function: _SW_ONOFF reads the ON/OFF status of a switch.
    - Range: _SW_ONOFF is applicable to switches and selector switches.
    - Return-value: When a switch is in the OFF status, 0 is returned. When a switch is in the ON status, 1 is returned. When all the selector switches are in the OFF status, 0 is returned. When one of the selector switches is in the ON status, the corresponding element number is returned.

36. _SL_SYNC
    - Function: _SL_SYNC reads the synchronous operation of a switch.
    - Range: _SL_SYNC is applicable to switches and selector switches.
    - Return-value: When the synchronous operation is not performed, 0 is returned. When the synchronous operation is performed, 1 is returned.

37. _SL_BORW
    - Function: _SL_BORW reads the switch device write method.
    - Range: _SL_BORW is applicable to selector switches.
    - Return-value: When the switch device write method is the bit type write method, 0 is returned. When it is the word type write method, 1 is returned.

- The types and usage of the request codes that can be used by PRMSTAT2 are explained below.

1. _PD_DCOLOR
    - Function: _PD_COLOR reads the display color of a control.
    - Range: _PD_DCOLOR is applicable to the ON color specification of numeric, character, clock, plot, free graph, meter, and lamp displays.
    - Type: Specify one of the following:
        - 0: Figure read
        - 1: Fore color read
        - 2: Back color read
        - 3: Display color read
    - Return-value: The number (0 to 15) of the read display color is returned.

2. _PD_BCOLOR
    - Function: _PD_BCOLOR reads the background color of a control.
    - Range: _PD_BCOLOR is applicable to numeric, character, clock, plot, bar graph, line chart, and free graph displays.
    - Type: Specify one of the following:
        - 0: Figure read
        - 1: Fore color read
        - 2: Back color read
    - Return-value: The number (0 to 15) of the read background color is returned.

3. _PD_PIPCOLOR

    Function: _PD_PIPCOLOR reads the internal color of a pipe or lamp display.

    Range: _PD_PIPCOLOR is applicable to pipe and lamp displays.

    Type: Specify one of the following:

    - 0: Read of OFF display color (valid for pipe and lamp displays)
    - 1: Read of ON1 display color (valid for pipe and lamp displays)
    - 2: Read of ON2 display color (valid for pipe displays)

    Return-value: The number (0 to 15) of the read internal color is returned.

4. _PD_BSLNE

    Function: _PD_BSLNE reads the type of a base line or a reference line.

    Range: _PD_BSLNE is applicable to bar graphs and line charts.

    Type: Specify one of the following:

    - 0: Read of base line type
    - 1: Read of reference line 1 type
    - 2: Read of reference line 2 type

    Return-value: The number (0 to 3) of the read line type is returned.

5. _PD_BSCOLOR

    Function: _PD_BSCOLOR reads the color of a base line or a reference line.

    Range: _PD_BSCOLOR is applicable to bar graphs and line charts.

    Type: Specify one of the following:

    - 0: Read of base line color
    - 1: Read of reference line 1 color
    - 2: Read of reference line 2 color

    Return-value: The number (0 to 15) of the read line color is returned.

6. _SW_ONFIG

    Function: _SW_ONFIG reads the graphic number displayed when a switch is ON.

    Range: _SW_ONFIG is applicable to switches and selector switches.

    Type: For a switch, specify 1. For a selector switch, specify the element number of the switch whose ON graphic is to be changed. The element number starts at 1.

    Return-value: The read graphic number is returned.

7. _SW_OFFFIG

    Function: _SW_OFFFIG reads the graphic number displayed when a switch is OFF.

    Range: _SW_OFFFIG is applicable to switches and selector switches.

    Type: For a switch, specify 1. For a selector switch, specify the element number of the switch whose OFF graphic is to be changed. The element number starts at 1.

    Return-value: The read graphic number is returned.

8. _SL_WRITE
   - Function: _SL_WRITE reads the switch write value.
   - Range: _SL_WRITE is applicable to switches.
   - Type: To read the write value when a switch is ON, specify 1. To read the write value when a switch is OFF, specify 0.
   - Return-value: The read write value is returned.

9. _PD_PLOTRNG
   - Function: PD PLOTRNG writes the start and end points of displaying a line chart.
   - Range: PD PLOTRNG is applicable to line charts.
   - Type: Specify one of the following:
     - 0: Indicates reading of the display start point.
     - 1: Indicates reading of the display end point.

- The types and usage of the request codes that can be used by PRSTAT3 are explained below.

1. _PD_RANGE
   - Function: _PD_RANGE reads the display range of a control.
   - Range: _PD_RANGE is applicable to bar graph, line chart, free graph, slide, meter, and plot displays.
   - Type: When reading Xmin, specify 0. When reading Xmax, specify 1. When reading Ymin, specify 2. When reading Ymax, specify 3.
   - Return-value: A value indicating the display range is returned.

2. _PD_BSVAL
   - Function: _PD_BSVAL reads the setting value of a base or reference line.
   - Range: _PD_BSVAL is applicable to bar graph and line chart displays.
   - Type: When changing a base line, specify 0. When changing reference line 1, specify 1. When changing reference line 2, specify 2.
   - Return-value: A value indicating the display range is returned.

- The types and usage of the request codes that can be used by PRMSTAT4 are explained below.

1. _PD_PTRN
   - Function: _PD_PTRN reads the display color of a control.
   - Range: _PD_PTRN is applicable to bar graph, 100 percent bar chart, and pie chart displays.
   - Type-1: Specify the number of the bar or zone whose display color is to be changed.
   - Type-2: Specify one of the following:
     - 0: Figure read
     - 1: Fore color read
     - 2: Back color read
   - Return-value: The values indicating the read figure and color number are returned.

2. _PD_LNE

Function: _PD_LNE reads the display color of a line chart.

Range: _PD_LNE is applicable to line charts.

Type-1: Specify the number of the line whose display color is to be changed.

Type-2: Specify one of the following:

0: Line type read

1: Line color read

Return-value: The values indicating the read line type and color are returned.

PSTAT

Function

■ Function

The PSTAT function reads the status of the specified part.

■ Format

PSTAT (part-name)

■ Example of Use

MODE = PSTAT (.BUHIN.)

■ Description

- The PSTAT function reads the status of the part specified in part-name.
- part-name is the name of the part whose status is to be read or the ID-type variable indicating the part.
- The value indicating the mode of the part can be obtained by executing this function. The following numeric values indicate modes.
  - 1: Switch input disable status
  - 2: Half tone status
  - 3: Close status

■ Related Item

PMODE

■ Example of Program

```
evnt
   input type% , id@ , data%
   if PSTAT(.BUHIN.) = 0 then
      pmode .BUHIN., 1
   endif
end evnt
```

RANGE

Statement

■ Function

The RANGE function modifies the area(s) of the control for which the maximum and minimum display data values were specified.

■ Format

RANGE control-name, area-1, area-2, area-3, area-4

■ Example of Use

RANGE ..GRAPH, 0, 0, 100, 100

■ Description

- control-name is the graph name or the ID-type variable indicating the graph.
- The maximum and minimum area values in the control can be set for each display as follows:

Area 1	Area 2	Area 3	Area 4	
Plot display	Minimum horizontal value	Maximum horizontal value	Minimum vertical value	Maximum vertical value
Bar graph display	Minimum value	Maximum value	Base value	–
Line chart display	Minimum value	Maximum value	–	–
Free graph display	Minimum value	Maximum value	–	–
Slide display	Minimum value	Maximum value	–	–
Meter display	Minimum value	Maximum value	–	–

"-" is ignored even if it is specified.

■ Related Item

None

■ Example of Program

```
evnt
   input type% , id@ , min%,max%
   if type% = 3 then
      range ..MTR000 , min%, max%,0,0
   endif
end evnt
```

READTIM

Function

■ Function

The READTIM function reads the current value of the specified timer.

■ Format

READTIM (timer-number)

■ Example of Use

DD = READTIM (TNO@)
DD = READTIM (VAR)

■ Description

- The READTIM function reads the current elapse time of the operating timer. This time is read in units of 100 milliseconds.
- timer-value is the ID-type variable indicating the number of the timer to be read or an integer-type value from 0 to 15.

■ Related Item

OPENTIM, STARTTIM, STOPTIM, CLOSETIM, CONTTIM, WRITETIM

■ Example of Program

```
conf
   static timid@
   timid@ = OPENTIM()
   settim timid@, 20, 0
   starttim timid@
end conf
evnt
   input type% , id@ , data%
   if type% = 3 then
      tim% = READTIM(timid@)
      numdsp ..NUM000,tim%*100
   end if
end evnt
```

RENAME

Statement

■ Function

The RENAME statement changes a file name or directory name.

■ Format

RENAME old file name, new file name

■ Example of Use

RENAME "A:\SUBDIR\FILE1", "FILE2"

■ Description

- A file name can be specified in a full path name including a drive name or in an abbreviated name beginning with a current directory name.
  Example: A:\SUBDIR\FILE1 FILE1
- A new file name must not contain a path name.
- To change a directory name, specify a directory name, instead of a file name.

■ Related Item

FOPEN,KILL,MKDIR,RMDIR

■ Example of Program

```
conf
  global dname$(13), pname1$(13), pname2$(13), pname3$(13)
  global dsel%, p1sel%, p2sel%, p3sel%
  strdsp ..str, "rename"
end conf
evnt
  input type%, id@, data%
  if data% = 1 then
    path$ = dname$(dsel%) + pname1$(p1sel%) + pname2$(p2sel%)
    strdsp .dsp.str, path$
    rename path$, pname3$(p3sel%)
  end if
end evnt
```

REOPENCOM

Statement

■ Function

The REOPENCOM statement reopens the temporarily closed serial line.

■ Format

REOPENCOM logical-device-name

■ Example of Use

REOPENCOM HST

■ Description

- The REOPENCOM statement permits the program, whose data reception from an external connecting device was temporarily inhibited by the CLOSECOM statement, to receive data again.
- logical-device-name specifies any of the following external connecting devices:
  - HST: Host computer
  - BCR: Bar code reader
  - TKY: Ten-key pad

■ Related Item

OPENCOM, CLOSECOM

■ Example of Program

```
conf
  OPENCOM HST
end conf
evnt
  input type% , id@ , data%
  if type% = 3 and data% = 1 then
    CLOSECOM HST
  else if type% = 3 and data% = 0 then
    REOPENCOM HST
  endif
end evnt
```

REOPENPARALLEL

Statement

■ **Function**

The REOPENPARALLEL statement permits data re-reception from the temporarily closed parallel port.

■ **Format**

REOPENPARALLEL input-bit

■ **Example of Use**

REOPENPARALLEL 3

■ **Description**

- The REOPENPARALLEL statement permits the script, whose data reception from the parallel port was temporarily inhibited by the CLOSEPARALLEL statement, to re-receive data.
- input-bit is the bit for restarting data reception. This input bit is the same as the bit specified by the CLOSEPARALLEL statement.

■ **Related Item**

OPENPARALLEL, CLOSEPARALLEL

■ **Example of Program**

```
conf
  OPENPARALLEL 3
end conf
evnt
  input type% , id@ , data%
  if type% = 3 and data% = 1 then
    CLOSEPARALLEL 3
  else if type% = 3 and data% = 0 then
    REOPENPARALLEL 3
  endif
end evnt
```

RESETALARM

Statement

■ Function The RESETALARM statement resets the specified alarm.

■ Format RESETALARM alarm-number

■ Example of Use RESETALARM (NO@)

■ Description

- alarm-number is the number of the alarm set by the SETALARM statement; it must be an ID-type variable.
- This statement resets the setting for posting an alarm ON to the program when a specified time is reached.

■ Related Item SETALARM

■ Example of Program

```
conf
   static alid@
   alid@ = setalarm(10,0)
end conf
evnt
   input type% , id@ , data%
   if type% = 3 then
      RESETALARM(alid@)
   end if
end evnt
```

RETURN

Statement

■ Function The RETURN statement returns control from the subroutine to the original program.

■ Format RETURN

■ Example of Use RETURN

■ Description

- The RETURN statement returns control to the statement following the statement called by the GOSUB statement.

■ Related Item GOSUB

■ Example of Program

```
evnt
   X = 10
   GOSUB SUB001
   numdsp ..NUM000, X
end evnt
SUB001:
   X = X+3
   RETURN
```

RIGHT$

Function

■ Function

The RIGHT$ function returns a character string the specified number of characters, starting from the left of the specified character string.

■ Format

RIGHT$ (character-string, number-of-characters)
RIGHT$ (registered-character-string-number, number-of-characters)
RIGHT$ (registered-character-string-name, number-of-characters)

■ Example of Use

A$ = RIGHT$ (MOJI$, 5)
A$ = RIGHT$ (4, 10)
A$ = RIGHT$ (TOROKU, 8)

■ Description

- The RIGHT$ function returns a character string the specified number of characters (bytes), starting from the right of the specified character-string.
- number-of-characters specifies the number of bytes of the character string to be fetched with a numeric value from 0 to 255. When number-of-characters is 0, a null character string is returned.
- character-string is a direct character string or a character string variable.
- registered-character-string-number is the numerical expression indicating the number registered by Screen Creator.
- registered-character-string-name is the name of the character string created by Screen Creator or the ID-type variable indicating the name of the character string.

■ Related Item

MID$, LEFT$

■ Example of Program

```
evnt
  b$ = "12345678"
  a$ = RIGHT$(b$ , 3)
  c$ = RIGHT$ (no , 3)
  c$ = RIGHT$ (id@ , 4)
end evnt
```

RMDIR

Statement

■ Function

The RMDIR statement deletes a directory.

■ Format

RMDIR directory-name

■ Example of Use

RMDIR “TEST”

■ Description

- The RMDIR statement is an instruction for deleting a subdirectory.
- Specify the directory to be deleted with a character string constant or variable.
- The directory to be deleted can be specified in directory-name together with a drive name.

■ Related Item

MKDIR, CHDIR

■ Example of Program

```
conf
end conf
evnt
   ......
   RMDIR ''C:TEST''
   ......
end evnt
```

ROTATE

Statement

■ **Function**

The ROTATE function rotates the figure displayed in the graphic display.

■ **Format**

ROTATE control-name, angle-of-rotation

■ **Example of Use**

ROTATE ..FIG000, 2

■ **Description**

- control-name is the graphic display name or the ID-type variable indicating the graphic display.
- angle-of-rotation specifies the angle of rotation with one of the following numeric values:
  - 0: Rotation of 0 degree
  - 1: Rotation of 90 degrees
  - 2: Rotation of 180 degrees
  - 3: Rotation of 270 degrees

■ **Related Item**

FIGDSP

■ **Example of Program**

```
evnt
   input ty , id@, fig%
   ROTATE ..FIG000 , fig%
end evnt
```

RSTAT

Function

■ Function

The RSTAT function checks the status of registered objects.

■ Format

RSTAT (registration-name, type, option)

■ Example of Use

VAR@ = RSTAT (GAMEN1.., 0, 1)

■ Description

- Of registered objects, the RSTAT function obtains the number of the object that is "number specified by option" away from the specified registration name.
- A variable or constant representing a screen name, registration character string name, or registration graphic name can be specified in registration-name.
- Specify 0 in type.
- When option is a positive value, the RSTAT function checks the registered objects in ascending order of their numbers. When option is a negative value, the RSTAT function checks the objects in descending order of their numbers.
- If there is no object that is "number specified by option" away from the specified registration name, the RSTAT function returns -1.

■ Related Item

GETGID, GETGNO

■ Example of Program

```
conf
end conf
evnt
   id@ = getgid()
   no% = RSTAT ( id@, 0, 1)         ' Checks the next registered screen
   if no% <> -1 then jump no%       ' number.
end evnt
```

RUN

Statement

■ Function

The RUN statement runs the specified program.

■ Format

RUN execution-part/screen

■ Example of Use

RUN .BUHIN.

■ Description

- The RUN statement issues a message to the part/screen specified in execution-part/screen and runs the part/screen program. (The message to be issued contains the message type and ID. It, however, does not contain the issued data.)
- The program to which a command was issued is not run when the RUN command is issued; it is run when the program that issued the RUN command terminates.
- execution-part/screen is a screen name, a part name, or an ID-type variable.

■ Related Item

INPUT, PRINT, SEND

■ Example of Program

```
evnt
  input ty , id@, fig%
  if ty = 3 and id@ = ..SWT000 then
    RUN .B000.
  endif
end evnt
```

SELECT CASE ... END SELECT

Statement

■ Function

The statements satisfying the specified condition are executed.

■ Format

SELECT CASE
CASE
statement-list
CASE
statement-list
CASE ELSE
statement-list
END SELECT

■ Example of Use

See “Example of Program” below.

■ Description

- The SELECT CASE statement executes the CASE statement list satisfying the specified conditional expression.
- When CASE, CASE ELSE, and END SELECT appear after the statements satisfying the specified condition have been executed, the SELECT CASE statement executes the statement following END SELECT.
- Condition judgment can be performed up to 50 times.

■ Related Item

IF ... THEN ... ELSE

■ Example of Program

```
evnt
   input ty , id@, dat%
   select case dat%
      case 1                 ' When dat% is 1
         aaa = 1
      case 2,3               ' When dat% is 2 or 3
         aaa = 2
      case 4 to 10           ' When dat% is 4 to 10
         aaa = 3
      case else              ' When dat% is another value
         aaa =4
   end select
end evnt
```

SEND

Statement

■ **Function**

The SEND statement sends data to the specified screen, part, or logical connecting device.

■ **Format**

SEND send-destination-name

■ **Example of Use**

SEND .BUHIN.

■ **Description**

- The SEND statement sends the data written by the PRINT statement to the specified send destination.
- send-destination-name is the name of the screen or part to which data is to be sent, the ID-type variable indicating the name, or one of the following logical connecting devices:
  - HST: Host computer
  - PRN: Printer
- The screen or part script that received data is not executed when the SEND command is issued; it is executed when the program that issued the SEND command terminates.

■ **Related Item**

RUN, PRINT

■ **Example of Program**

```
evnt
   input ty , id@, dat%
   if ty = 3 and id@ = ..SWT000 then
      print “BUHIN1”,dat%
      send .B0000.
   endif
end evnt
```

SETALARM

Statement

■ Function

The SETALARM statement sets an alarm time.

■ Format

SETALARM (hour, minute)

■ Example of Use

ID@ = SETALARM (13, 30)

■ Description

- The SETALARM statement sets an alarm time in the OIP built-in clock. When the set alarm time is reached, the data indicating this effect is transmitted to the set screen or part program. Up to 16 alarms can be used.
- hour specifies the hour(s) to be set with a numeric value from 0 to 23.
- minute specifies the minute(s) to be set with a numeric value from 0 to 59.
- When the SETALARM function is executed, the alarm number is returned. The alarm number to be returned is an ID-type variable.
- This function can be used by the screen or part program being displayed.

■ Related Item

RESETALARM

■ Example of Program

```
conf
   static alid@
   alid@ = SETALARM(10,0)
end conf
evnt
   input type% , id@ , data%
   if type% = 3 then
      resetalarm(alid@)
   end if
end evnt
```

SETBEEP

Statement

■ **Function**

The SETBEEP statement specifies the tone of a buzzer.

■ **Format**

SETBEEP ON-time, OFF-time, sound-count

■ **Example of Use**

SETBEEP 10, 5, 3

■ **Description**

- The SETBEEP statement sets the tone color of the buzzer to be sounded by the BEEP command
- ON-time specifies the time during which the buzzer continues to sound in units of 100 milliseconds.
- OFF-time specifies the time during which the buzzer continues not to sound in units of 100 milliseconds.
- sound-count indicates the number of times the buzzer sounds and does not sound. It is impossible to specify 0.
- When OFF-time is 0, the buzzer continues to sound.

■ **Related Item**

BEEP

■ **Example of Program**

```
conf
   SETBEEP 50,20,3
end conf
evnt
   input type%, id@, data%
   if id@ = ..SWT000 then
      BEEP 1
   else
      BEEP 0
   endif
end evnt
```

SETBLIGHT

Statement

■ **Function**

The SETBLIGHT statement sets the time that lasts till the back light is turned off.

■ **Format**

SETBLIGHT OFF-time

■ **Example of Use**

SETBLIGHT 20

■ **Description**

- OFF-time indicates the time that lasts till the back light is turned off; it is an integer-type variable or a numeric value. OFF-time is set in minutes. When OFF-time is 0, the back light is not turned off.

■ **Related Item**

GETBLIGHT

■ **Example of Program**

```
conf
   getblight var
   var = var*2
   SETBLIGHT var
end conf
```

SETDATE

Statement

■ **Function**

The SETDATE statement sets the date of the built-in clock.

■ **Format**

SETDATE year, month, day

■ **Example of Use**

SETDATE 92, 12, 1

■ **Description**

- year is the low-order two digits of A.D (0 to 99).
- month is a numeric value from 1 to 12.
- day is a numeric value from 1 to 31.
- If an unexisting year, month, or day is specified, an error occurs.
- The day of the week is automatically set based on preset year, month and day.
- Once date is set using the SETDATE command in a model with a battery backup calendar IC (GC56LC or GC55EM), the date is updated even while the power is off. If a model with no calendar IC (GC53LC or GC53LM) is turned off, the date is initialized to January 1, 1998 (Thursday) and the time to 00:00:00 when it is turned on again. The date and time are updated while the power is on.

■ **Related Item**

DATE\$, GETDATE, GETDATE, SETTIME, TIME\$

■ **Example of Program**

```
evnt
   input type,id@,dat
   if type = 3 then
      y = 94
      m = 12
      d = 1
      setdate y, m, d
   endif
end evnt
```

SETLNEPLOT

Statement

■ **Function**

The SETLNEPLOT statement sets the display range of a line chart.

■ **Format**

SETLNEPLOT display-start-point, display-end-point

■ **Example of Use**

SETLNEPLOT 10, 50

■ **Description**

- The SETLNEPLOT statement sets the display range of a line chart. Executing LNEDSP, LNESHIFT, or PRDSP after this display range has been set displays the line chart within the set range.
- After LNEDSP, LNESHIFT, or PRDSP has been executed, the set display range is released and the entire range display status is set.
- Line charts for which "Blink" or "On-and-Off" is specified are displayed within the entire range.
- When different ranges are set for two or more line charts within 100 milliseconds, the last set range corresponds to the first line chart to be displayed. All other line charts are displayed.

■ **Related Item**

LNEDSP, LNESHIFT, PRDSP

■ **Example of Program**

```
evnt
   input type,id@,data
   SETLNEPLOT 20, 30
   lneshift (..lnegraph , 1,1, 40)
end evnt
```

SETSIO

Statement

■ Function

The SETSIO statement sets a non-protocol communication reception method.

■ Format

SETSIO port-number, value

■ Example of Use

SETSIO 2 , &HD

■ Description

- The SETSIO statement sets the condition for issuing messages to BASIC of the part/screen when data is received in the non-procedual communication mode.
- port-number specifies the port for which the non-procedual communication mode is to be set.
- When the port specified in port-number is in the binary mode, value specifies the number of data to be received (in bytes). (0 cannot be specified.) When the port is in the text mode, value specifies a terminator code (1 to 0FFh) of the received data.
- For the binary mode, specify the number of bytes to be received from the connecting device. When the specified number of bytes are received, a message is transmitted to the part/screen.
- For the text mode, when a terminator code is received, a message is transmitted to the part/screen. A terminator code can be specified only by one byte.
- The port to be set must be opened by the OPENSIO statement in advance.

■ Related Item

OPENSIO, CLOSESIO, WRITESIO, WRITWSIOB, FLUSH, IOCTL

■ Example of Program

```
conf
   global buf$ * 200
   opensio 2 , 1 , buf$
   SETSIO  2 , &HD
end conf
evnt
   strdsp ..STR000 , buf$
   closesio 2
end evnt
```

SETTIM

Statement

■ Function

The SETTIM statement sets the limit time of the specified timer.

■ Format

SETTIM timer-number, time-limit, timer-type

■ Example of Use

SETTIM ID@, 100, 0
SETTIM VAR, 200, 1

■ Description

- The SETTIM statement determines the operation of the specified timer. The timer must be stopped when it is set.
- timer-number is the ID-type variable indicating the number of the timer whose operation is to be set or an integer-type value from 0 to 15.
- The time specified in time-limit starts to be counted when operation of the specified timer is started. It is specified in units of 100 milliseconds.
- timer-type specifies the type of timer to be set. Timers are classified into two types: normal and interval. The normal timer stops when the specified time limit is reached once. The interval timer restarts counting from 0 when the specified time limit is reached once.
  0: Normal timer
  1: Interval timer
- If one second or lower is set as the time limit in the interval timer, messages may be accumulated to cause an error.

■ Related Item

OPENTIM, STARTTIM, STOPTIM, CLOSETIM, CONTTIM, READTIM

■ Example of Program

```
conf
   static timid@
   timid@ = opentim()
   SETTIM timid@, 20, 0
   starttim timid@
end conf
evnt
   input type% , id@ , data%
   if type% = 3 then
      tim% = readtim(timid@)
      numdsp ..NUM000,tim%*100
   end if
end evnt
```

SETTIME

Statement

■ **Function**

The SETTIME statement sets the time of the built-in clock.

■ **Format**

SETTIME hour, minute, second

■ **Example of Use**

SETTIME 12, 0, 0

■ **Description**

- hour is a numeric value from 0 to 23.
- minute is a numeric value from 0 to 59.
- second is a numeric value from 0 to 59.
- If an unexisting hour, minute, or second is specified, an error occurs.
- Once time is set using the SETTIME command in a model with a battery backup calendar IC (GC56LC or GC55EM), time is updated even while the power is off. If a model with no calendar IC (GC53LC or GC53LM) is turned off, the date is initialized to January 1, 1998 (Thursday) and the time to 00:00:00 when it is turned on again. The date and time are updated while the power is on.

■ **Related Item**

DATE\$, GETDATE, GETDATE, SETDATE, TIME\$

■ **Example of Program**

```
evnt
   input type% , id@ , h%, m%, s%
   settime h%, m%, s%
end evnt
```

SHIFT

Statement

■ Function

The SHIFT statement shifts the contents of the specified variable left or right.

■ Format

SHIFT variable-name, shift-amount

■ Example of Use

SHIFT VARIABLE% , 1

■ Description

- The SHIFT statement shifts the contents (bit string) of the specified variable by the specified amount left or right.
- 0 is set in the positions of the bits vacated as a result of the shifting.
- variable-name specifies the variable name used to shift the bit string; it must be an integer-type variable.
- shift-amount specifies how much the bit string in the variable is to be shifted. A numeric value from 31 to -31 can be specified in shift-amount. When the specified shift amount is positive, the SHIFT statement shifts the bit string left. When it is negative, the SHIFT statement shifts the bit string right.

■ Related Item

None

■ Example of Program

```
conf
end conf
evnt
   input type% , id@ , data%
   numdsp ..NUM000 , data%
   shift data% , 1
   numdsp ..NUM000 , data%
end evnt
```

SIN

Function

- **Function** The SIN function calculates a sine for the specified numerical expression.

- **Format** SIN (numerical-expression)

- **Example of Use** X = SIN (ANGLE)

- **Description**
  - The SIN function calculates a sine value for the specified numerical expression. The unit for the numeric expression is radian.

- **Related Item** ATN, COS, TAN

- **Example of Program**

```
evnt
   angle = 3.141592/3
   x = SIN ( angle )
   numdsp ..num000,x
end evnt
```

SLDDSP

Statement

■ Function

The SLDDSP statement displays data in the slide display.

■ Format

SLDDSP control-name, display-data

■ Example of Use

SLDDSP .BUHIN.GRAPH, 30.0

■ Description

- control-name is the slide display name or the ID-type variable indicating the slide display.
- display-data is numeric data indicating the display position of the point graphic to be displayed in the slide display.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

None

■ Example of Program

```
evnt
   input type,id@,data
   SLDDSP ..SLD000, data
end evnt
```

SOF

Function

■ Function

The SOF function calculates the size of a field.

■ Format

SOF (file-number)

■ Example of Use

AAA = SOF (file-number)

■ Description

- file-number is the file number defined in the FIELD declaration. This size becomes the size of the file to be actually read or written.
- The size is calculated in bytes.

■ Related Item

FOPEN, FIELD, FCLOSE, FPUT, FGET, EOF

■ Example of Program

```
conf
   field  5
      global no%
      global moji1$ , moji2$
   end field
   global buff$ * 50
   opensio 1 , 0 , buff$
   fopen  ''C:TEST', 2 , 5
end conf
evnt
   no% = 1
   moji1$ = ''product-name''
   moji2$ = ''product-number''
   size% = SOF(5)
   mcpy 5 , buff$
   writesiob 1 , size% , buff$
end evnt
```

SQR

Function

■ Function

The SQR function calculates a square.

■ Format

SQR (numerical-expression)

■ Example of Use

X = SQR (Y)

■ Description

- The SQR function calculates a square for the specified numerical expression. numerical-expression must be a numeric value greater than or equal to 0.

■ Related Item

None

■ Example of Program

```
evnt
   x = SQR ( a^2 + b^2)
   numdsp ..NUM000, X
end evnt
```

STARTTIM

Statement

■ Function

The STARTTIM statement starts the operation of the specified timer.

■ Format

STARTTIM timer-number

■ Example of Use

STARTTIM ID@
STARTTIM VAR

■ Description

- The STARTTIM statement starts the operation of the specified timer. (The timer starts increment from 0.)
- timer-number is the ID-type variable indicating the number of the timer that starts increment or an integer-type variable from 0 to 15.

■ Related Item

OPENTIM, STOPTIM, CONTTIM, CLOSETIM, SETTIM, READTIM

■ Example of Program

```
conf
   static timid@
   timid@ = opentim()
   settim timid@, 20, 0
   STARTTIM timid@
end conf
evnt
   input type% , id@ , data%
   if type% = 3 then
      tim% = readtim(timid@)
      numdsp ..NUM000,tim%*100
   end if
end evnt
```

STATIC

Statement

■ **Function**

The STATIC statement declares that static variables are to be used.

■ **Format**

STATIC variable-name [, variable-name ...]

■ **Example of Use**

STATIC VAR, XYZ(2,3), MOJI$ * 20

■ **Description**

- The STATIC statement declares that static variables are to be used. Static variables can be used only the declared program. These variables are initialized once when the power supply is turned on. The values of static variables used after the power supply has been turned on are retained.
- A normal variable, an array variable, or a character string variable can be written in variable-name.
- When an array or character variable is declared, the DIM and STRING statements need not be declared.

■ **Related Item**

AUTO, BACKUP, DIM, GLOBAL, LOCAL, STRING

■ **Example of Program**

```
conf
   STATIC var%, float
   STATIC moji$ * 50, moji2(10) * 3
   STATIC xyz@(10,10)
end conf
```

STOP

Statement

■ Function

The STOP statement stops the execution of the program.

■ Format

STOP

■ Example of Use

STOP

■ Description

- The STOP statement stops the execution of the program following this statement.

■ Related Item

RUN

■ Example of Program

```
evnt
   input type , id@, data
   if type = 3 and data = 0 then STOP
   numdsp ..NUM000, data
end evnt
```

STOPTIM

Statement

■ Function

The STOPTIM statement stops the increment operation of the specified timer.

■ Format

STOPTIM timer-number

■ Example of Use

STOPTIM ID@
STOPTIM VAR

■ Description

- The STOPTIM statement stops the increment operation of the specified timer.
- timer-number is the ID-type variable indicating the number of the timer that stops increment or an integer-type variable from 0 to 15.

■ Related Item

OPENTIM, STARTTIM, CONTTIM, CLOSETIM, SETTIM, READTIM

■ Example of Program

```
conf
   static timid@
   timid@ = opentim()
   settim timid@, 20, 0
   starttim timid@
end conf
evnt
   input type% , id@ , data%
   if type% = 3 and data% = 1 then
      tim% = readtim(timid@)
      numdsp ..NUM000,tim%*100
   else
     STOPTIM timid@
   end if
end evnt
```

STR$

Function

■ Function

The STR$ function converts the specified numeric value to a character string.

■ Format

STR$ (numerical-expression)

■ Example of Use

A$ = STR$(123)

■ Description

- An integer- or floating point-type numerical expression can be specified in numerical-expression.
- When the numeric value specified in numerical-expression is negative, "-" is added to the beginning of the character string.

■ Related Item

VAL

■ Example of Program

```
evnt
   input type, id@,data
   a$ = STR$ ( data )
   strdsp ..hyojiki , a$
end evnt
```

STRCOLOR

Statement

■ Function

The STRCOLOR statement changes the colors and background figure of the character display.

■ Format

STRCOLOR control-name, character-display-color, tile, display-color, background-color

■ Example of Use

STRCOLOR ..GRAPH, 1, 2, 5, 2

■ Description

- The STRCOLOR statement changes the background tile and colors of the character display. -1 indicates that the color and tile for which -1 was specified remain unchanged.
- control-name is the character display name or the ID-type variable indicating the character display.
- character-display-color indicates the color in which characters are displayed. Specify this character display color with a numeric value from 0 to 15.
- tile indicates the background tiling figure of the character display. Specify this tiling figure with a numeric value from 0 to 15.
- display-color is the numeric value indicating the color number of the tile display section. Specify this color number with a numeric value from 0 to 15.
- background-color is the numeric value indicating the color number of the tile background section. Specify this color number with a numeric value from 0 to 15.

■ Related Item

STRDSP, STRFORM

■ Example of Program

```
conf
   static name@
   name@ = ..STR000
end conf
evnt
   input type%, id@, data%
   if type% = 3 then
      STRCOLOR name@, 2, -1,-1,-1
   endif
end evnt
```

STRDSP

Statement

■ Function

The STRDSP statement displays data in the character display.

■ Format

STRDSP control-name, display-data

■ Example of Use

STRDSP .BUHIN.GRAPH, “ABCDEF”

■ Description

- The STRDSP statement displays data in the character display.
- control-name is the character display name or the ID-type variable indicating the character display.
- display-data is character data to be displayed in the character display.
- display-value cannot be changed even if this statement is issued to the display for which operation parameters are set to “effective” in the control.

■ Related Item

STRCOLOR, STRFORM

■ Example of Program

```
conf
   static name@
   name@ = ..STR000
end conf
evnt
   input type%, id@, data$
   STRDSP name@, data$
end evnt
```

STRFORM

Statement

■ Function

The STRFORM statement changes the display method of the character display.

■ Format

STRFORM control-name, display-method

■ Example of Use

STRFORM ..HYOJIKI, 0

■ Description

- The STRFORM statement changes the display method of the character display.
- control-name is the character display name or the ID-type variable indicating the character display.
- display-method is the numeric value indicating any of the following three display methods:
  - 0: Left-justification method
  - 1: Centering method
  - 2: Right-justification method

■ Related Item

STRCOLOR, STRDSP

■ Example of Program

```
evnt
   input type , id@,data
   var@ = .buhin.moji
   STRFORM var@ , data
   strdsp  var@ , "ABCDEFG"
end evnt
```

STRING

Statement

■ Function

The STRING statement specifies the size of the character string variable to be used.

■ Format

STRING variable-name * size [variable-name * size ......]

■ Example of Use

STRING MOJI$ * 50

■ Description

- The STRING statement is used to specify a size of a local character string variable.
- The STRING statement is adopted to maintain the compatibility with GCSGP3. Use LOCAL, instead of STRING, in Screen Creator 5.
- The default size of the character string variable is 20 bytes. Use the STRING statement to use a variable whose size is greater than 20 bytes. The character string variable must be declared before it is used.
- variable-name must end with $.
- Specify size with an integer value.
- Two or more character string variable can be specified in one line, delimited by a comma (,).

■ Related Item

GLOBAL, STATIC, BACKUP, LOCAL

■ Example of Program

```
conf
   string xxx$ * 40
   string moji$ * 50
end conf
```

SWFIG

Statement

■ Function

The SWFIG statement sets the graphic to be displayed when the status of the specified switch changes.

■ Format

SWFIG switch-name, display-graphic, status, sub-ID

■ Example of Use

SWFIG ..SW1, FIG3, 0, 0

■ Description

- The SWFIG statement specifies the graphic to be displayed in the specified switch when the switch changes from the ON status to the OFF status. Both the unit switch and selector switch can be used. When the selector switch is used, its sub-ID must be specified.
- switch-name is the name assigned to the switch or the ID-type variable indicating the name.
- display-graphic is the graphic name or the ID-type variable indicating the name.
- status is the integer value indicating whether the graphic is displayed when the switch status is ON or OFF.
  - 0: The graphic is displayed when the switch status is OFF.
  - 1: The graphic is displayed when the switch status is ON.
- sub-ID is required when the selector switch is used. Specify the sub-switch number of the selector switch in sub-ID. The sub-switch number in the upper left end is assigned 1. The sub-switch numbers increase in the right direction. They decrease in the downward direction. (Specify 0 in sub-ID when the selector switch is not used.)

■ Related Item

None

■ Example of Program

```
conf
   static figid@,subid,onoff
   figid@ = FIG03
   subid = 3
   onoff = 1
end conf
evnt
   input type,id@,data
   if type = 3 and id@ = ..SWT000 then
      SWFIG id@ , figid@ , onoff , subid
   endif
end evnt
```

SWMODE

Statement

■ Function

The SWMODE statement modifies the status of the specified switch.

■ Format

SWMODE switch-name, mode

■ Example of Use

SWMODE ..SW1, 2

■ Description

- switch-name is the name of the switch whose status is to be modified or the ID-type variable indicating the switch.
- mode indicates the status to be modified.
  - 0: Normal status
  - 1: Input disable status
  - 2: Half tone status

■ Related Item

None

■ Example of Program

```
evnt
   input type,id@,data
   if type  = 3 then
      SWMODE ..sw2 , 1
      SWMODE var@ ,2
   end if
end evnt
```

SWREAD

Function

■ **Function**

The SWREAD function reads the status of the specified switch.

■ **Format**

SWREAD (switch-name)

■ **Example of Use**

STATE = SWREAD (..SW1)

■ **Description**

- The SWREAD function reads the status (ON or OFF) of the specified switch.
- switch-name is the name assigned to the switch or the ID-type variable indicating the name.
- The CONF and part CONF block of the global screen cannot be used in the switch primitive where operation parameters are valid.
- The SWREAD statement cannot read the synchronous switch status of an undisplayed screen.
- As a result of executing this function, the status of normal switches is indicated by the following numeric values:
  - 0: OFF status
  - 1: ON status
- As a result of executing this function, the status of selector switches is indicated by the following numeric values:
  - 0: All selector switches are OFF.
  - Other values: Numbers of the sub-switches that are ON. (The sub-switch number in the upper left end is 1. The sub-switch numbers increase in the right direction. They decrease in the downward direction.)

■ **Related Item**

SWWRITE

■ **Example of Program**

```
evnt
   input type,id@,data
   id@ = ..SW2
   state = SWREAD (ID@)
   if state = 0 then
      swwrite id@,1
   endif
end evnt
```

SWREV

Statement

■ Function

The SWREV statement sets whether to reverse the display of the specified switch when the switch status changes.

■ Format

SWREV switch-name, operation

■ Example of Use

SWREV ..SW2, 0

■ Description

- The SWREV statement sets whether to reverse the display of the specified switch when the switch on the touch panel is pressed or the status is changed.
- switch-name is the name assigned to the switch or the ID-type variable indicating the name.
- The CONF and part CONF block of the global screen cannot be used in the switch primitive where operation parameters are valid.
- operation indicates whether to reverse the display of the switch with the following numeric values:
  - 0: The display of the switch is not reversed.
  - 1: The display of the switch is reversed.

■ Related Item

None

■ Example of Program

```
evnt
   input type,id@,data
   if type = 3 and id@ = ..SWT000 then
      id@ = ..SW2
      SWREV id@,1
   endif
end evnt
```

SWWRITE

Statement

■ Function

The SWWRITE statement changes the status of the specified switch.

■ Format

SWWRITE switch-name, status

■ Example of Use

SWWRITE ..SW1, 1

■ Description

- The SWWRITE statement changes the status (ON or OFF) of the specified switch even if the switch on the touch panel is not pressed. When the status is changed, the data indicating the status is transmitted to the part program on which the switch is placed.
- switch-name is the name assigned to the switch or the ID-type variable indicating the name.
  For multi-switches, it is necessary to set switch numbers in the offset and to get switch IDs using the GETID command.
- status indicates that the normal switches are in any of the following statuses:
  - 0: OFF status
  - 1: ON status
- status indicates that the selector switches are in any of the following statuses:
  - 0: All selector switches are OFF.
  - Other values: Numbers of the sub-switches that are ON. (The sub-switch number in the upper left end is 1. The sub-switch numbers increase in the right direction. They decrease in the downward direction.)
- The numbers of multi-switches and selector switches are counted as 1, 2, 3 and so forth from the upper left switch. When all switches are counted in the X direction, the switches on the lower Y line are counted in the same way. They are integers.
- When this statement is executed, a message is issued as a switch is pressed.
- Executing the SWWRITE statement for the switch where synchronous operation is valid causes an error.
- The SWWRITE statement is invalid for the switch of the momentary type.

■ Related Item

GETID,SWREAD

Example of Program

```
evnt
   input type,id@,data
   id@ = ..SW2
   state = swread (ID@)
   if state = 0 then
      SWWRITE id@,1
   endif
end evnt
```

TAN

Function

■ Function

The TAN function calculates a tangent for the specified numerical expression.

■ Format

TAN (numerical-expression)

■ Example of Use

X = TAN (ANGLE)

■ Description

- The TAN function calculates a tangent value for the specified numerical expression. The unit for the numeric expression is radian.

■ Related Item

ATN, SIN, COS

■ Example of Program

```
evnt
   angle = 3.141592/3
   x = TAN ( angle )
   numdsp ..num000,x
end evnt
```

TIME\$

Statement

■ **Function** The TIME$ statement reads the current time.

■ **Format** TIME$

■ **Example of Use** A$ = TIME$

■ **Description**

- The TIME$ statement reads the current time with a character string of H:M:S format.
- This statement cannot be used to set the current time.
- Once time is set using the SETTIME command in a model with a battery backup calendar IC (GC56LC or GC55EM), time is updated even while the power is off. If a model with no calendar IC (GC53LC or GC53LM) is turned off, the date is initialized to 98-01-01 and the time to 00:00:00 when it is turned on again. The date and time are updated while the power is on.

■ **Related Item** DATE\$, GETDATE, GETTIME, SETDATE, SETTIME

■ **Example of Program**

```
conf
   moji$ = TIME$
   strdsp ..STR000 , moji$
end conf
```

TIMID

Function

■ Function

The TIMID function changes an integer-type timer number to an ID-type timer number.

■ Format

TIMID (number)

■ Example of Use

AA@ = TIMID (VAR)

■ Description

- number is the timer number (integer value) to be changed to an ID-type timer number.

■ Related Item

TIMINT, OPENTIM2

■ Example of Program

```
conf
   opentim2(2)
   settim 2 , 20, 0
   starttim 2
end conf
evnt
   input type,id@
   if id@ = timid(2) then
      .......
   end if
end evnt
```

TIMINT

Function

■ Function

The TIMINT function changes an ID-type timer number to an an integer-type timer number.

■ Format

TIMINT (ID-number)

■ Example of Use

VAR = TIMINT (ID@)

■ Description

- ID-number is the ID-type timer number to be changed to to an integer-type timer number.

■ Related Item

TIMID, OPENTIM

■ Example of Program

```
evnt
   .....
   id@=opentim()
   no = TIMINT (id@)
   chktim ( no )
   ....
end evnt
```

VAL/VAL2

Function

■ **Function**

The VAL/VAL2 function converts the number specified in character-string to a numeric value.

■ **Format**

VAL (character-string)
VAL2 (character-string)

■ **Example of Use**

A = VAL (“123”)
A = VAL2 (“123.45”)

■ **Description**

- When the specified character string begins with a character other than +, -, 0 to 9, E and ., the VAL/VAL2 function returns 0.
- If the specified character string contains an unconvertible character, the VAL/VAL2 function converts the characters before it.
- When the VAL function is used to convert the number specified in character-string to a numeric value, the result becomes real type.
- When the VAL2 function is used to convert the number specified in character-string to a numeric value, the result becomes integer type.

■ **Related Item**

STR$

■ **Example of Program**

```
conf
   var = VAL ( “234”)
   numdsp ..NUM000 , var
end conf
```

WHILE ... WEND

Statement

■ Function

The instructions between the WHILE and WEND statements are executed while the specified conditional expression is true (satisfactory).

■ Format

WHILE conditional-expression
......
WEND

■ Example of Use

WHILE X > 0
....
WEND

■ Description

- When the specified conditional expression is true, the instructions between the WHILE and WEND statements are executed. When it becomes false, the instructions following the WEND statement are executed.

■ Related Item

IF ... THEN ... ELSE

■ Example of Program

```
conf
   static var(10)
   WHILE i% < 10
      var(i%) = i% * 5
   WEND
end conf
```

WRITESIO/WRITESIOB

Statement

■ **Function**

The WRITESIO and WRITESIOB statements write transmission data to a non-procedual communication transmission buffer.

■ **Format**

WRITESIO port-number, variable-name
WRITESIOB port-number, number-of bytes, variable-name

■ **Example of Use**

WRITESIO 2 , moji$
WRITESIOB 2 , 20 , moji$

■ **Description**

- The WRITESIO statement writes transmission data to a non-procedual communication transmission buffer (serial port) in the text mode. The WRITESIOB statement writes transmission data to the same buffer (serial port) in the binary mode.
- port-number specifies the channel (CH1 to CH3) to which transmission data is to be written with a numeric value from 1 to 3.
- Of the transmission data written to the variable specified by variable-name, number-of-bytes specifies the number of bytes to be transmitted (valid when the binary mode is used).
- variable-name specifies the name of the variable to which transmission data is written.
- In the text mode, the written data is transmitted till the code (0h) indicating the end of the character string is detected. (That is, data from 1 to 0FFh can be transmitted. No terminator code is automatically inserted into the end of data.)
- In the binary mode, all data (0 to 0FFh) can be transmitted.
- The port to which transmission data is to be written must be opened by the OPENSIO statement in advance.

■ **Related Item**

OPENSIO, CLOSESIO, WRITESIO, WRITWSIOB, SETSIO

■ **Example of Program**

```
conf
  global buf$ * 200
  opensio 2 , 1 , buf$
  setsio  2 , &HD
end conf
evnt
  sendbuf$ = ‘‘ABCDEFG’’
  WRITESIO 2 , sendbuf$
  closesio 2
end evnt
```