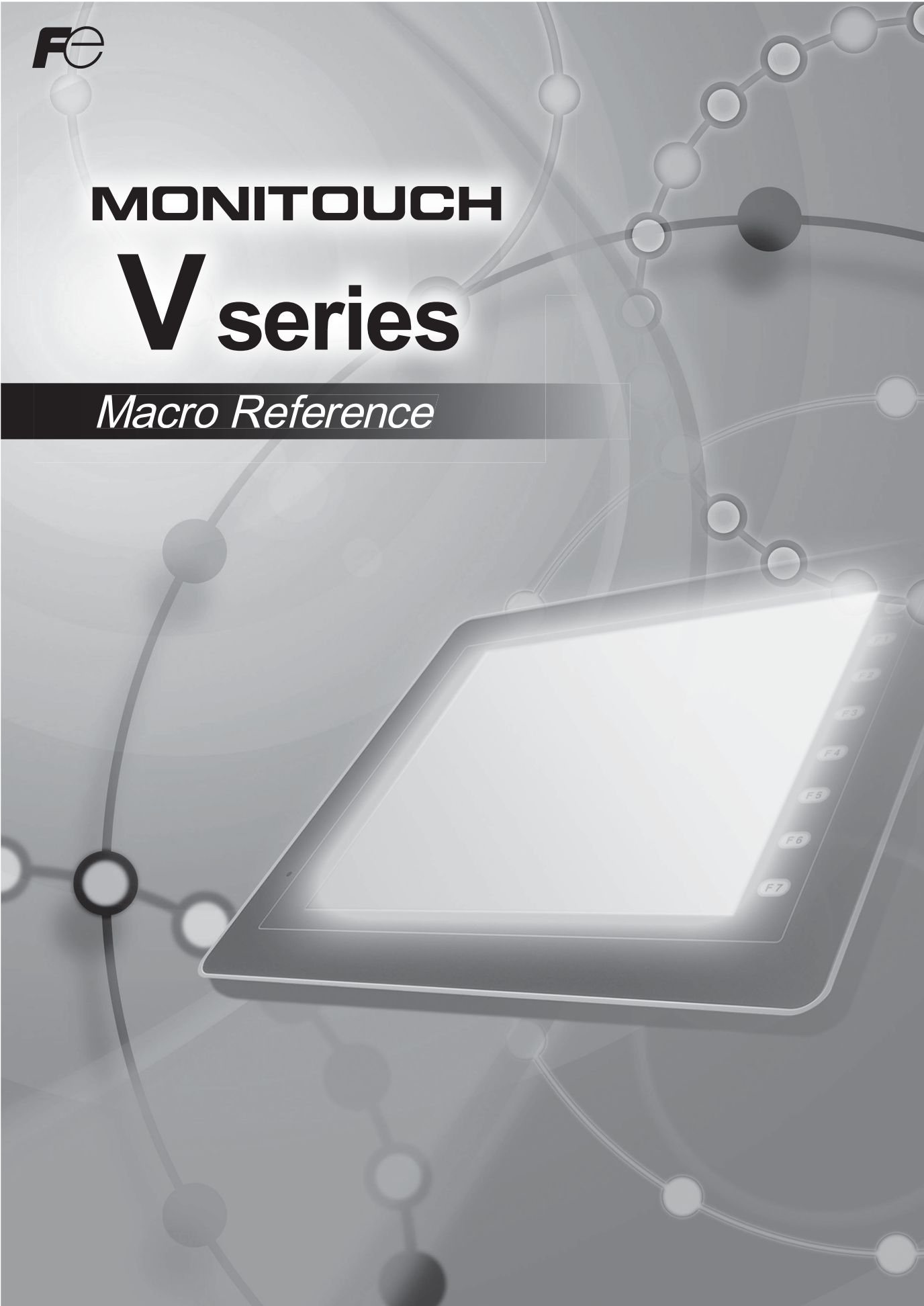
MONITOUCH

V series

Macro Reference



Record of Revisions

Reference numbers are shown at the bottom left corner on the back cover of each manual.

Date	Reference No.	Revised Contents
January, 2008	1056NE0	First edition
July, 2011	1056NE1	Second edition • Revised for reprint • Front and back covers revised • Supported models added V815X, V810C, V808C, V806 series, V808CH, and TELLUS version 3 • Macro commands added Math & Trig, IF/ELSE/ENDIF, SMPL_CSV2/SMPL_CSVBAK2, HDCOPY3, CLND_TO_GRE, GRE_TO_CLND, FORMAT_DATA, FORMAT_STR, MOVE_FILE, READ_FILE, WRITE_FILE
July, 2012	1056NE2	Third edition • Front cover revised • Macro command added IF/ELSE/ENDIF (BIT) • Revised for reprint

Preface

Congratulations on purchasing the MONITOUCH V series.
The “V Series Macro Reference” manual describes macro functions used on the drawing/editing software (V-SFT version 5) for the MONITOUCH V series. For a correct use of the product, read this manual thoroughly.

About Manuals

The following manuals are available for the MONITOUCH V series.
Refer to them as necessary.

Manual Name	Reference No.	Contents
V Series Macro Reference (this manual)	1056NEx	For the V-SFT version 5, an overview of macros as well as a detailed description of the macro editor operations and macro commands are provided.
V8 Series Reference Manual	1055NEx	The functions of the MONITOUCH V8 series are explained in detail.
V8 Series Reference: Additional Functions	1060NEx	The functions that are added from the V-SFT version 5.1.0.0 to the MONITOUCH V8 series are explained in detail.
V8 Series Introductory Manual	1057NEx	For the MONITOUCH V8 series, its overview as well as a detailed description of the configuration software basic operations are provided.
V8 Series Operation Manual	1058NEx	The information related to the operations of the V-SFT version 5, such as software composition, editing procedure or limitations, is explained in detail.
V8 Series Hardware Specifications	2016NEx	Hardware specifications and handling procedures of the MONITOUCH V8 series are explained.
V806 Series Hardware Specifications	2017NEx	Hardware specifications and handling procedures of the MONITOUCH V806 series are explained.
V815 Hardware Specifications	2018NEx	Hardware specifications and handling procedures of the MONITOUCH V815 are explained.
V808CH Hardware Specifications	2019NEx	Hardware specifications and handling procedures of the MONITOUCH V808CH are explained.
V8 Series Connection Manual	2201NEx	Wiring diagrams and procedures for connection between the MONITOUCH V8 series and devices of individual manufacturers are explained.
V Series DLL Function Specifications	1059NEx	DLL files used for Ethernet (HKEtn20.dll) and CF card (VCFAcs.dll) are explained in detail.
Reference Manual Version 3	1050NEx	Functions of the MONITOUCH V6/V7 series are explained in detail.
V7 Series Hardware Specifications	2010NEx	Hardware specifications and handling procedures of the MONITOUCH V7 series are explained.
V706 Series Hardware Specifications	2012NEx	Hardware specifications and handling procedures of the MONITOUCH V706 series are explained.
V715 Hardware Specifications	2015NEx	Hardware specifications and handling procedures of the MONITOUCH V715 are explained.
PLC Connection Manual	2200NEx	Wiring diagrams and procedures for connection between the MONITOUCH V6/V7 series and devices of individual manufacturers are explained
Temperature Control Network	1033NEx	Connecting procedures and wiring diagrams relevant to the temperature control network for the MONITOUCH V6/V7 series are explained.

V Series Models

The following V series models are available:

Generic Name	Series	Symbol	Model
V series	V8 series	V815X	V815iX
		V812S	V812iS, V812S
		V810S	V810iS, V810S
		V810T	V810iT, V810T
		V810C	V810iC, V810C
		V808S	V808iS, V808S
		V808C	V808iC, V808C
		V808CH	V808iCH, V808CH
	V806 series	V806T	V806iT, V806T
		V806C	V806iC, V806C
		V806M	V806iM, V806M
	V7 series	V715X	V715X
		V712S	V712iS, V712S
		V710S	V710iS, V710S
		V710T	V710iT, V710T
		V710C	
		V708S	V708iS, V708S
		V708C	
	V706 series	V706T	
		V706C	
		V706M	
	V6 series	V612T	
		V612C	
		V610S	
		V610T	
		V610C	
		V608C	
		V606iT	
		V606iC	
		V606iM	
		V606C	
		V606M	
		V606eC	
		V606eM	
		V609E	
		V608CH	
	V4 series	V4	
		V4S	

(to be continued)

Generic Name	Series	Symbol	Model
TELLUS	TELLUS Ver. 3	TELLUS3 HMI	HMI *1
	TELLUS Ver. 2	TELLUS2 HMI	HMI *1

*1 Limitations and notes on macro commands should be noted in the case of the TELLUS remote mode.
For more information, consult your local distributor.

Please note that the V series model names are used as listed above in the manuals.

Notes on Safe Usage of MONITOUCH

In this manual, you will find various notes categorized under the following levels with the signal words “DANGER,” and “CAUTION.”

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.

Note that there is a possibility that the item listed with **CAUTION** may have serious ramifications.

DANGER

- Never use the output signal of MONITOUCH for operations that may threaten human life or damage the system, such as signals used in case of emergency. Please design the system so that it can cope with the malfunctions of a touch switch. A malfunction of a touch switch will result in machine accident or damage.
- Turn off the power supply when you set up the unit, connect new cables or perform maintenance or inspections. Otherwise, electrical shock or damage may occur.
- Never touch any terminals while the power is on. Otherwise, electric shock may occur.
- You must put a cover on the terminals on the unit when you turn the power on and operate the unit. Otherwise, electric shock may occur.
- The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, do not ingest the leaked liquid crystal. If the liquid crystal spills on skin or clothing, use soap and wash off thoroughly.
- Never disassemble, recharge, deform by pressure, short-circuit, reverse the polarity of the lithium battery, nor dispose of the lithium battery in fire. Failure to follow these conditions will lead to explosion or ignition.
- Never use a lithium battery that is deformed, leaks, or shows any other signs of abnormality. Failure to follow these conditions will lead to explosion or ignition.
- For the V8 series or V715X, the power lamp flashes when the backlight is at the end of life or is faulty. However, the switches on the screen are operable at this time. Do not touch the screen when the screen becomes dark and the power lamp flashes. Otherwise, a malfunction may occur and result in machine accident or damage.

⚠CAUTION

- Check the appearance of the unit when it is unpacked. Do not use the unit if any damage or deformation is found. Failure to do so may lead to fire, damage or malfunction.
- For use in a facility or for a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, please consult your local distributor.
- Operate (or store) MONITOUCH under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage or deterioration.
- Understand the following environmental limits for use and storage of MONITOUCH. Otherwise, fire or damage to the unit may result.
  - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids or cutting oil can come into contact with the unit.
  - Avoid high temperature, high humidity, and outside weather conditions, such as wind, rain or direct sunlight.
  - Avoid locations where excessive dust, salt, and metallic particles are present.
  - Avoid installing the unit in a location where vibration or physical shock may be transmitted.
- Equipment must be correctly mounted so that the main terminal of MONITOUCH will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- Tighten the fixtures of MONITOUCH with a torque in the specified range. Excessive tightening may distort the panel surface. Loose tightening may cause MONITOUCH to come off, malfunction or be short-circuited.
- Check periodically that terminal screws on the power supply terminal block and fixtures are firmly tightened. Loosened screws may result in fire or malfunction.
- Tighten terminal screws on the power supply terminal block equally to a torque of 0.8 N•m for the V812 or V810 series, or 1.2 N•m for the V808 series. Improper tightening of screws may result in fire, malfunction, or trouble.
- Tighten mounting screws on the unit equally to a torque of 0.5 to 0.7 N•m. Excessive tightening may distort the panel surface. Loose tightening may cause MONITOUCH to come off, malfunction or be short-circuited.
- MONITOUCH has a glass screen. Do not drop or give physical shock to the unit. Otherwise, the screen may be damaged.
- Connect the cables correctly to the terminals of MONITOUCH in accordance with the specified voltage and wattage. Over-voltage, over-wattage, or incorrect cable connection could cause fire, malfunction or damage to the unit.
- Be sure to establish a ground of MONITOUCH. The FG terminal must be used exclusively for the unit with the level of grounding resistance less than 100Ω. Otherwise, electric shock or a fire may occur.
- Prevent any conductive particles from entering into MONITOUCH. Failure to do so may lead to fire, damage, or malfunction.
- After wiring is finished, remove the paper used as a dust cover before starting to operate MONITOUCH. Operation with the cover attached may result in accident, fire, malfunction, or trouble.
- Do not attempt to repair MONITOUCH at your site. Ask Hakko Electronics or the designated contractor for repair.
- Do not repair, disassemble or modify MONITOUCH. We are not responsible for any damages resulting from repair, disassembly or modification of MONITOUCH that was performed by an unauthorized person.
- Do not use a sharp-pointed tool when pressing a touch switch. Doing so may damage the screen. Doing so may damage the screen.
- Only experts are authorized to set up the unit, connect the cables or perform maintenance and inspection.
- Lithium batteries contain combustible material such as lithium or organic solvent. Mishandling may cause heat, explosion or ignition resulting in fire or injury. Read related manuals carefully and handle the lithium battery correctly as instructed.
- When using a MONITOUCH that has analog switch resolution with resistance film, do not press two or more points on the screen at the same time. If two or more positions are pressed at the same time, the switch located between the pressed positions activates.
- Take safety precautions during such operations as setting change during running, forced output, start, and stop. Any misoperation may cause unexpected machine motions, resulting in machine accident or damage.
- In facilities where a failure of MONITOUCH could lead to accident threatening human life or other serious damage, be sure that the facilities are equipped with adequate safeguards.
- At the time of disposal, MONITOUCH must be treated as industrial waste.
- Before touching MONITOUCH, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- The LED lamp on the CF card interface cover provided to the V8 series or V715X lights up in red when the power is supplied to the CF card. Never remove the CF card or turn off the power of MONITOUCH while the LED lamp is lit. Doing so may destroy the data on the CF card. Check that the LED lamp has gone off before removing the CF card or turning off the power of MONITOUCH.

[General Notes]

- Never bundle control cables nor input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep these cables at least 200 mm away from the high-voltage and large-current carrying cables. Otherwise, malfunction may occur due to noise.
- When using MONITOUCH in an environment where a source of high-frequency noise is present, it is recommended that the FG shielded cable (communication cable) be grounded at its ends. However, the cable may be grounded only at one end if this is necessary due to unstable communication conditions or for any other reason.
- Plug connectors or sockets of MONITOUCH in the correct orientation. Failure to do so may lead to malfunction.
- If a LAN cable is inserted into the MJ1 or MJ2 connector on the main unit, the counterpart device may be damaged. Check the indication on the unit and insert a cable into the correct position.
- Do not use thinners for cleaning because they may discolor the MONITOUCH surface. Use alcohol or benzine commercially available.
- If a data receive error occurs when MONITOUCH and the counterpart (PLC, temperature controller, etc.) are started at the same time, read the manual for the counterpart unit and reset the error correctly.
- Avoid discharging static electricity on the mounting panel of MONITOUCH. Static charges can damage the unit and cause malfunctions. Otherwise, malfunction may occur due to noise.
- Avoid prolonged display of any fixed pattern. Due to the characteristics of the liquid crystal display, an afterimage may occur. If a prolonged display of a fixed pattern is expected, use the auto OFF function of the backlight.

[Notes on LCD]

Note that the following conditions may occur under normal circumstances.

- The response time, brightness and colors of MONITOUCH may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the liquid crystal characteristics.
- There are variations in brightness and colors on each unit.
- Cold cathode tubes are incorporated into the LCD display for backlights. Optical properties (brightness, irregular colors, etc.) may change in a low-temperature environment or over time of operation.

Contents

1 Outline

1.1 Type of V Series Macros

Macros, created with V-series-specific commands, are used to process user programs.
Macro creation is made simple with easy-to-use commands.
Macros are executable for the following occasions:

- Screen
  - OPEN macro: Executes once when the screen is opened.
  - CLOSE macro: Executes once when the screen is switched.
  - CYCLE macro: Executes repeatedly while the screen is open.

- Multi-overlap
  - OPEN macro: Executes once when the multi-overlap is opened.
  - CLOSE macro: Executes once when the multi-overlap is closed.
    * OPEN and CLOSE macros cannot be used for call-overlaps.

- Switch
  - ON macro: Executes once when the switch is pressed.
  - OFF macro: Executes once when the switch is released.

- Function switch
  - ON macro: Executes once when the function switch is pressed.
  - OFF macro: Executes once when the function switch is released.

- Initial Macro
  The specified macro block executes once before the V series starts communicating with the PLC. (Refer to page 1-3.)

- Global Macro
  The specified macro block is executed once when the macro execution bit in the read area changes from 0 → 1 (leading edge). (Refer to page 1-4.)

- Event Timer Macro
  The specified macro block executes at regular intervals, regardless of which screen is currently displayed. (Refer to page 1-5.)

- Interval Timer
  While a screen equipped with the interval timer is displayed, the timer starts as preset. Each time the preset time has elapsed, the specified macro block is executed. (Refer to page 1-6.)

- Macro Mode
  While a screen equipped with macro mode is displayed, macros are executed according to the status at the specified memory addresses. (Refer to page 1-12.)
  - ON macro: Executes when the bit at the specified memory address changes from 0 → 1 (leading edge).
  - OFF macro: Executes when the bit at the specified memory address changes from 1 → 0 (falling edge).

1.2 Notes on Macros

- A maximum of 1,024 lines (instructions) can be set for one macro.
- The maximum of executable lines in macros is 160,000.
  If the maximum permissible number is exceeded by, for instance the repetition of the same macro with the use of a loop macro, macro execution is forcibly terminated.
  With the V8 series, if the maximum number of executions is exceeded “-1 (DEC)” is stored at $s1059.
- When an external device memory is used with multiple MOV commands, the external memory is accessed each time so the processing speed is slowed down.
  Example:

  Line No. 0 PLC1 [D00200] = $u00200 (W)
  Line No. 1 PLC1 [D00201] = $u00201 (W)
  Line No. 2 PLC1 [D00202] = $u00202 (W)
  Line No. 3 PLC1 [D00203] = $u00203 (W)
  Line No. 4 PLC1 [D00204] = $u00204 (W)

  In the above example, the V series goes and writes data to D200 as commanded in line No. 0, then goes and writes data to D201 as commanded in line No. 1, and so on. Communications that frequently occur will result in a prolonged processing time.
  To shorten the communications time, give a BMOV command as shown below. The contents of the macro using BMOV are the same as the above macro consisting of five lines, but the data writing takes place only once.

  Line No. 0 PLC1 [D00200] = $u00200 C:5 (BMOV) (W)

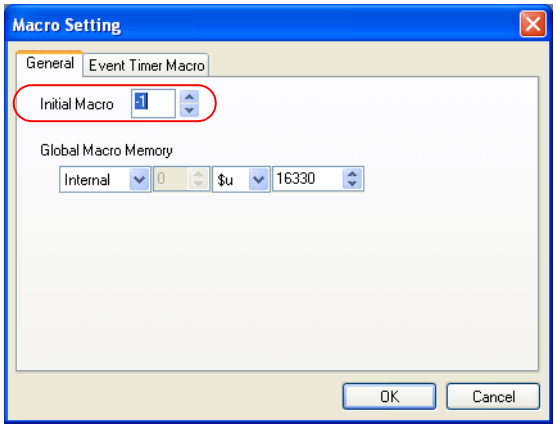
  The processing speed is increased and the number of macro commands is reduced.
  As described above, macros can be simplified when you plan to make their commands more efficient to use.

1.3 Initial Macro

An initial macro is executed once before the V series starts communicating with the external device.

Macro Setting

[General] tab window



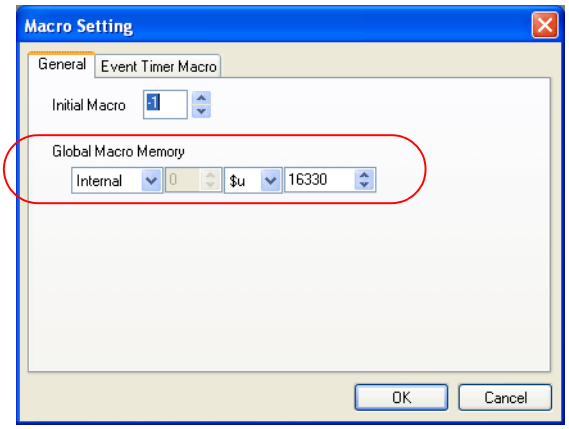
Initial Macro	Specify the macro block number to be executed before the V series starts communicating with the PLC. 0 - 1023: Macro block number –1: Initial macro invalid

1.4 Global Macro

A global macro is executed when the bit is set (ON), regardless of the screen displayed.

Macro Setting

[General] tab window



Global Macro Memory	Specify the memory address where the macro block number to be executed is contained.

Macro Execution Steps

1. The macro block number is specified at the global macro memory address.
2. Bit 8 of the read area “n + 1” is set ([0 → 1] leading edge).
   ↓
   Execution of the macro
   ↓
3. Bit 8 of the read area “n + 1” is set ([1 → 0] leading edge).

Supplemental Remarks

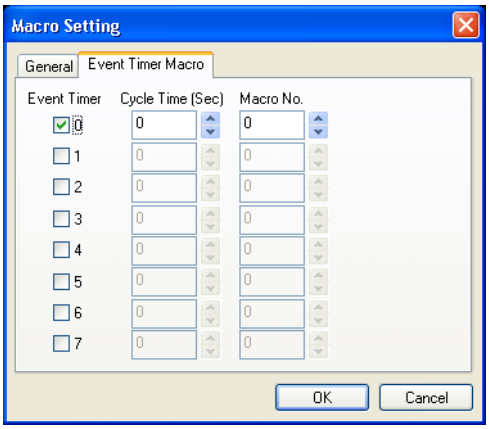
- You will see the time when bit 8 of the read area “n + 1” is reset (OFF) from bit 8 of the write area “n + 1” (global macro execution bit).

1.5 Event Timer Macro

An event timer macro is executed at regular intervals, regardless of the screen displayed.

Macro Setting

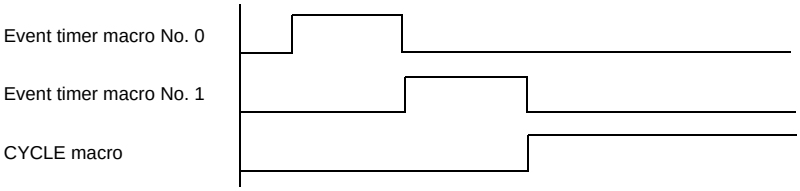
[Event Timer Macro] tab window



Event Timer No.	0 - 7 A maximum of eight event timer macro blocks can be set.
Cycle Time	0 - 3600 (sec) Specify a cycle time for the timer. The specified macro block is executed each time the specified time has elapsed.
Macro No.	0 - 1023 Specify the macro block number to be executed.

Supplemental Remarks

1. When the timers for multiple event timer macros are up at the same time:
   Event timer macro blocks are executed in ascending numeric order of [Event Timer No.].
   After a macro block has been processed, execution proceeds to the next macro block.

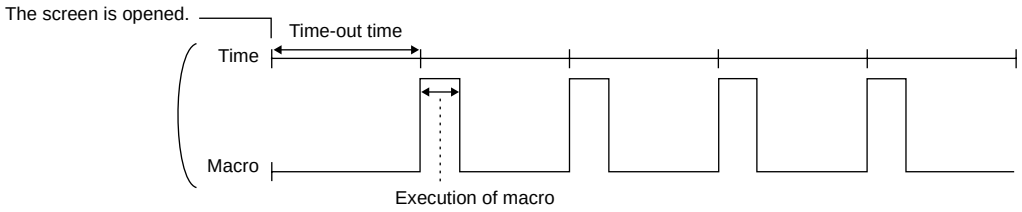


2. When accessing the same external device memory address in some event timer macros:
   The processing ability will be improved if you set the event timer macro No. 0 that reads the external device memory into the internal memory and make other event timer macros refer to this internal memory.
   In order to improve the overall processing ability, reduce the number of times that the external device memory is accessed.

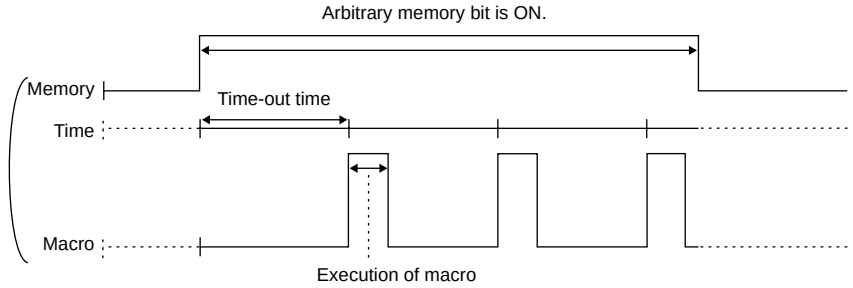
1.6 Interval Timer

The interval timer has the following functions:

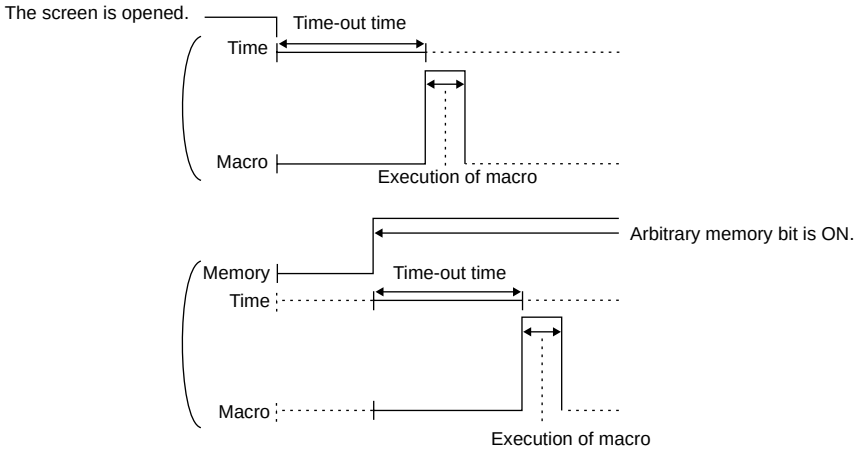
- The specified macro block is executed at arbitrary-set time intervals from the instant the screen is opened.



- The specified macro block is executed at arbitrary-set time intervals from the instant an arbitrary bit is set (ON). (This function is valid only while the bit is set.)

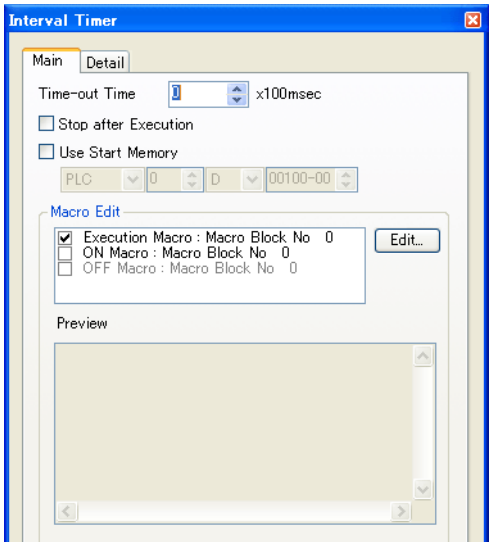


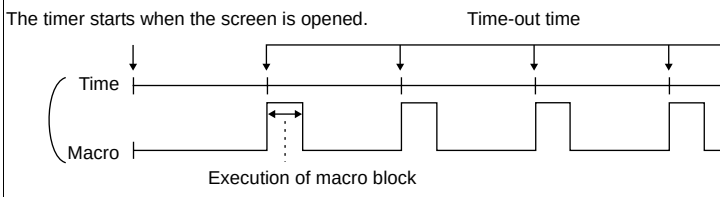
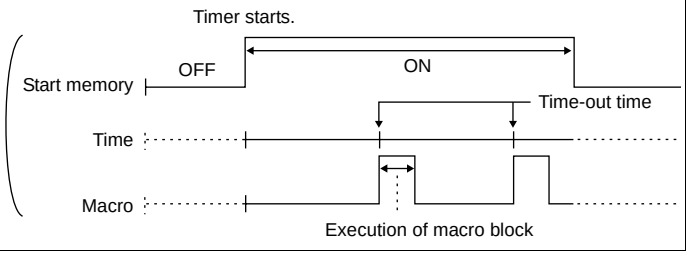
- The specified macro block is executed once after an arbitrary length of time has elapsed from the instant the screen is opened or an arbitrary bit is set (ON).

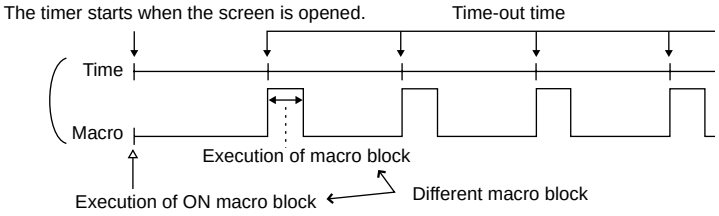
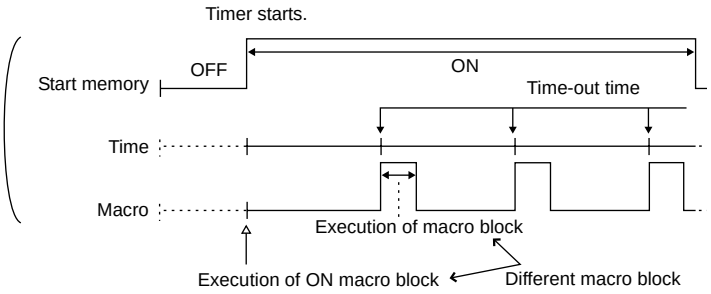
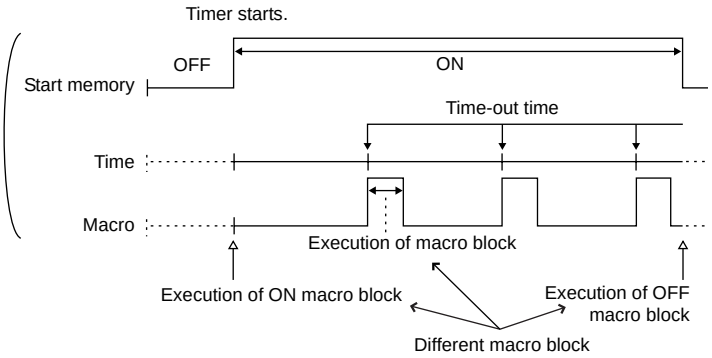


Dialog Setting

[Main] tab window

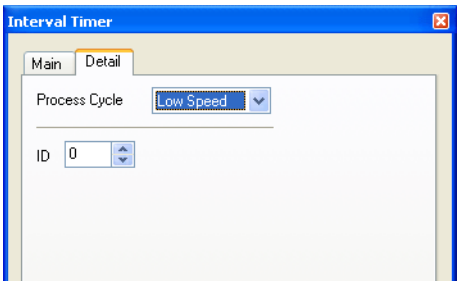


Time-out Time *1	0 - 255 (× 100 msec) Specify a time-out period so that the specified macro block is executed at intervals of [Time-out Time]. With “0” specified, the macro block is executed every cycle. When to start the timer depends on the [Use Start Memory] setting.
☐ Stop after Execution	Check this box when executing the macro block only once. When the specified time-out period has elapsed and the macro block has been executed, the timer comes to a stop.
☐ Use Start Memory	Check this box when specifying the start memory. • Unchecked  • Checked While the start memory bit is set to “1”: The macro block is executed at regular intervals as specified for [Time-out Time] while the bit is set (0 → 1). While the start memory bit is reset to “0”: The macro block is not executed without counting [Time-out Time]. 

☐ Execution Macro	Specify the macro block number to be executed when the [Time-out Time] has elapsed.
☐ ON Macro	Specify the macro block number to be executed once when the timer starts. • [☐ Use Start Memory] unchecked: When the screen is opened, the timer starts and the ON macro block is executed.  • [☑ Use Start Memory] checked: The ON macro block is executed when the start memory bit is set to "1". 
☐ OFF Macro	This option is enabled, provided that [☑ Use Start Memory] is checked. Specify the macro block number to be executed once when the start memory bit is reset (1 → 0).  This option is useful for clearing the internal memory that is used for a macro.
Edit	This button is used to open a macro block.
Preview	This area displays the contents of the macro block number selected under [Macro Edit].

*1 [Time-out Time] might vary according to the contents of the screen.

[Detail] tab window

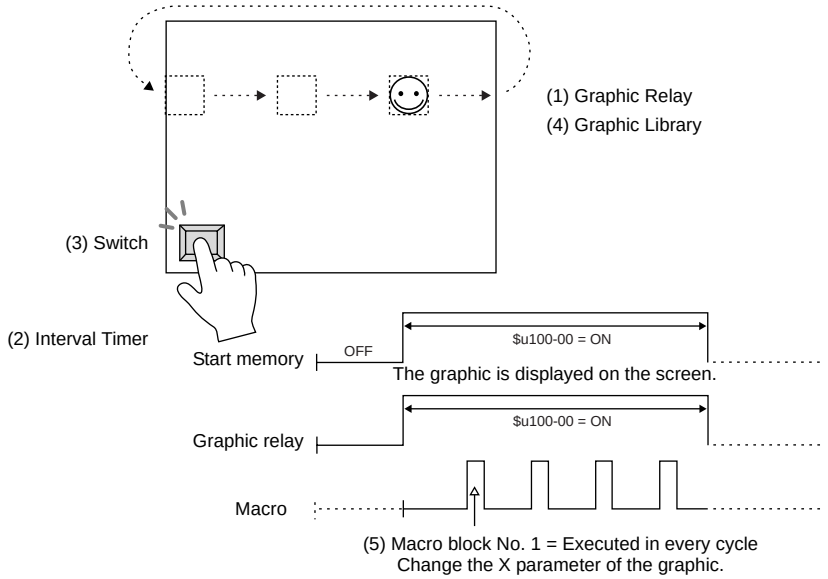


Process Cycle	Specify the cycle for the V series to read the PLC when they are communicating. For more information, refer to the V8 Series Reference Manual.
ID	Specify an ID. For more information, refer to the V8 Series Operation Manual.

Setting Example

Graphic movement on the screen

When the switch is pressed, a graphic from the graphic library is displayed. At the same time, the graphic placed on the left of the screen starts to move to the right.
Pressing the switch next clears the graphic. Pressing the switch again displays the graphic in the same position where it was displayed last. The graphic starts to move to the right.



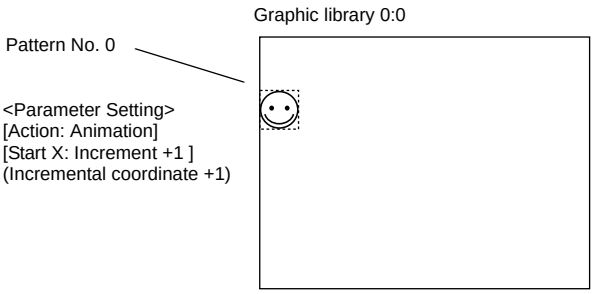
Screen Edit

(1) Graphic Relay
- Memory: $u100-00
- Start Graphic: GNo.0 No. 0
- No. of Relays: 1
- No. of Parameter Words: 1
- Type: 1-Graphic
- Mode: XOR
- Process Cycle: Low Speed
- ID: 0

(2) Interval Timer
- Time-out time: 0
- ☐ Stop after Execution
- ☑ Use Start Memory: $u100-00
- ☑ Execution Macro: Macro Block No. 1
- ☐ ON Macro: Macro Block No.
- ☐ OFF Macro: Macro Block No.
- Process Cycle: Low Speed
- ID: 1

(3) Switch
- Output Memory: $u100-00
- Output Action: Alternate
- Lamp Memory: $u100-00

(4) Graphic Library Edit
Example: GNo. 0 & No. 0
Place the following graphic on the screen, and specify the X parameter.



(5) Macro Block Edit
Example: Macro block No. 1

```
0    $u00101 = $u00101 + 1(W)
1    IF ($u00101 = 640) LB00 (W)
2    RET
3    LB00:
4    $u00101 = 0(W)
```

Macro block to change the X parameter of the graphic start point
While the count on the X axis is increasing up to 640 (0 → 1 → ••• → 640 → 0 → 1 → ••• → 640), the graphic moves from the left to the right.

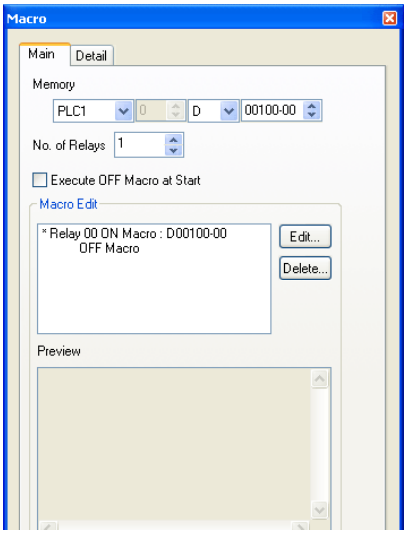
Transfer the above screen data to the V series for checking.

1.7 Macro Mode

Macro mode can be set for screens and multi-overlaps.
Macro mode is used to execute an ON macro when the corresponding bit changes from 0 → 1 (leading edge) and an OFF macro when the corresponding bit changes from 1 → 0 (falling edge).
However, when the screen (multi-overlap) is opened, macro mode executes macros in the level state. (Refer to [Execute OFF Macro at Start].)
A maximum of 32 ON/OFF macros each can be set using the consecutive bits.

Setting

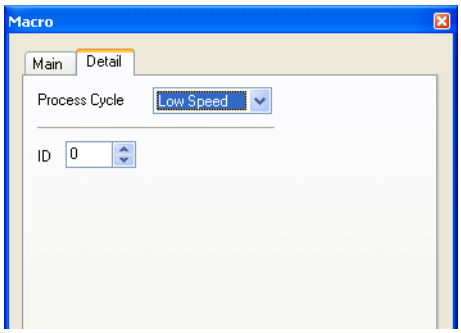
[Main] tab window



Memory	Specify the memory address that triggers the macro.
No. of Relays	1 - 32 Specify the number of bits for triggering macros. The number specified here is common to both the ON macro and OFF macro. Example: “10” specified for [No. of Relays] - ON macro: 10 maximum - OFF macro: 10 maximum In this case, 10 bits must be allocated for [Memory].
☐ Execute OFF Macro at Start	Set the operation to be performed when a screen or multi-overlap that contains macro mode is open. • Checked While the bit of [Memory] is set (ON), the ON macro is executed; while it is reset (OFF), the OFF macro is executed. • Unchecked The ON macro is executed while the bit of [Memory] is set (ON). While the bit of [Memory] is reset (OFF), nothing is executed.
Macro Edit	As many ON/OFF macros as the number for [No. of Relays] can be set.
Edit	The macro editor window corresponding to the selected alarm is opened.

Delete	The macro for the alarm selected under [Macro Edit] is deleted.
Preview	The macro for the alarm selected under [Macro Edit] is displayed.

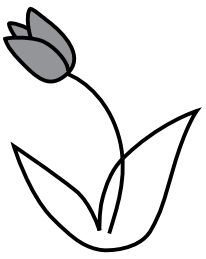
[Detail] tab window



Process Cycle	Specify the cycle for the V series to read the PLC when they are communicating. For more information, refer to the V8 Series Reference Manual.
ID	Specify an ID. For more information, refer to the V8 Series Operation Manual.

MEMO

Please use this page freely.



2 Edit

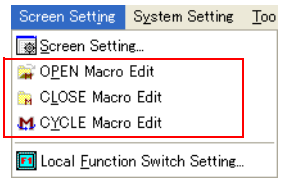
2.1 Macro Editor

This section describes the usage of the macro editor.

Start

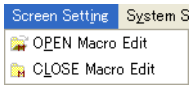
Screen

- OPEN macro
  [Screen Setting] → [OPEN Macro Edit]
- CLOSE macro
  [Screen Setting] → [CLOSE Macro Edit]
- CYCLE macro
  [Screen Setting] → [CYCLE Macro Edit]



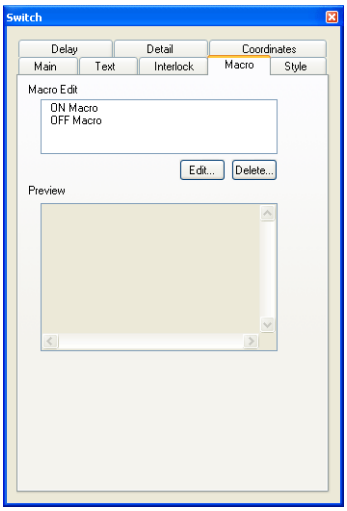
Overlap library

- OPEN macro
  [Screen Setting] → [OPEN Macro Edit]
- CLOSE macro
  [Screen Setting] → [CLOSE Macro Edit]



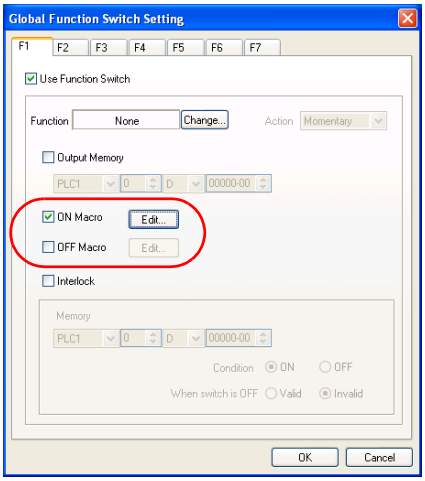
Switch

- ON Macro
  [Macro] → [Macro Edit: ON Macro] → [Edit]
  Or double-click [ON Macro] under [Macro Edit].
- OFF Macro
  [Macro] → [Macro Edit: OFF Macro] → [Edit]
  Or double-click [OFF Macro] under [Macro Edit].



Function switch

- ON Macro
  [Function Switch Setting] → [ON Macro] → [Edit]
- OFF Macro
  [Function Switch Setting] → [OFF Macro] → [Edit]

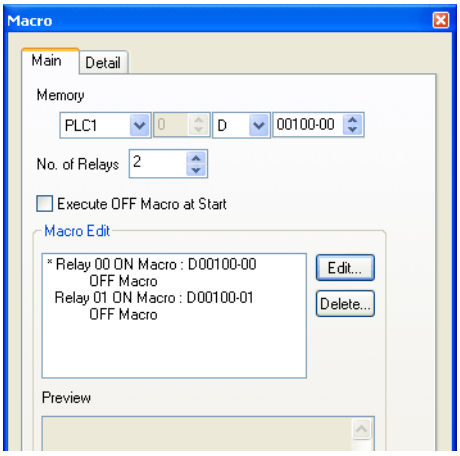


Macro block

[Registration Item] → [Macro Block]
Specify the desired macro block number and click [OK].

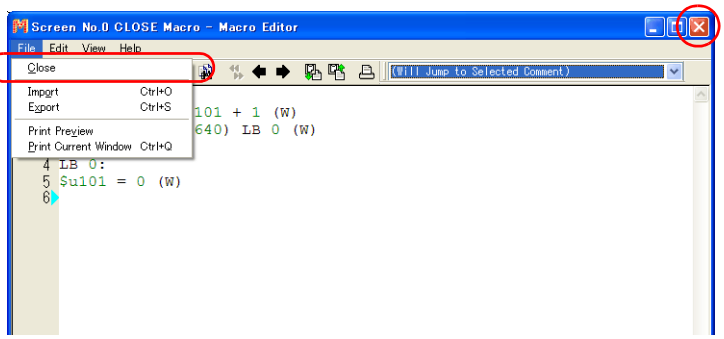
Macro mode

- ON Macro
  [Main] → [Macro Edit: ON Macro] → [Edit]
  Or double-click [ON Macro].
- OFF Macro
  [Main] → [Macro Edit: OFF Macro] → [Edit]
  Or double-click [OFF Macro].

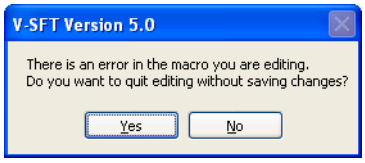


Quit

1. Select [Close] from the [File] menu, or click the close button in the upper right corner of the window.

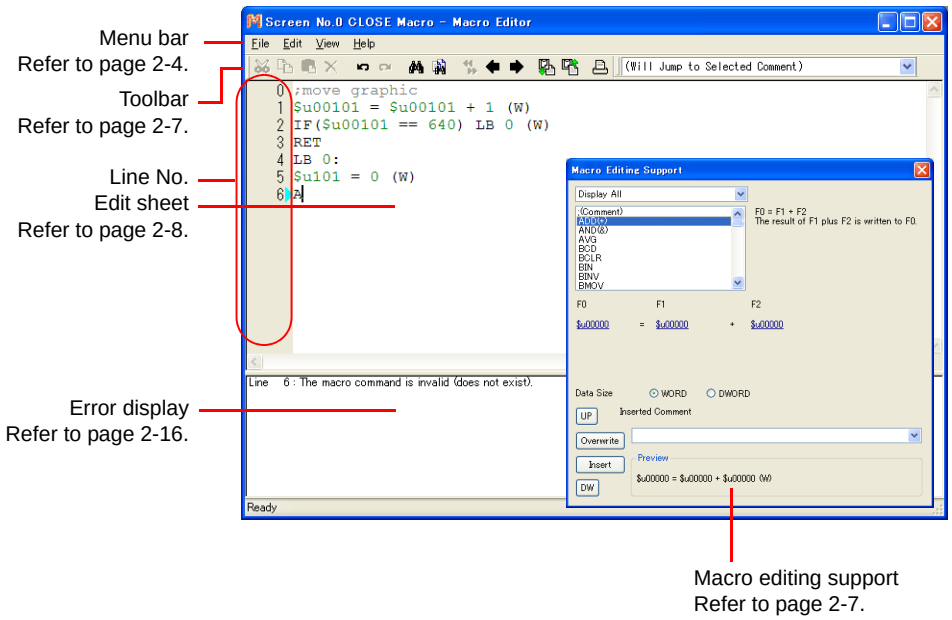


2. The macro editor is terminated with no error detected. If any error is found, the following message appears:
   Clicking [Yes] allows you to quit the macro editor without saving the program you edited.
   Clicking [No] returns you to the macro editor.



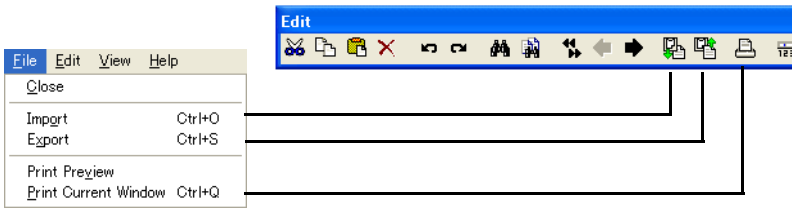
Screen Composition

The macro editor window is configured as follows:



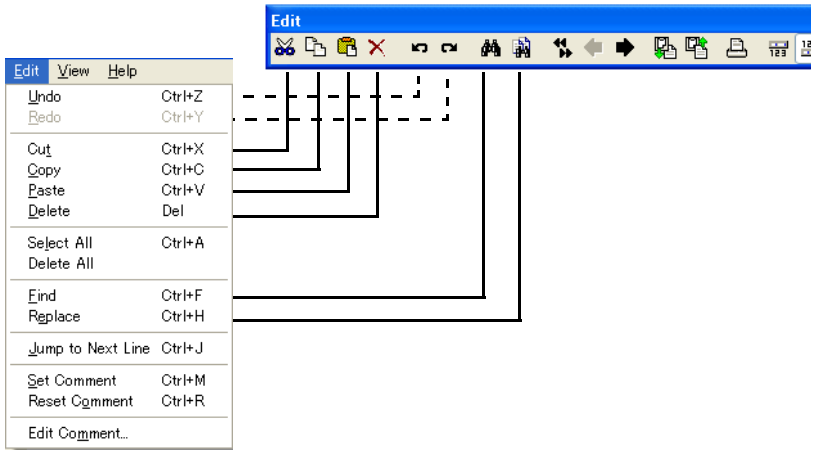
Menus

[File] menu



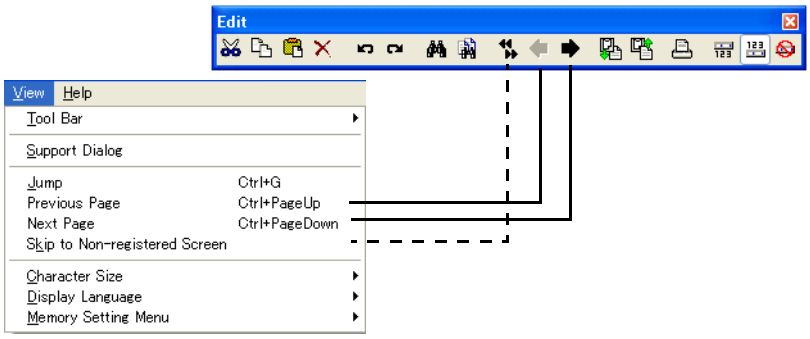
Close	Quits the macro editor.
Import	Reads text files.
Export	Saves the macro currently being edited to a text file.
Print Preview	Displays the printout image of the macro being edited.
Print Current Window	Prints the macro currently being edited.

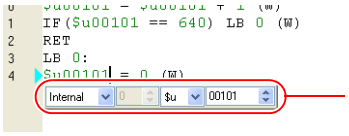
[Edit]/right-click menu



Undo	Returns you to the previous state by canceling the effect of the most recently executed command.
Redo	Returns you to the state before [Undo] is executed.
Cut	Cuts the selected area and saves it to the clipboard.
Copy	Copies the selected area and saves it to the clipboard.
Paste	Pastes the data from the clipboard.
Delete	Deletes the selected area.
Select All	Selects all macros currently being edited.
Delete All	Deletes all macros currently being edited.
Find	Searches for characters in the macro currently being edited.
Replace	Searches for characters in the macro currently being edited and replaces them.
Jump to Next Line	Jumps to the specified line.
Set Comment	Converts the line selected in the macro editor window to a comment (with “;” as the first character).
Reset Comment	Resets the comment conversion selected in the macro editor window (deletes the first character “;” from the comment).
Edit Comment	Allows you to edit comments on macro blocks during macro block editing.

[View] menu



Tool Bar	Selects whether to show/hide the toolbar.
Support Dialog	Selects whether to show/hide the [Macro Editing Support] dialog. For more information on the dialog, refer to page 2-7.
Jump	Opens the macro editor window for the number specified in [Macro Block].
Previous Page	Opens the previous page.
Next Page	Opens the next page.
Skip to Non-registered Screen	Skips the non-registered screens at the time of screen change.
Character Size	Allows you to select the size of characters to be displayed in the macro editor.
Display Language	Allows you to select the language to be displayed in the macro editor.
Memory Setting Menu (Upside Display, Downside Display, Hide)	Allows you to select the position where the memory setting pull-down menu appears in the macro editor. Example: [Downside Display] selected 

Toolbar

Edit

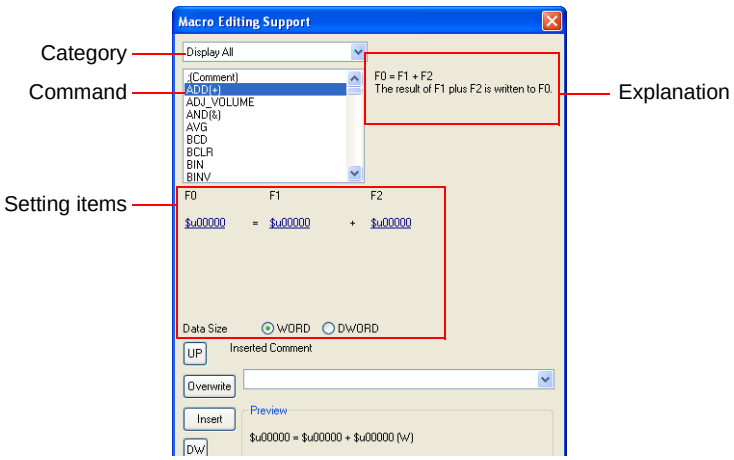
Refer to “Menus” (page 2-4).

Comment List

	
Comment List	Jumps to the selected comment line.

Macro Editing Support

To go to this dialog, select [Support Dialog] from the [View] menu.



Category	Macro category list
Command	The list of commands contained in the selected category
Setting items	Setting items required for the selected command
Inserted Comment	Comments can be registered together with commands.
UP/DW	Moves the selected line.
Overwrite	Overwrites the selected line with the contents of [Preview].
Insert	Inserts the contents of [Preview] into the position above the selected line.
Explanation	Explains the command selected from the list.
Preview	Displays the preview of macro editing.

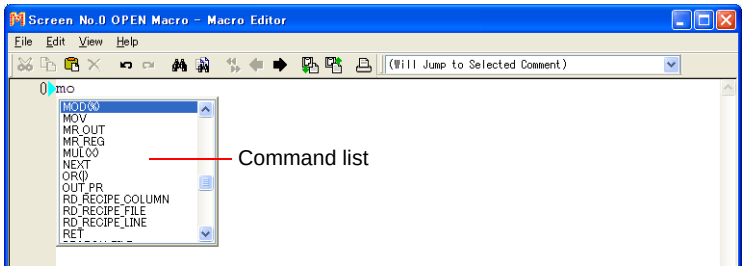
Edit

You can utilize the macro editor in several editing manners. Choose a desired one.

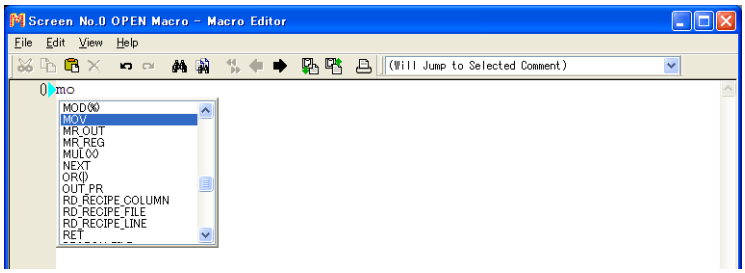
1: Command entry
Editing is performed with the command list. This method is useful when you know the names of particular commands. (Refer to page 2-8.)
2: Direct entry
Editing is performed by entering text through the keyboard of your computer. (Refer to page 2-10.)
3: Macro editing support
Editing is performed in the dialog that provides the explanation of individual commands. This method is best suited to beginners. (Refer to page 2-12.)
4: Text entry
Editing is performed with a text editor (commercially available). Macro programming is enabled even in an environment without the editor. (Refer to page 2-14.)

1: Command entry

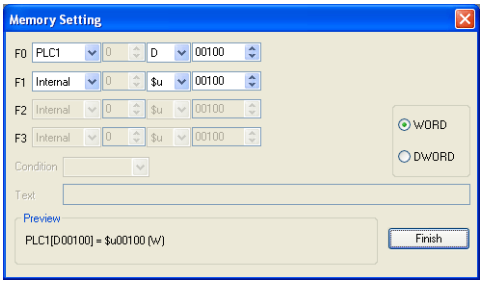
- New registration
  1. Select a line using the [UP] / [DW] button.
  2. Enter a command. The command list appears.



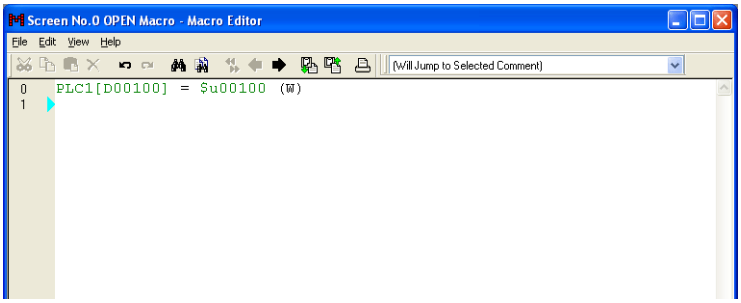
  3. Choose the desired command from the list and double-click it.
     Alternatively, choose the desired command using the [↑] / [↓] key on the keyboard and press the Enter key.



  4. The [Memory Setting] dialog appears. Make necessary settings such as the memory address, data length, etc. in the dialog and click the [Finish] or [×] button.

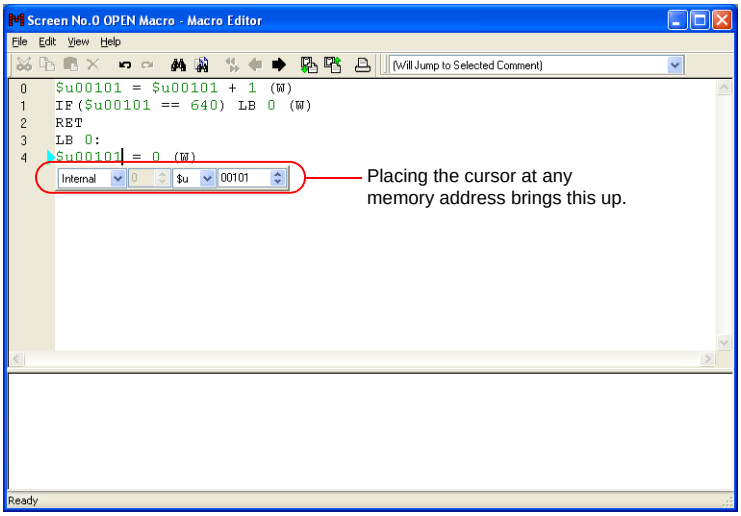


5. The line has been registered. To proceed with the next line registration, go back to step 1.



- Memory change
  Memory addresses (corresponding to [F0] / [F1] / [F2] / [F3]) are colored green. Follow the steps below when you wish to change any memory addresses:

  - Select the desired memory address in green with the cursor. The memory setting menu is displayed. Change the address as necessary.

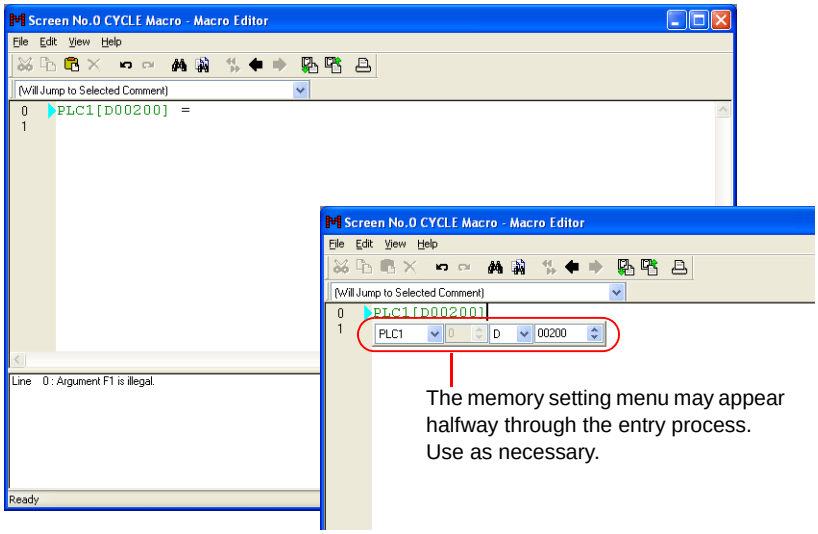


  - Select the desired memory address in green with the cursor, and type an address change through your computer keyboard.

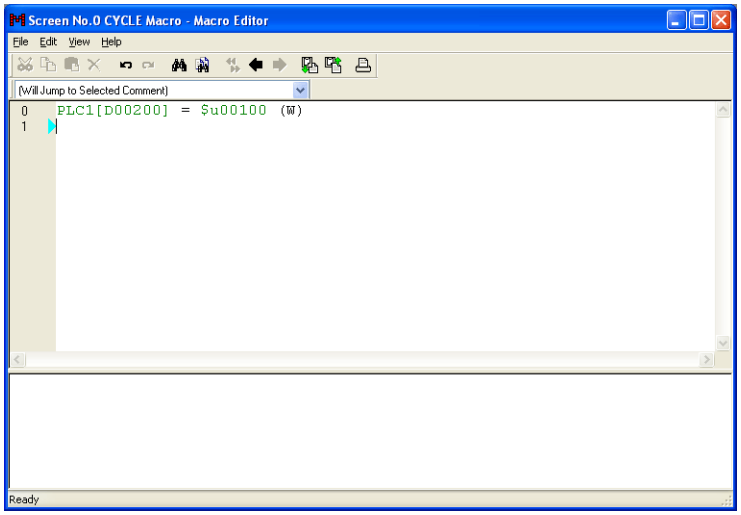
- Command change
  Choose the line you wish to change. Delete the line and register a new line.

2: Direct entry

- New registration
  1. Select a line using the [UP] / [DW] button.
  2. Enter mnemonic codes through the keyboard.
     Example: MOV command
     PLC1 [D200] = $u100 (W)
     * For designating memory, refer to page 2-17.

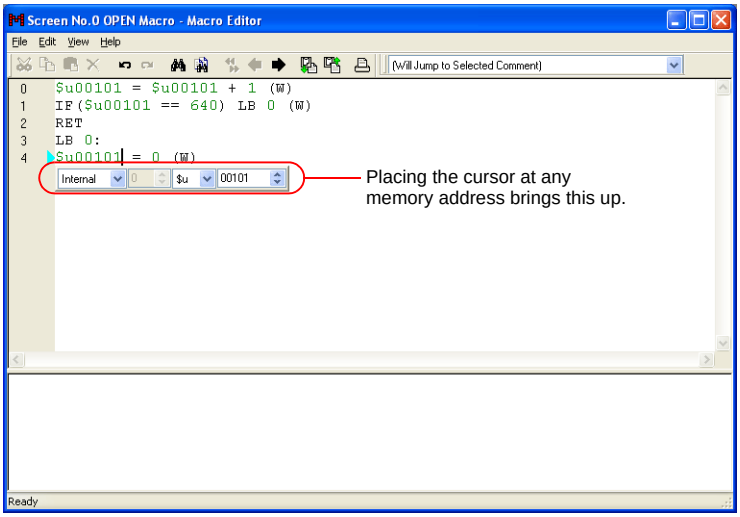


3. Press the Enter key to go to the next line. To proceed with the next line registration, go back to step 1.



- Memory change
  Memory addresses (corresponding to [F0] / [F1] / [F2] / [F3]) are colored green. Follow the steps below when you wish to change any memory addresses:

  - Select the desired memory address in green with the cursor. The memory setting menu is displayed. Change the address as necessary.

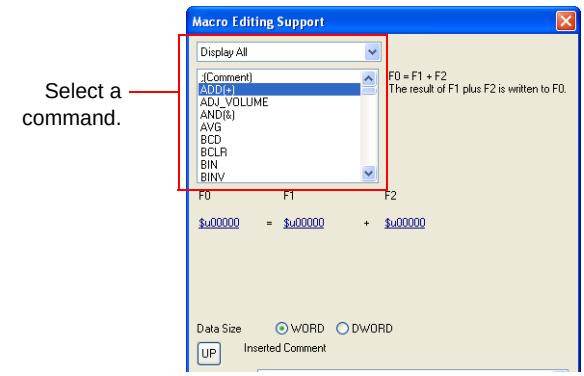


  - Select the desired memory address in green with the cursor, and type an address change through the keyboard.

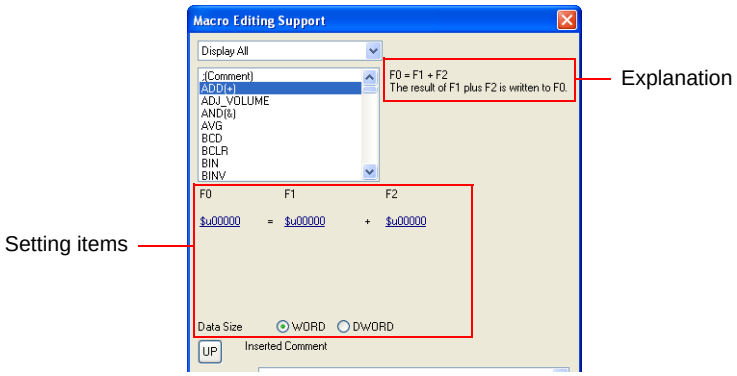
- Command change
  Choose the line you wish to change. Delete the line and register a new line.

3: Macro editing support

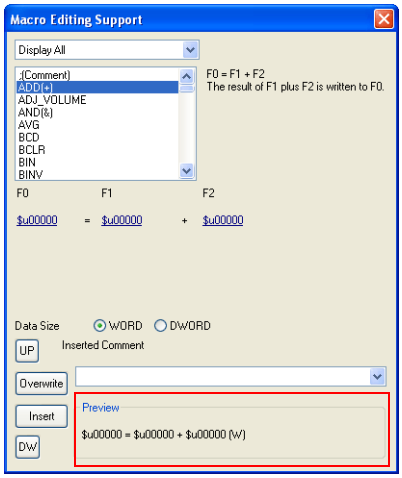
- New registration
  1. Select a line using the [UP] / [DW] button.
  2. Select the desired command from the pull-down menu and the macro list.



  3. The setting items required for the selected command are displayed. Enter a memory address, data length, etc.

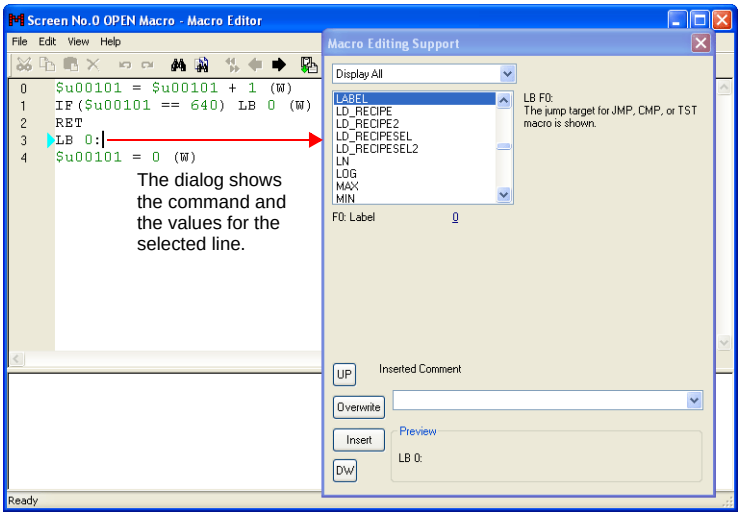


  4. The settings made are displayed under [Preview].



  5. If you wish to make a comment, enter it in the comment entry box.
  6. To overwrite the selected line, press the [Overwrite] button. To insert a line into the position above the selected line, press the [Insert] button.
  7. The line has been registered. To proceed with the next line registration, go back to step 1.

- Memory change
  1. Select the line to be modified. The command and the values specified for the line are displayed in the [Macro Editing Support] dialog.

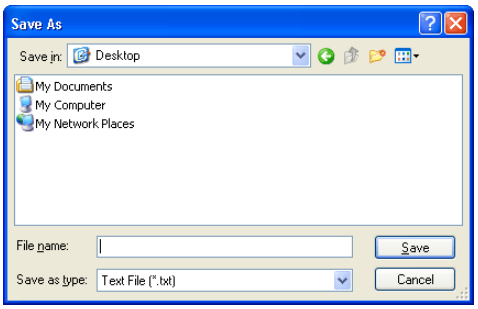


  2. Change the memory addresses as desired and click the [Overwrite] button. Clicking the [Insert] button inserts the changed setting into the position above the selected line.

4: Text entry

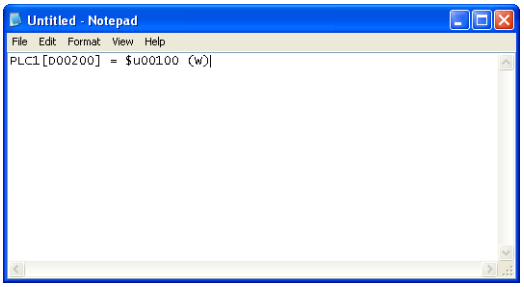
The macro editor is capable of importing and exporting text files. Even if the editor is not installed on your computer, macros can be created with commercially available software.

- Export
  1. From the [File] menu, select [Export]. The [Save As] dialog is displayed.

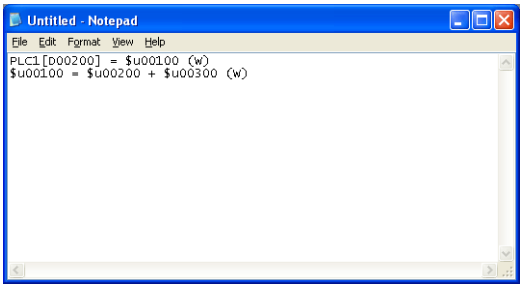


  2. Enter a file name and click [Save]. A text file is created under the name.

- Text editing
  Editing on Notepad
  1. Open the text file on Notepad.

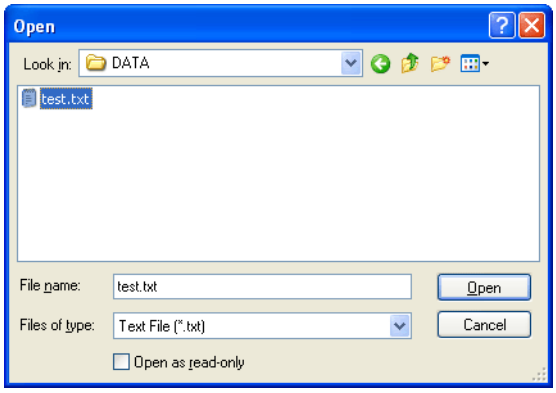


  2. Select a line using the [UP] / [DW] button.
  3. Enter mnemonic codes through the keyboard.
     Example: Addition command
     $u1000 = $u200 + $u300 (W)
     * For designating memory, refer to page 2-17.

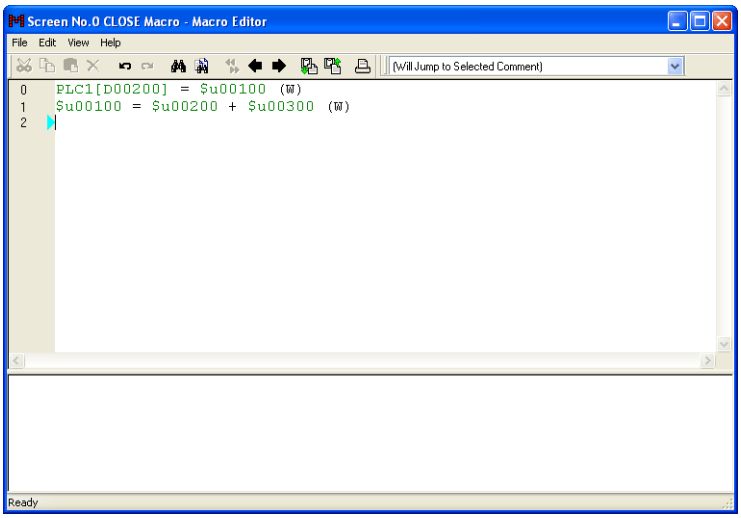


  4. Save the file.

- Import
  1. Open the edit sheet, to which a text file will be imported.
  2. From the [File] menu, select [Import]. The [Open] dialog is displayed.

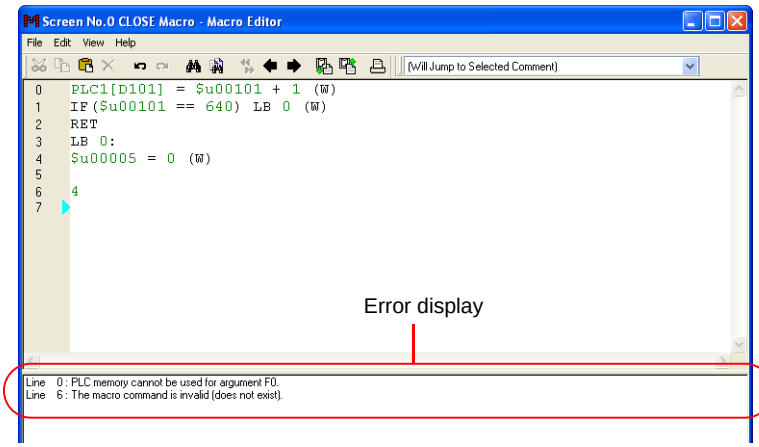


  3. Select the desired file and click [Open]. The text file is imported.

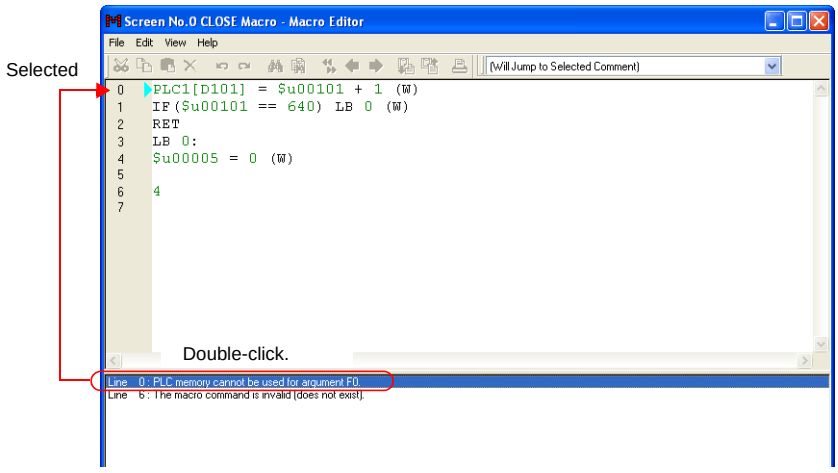


Error

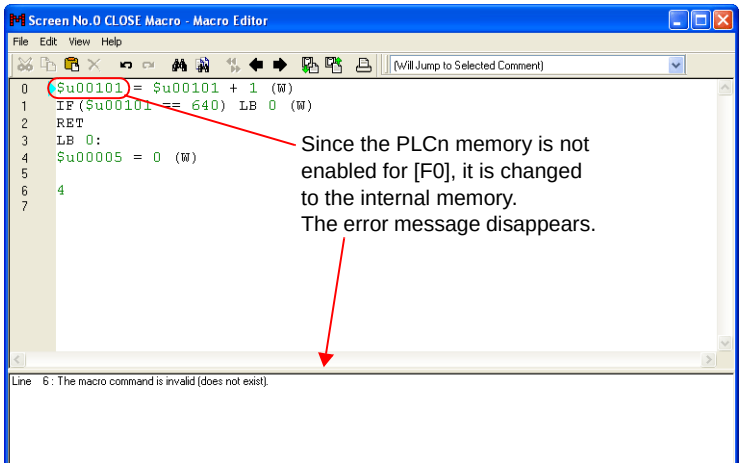
1. If the registered lines of a macro have any errors, error messages are displayed.



2. Double-clicking an error message selects the corresponding line.



3. Correct the error as needed in the message. Once finished, the message disappears.



Memory Types

The following memory types are available with macros:

Memory			Setting Range		Remarks
			V8 series	V7/V6 series	
Internal memory	$u		$u00000 - $u32767	$u00000 - $u16383	
	$s		$s0000 - $s2047	$s0000 - $s1023	
	$L		Varies depending on the setting. *1		
	$LD		Varies depending on the setting. *1		
	$T		$T0000 - $T1023		
	$P n : *2		$Pn:000 - $Pn:511	-	
	$M		$M0000 - $M2047	-	
	$MC		$MC0000 - $MC2047	-	In bytes
	$C		$C0000 - $C4095	-	
	Indirect memory designation		For more information, refer to page 2-18.		Only for $u/$T/$M
Memory card	[File number: Record number]#address		[0:0] #0000 - [15:4094] #4095		
PLCn memory	PLCn [xxxx] *2*3		Example: PLC1 [D100]	–	1:1 communication
	PLCn [Port number xxxx] *2 *3		Example: PLC1 [1:D100]	–	1:n communication
PLC memory	PLC [xxxx] *3		–	Example: PLC [D100]	1:1 communication
	PLC [Port number: xxxx] *3		–	Example: PLC [1:D100]	1:n communication
PLC2 memory	TEMP [Port number: xxxx] *3		–	Example: TEMP [1:D100]	
Temperature controller memory			–	Example TEMP [1:0100]	
Constant	DEC	WORD	0U - 65535U		Add “U” to the extreme right position.
		DWORD	0U - 4294967295U		
	DEC–	WORD	–32768 - 32767		
		DWORD	–2147483648 - 2147483647		
	OCT	WORD	0o - 177777o		Add “o” to the extreme right position. (lower-case “o”)
		DWORD	0o - 37777777777o		
	HEX	WORD	0000H - FFFFH		Add “H” to the extreme right position.
		DWORD	00000000H - FFFFFFFFH		
	FLOAT	DWORD	–3.402823E+38 - –1.401298E–45 0 1.401298E–45 - 3.402823E+38		

*1 The specifiable range differs depending on the setting set on the [SRAM/Clock Setting] dialog.

*2 For “n”, set the number of the connected device (1 to 8).

*3 The entry in square brackets [xxxx] differs according to the model. Refer to the list of available memories in the V8 Series Connection Manual.

Indirect Memory Designation

How to perform indirect designation depends on the types of memory and addresses.

Internal memory, PLC (1 - 8) memory

- Addresses 0 - 65535:

	15 MSB 8	7 LSB 0
n+0	Model	Memory type
n+1	Memory number (address)	
n+2	Expansion code	Bit designation
n+3	00	Port number

- Addresses 65536 and above:

	15 MSB 8	7 LSB 0
n+0	Model	Memory type
n+1	Memory number (address) lower-order	
n+2	Memory number (address) higher-order	
n+3	Expansion code	Bit designation
n+4	00	Port number

- Model, memory type (hexadecimal)

Memory			Model	Memory type
Internal memory	$u		00	00
	$s			01
	$L	0 - 65535	00	02
		65536 -	80	
	$LD	0 - 65535	00	03
		65536 -	80	
	$T		00	04
	$Pn*1		00	05
	$M		00	06
	$MC		00	07
	$C		00	08
PLC1 memory*2	0 - 65535		01/11*3	The memory type depends on the memory used. Refer to the V8 Series Connection Manual or the PLC Connection Manual and set the type number of the memory.
	65536 -		81/91*3	
PLC2 memory*2	0 - 65535		03/12*3	
	65536 -		83/92*3	
PLC3 memory	0 - 65535		13	
	65536 -		93	
PLC4 memory	0 - 65535		14	
	65536 -		94	
PLC5 memory	0 - 65535		15	
	65536 -		95	
PLC6 memory	0 - 65535		16	
	65536 -		96	
PLC7 memory	0 - 65535		17	
	65536 -		97	
PLC8 memory	0 - 65535		18	
	65536 -		98	

*1 “n” treated as an expansion code
*2 For the V7/V6 series: PLC1 memory = the PLC memory, and PLC2 memory = the temperature controller memory
*3 The memory will work when specified with either model.

- Expansion code
  An expansion code should be designated, depending on the type of memory in use. For more information, refer to the description of indirect memory designation relevant to the target memory type in the V8 Series Connection Manual.

  Ex.: Mitsubishi Electric SPU memory

  Unit No. 0: 00
  Unit No. 1: 01

- Port number
  1 : 1 or multi-link: Not used
  1 : n (multi-drop): Set the port number of the connected device.

Memory card

	15 MSB 8	7 LSB 0
n+0	02H	File No.
n+1	Word address in the record	
n+2	Record No.	

- File number, word address in the record, record number
  Refer to the memory card map in the V8 Series Reference Manual.

Example

- When accessing a word in the PLCn memory, “0” is specified for the “n + 2” word even in the case of memory that does not use an expansion code.
  Ex.: Accessing D165 in a Mitsubishi PLC (PLC1)
  (Macro)
  $u100 = 0100H (W) Model: 01 (PLC1 memory) Memory type: 00
  $u101 = 0165 (W) Memory No.: 165
  $u102 = 0000 (W) Expansion code: None
  $u200 = *$u100 (W)
  (Result of execution)
  Data at D165 is transferred to $u200.

- When accessing the bit-writable memory, such as the Mitsubishi M Relay, the following setting is necessary.

  Memory number = M (address)/16

  Ex.: Accessing M20
  (Macro)
  $u100 = 0106H (W) Model: 01 (PLC1 memory) Memory type: 06
  $u101 = 0001H (W) Memory No. = 20 ÷ 16 = 1...4
  $u102 = 0004H (W) Expansion code: None Bit designation: 4
  *$u100 (ON)
  (Result of execution)
  The bit of M20 is set (ON).

2.2 Attribute

Attribute settings are required for handling CSV files. Attribute settings are made to register CSV file data formats. MONITOUCH will read and write to CSV files in accordance with the attribute settings.

Applicable Macros

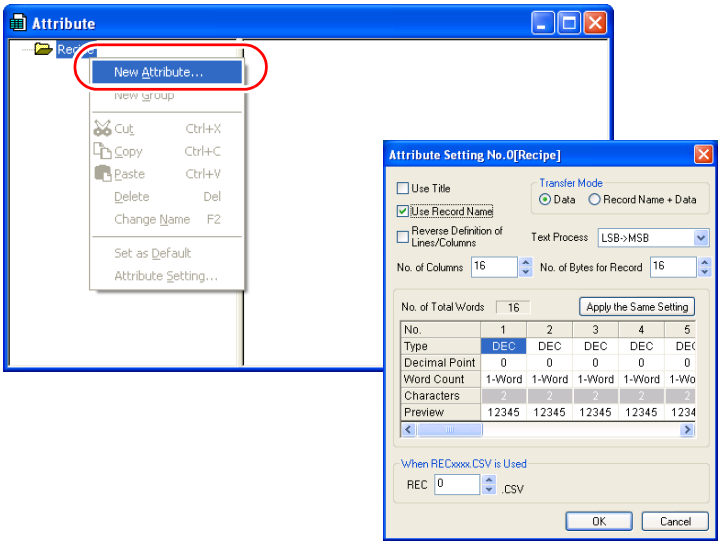
Function	Macro	CSV file name	Refer to:
Recipe	LD_RECIPE	RECxxxx.CSV 0000 - 9999 (Designation of a number)	page 4-160
	LD_RECIPE2		page 4-163
	LD_RECIPESEL		page 4-165
	LD_RECIPESEL2		page 4-168
	SV_RECIPE		page 4-172
	SV_RECIPE2		page 4-174
	SV_RECIPESEL		page 4-176
	SV_RECIPESEL2		page 4-179
	RD_RECIPE_FILE	xxxxxxxx.CSV 8 one-byte upper-case alphanumeric characters or less (Designation of a name)	page 4-184
	RD_RECIPE_LINE		page 4-186
	RD_RECIPE_COLUMN		page 4-188
	WR_RECIPE_FILE		page 4-190
	WR_RECIPE_LINE		page 4-192
	WR_RECIPE_COLUMN		page 4-194
Sampling	SMPL_CSV	SMPxxxx.CSV 0000 - 0011 (Designation of a number)	page 4-201
	SMPL_CSV2	xxxxxxxx.CSV Designation of a file name	page 4-205
	SMPLCSV_BAK	SMPxx_xx.CSV 00 - 11 (Designation of a number) 00 - 99	page 4-209
	SMPLCSV_BAK2	xxxxxxxx.CSV Designation of a file name	page 4-213

Start

Attribute Setting for Recipe

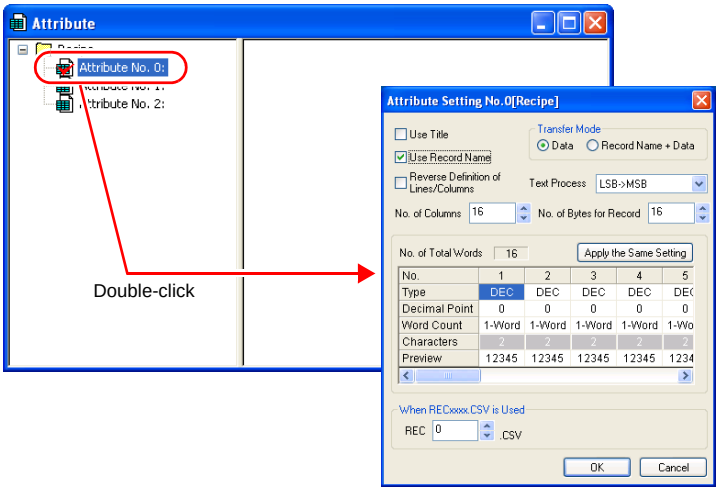
1. Select [System Setting] → [Attribute Setting]. The [Attribute] window is displayed.

2. To add a new attribute, right-click on the recipe folder and select [New Attribute].



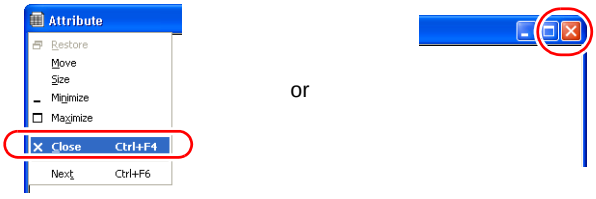
The [Attribute Setting] dialog is displayed.
For more information on setting items, refer to page 2-31.

3. To check or change an existing attribute, double-click the attribute.



The [Attribute Setting] dialog is displayed.
For more information on setting items, refer to page 2-31.

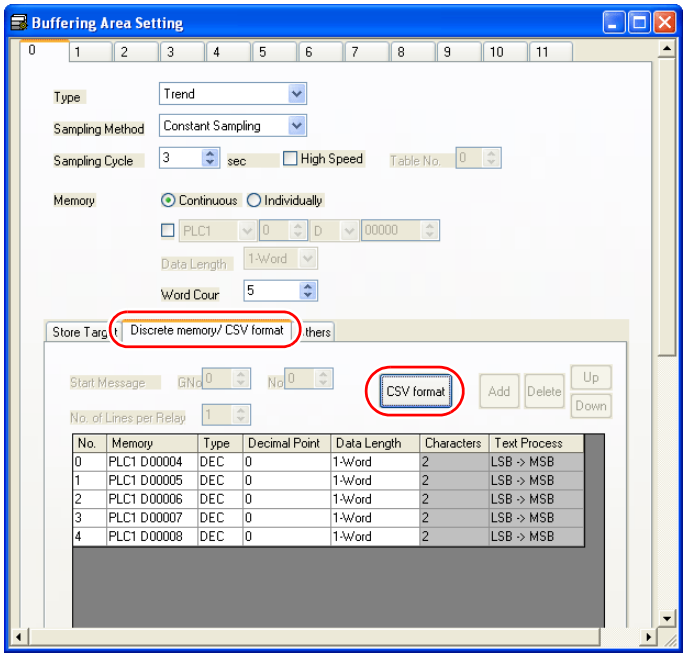
4. To close the [Attribute] window, click the icon on the top left corner of the window and click [Close] or click the [X] button at the top right corner.



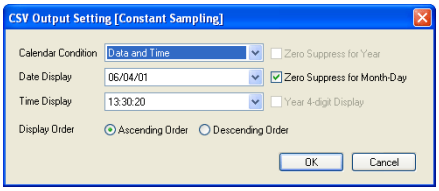
Attribute Setting for Sampling

Attribute settings for sampling can be made in the [Buffering Area Setting] dialog.

1. Select [System Setting] → [Buffering Area Setting]. The [Buffering Area Setting] dialog is displayed.
2. Click the [CSV format] button on the [Discrete memory/CSV format] tab window in the [Buffering Area Setting] dialog.



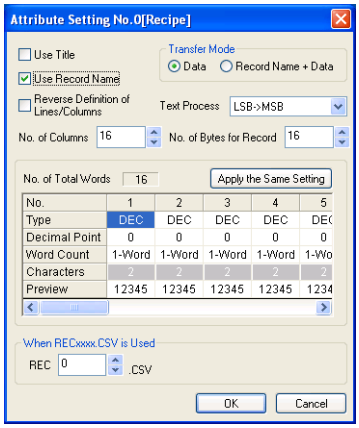
3. The [CSV Output Setting] dialog appears.



For description of the dialog, refer to page 2-31.

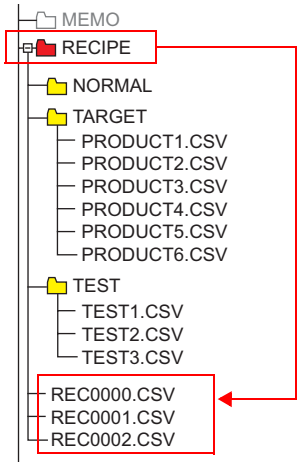
Recipe

[Attribute Setting] dialog



☐ Use Title *1	Set how to treat the first line in the CSV file. • Unchecked The first line in the CSV file is treated as data. CSV file 6000, 15, 200 6100, 15, 201 6200, 20, 202 6300, 20, 203 Display on MONITOUCH ..\ | #1 | #2 | #3 #1 | 6000 | 15 | 200 #2 | 6100 | 15 | 201 #3 | 6200 | 20 | 202 #4 | 6300 | 20 | 203 • Checked The first line in the CSV file is treated as title. CSV file Title1, Title2, Title3 6000, 15, 200 6100, 15, 201 6200, 20, 202 6300, 20, 203 Display on MONITOUCH ..\ | Title1 | Title2 | Title3 #1 | 6000 | 15 | 200 #2 | 6100 | 15 | 201 #3 | 6200 | 20 | 202 #4 | 6300 | 20 | 203

<table>
<tr><td>☐ Use Record Name
*1</td><td>Set how to treat the first column in the CSV file.
• Unchecked
The first column in the CSV file is treated as data.
CSV file
<table><tr><td>6000</td><td>15</td><td>200</td><td></td></tr><tr><td>6100</td><td>15</td><td>201</td><td></td></tr><tr><td>6200</td><td>20</td><td>202</td><td></td></tr><tr><td>6300</td><td>20</td><td>203</td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>Display on MONITOUCH
<table><tr><td>..\</td><td>#1</td><td>#2</td><td>#3</td></tr><tr><td>#1</td><td>6000</td><td>15</td><td>200</td></tr><tr><td>#2</td><td>6100</td><td>15</td><td>201</td></tr><tr><td>#3</td><td>6200</td><td>20</td><td>202</td></tr><tr><td>#4</td><td>6300</td><td>20</td><td>203</td></tr></table>• Checked
The first column in the CSV file is treated as a record name.
CSV file
<table><tr><td>ITEM1</td><td>6000</td><td>15</td><td>200</td></tr><tr><td>ITEM2</td><td>6100</td><td>15</td><td>201</td></tr><tr><td>ITEM3</td><td>6200</td><td>20</td><td>202</td></tr><tr><td>ITEM4</td><td>6300</td><td>20</td><td>203</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>Display on MONITOUCH
<table><tr><td>..\</td><td>#1</td><td>#2</td><td>#3</td></tr><tr><td>ITEM1</td><td>6000</td><td>15</td><td>200</td></tr><tr><td>ITEM2</td><td>6100</td><td>15</td><td>201</td></tr><tr><td>ITEM3</td><td>6200</td><td>20</td><td>202</td></tr><tr><td>ITEM4</td><td>6300</td><td>20</td><td>203</td></tr></table></td></tr>
<tr><td>Transfer Mode
[Data] or
[Record Name + Data]</td><td>This option is enabled when [☑ Use Record Name] is checked.
• [Data]
Only data is transferred.
• [Record Name + Data]
Both record name and data are transferred.</td></tr>
<tr><td>Text Process
(LSB→MSB /
MSB→LSB)</td><td>Valid when the record name data and data type have been made “CHR”.
Sets the order for text processing.</td></tr>
<tr><td>No. of Bytes for
Record
(0 - 32)</td><td>This option is enabled when [Record Name + Data] is checked under [Transfer Mode].
Specify the number of bytes used for a record name.</td></tr>
<tr><td>☐ Reverse Definition of Lines/Columns</td><td>The definition of lines and columns in the attribute setting can be reversed.
Check this box as necessary according to the CSV file.
• Unchecked
CSV file
The columns are in the same format.
<table><tr><td>DEC
↓</td><td>CHAR
↓</td><td>DEC
↓</td></tr><tr><td>1</td><td>A</td><td>100</td></tr><tr><td>2</td><td>B</td><td>200</td></tr><tr><td>3</td><td>C</td><td>300</td></tr><tr><td>4</td><td>D</td><td>400</td></tr></table>• Checked
CSV file
The lines are in the same format.
<table><tr><td>DEC →</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>CHAR →</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>DEC →</td><td>100</td><td>200</td><td>300</td><td>400</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
</table>

No. of Columns *2 (1 - 4096)	This option is enabled when [☐ Reverse Definition of Lines/Columns] is unchecked. Specify the number of columns of data in the CSV file. The column of record names is not counted.
No. of Lines *2 (1 - 4096)	This option is enabled when [☑ Reverse Definition of Lines/Columns] is checked. Specify the number of lines in the CSV file.
No. of Total Words *2 (1 - 4096)	The total is calculated automatically based on the data format.
Data Type	Specify the data format in the CSV file. Type: DEC/DEC-/HEX/OCT/BIN/CHAR/BCD/FLOAT Decimal Point: 0 - 32 Word Count: 1-Word / 2-Word Characters: 2 - 255
When RECxxxx.CSV is Used (xxxx: 0000 - 9999)	This option is enabled when [REC0000.CSV] - [REC9999.CSV] is specified for the CSV file name. Enter the CSV file number corresponding to the attribute setting. The location of CSV files is under the RECIPE folder at CF\(access folder)\RECIPE.  * This option is disabled when an arbitrary string is given to a CSV file name.

*1 Use of both title and record name:

CSV file

-	Title1	Title2	Title3
ITEM1	6000	15	200
ITEM2	6100	15	201
ITEM3	6200	20	202
ITEM4	6300	20	203

Display on MONITOUCH

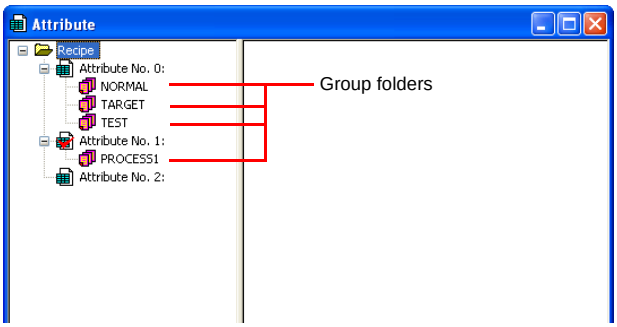
..\	Title1	Title2	Title3
ITEM1	6000	15	200
ITEM2	6100	15	201
ITEM3	6200	20	202
ITEM4	6300	20	203

*2 The maximum permissible number of columns/lines is 4,096. However, as many columns or lines as 4,096 will not be available if [No. of Total Words] reaches 4,096 words.

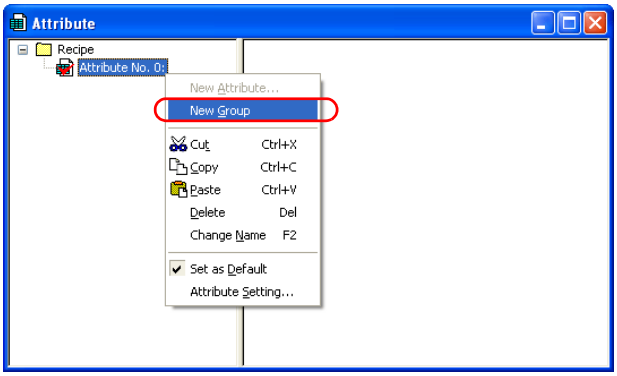
Group folder creation

If you wish to give an arbitrary name to a CSV file*, create a group folder* and store the CSV file in the folder. All CSV files contained in the group folder use settings with common attributes.

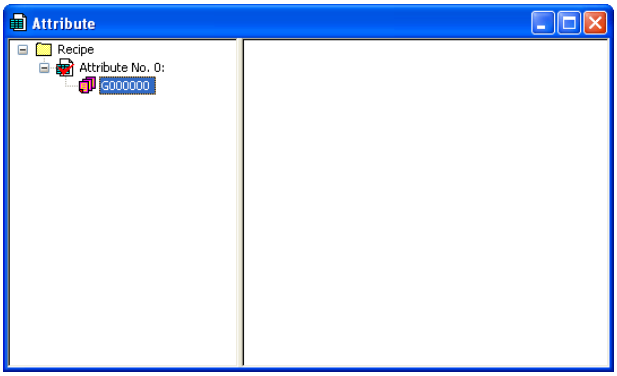
* Up to 8 one-byte upper-case alphanumeric characters are allowed for the name of a group folder or a CSV file.



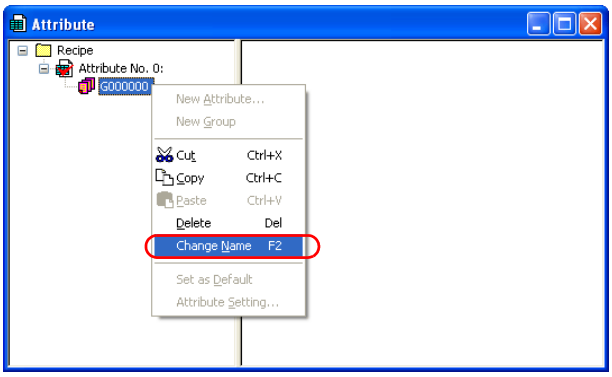
- Procedure
  1. Right-click the desired attribute number. The right-click menu is displayed.



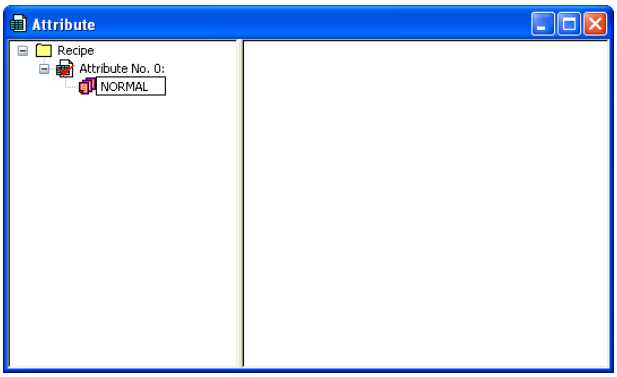
  2. Select [New Group]. The [G000000] folder is created.



3. Give a name to the folder. Right-click [G000000]. The right-click menu is displayed.



4. Select [Change Name]. [G000000] is highlighted and the cursor appears there. Enter a desired name.

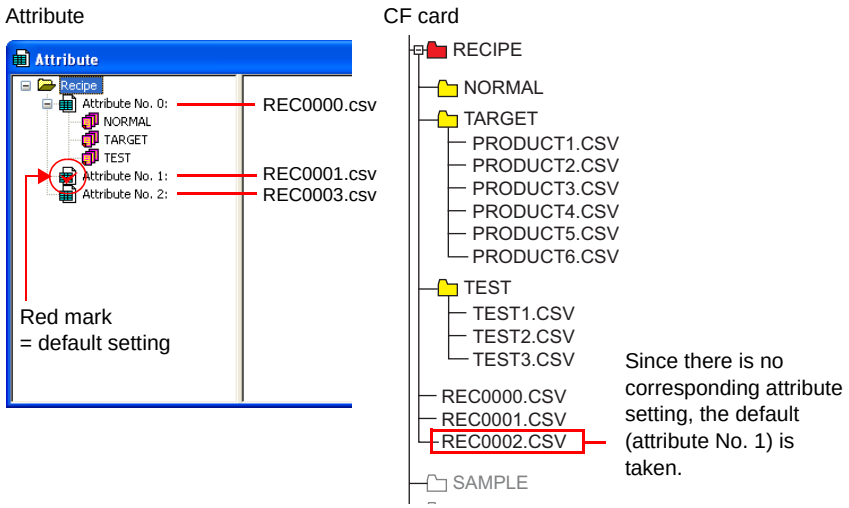


5. Create folders as necessary by following steps 1 through 4.

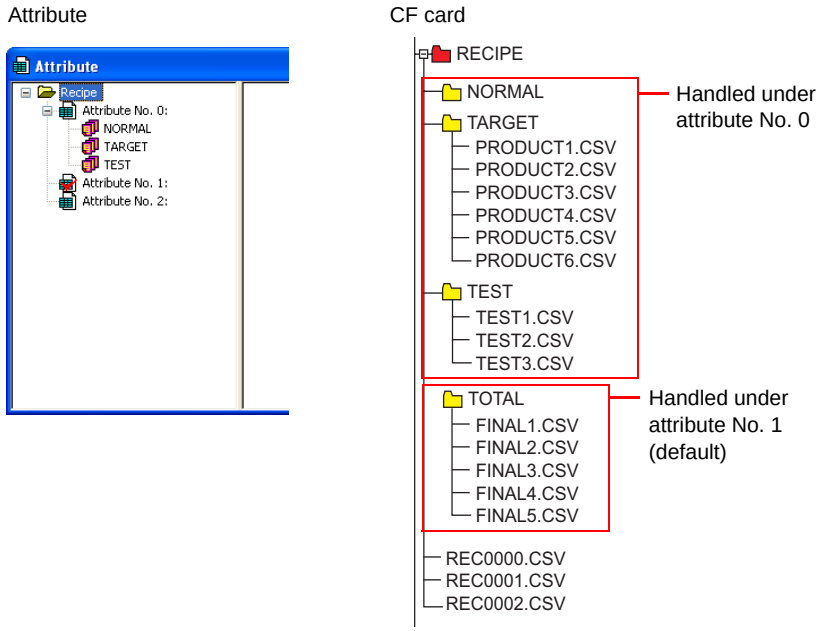
Default setting

There is one attribute icon given a red mark. This attribute setting is referred to as the default setting. The default takes effect in the following cases:

- In the case where there is no corresponding attribute setting for a RECxxxx.csv file:



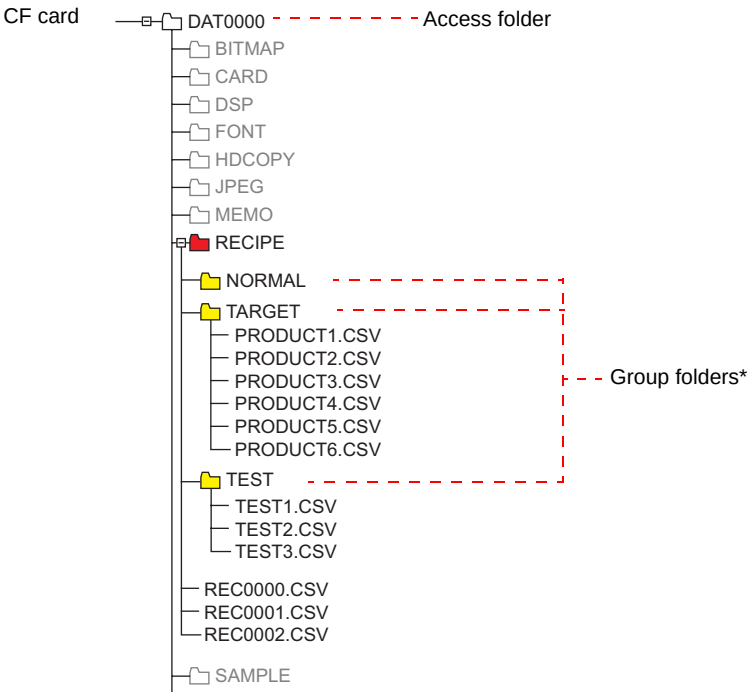
- In the case where a group folder that was not set in the [Attribute] window has been added via Explorer to the CF card:



CSV file name and storage target

Depending on the name of a CSV file, its location and file designation vary. Create a file according to your purpose.

File name	Store target
RECxxxx.CSV 0000 - 9999	Access folder\RECIPE\ See the following:
xxxxxxxx.CSV 8 one-byte upper-case alphanumeric characters or less	Access folder\RECIPE\(group folder)\ 8 one-byte upper-case alphanumeric characters or less See the following:



* Group folders are defined in the [Attribute] window. A group folder defined in the window will be created automatically when the CF card is inserted into MONITOUCH.

Total number of CSV files

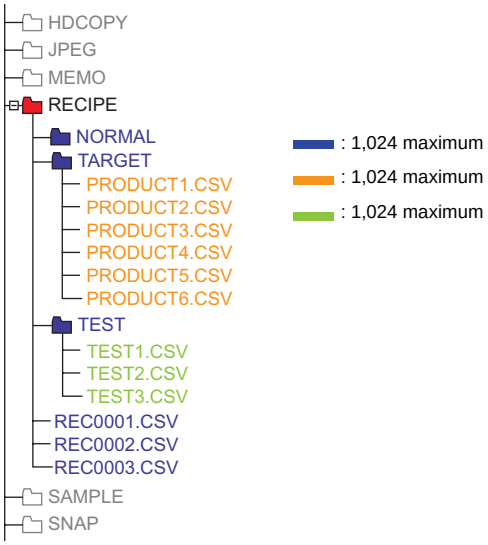
There is a limitation on the number of group folders and CSV files that can be handled in the recipe mode.

- The total of group folders and CSV files in the RECIPE folder: 1,024 maximum
- The number of CSV files in a group folder: 1,024 maximum

Any more folders and files than 1,024 are not recognized in the recipe mode.

* When access to CSV files is made by a macro command, this limitation is not imposed.

The time for accessing increases proportionately with the number of files.



Data in CSV file

- The number of words to be transferred
  A maximum of 4,096 words can be read and written at one time in recipe mode or a macro. If you attempt to transfer data exceeding capacity, 4,096 words are transferred, but extra words will not be transferred.

- Lines and columns
  The number of lines/columns to be handled varies, depending on the attribute setting.

	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns *4
Number of Lines	1 - 32767	1 - 4096 *3
Number of Columns *1	1 - 4096 *2	1 - 4096

*1 Excel is capable of handling a maximum of 256 columns.
*2 The maximum number of words per column: 4,096 words
*3 The maximum number of words per line: 4,096 words
*4 File size: 1 MB or less

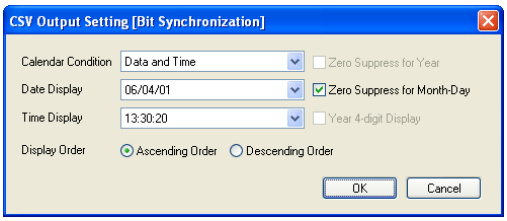
- Number of bytes for record
  32 bytes maximum per record
  * The setting can be made in the [Attribute Setting] dialog.

- Number of bytes for a title name
  32 bytes maximum per title

Sampling

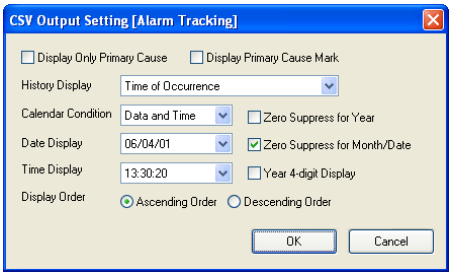
CSV output (attribute) setting

- [Sampling Method]: [Bit Synchronization], [Constant Sampling], [Device Memory Map] or [Time Order Alarming]



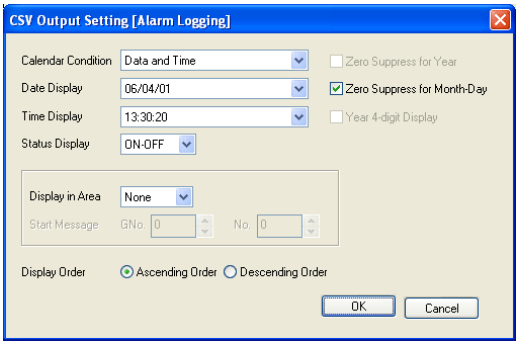
Calendar Condition	Specify the format of display in the CSV file. The dialog contains the options as shown above. For more information, refer to the V8 Series Reference Manual.
Date Display	
Time Display	
Display Order	
☐ Zero Suppress for Year	
☐ Zero Suppress for Month-Day	
☐ Year 4-digit Display	

- [Sampling Method]: [Alarm Tracking]



☐ Display Only Primary Cause	Specify the format of display in the CSV file. The dialog contains the options as shown above. For more information, refer to the V8 Series Reference Manual.
☐ Display Primary Cause Mark	
History Display	
Calendar Condition	
Date Display	
Time Display	
☐ Zero Suppress for Year	
☐ Zero Suppress for Month/Date	
☐ Year 4-digit Display	
Display Order	

- [Sampling Method]: [Alarm Logging]

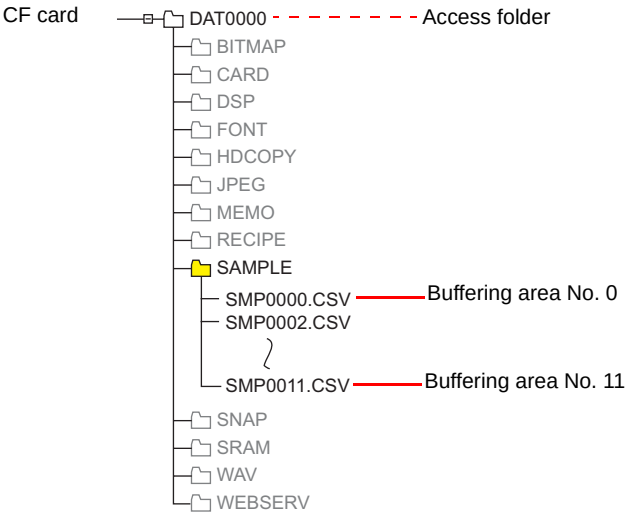


Calendar Condition	Specify the format of display in the CSV file. The dialog contains the options as shown above. For more information, refer to the V8 Series Reference Manual.
Date Display	
Time Display	
Status Display	
Display in Area	
Display Order	
☐ Zero Suppress for Year	
☐ Zero Suppress for Month-Day	
☐ Year 4-digit Display	

CSV file name and storage target

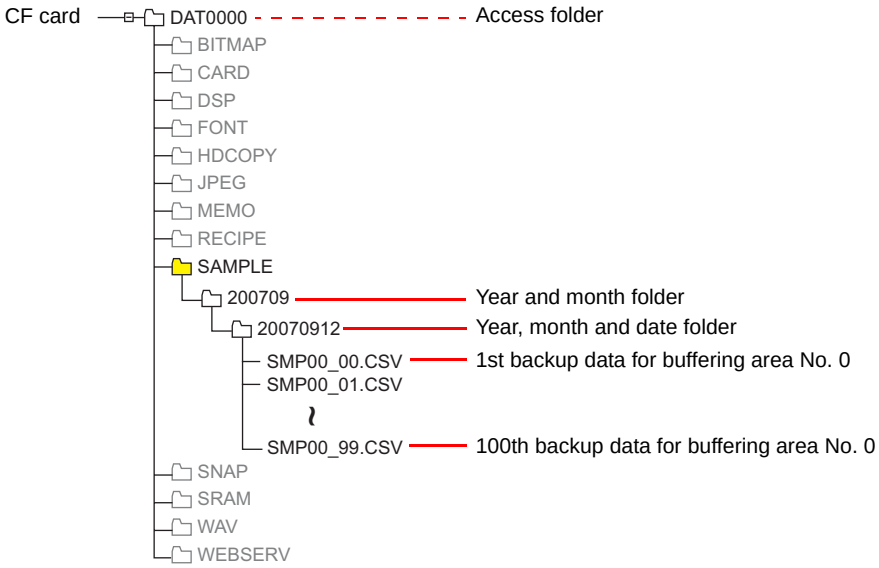
- For “SMPL_CSV”:

File name	Store target
SMPxxxx.CSV 0000 - 0011: Buffer number	Access folder\SAMPLE\ See the following:



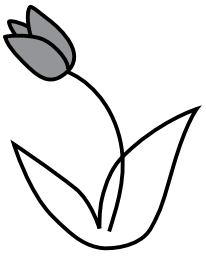
- For “SMPLCSV_BAK”:

File name	Storage target
SMPxx_xx.CSV 00 - 99: Backup times 00 - 11: Buffer number	Access folder\SAMPLE\(Year and month folder) \(Year month and date folder) See the following:



MEMO

Please use this page freely.



3 Command

3.1 Macro Command List

Category	Command Name	Mnemonic	Contents	Refer to:
Arithmetical Operation	ADD(+)	F0 = F1 + F2 (W) F0 = F1 + F2 (D)	Addition	page 4-2
	SUB(-)	F0 = F1 – F2 (W) F0 = F1 – F2 (D)	Subtraction	page 4-4
	MUL(X)	F0 = F1 F2 (W) F0 = F1 F2 (D)	Multiplication	page 4-6
	DIV(/)	F0 = F1 / F2 (W) F0 = F1 / F2 (D)	Division	page 4-8
	MOD(%)	F0 = F1 % F2 (W) F0 = F1 % F2 (D)	Remainder of division	page 4-9
Logical Operation	AND(&)	F0 = F1 & F2 (W) F0 = F1 & F2 (D)	Logical product	page 4-10
	OR(|)	F0 = F1 | F2 (W) F0 = F1 | F2 (D)	Logical add	page 4-11
	XOR(^)	F0 = F1 ^ F2 (W) F0 = F1 ^ F2 (D)	Exclusive OR	page 4-12
	SHL(<<)	F0 = F1 << F2 (W) F0 = F1 << F2 (D)	Left shift	page 4-13
	SHR(>>)	F0 = F1 >> F2 (W) F0 = F1 >> F2 (D)	Right shift	page 4-14
Statistic	MAX	F0 = MAX (F1 C:F2) (W) F0 = MAX (F1 C:F2) (D)	Maximum	page 4-15
	MIN	F0 = MIN (F1 C:F2) (W) F0 = MIN (F1 C:F2) (D)	Minimum	page 4-16
	AVG	F0 = AVG (F1 C:F2) (W) F0 = AVG (F1 C:F2) (D)	Average	page 4-17
	SUM	F0 = SUM (F1 C:F2) (W) F0 = SUM (F1 C:F2) (D)	Sum	page 4-18
Mathematics/ trigonometric	EXP	F0 = EXP (F1) (F)	Exponent	page 4-19
	EXPT	F0 = EXPT (F1,F2) (F)	Powers	page 4-20
	LN	F0 = LN (F1) (F)	Natural logarithms	page 4-21
	LOG	F0 = LOG (F1) (F)	Common logarithms	page 4-22
	SQRT	F0 = SQRT (F1) (F)	Square roots	page 4-23
	ABS	F0 = ABS (F1) (W) F0 = ABS (F1) (D) F0 = ABS (F1) (F)	Absolute value	page 4-24
	NEG	F0 = NEG (F1) (W) F0 = NEG (F1) (D) F0 = NEG (F1) (F)	Sign inversion	page 4-25
	SIN	F0 = SIN (F1) (F)	Sine	page 4-26
	COS	F0 = COS (F1) (F)	Cosine	page 4-27
	TAN	F0 = TAN (F1) (F)	Tangent	page 4-28
	ASIN	F0 = ASIN (F1) (F)	Arcsine	page 4-29
	ACOS	F0 = ACOS (F1) (F)	Arccosine	page 4-30
	ATAN	F0 = ATAN (F1) (F)	Arctangent	page 4-31
	DEG	F0 = DEG (F1) (F)	Convert radians → degrees	page 4-32
	RAD	F0 = RAD (F1) (F)	Convert degrees → radians	page 4-33

Category	Command Name	Mnemonic	Contents	Refer to:
Bit Operation	BSET	F0 (ON)	Bit set (ON)	page 4-34
	BCLR	F0 (OFF)	Bit reset (OFF)	page 4-35
	BINV	F0 (INV)	Bit inversion	page 4-36
Conversion	BCD	F0 = F1 BCD (W) F0 = F1 BCD (D)	Conversion to BCD	page 4-37
	BIN	F0 = F1 BIN (W) F0 = F1 BIN (D)	Conversion to BIN	page 4-38
	CWD	F0 = F1 D <- W	Convert one-word → double-word	page 4-39
	CVP	F0 = F1 PLC <- (W) F0 = F1 PLC <- (D)	Convert DEC → PLC1	page 4-40
	CVPFMT	F0 = F1 (W) PLC F2 <- F0 = F1 (D) PLC F2 <-	Convert DEC → PLCn	page 4-41
	CVB	F0 = F1 (W) <- PLC F0 = F1 (D) <- PLC	Convert PLC1 → DEC	page 4-42
	CVBFMT	F0 = F1 (W) <- PLC F2 F0 = F1 (D) <- PLC F2	Convert PLCn → DEC	page 4-43
	SWAP	F0 C:F1	Swap MSB with LSB	page 4-44
	CHR	F0 = ‘ ‘	Convert text → code (PLC1 code fixed)	page 4-45
	STRING	F0 = ‘ ‘ (STRING)	Convert text → code	page 4-46
	CVFD	F0 (D) <- F1 (F) F2 (D)	Convert real number → BIN	page 4-47
	CVDF	F0 (F) <- F1 (D) F2 (D)	Convert BIN → real number	Page 4-49
	CLND_TO_GRE	CLND_TO_GRE F0 F1 F2	Convert calendar data → GMT-based UNIX time	page 4-51
	GRE_TO_CLND	GRE_TO_CLND F0 F1 F2	Convert GMT-based UNIX time → calendar data	page 4-53
	FORMAT_DATA	FORMAT_DATA F0 F1 F2	Convert string → numerical data	page 4-55
	FORMAT_STR	FORMAT_STR F0 F1 F2	Convert numerical data → string	page 4-59
Transfer	MOV	F0 = F1 (W) F0 = F1 (D)	Transfer	page 4-63
	BMOV	F0 = F1 C:F2 (BMOV) (W) F0 = F1 C:F2 (BMOV) (D)	Block transfer	page 4-64
	CVMOV	F0 = F1 C:F2 (CVMOV) (W) F0 = F1 C:F2 (CVMOV) (D)	(With data conversion) Block transfer	page 4-66
	CVSMOV	F0 = F1 C:F2 (CVSMOV) (W) F0 = F1 C:F2 (CVSMOV) (D)	(With text conversion) Block transfer	page 4-69
	FILL	F0 = F1 C:F2 (FILL)	Transfer all	page 4-71
Comparison	CMP	IF (F0 = F1)F2 (W) IF (F0 = F1)F2 (D)	Comparison	page 4-72
	TST	IFZ (F0 & F1) F2 (W) IFZ (F0 & F1) F2 (D)	Logical product comparison	page 4-74

	IF
	ELSE
	ENDIF
		IF (F0 (condition) F1) (W)
		IF (F0 (condition) F1) (D)
		IF ((condition) F0) (B)
		ELSE
		ENDIF
			Conditional branch	page 4-75

Category	Command Name	Mnemonic	Contents	Refer to:
Macro Operation Control	CALL	CALL F0	Macro block call	page 4-77
	JMP	JMP F0	Jump	page 4-79
	LABEL	LB F0:	Label	page 4-80
	FOR/NEXT	FOR F0 / NEXT	Loop between FOR and NEXT	page 4-81
	RET	RET	Finish macro processing	page 4-83
	SWRET	SWRET	Execute switch function	page 4-84
	WAIT	WAIT	For V4 series	page 4-85
	EN_INT	EN_INT	Interruption enabled	page 4-86
FROM Backup	FROM_WR	FROM_WR F0 F1	Write to FROM	page 4-87
	FROM_RD	FROM_RD F0 F1	Read from FROM	page 4-88
Printer	MR_OUT	MR_OUT F0	MR400 call processing	page 4-89
	MR_REG	MR_REG F0	MR400 registration processing	page 4-90
	OUT_PR	OUT_PR F0 F1	Execute printer command	page 4-92
Video	Video	Video MEMORY F1	Memory designation	page 4-93
		Video SIZE F1	Size	page 4-101
		Video SIZE F1 F2	Size (dot)	page 4-102
		Video SEL_CH F1	Channel	page 4-103
		Video DITHER F1	Dithering	page 4-104
		Video BRIGHT F1	Brightness	page 4-105
		Video CONTRAST F1	Contrast	page 4-106
		Video COLOR F1	Color shade	page 4-107
		Video INF F1	Save settings/reset to default	page 4-108
	Video2	Video2 MEMORY F1	Memory designation	page 4-109
		Video2 SNAP F1 F2	Snap	page 4-129
		Video2 SNAP F1 F2 (SIZE)	Snap (SIZE)	page 4-131
		Video2 STROBE F1 F2	Strobe snap	page 4-133
		Video2 RE_SIZE	Resize	page 4-135
		Video2 ZOOM F1 F2	Zoom	page 4-136
		Video2 BRIGHT F1 F2	Brightness	page 4-137
		Video2 CONTRAST F1 F2	Contrast	page 4-138
		Video2 COLOR F1 F2	Color shade	page 4-139
		Video2 VIDEOINF F1 F2	Save settings/reset to default	page 4-140
		Video2 PAUSE F1	Pause	page 4-141
		Video2 RESTART F1	Pause cancel	page 4-142
		Video2 DELETE F1	Delete	page 4-143
		Video2 SNAP_SEQ F1 F2	Continuous single snap change	page 4-144
		Video2 CLIP_POS F1 F2 F3	Clip start position change	page 4-146
		Video2 CLIP_SIZE F1 F2 F3	Clip size change	page 4-147

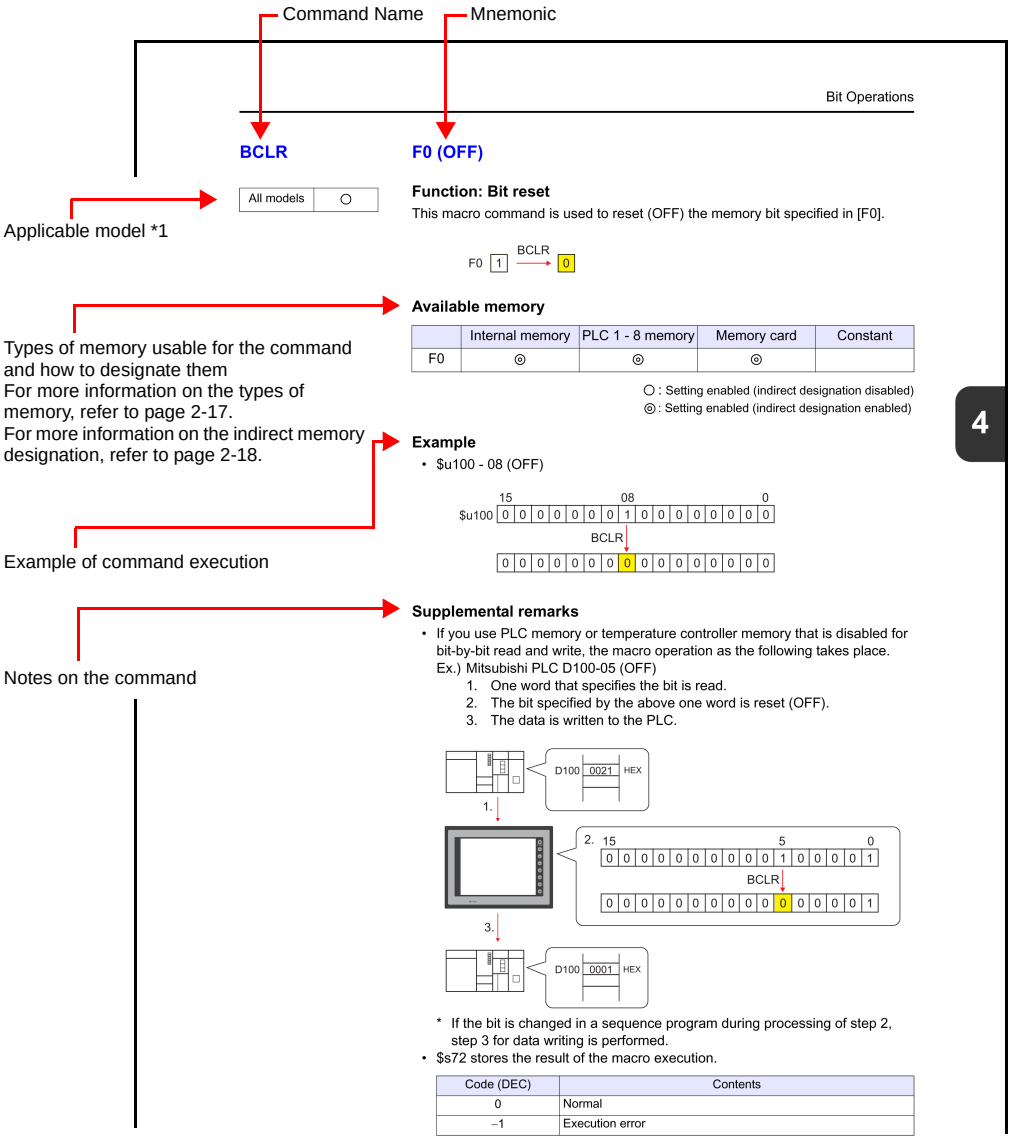
Category	Command Name	Mnemonic	Contents	Refer to:
PLC	PLC_CLND	PLC_CLND F0 PLC F1 F2 F3	Calendar control for PLCn	page 4-148
	PLC_CTL	PLC_CTRL PLC F0 F1 F2	PLCn control	page 4-150
	TBL_READ	TBL_READ F0 <- TABLE : PLC F1 : F2	Device memory map memory read	page 4-152
	TBL_WRITE	TBL_WRITE TABLE : PLC F1 : F0 <- F2	Device memory map memory write	page 4-153
Temperature Control / PLC2Way	TEMP_READ	TEMP_READ F0 <- TABLE : F1	Device memory map memory read (PLC2)	page 4-154
	TEMP_WRITE	TEMP_WRITE TABLE : F0 <- F1	Device memory map memory write (PLC2)	page 4-155
	TEMP_CTL	TEMP_CTL F0 F1	PLC2 control	page 4-156
Ethernet	SEND	SEND F0 C:F1 TO F2	Transfer on the network	page 4-157
	EREAD	EREAD F0 = F1 C:F2 F3	Read on the network	page 4-158
	EWRITE	EWRITE F0 F1 = F2 C:F3	Write on the network	page 4-159
CF Card (Recipe)	LD_RECIPE	LD_RECIPE F0 F1	Read CSV file	page 4-160
	LD_RECIPE2	LD_RECIPE2 F0 F1 F2		page 4-163
	LD_RECIPESEL	LD_RECIPESEL F0 F1		page 4-165
	LD_RECIPESEL2	LD_RECIPESEL2 F0 F1 F2		page 4-168
	SV_RECIPE	SV_RECIPE F0 F1 F2	Save to CSV file	page 4-172
	SV_RECIPE2	SV_RECIPE2 F0 F1 F2 F3		page 4-174
	SV_RECIPESEL	SV_RECIPESEL F0 F1		page 4-176
	SV_RECIPESEL2	SV_RECIPESEL2 F0 F1 F2		page 4-179
	SET_RECIPEFOLDER	SET_RECIPEFOLDER F0	Folder designation	page 4-182
	RD_RECIPE_FILE	RD_RECIPE_FILE F0 F1	Read CSV file	page 4-184
	RD_RECIPE_LINE	RD_RECIPE_LINE F0 F1 F2 F3		page 4-186
	RD_RECIPE_COLUMN	RD_RECIPE_COLUMN F0 F1 F2 F3		page 4-188
	WR_RECIPE_FILE	WR_RECIPE_FILE F0 F1	Save to CSV file	page 4-190
	WR_RECIPE_LINE	WR_RECIPE_LINE F0 F1 F2 F3		page 4-192
	WR_RECIPE_COLUMN	WR_RECIPE_COLUMN F0 F1 F2 F3		page 4-194
	GET_RECIPE_FILEINFO	GET_RECIPE_FILEINFO F0 F1 F2	CSV file information	page 4-196
CF Card (Sampling)	SMPL_BAK	SMPL_BAK F0	Save backup	page 4-198
	SMPL_CSV	SMPL_CSV F0	Create CSV file	page 4-201
	SMPL_CSV2	SMPL_CSV2 F0 F1	Create CSV file (file name designation)	page 4-205
	SMPL_SAVE	SMPL_SAVE	Save data on temporary storage	page 4-207
	SMPLCSV_BAK	SMPLCSV_BAK F0	Save backup (CSV file)	page 4-209
	SMPLCSV_BAK2	SMPLCSV_BAK2 F0 F1	Save backup (CSV file, file name designation)	page 4-213

Category	Command Name	Mnemonic	Contents	Refer to:
CF Card (Others)	HDCOPY	HDCOPY	Hardcopy	page 4-215
	HDCOPY2	HDCOPY2 F0	Hardcopy	page 4-216
	HDCOPY3	HDCOPY3 F0	Hardcopy (file name designation)	page 4-217
	SET_DRIVE	SET_DRIVE F0	Select drive	page 4-218
	COPY_FILE	COPY_FILE F0 F1	Copy file	page 4-219
	MOVE_FILE	MOVE_FILE F0 F1 F2	Move file	page 4-221
	READ_FILE	READ_FILE F0 F1 F2 F3	Read universal file	page 4-223
	WRITE_FILE	WRITE_FILE F0 F1 F2	Write to universal file	page 4-225
Real No. Arithmetical Operation	F_ADD(+)	F0 = F1 + F2 (F)	Real number addition	page 4-227
	F_SUB(-)	F0 = F1 – F2 (F)	Real number subtraction	page 4-228
	F_MUL(X)	F0 = F1 × F2 (F)	Real number multiplication	page 4-229
	F_DIV(/)	F0 = F1 / F2 (F)	Real number division	page 4-230
Real No. Statistics	F_SUM	F0 = F_SUM (F1 C:F2) (F)	Sum of real number data	page 4-231
	F_AVG	F0 = F_AVG (F1 C:F2) (F)	Average of real number data	page 4-232
	F_MAX	F0 = F_MAX (F1 C:F2) (F)	Maximum of real number data	page 4-233
	F_MIN	F0 = F_MIN (F1 C:F2) (F)	Minimum of real number data	page 4-234
Others	;(Comment)	;	Comment	page 4-235
	BRIGHT	BRIGHT F0	Brightness adjustment	page 4-236
	GET_MSGBLK	GET_MSGBLK F0 F1	Message acquisition	page 4-237
	PLC_ULR	PLC_ULR F0 F1	Read user log	page 4-238
	RECONNECT	RECONNECT F0	Multi-drop reconnection (PLC1)	page 4-240
	RECONNECT_EX	RECONNECT_EX PLC F0 F1	Restart	page 4-241
	SAMPLE	SAMPLE F0 F1 F2	Sampling data acquisition	page 4-242
	SEARCH_FILE	SEARCH_FILE F0 F1	JPEG file search	page 4-245
	ADJ_ANGLE	ADJ_ANGLE F0	Adjust viewing angle	page 4-246
	SAVE_ANGLE	SAVE_ANGLE	Save viewing angle adjustment value	page 4-247
	ADJ_VOLUME	ADJ_VOLUME F0 F1 F2	Adjust volume	page 4-248
	SAVE_VOLUME	SAVE_VOLUME	Save volume	page 4-249
	TREND REFRESH	TREND REFRESH F0 F1	Trend sampling	page 4-250
	SYS	SYS (SET_SCRN) F1	Screen number designation	page 4-251
		SYS (SET_MOVLP) F1	Multi-overlap/global overlap setting	page 4-252
		SYS (OVLP_SHOW) F1	Overlap ON/OFF	page 4-254
		SYS (OVLP_POS) F1	Overlap relocation	page 4-255
		SYS (GET_MSG) F1	Message acquisition	page 4-256

Category	Command Name	Mnemonic	Contents	Refer to:
Others	SYS	SYS (GET_XY) F1	Acquisition of X and Y coordinates on circumference	page 4-258
		SYS (SET_BZ) F1	Buzzer control	page 4-260
		SYS (GET_TIME) F1	System time acquisition	page 4-261
		SYS (STA_TIME) F1	Timer setting	page 4-262
		SYS (GET_CLND) F1	Calendar acquisition	page 4-264
		SYS (SET_CLND) F1	Calendar setting	page 4-265
		SYS (SET_BUFNO) F1	Trend sampling Data sampling	page 4-266
			Alarm function	page 4-268
		SYS (GET_SMPL) F1	Sampling data acquisition	page 4-269
		SYS (GET_SCUR) F1	Cursor point acquisition	page 4-271
		SYS (GET_BUF) F1	Alarm mask information acquisition	page 4-273
		SYS (DSP_DATA) F1	Show/hide numerical data display	page 4-276
		SYS (CHG_DATA) F1	Change numerical data display property	page 4-277
		SYS (STA_LIST) F1	Data sheet print	page 4-279
		SYS (RGB_CHG) F1	Change RGB input parameter	page 4-281
		SYS (SET_RGB) F1	Switch from/to RGB input screen	page 4-282
			Snap/delete RGB input screen	page 4-283
			RGB input channel selection	page 4-285
		SYS (SET_BKLT) F1	Backlight control	page 4-286
		SYS (RESTART) F1	Restart	page 4-287
		SYS (CONTRAST) F1	Contrast adjustment	page 4-288
		SYS (CHG_LANG) F1	Language change	page 4-289
		SYS (RESET_SCRN) F1	Redisplay screen	page 4-291
		SYS (GET_STATUS_FL) F1	FL-net information acquisition	page 4-292
		SYS (SET_DSW) F1	Deadman switch setting	page 4-293
		SYS (OUT_ENQ) F1	Universal serial	page 4-294
			A-link + Net10	page 4-295
		SYS (SET_SYS_CLND) F1	System calendar setting	page 4-296
Others	HMI-FUNC	HMI-UserFunc (F1 , “ ”)	DLL function execution	page 4-297
		HMI-LoadDll (F1 , “ ”)	Load DLL	page 4-298
		HMI-ShutDown	Computer shutdown	page 4-299
		HMI-UserExe (“ ”)	Application file execution	page 4-300
		HMI-Close	TELLUS termination	page 4-301

4 Details of Macro Commands

4.1 Guide to Chapter 4



*1 Refer to “V Series Models” in this manual.

4.2 Arithmetical Operation

ADD(+)

F0 = F1 + F2 (W) . . . . . WORD

F0 = F1 + F2 (D) . . . . . DWORD

All models	○

Function: Addition

This macro command is used to write the result of [F1] plus [F2] to [F0].

WORD

	F1
+	F2
	F0

DWORD

	F1+1	F1
+	F2+1	F2
	F0+1	F0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎*1		
F1	◎	◎*1		○
F2	◎	◎*1		○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

*1 Available only with the V8 series/TELLUS3 HMI

Setting range

	WORD	DWORD
F0	−32768 - +32767 (Decimal system with signs)	−2147483648 - +2147483647 (Decimal system with signs)
F1		
F2		

Example

- $u100 = $u200 + $u300 (W)

	$u200
+	$u300
	$u100

	5
+	100
	105

- $u100 = $u200 + $u300 (D)

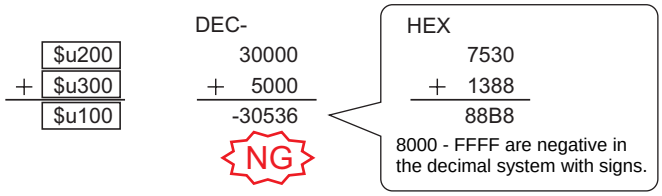
	$u201	$u200
+	$u301	$u300
	$u101	$u100

	70000
+	100
	70100

Supplemental remarks

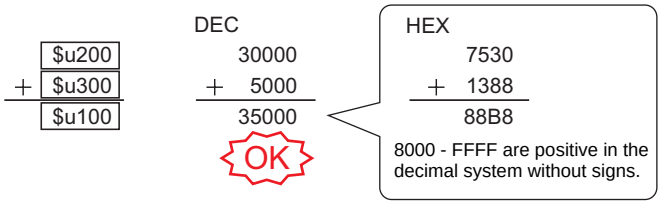
- Operation is performed in the decimal system with signs. Be sure that the result [F0] falls within the permissible range.

  $u100 = $u200 + $u300 (W)



* The execution result in the example above is an overflow.

If an operation results in “65535” in the decimal system (WORD) or less, it matches the result in the decimal system without signs.



* The execution result in the example above is an overflow.

- In a case where [F1] and [F2] are specified in the following ranges, they are treated as negative values –1 to –32768.
  32768 - 65535 (DEC)
  100000 - 17777 (OCT)
  8000 - FFFF (HEX)

- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

SUB(-)

All models	○

F0 = F1 - F2 (W) . . . . . WORD

F0 = F1 - F2 (D). . . . . DWORD

Function: Subtraction

This macro command is used to write the result of [F1] minus [F2] to [F0].

WORD

	F1
−	F2
	F0

DWORD

	F1+1	F1
−	F2+1	F2
	F0+1	F0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎*1		
F1	◎	◎*1		○
F2	◎	◎*1		○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

*1 Available only with the V8 series/TELLUS3 HMI

Setting range

	WORD	DWORD
F0	−32768 - +32767 (Decimal system with signs)	−2147483648 - +2147483647 (Decimal system with signs)
F1		
F2		

Example

- $u100 = $u200 − $u300 (W)

	$u200
−	$u300
	$u100

	100
−	40
	60

- $u100 = $u200 − $u300 (D)

	$u201	$u200
−	$u301	$u300
	$u101	$u100

	70000
−	100
	69900

Supplemental remarks

- Operation is performed in the decimal system with signs. Be sure that the result [F0] falls within the permissible range.

	$u200
−	$u300
	$u100

DEC-

	-30000
−	5000
	30536

NG

HEX

	8AD0
−	1388
	7748

0000 - 7FFF are positive in the decimal system with signs.

* The execution result in the example above is an underflow.

- In a case where [F1] and [F2] are specified in the following ranges, they are treated as negative values –1 to –32768.
  32768 - 65535 (DEC)
  100000 - 17777 (OCT)
  8000 - FFFF (HEX)

- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

MUL(X)

All models	○

F0 = F1 x F2 (W) . . . . . WORD

F0 = F1 x F2 (D) . . . . . DWORD

Function: Multiplication

This macro command is used to write the result of [F1] multiplied by [F2] to [F0].

WORD

	F1
×	F2
	F0

DWORD

	F1+1	F1
×	F2+1	F2
	F0+1	F0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎*1		
F1	◎	◎*1		○
F2	◎	◎*1		○

○ : Setting enabled (indirect designation disabled)

◎ : Setting enabled (indirect designation enabled)

*1 Available only with the V8 series/TELLUS3 HMI

Setting range

	WORD	DWORD
F0	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)
F1		
F2		

Example

- $u100 = $u200 × $u300 (W)

	$u200
×	$u300
	$u100

	100
×	40
	4000

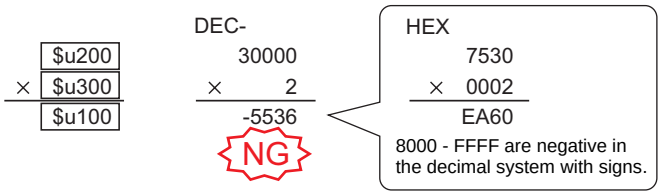
- $u100 = $u200 × $u300 (D)

	$u201	$u200
×	$u301	$u300
	$u101	$u100

	40000
×	2
	80000

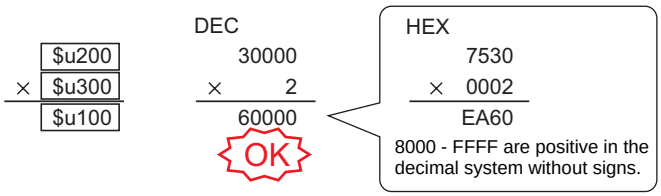
Supplemental remarks

- Operation is performed in the decimal system with signs. Be sure that the result [F0] falls within the permissible range.



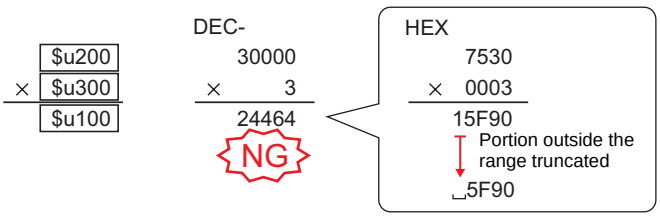
* The execution result in the example above is an overflow.

If an operation results in “65535” (WORD) or less, it matches the result in the decimal system without signs.



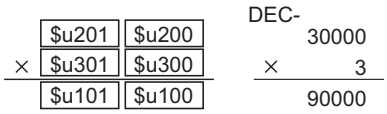
* The execution result in the example above is an overflow.

- If the result [F0] is outside the permissible range, the extra portion is truncated.



* The execution result in the example above is normal.

In this case, operation is performed in DWORD.



- In a case where [F1] and [F2] are specified in the following ranges, they are treated as negative values –1 to –32768.
  32768 - 65535 (DEC)
  100000 - 17777 (OCT)
  8000 - FFFF (HEX)

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

DIV(/)

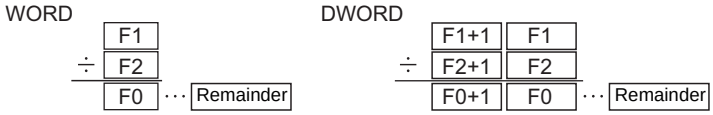
All models	○

F0 = F1 / F2 (W) . . . . . WORD

F0 = F1 / F2 (D). . . . . DWORD

Function: Division

This macro command is used to write the result of [F1] divided by [F2] to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎*1		
F1	◎	◎*1		○
F2	◎	◎*1		○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

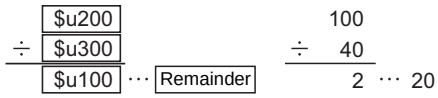
*1 Available only with the V8 series/TELLUS3 HMI

Setting range

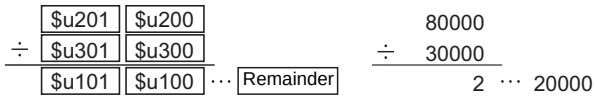
	WORD	DWORD
F0 F1 F2	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)

Example

- $u100 = $u200 / $u300 (W)



- $u100 = $u200 / $u300 (D)



Supplemental remarks

- Operation is performed in the decimal system with signs. Be sure that the [F1] value falls within the permissible range.
- In a case where [F1] and [F2] are specified in the following ranges, they are treated as negative values –1 to –32768.
  32768 - 65535 (DEC)
  100000 - 17777 (OCT)
  8000 - FFFF (HEX)
- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
3	Calculation operation error
–1	Execution error

MOD(%)

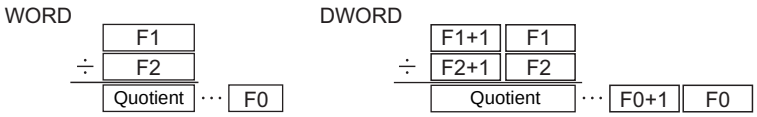
All models	○

F0 = F1 % F2 (W). . . . . WORD

F0 = F1 % F2 (D) . . . . . DWORD

Function: Remainder of division

This macro command is used to write the remainder of [F1] divided by [F2] to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎*1		
F1	◎	◎*1		○
F2	◎	◎*1		○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

*1 Available only with the V8 series/TELLUS3 HMI

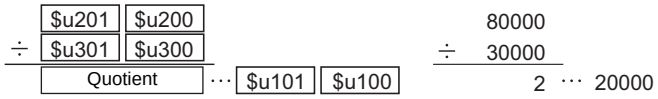
Setting range

	WORD	DWORD
F0	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)
F1		
F2		

Example

- $u100 = $u200 % $u300 (W)

- $u100 = $u200 % $u300 (D)



Supplemental remarks

- Operation is performed in the decimal system with signs. Be sure that the [F1] value falls within the permissible range.
- In a case where [F1] and [F2] are specified in the following ranges, they are treated as negative values –1 to –32768.
  32768 - 65535 (DEC)
  100000 - 17777 (OCT)
  8000 - FFFF (HEX)
- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
3	Calculation operation error
–1	Execution error

4.3 Logical Operation

AND(&)

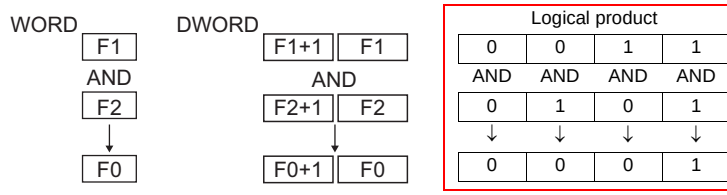
All models	○

F0 = F1 & F2 (W) . . . . . WORD

F0 = F1 & F2 (D) . . . . . DWORD

Function: Logical product

This macro command is used to write the result of [F1] ANDed with [F2] bit by bit to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

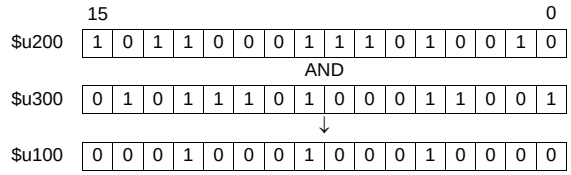
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

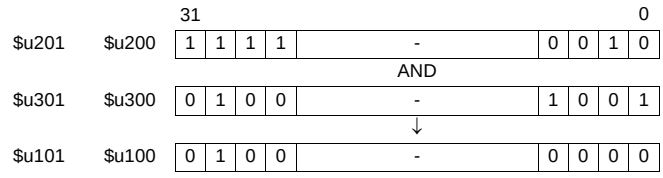
	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2		

Example

- $u100 = $u200 & $u300 (W)



- $u100 = $u200 & $u300 (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

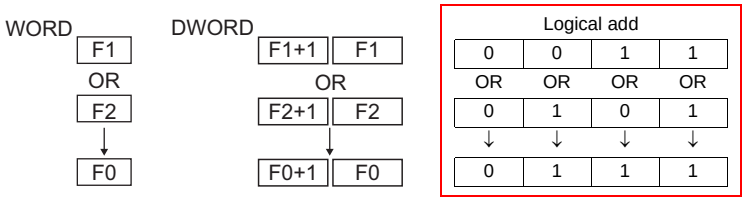
OR(|)

All models	○

F0 = F1 | F2 (W) . . . . . WORD
F0 = F1 | F2 (D) . . . . . DWORD

Function: Logical add

This macro command is used to write the result of [F1] ORed with [F2] bit by bit to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

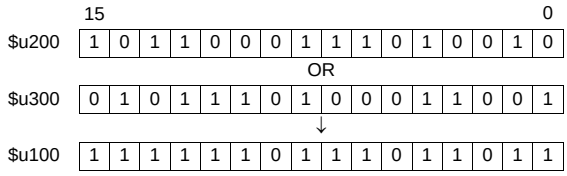
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

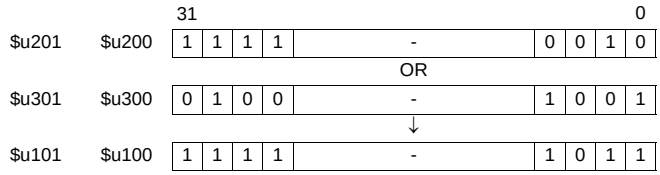
	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2		

Example

- $u100 = $u200 | $u300 (W)



- $u100 = $u200 | $u300 (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

XOR(^)

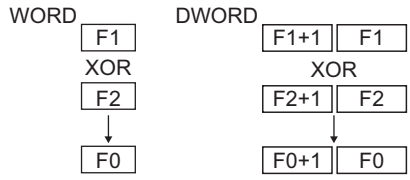
All models	○

F0 = F1 ^ F2 (W) . . . . . WORD

F0 = F1 ^ F2 (D) . . . . . DWORD

Function: Exclusive OR

This macro command is used to write the result of [F1] XORed with [F2] bit by bit to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

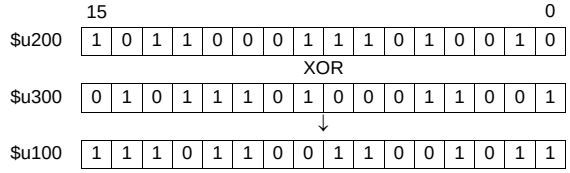
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

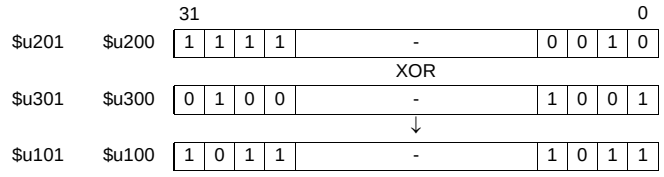
	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2		

Example

- $u100 = $u200 ^ $u300 (W)



- $u100 = $u200 ^ $u300 (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

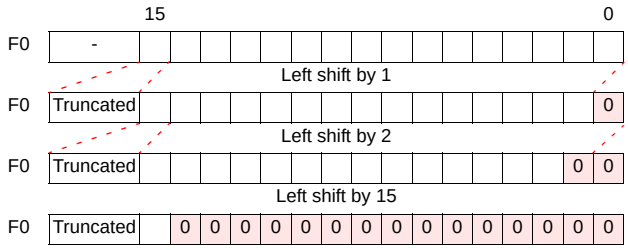
SHL(<<)

All models	○

F0 = F1 << F2 (W) . . . . . WORD
F0 = F1 << F2 (D) . . . . . DWORD

Function: Left shift

This macro command is used to perform logical shift of [F1] to the left by the number of bits specified in [F2] and write the result to [F0]. The higher-order bits (by the number in [F2]) are truncated. "0" is assigned to the lower-order bits (by the number in [F2]).



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	○			○

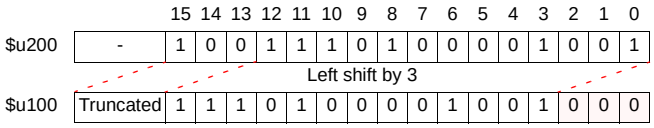
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

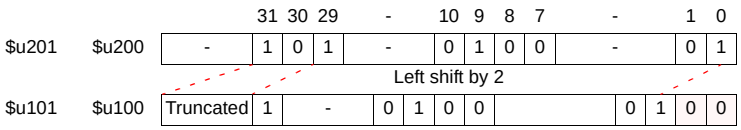
	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2	0 - 15	0 - 31

Example

- $u100 = $u200 << 3 (W)



- $u100 = $u200 << 2 (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SHR(>>)

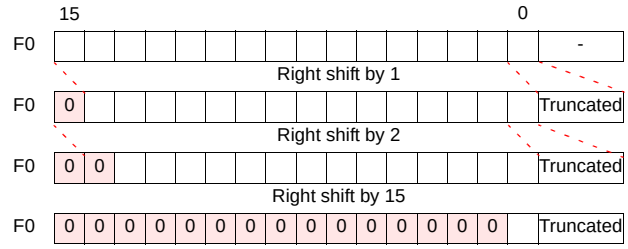
All models	○

F0 = F1 >> F2 (W). . . . . WORD

F0 = F1 >> F2 (D) . . . . . DWORD

Function: Right shift

This macro command is used to perform logical shift of [F1] to the right by the number of bits specified in [F2] and write the result to [F0]. The lower-order bits (by the number in [F2]) are truncated. "0" is assigned to the higher-order bits (by the number in [F2]).



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	○			○

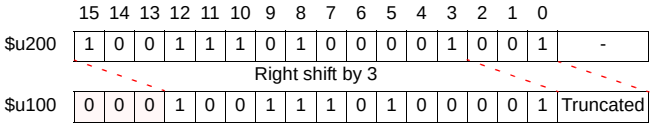
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

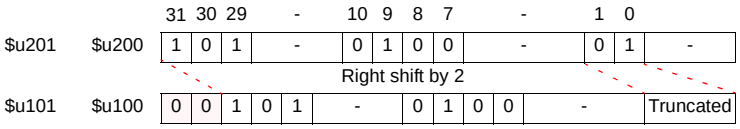
	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2	0 - 15	0 - 31

Example

- $u100 = $u200 >> 3 (W)



- $u100 = $u200 >> 2 (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

4.4 Statistic

MAX

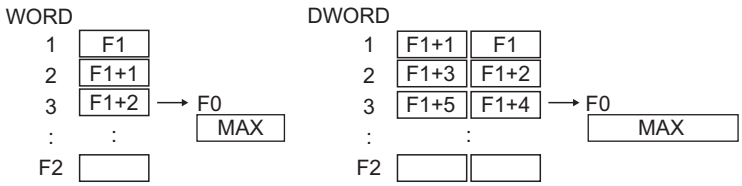
All models	○

F0 = MAX (F1 C : F2) (W) . . . . . WORD

F0 = MAX (F1 C : F2) (D) . . . . . DWORD

Function: Maximum

This macro command is used to find the maximum data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

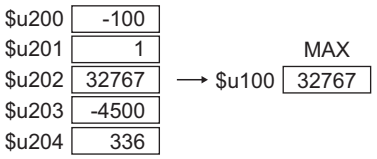
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

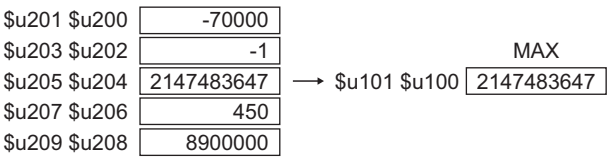
	WORD	DWORD
F0	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)
F1		
F2	0 - 512	0 - 512

Example

- $u100 = MAX ($u200 C : 5) (W)



- $u100 = MAX ($u200 C : 5) (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

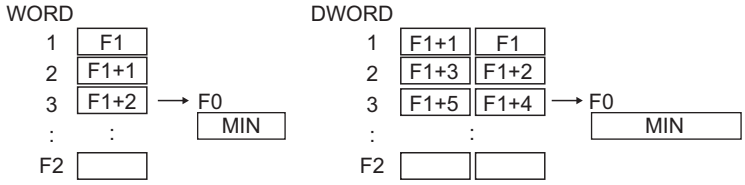
MIN

All models	○

F0 = MIN (F1 C : F2) (W) . . . . . WORD
F0 = MIN (F1 C : F2) (D) . . . . . DWORD

Function: Minimum

This macro command is used to find the minimum data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

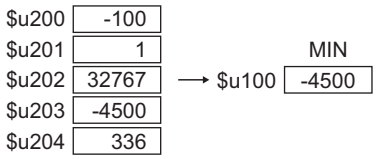
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

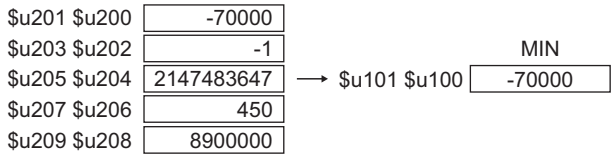
	WORD	DWORD
F0	−32768 - +32767 (Decimal system with signs)	−2147483648 - +2147483647 (Decimal system with signs)
F1		
F2	0 - 512	0 - 512

Example

- $u100 = MIN ($u200 C : 5) (W)



- $u100 = MIN ($u200 C : 5) (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

AVG

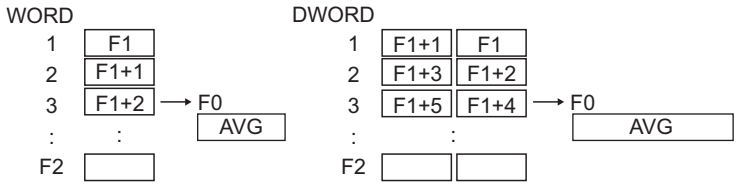
All models	○

F0 = AVG (F1 C : F2) (W) . . . . . WORD

F0 = AVG (F1 C : F2) (D) . . . . . DWORD

Function: Average

This macro command is used to average the data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

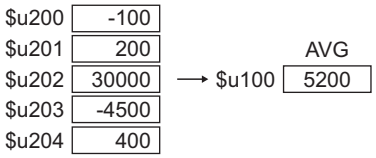
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

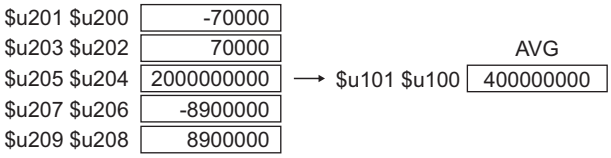
	WORD	DWORD
F0	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)
F1		
F2	0 - 512	0 - 512

Example

- $u100 = AVG ($u200 C : 5) (W)



- $u100 = AVG ($u200 C : 5) (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
3	Calculation operation error
–1	Execution error

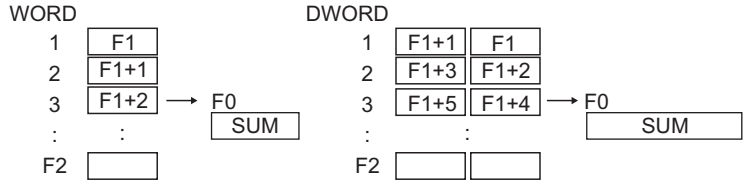
SUM

All models	○

F0 = SUM (F1 C : F2) (W) . . . . . WORD
F0 = SUM (F1 C : F2) (D) . . . . . DWORD

Function: Sum

This macro command is used to determine the sum of the data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

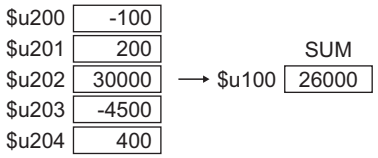
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

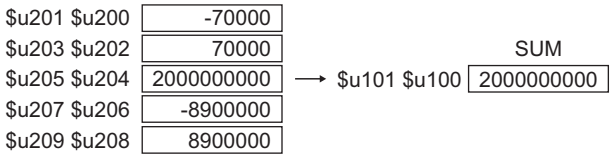
	WORD	DWORD
F0	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)
F1		
F2	0 - 512	0 - 512

Example

- $u100 = SUM ($u200 C : 5) (W)



- $u100 = SUM ($u200 C : 5) (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

4.5 Mathematics/trigonometric

EXP F0 = EXP(F1) (F)

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Calculation of the exponent

This macro command is used to store the exponent of [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- $u100 = EXP ($u200) (F)

$$2.71828 = e^{1.0}$$

When $u200 = “1.0”, on command execution “2.71828” is stored in $u100.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real number, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

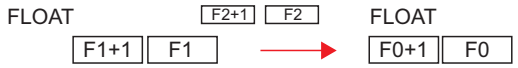
EXPT

F0 = EXPT(F1,F2) (F)

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Calculation of powers

This macro command is used to store [F1] to the power of [F2] in [F0].
Specify [F0], [F1], and [F2] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	

Example

- $u100 = EXPT ($u200,$u300) (F)

$$8 = 2^{3}$$

When $u200 = “2” and $u300 = “3”, on command execution “8” is stored in $u100.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

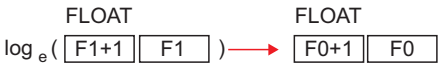
LN

F0 = LN(F1) (F)

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Calculation of natural logarithms

This macro command is used to store the value of the natural logarithm of [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- $u100 = LN ($u200) (F)

$$2.302585 = \log_e (10.0)$$

When $u200 = “10.0”, on command execution “2.302585” is stored in $u100.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real number, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

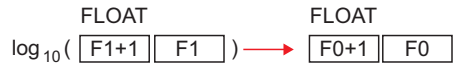
LOG

F0 = LOG(F1) (F)

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Calculation of common logarithms

This macro command is used to store the value of the common logarithm of [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- $u100 = LOG ($u200) (F)

$$1.0 = \log_{10}(10.0)$$

When $u200 = “10.0”, on command execution “1.0” is stored in $u100.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real number, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

SQRT

F0 = SQRT(F1) (F)

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Calculation of square roots

This macro command is used to store the value of the square root of [F1] in [F0]. Specify [F0] and [F1] as floating decimal point (FLOAT) type values.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- $u100 = SQRT ($u200) (F)

$$1.41421 = \sqrt{\ } (2.0)$$

When $u200 = “2.0”, on command execution “1.41421” is stored in $u100.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real number, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

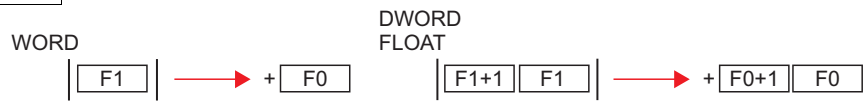
ABS

F0 = ABS (F1) (W) . . . . . WORD
F0 = ABS (F1) (D) . . . . . DWORD
F0 = ABS (F1) (F) . . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Absolute value

This macro command is used to store an absolute value of [F1] in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

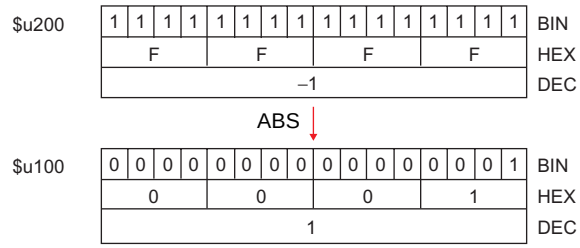
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD	FLOAT
F0	–32767 to +32767 (Decimal system with signs)	–2147483647 to +2147483647 (Decimal system with signs)	IEEE 32-bit single precision real number
F1			

Example

- $u100 = ABS ($u200) (W)
  When $u200 = "–1", on command execution "1" is stored in $u100.



Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

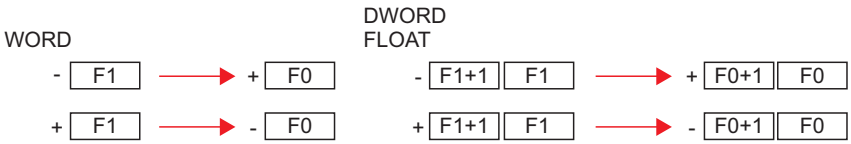
NEG

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

F0 = NEG (F1) (W) . . . . . WORD
F0 = NEG (F1) (D) . . . . . DWORD
F0 = NEG (F1) (F) . . . . . FLOAT

Function: Sign inversion

This macro command is used to store a value with its sign inverted from [F1] in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

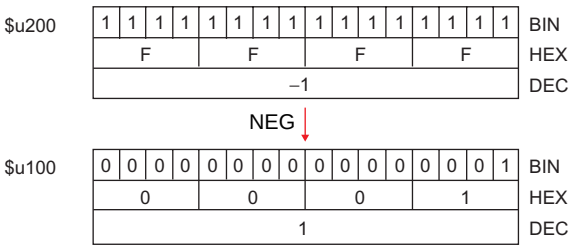
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD	FLOAT
F0	–32767 to +32767 (Decimal system with signs)	–2147483647to +2147483647 (Decimal system with signs)	IEEE 32-bit single precision real number
F1			

Example

- $u100 = NEG ($u200) (W)
  When $u200 = "–1", on command execution "1" is stored in $u100.



Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*

* An indefinite value is stored in [F0].

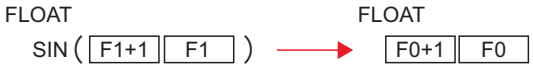
SIN

F0 = SIN (F1) (F) . . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Sine

This macro command is used to store a sine of the angle (in radians) specified for [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

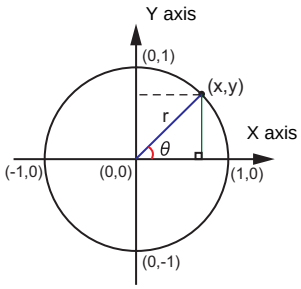
	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain the value for sin 90° in radians;
  $u200 = RAD (90) (F)
  $u100 = SIN ($u200) (F)
  The operation result of “1” is stored in $u100.

* The sine, cosine and tangent of the trigonometric functions can be obtained based on the formulae below.
- Radian (circular measure)
  1 rad = 360/2 π
  = approx. 57.29578 deg.

$$\sin\theta = \frac{y}{r}$$
$$\cos\theta = \frac{x}{r}$$
$$\tan\theta = \frac{y}{x}$$



Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- To convert the unit of an angle, use the macro command of DEG (page 4-32) or RAD (page 4-33).

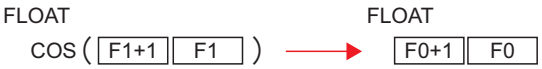
COS

F0 = COS (F1) (F) . . . . . .FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Cosine

This macro command is used to store a cosine of the angle (in radians) specified for [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain the value for cos 0° in radians;
  $u200 = RAD (0) (F)
  $u100 = COS ($u200) (F)
  The operation result of “1” is stored in $u100.
  * For more information on cosθ of the trigonometric functions, refer to “Example” of “Function: Sine” on page 4-26.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- To convert the unit of an angle, use the macro command of DEG (page 4-32) or RAD (page 4-33).

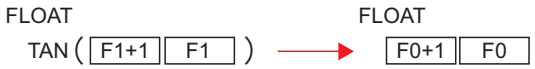
TAN

F0 = TAN (F1) (F) . . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Tangent

This macro command is used to store a tangent of the angle (in radians) specified for [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain the value for tan 45° in radians;
  $u200 = RAD (45) (F)
  $u100 = TAN ($u200) (F)
  The operation result of “1” is stored in $u100.

  * For more information on tanθ of the trigonometric functions, refer to “Example” of “Function: Sine” on page 4-26.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*1
2	Underflow*1
3	Operation execution error*2

*1 An indefinite value is stored in [F0].
*2 When the value specified for [F1] is π × (0.5 + n), “–1” is stored in [F0]. (n: integer)

- To convert the unit of an angle, use the macro command of DEG (page 4-32) or RAD (page 4-33).

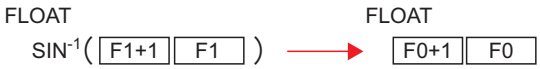
ASIN

F0 = ASIN (F1) (F) . . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Arcsine

This macro command is used to store an arcsine of the angle (in radians) specified for [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

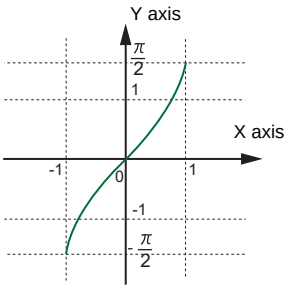
Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain the value for $\sin^{-1} 1$;
  $u100 = ASIN (1) (F)
  The operation result of “1.570796” (= π/2) is stored in $u100.

  * The $\sin^{-1}$ of the trigonometric functions is expressed in the graph shown on the right.



Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*1
2	Underflow*1
3	Operation execution error*2

*1 An indefinite value is stored in [F0].
*2 When the value specified for [F1] is outside the range from “–1” to “1”, “–1” is stored in [F0].

- To convert the unit of an angle, use the macro command of DEG (page 4-32) or RAD (page 4-33).

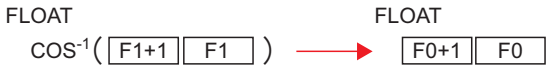
ACOS

F0 = ACOS (F1) (F). . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Arccosine

This macro command is used to store an arccosine of the angle (in radians) specified for [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

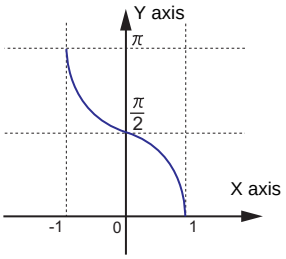
Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain the value for $\cos^{-1} 0$;
  $u100 = ACOS (0) (F)
  The operation result of “1.570796” (= π/2) is stored in $u100.

  * The $\cos^{-1}$ of the trigonometric functions is expressed in the graph shown on the right.



Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*1
2	Underflow*1
3	Operation execution error*2

*1 An indefinite value is stored in [F0].
*2 When the value specified for [F1] is outside the range from “–1” to “1”, “–1” is stored in [F0].

- To convert the unit of an angle, use the macro command of DEG (page 4-32) or RAD (page 4-33).

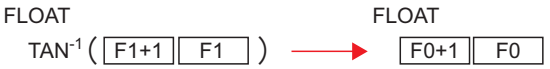
ATAN

F0 = ATAN (F1) (F) . . . . . .FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Arctangent

This macro command is used to store an arctangent of the angle (in radians) specified for [F1] in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

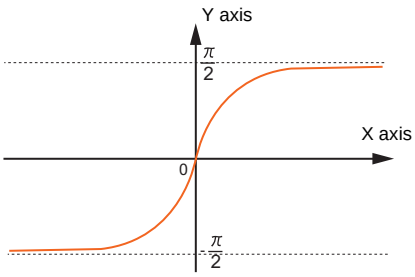
Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain the value for $\tan^{-1} 0$;
  $u100 = ATAN (0) (F)
  The operation result of “0” is stored in $u100.

  * The $\tan^{-1}$ of the trigonometric functions is expressed in the graph shown on the right.



Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*
2	Underflow*

  * An indefinite value is stored in [F0].

- To convert the unit of an angle, use the macro command of DEG (page 4-32) or RAD (page 4-33).

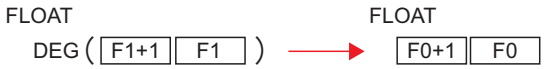
DEG

F0 = DEG (F1) (F) . . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Convert radians to degrees

This macro command is used to convert the unit of an angle specified for [F1] from radians to degrees and store the converted value in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain a value in degrees;
  $u100 = ASIN (1) (F)
  $u200 = DEG ($u100) (F)
  The operation result of “90” is stored in $u200.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

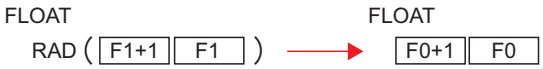
RAD

F0 = RAD (F1) (F) . . . . . FLOAT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Convert degrees to radians

This macro command is used to convert the unit of an angle specified for [F1] from degrees to radians and store the converted value in [F0].
Specify [F0] and [F1] as floating decimal point (FLOAT) type values.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	

Example

- To obtain 180° in radians;
  $u100 = RAD (180) (F)
  The operation result of “3.141592” (= π) is stored in $u100.

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056.

Code (DEC)	Contents
0	Normal
1	Overflow*
2	Underflow*

* An indefinite value is stored in [F0].

4.6 Bit Operation

BSET

F0 (ON)

All models	○

Function: Bit set

This macro command is used to set (ON) the memory bit specified in [F0].

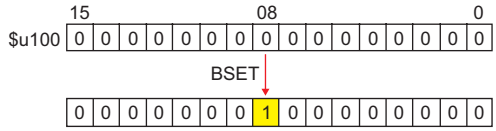
Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

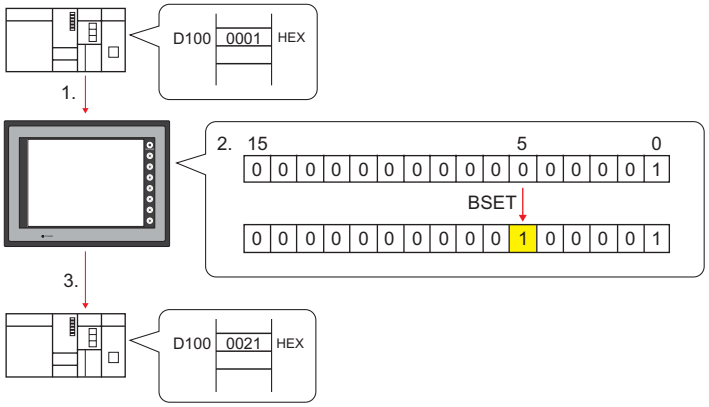
Example

- $u100 - 08 (ON)



Supplemental remarks

- If you use PLC memory or temperature controller memory that is disabled for bit-by-bit read and write, the macro operation as the following takes place.
  Ex.) Mitsubishi PLC D100-05 (ON)
  1. One word that specifies the bit is read.
  2. The bit specified by the above one word is set (ON).
  3. The data is written to the PLC.



  * If the bit is changed in a sequence program during processing of step 2, step 3 for data writing is performed.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

BCLR

F0 (OFF)

All models	○

Function: Bit reset

This macro command is used to reset (OFF) the memory bit specified in [F0].

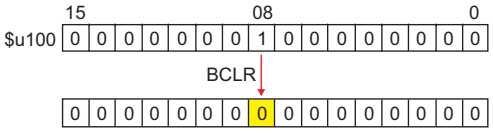
Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

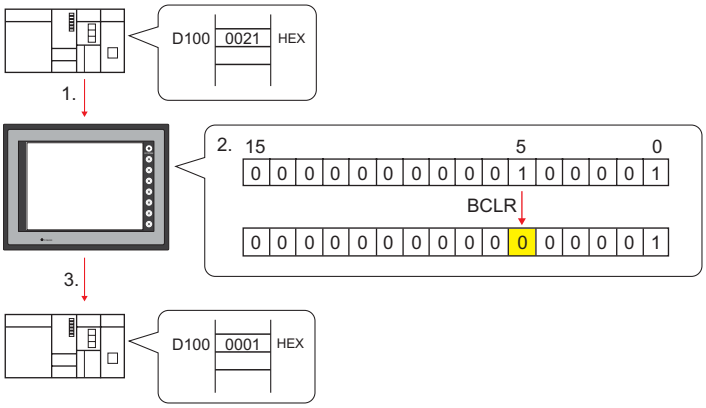
Example

- $u100 - 08 (OFF)



Supplemental remarks

- If you use PLC memory or temperature controller memory that is disabled for bit-by-bit read and write, the macro operation as the following takes place.
  Ex.) Mitsubishi PLC D100-05 (OFF)
  1. One word that specifies the bit is read.
  2. The bit specified by the above one word is reset (OFF).
  3. The data is written to the PLC.



  * If the bit is changed in a sequence program during processing of step 2, step 3 for data writing is performed.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

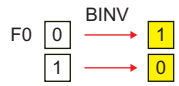
BINV

All models	○

F0 (INV)

Function: Bit inversion

This macro command is used to invert the memory bit specified in [F0].



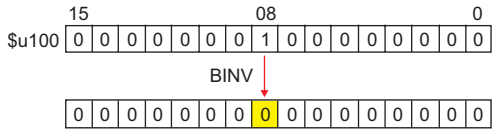
Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

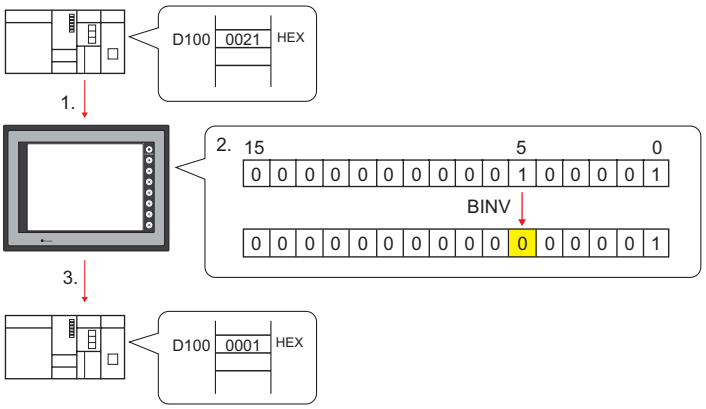
Example

- $u100 - 08 (INV)



Supplemental remarks

- If you use PLC memory or temperature controller memory that is disabled for bit-by-bit read and write, the macro operation as the following takes place.
  Ex.) Mitsubishi PLC D100-05 (INV)
  1. One word that specifies the bit is read.
  2. The bit specified by the above one word is inverted.
  3. The data is written to the PLC.



  * If the bit is changed in a sequence program during processing of step 2, step 3 for data writing is performed.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

4.7 Conversion

BCD

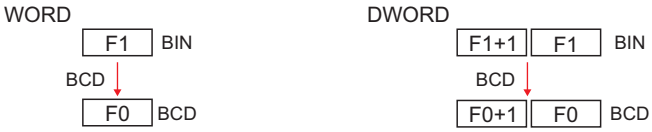
All models	○

F0 = F1 (W) BCD . . . . . WORD

F0 = F1 (D) BCD . . . . . DWORD

Function: Conversion to BCD

This macro command is used to convert the binary data specified in [F1] to BCD and write the result to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			

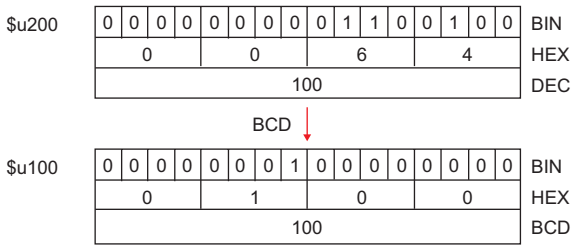
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD
F0	0 - 9999 (BCD)	0 - 99999999 (BCD)
F1	0 - 9999 (Decimal system without signs)	0 - 99999999 (Decimal system without signs)

Example

- $u100 = $u200 (W) BCD



Supplemental remarks

- If the value in [F1] is outside the permissible range, [F0] becomes “0”.
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

BIN

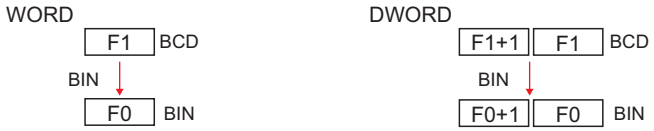
All models	○

F0 = F1 (W) BIN . . . . . WORD

F0 = F1 (D) BIN. . . . . DWORD

Function: Conversion to BIN

This macro command is used to convert the BCD data specified in [F1] to binary data and write the result to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			

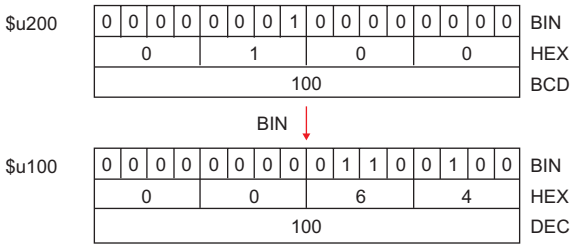
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD
F0	0 - 9999 (Decimal system without signs)	0 - 99999999 (Decimal system without signs)
F1	0 - 9999 (BCD)	0 - 99999999 (BCD)

Example

- $u100 = $u200 (W)BIN



Supplemental remarks

- If the value in [F1] is outside the permissible range, [F0] becomes “0”.
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

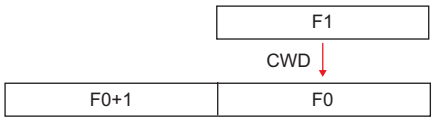
CWD

F0 = F1 D <-W

All models	○

Function: Convert one-word → double-word

This macro command is used to convert the one-word data with sign specified in [F1] to double-word data with sign and write the result to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			

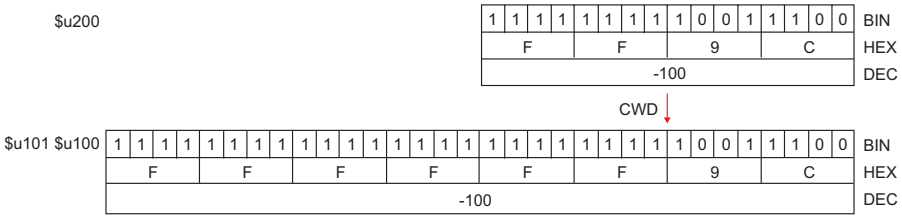
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

Memory	Value
F0	−32768 - +32767 (Decimal system with signs)
F0+1	
F1	

Example

- $u100 = $u200 D <- W



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

CVP

All models	○

F0 = F1 (W) PLC <-. . . . . WORD
F0 = F1 (D) PLC <- . . . . . DWORD

Function: Convert binary data to PLC1-format data

This macro command is used to convert the binary data specified in [F1] to the PLC1-format data and write the result to [F0].
The following PLCs manipulate PLC-format data.

- Fuji Electric: MICREX-F all types
- Yaskawa: Memobus [Transmission Mode: Type 1]
- OMRON: All [Transmission Mode: Transmission Mode 2]

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			

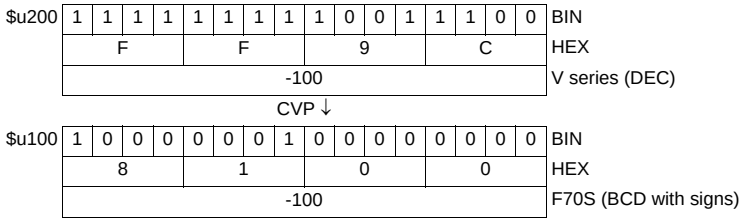
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

- The available memory address range and the type of data vary, depending on the PLCs. Refer to the PLC manual for details.

Example

- Fuji MICREX-F F70S BCD with signs (–7999 to +7999)
  The most significant bit
  OFF: Positive
  ON: Negative
  $u100 = $u200 (W) PLC<-



Supplemental remarks

- The macro command is used in combination with MOV or BMOV.
- To convert to characteristic data other than for PLC1, use “ CVPFMT” (page 4-41).
- For the V8 series, the result of macro execution is stored in $s1057.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

CVPFMT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

F0 = F1 (W) PLC F2 <- . . . . . WORD

F0 = F1 (D) PLC F2 <- . . . . . DWORD

Function: Convert binary data to PLC-format data specified at [F2]

This macro command is used to convert the binary data specified in [F1] to the PLC-format data specified at [F2] and write the result to [F0].
The following PLCs manipulate PLC-format data.

- Fuji Electric: MICREX-F all types
- Yaskawa: Memobus [Transmission Mode: Type 1]
- OMRON: All [Transmission Mode: Transmission Mode 2]

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

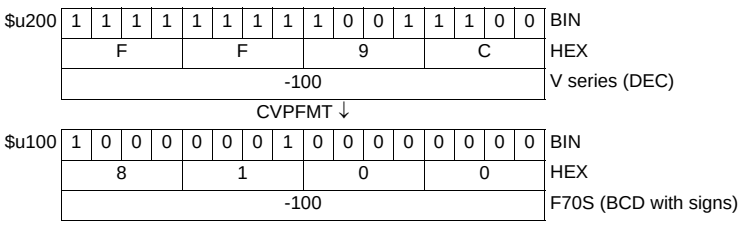
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	The available memory address range and the type of data vary, depending on the PLCs. Refer to the PLC manual for details.
F1	
F2	1 - 8

Example

- Fuji's MICREX-F series is connected as PLC2.
- Fuji MICREX-F F70S BCD with signs (-7999 to +7999)
  The most significant bit
  OFF: Positive
  ON: Negative
  $u100 = $u200 (W) PLC2 <-



Supplemental remarks

- The macro command is used in combination with MOV or BMOV.
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

CVB

All models	○

F0 = F1 (W) <- PLC. . . . . WORD
F0 = F1 (D) <- PLC . . . . . DWORD

Function: Convert PLC1-format data to binary data

This macro command is used to convert the PLC1-format data specified in [F1] to binary data and write the result to [F0].
The following PLCs manipulate PLC-format data.

- Fuji Electric: MICREX-F all types
- Yaskawa: Memobus [Transmission Mode: Type 1]
- OMRON: All [Transmission Mode: Transmission Mode 2]

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○

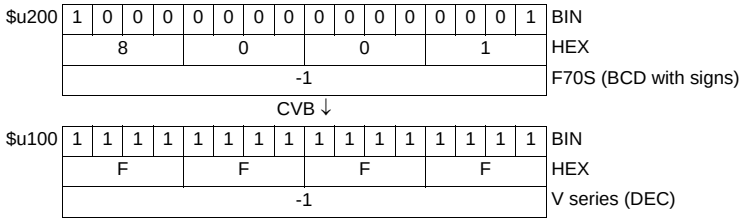
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

- The available memory address range and the type of data vary, depending on the PLCs. Refer to the PLC manual for details.

Example

- Fuji MICREX-F F70S BCD with signs (–7999 to +7999)
  The most significant bit
  OFF: Positive
  ON: Negative
  $u100 = $u200 (W) <-PLC



Supplemental remarks

- The macro command is used in combination with MOV or BMOV.
- To convert to characteristic data other than for PLC1, use “ CVBFMT” (page 4-43).
- For the V8 series, the result of macro execution is stored in $s1057.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

CVBFMT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

F0 = F1 (W) <- PLC F2 . . . . . WORD
F0 = F1 (D) <- PLC F2 . . . . . DWORD

Function: Convert PLC-format data specified at [F2] to binary data

This macro command is used to convert the PLC-format data specified at [F2] in [F1] to the binary data and write the result to [F0].
The following PLCs manipulate PLC-format data.

- Fuji Electric: MICREX-F all types
- Yaskawa: Memobus [Transmission Mode: Type 1]
- OMRON: All [Transmission Mode: Transmission Mode 2]

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

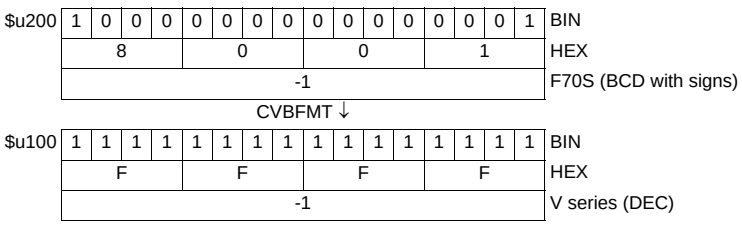
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	The available memory address range and the type of data vary, depending on the PLCs. Refer to the PLC manual for details.
F1	
F2	1 - 8

Example

- Fuji's MICREX-F series is connected as PLC2.
- Fuji MICREX-F F70S BCD with signs (-7999 to +7999)
  The most significant bit
  OFF: Positive
  ON: Negative
  $u100 = $u200 (W) <- PLC2



Supplemental remarks

- The macro command is used in combination with MOV or BMOV.
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

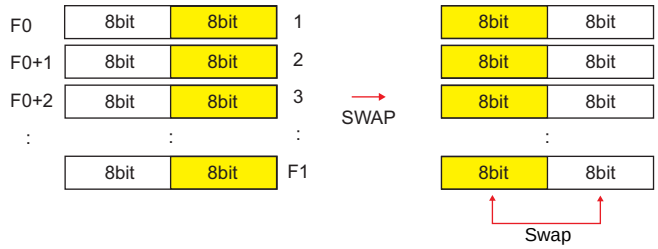
SWAP

F0 = C : F1 (SWAP)

All models	○

Function: Swap MSB with LSB

This macro command is used to perform a swap between the higher-order byte and the lower-order byte of the data at the location starting from the address specified in [F0]. The data count is specified in [F1].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0000 - FFFF (HEX)
F1	0 - 1024

Example

- $u100 C : 2 (SWAP)

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

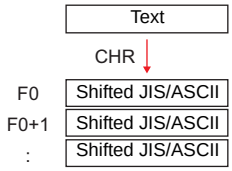
CHR

F0 = ' '

All models	○

Function: Convert text → code

This macro command is used to convert the text placed in quotation marks ' ' to the shifted JIS/ASCII codes and write the result to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	Shifted JIS/ASCII	82 bytes maximum Variable depending on the bytes of the text
F0+1		
:		
' '	Text	80 bytes maximum

Example

- When [MSB → LSB] is selected for [Text Process] on the [Communication Setting] tab window.
  $u100 = string

Text	string					
	CHR↓					
$u100	7	3	7	4	HEX	ts
$u101	7	2	6	9	HEX	ir
$u102	6	E	6	7	HEX	gn
$u103	0	0	0	0	HEX	Null code

Supplemental remarks

- Swap between the higher-order byte and the lower-order byte can be set by selecting an option for [Text Process] on the [Communication Setting] tab window in the [Device Connection Setting] dialog.
- Regardless of the setting above, use a " STRING" command (page 4-46) for [LSB → MSB] conversions.
- A null code is added to the end. Even-number-byte text thereby uses one extra word.
- For the V8 series, the result of macro execution is stored in $s1057.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

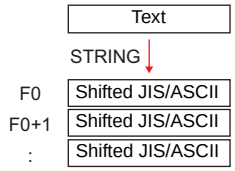
STRING

F0 = ’ ’(STRING)

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Convert text → code

This macro command is used to convert the text placed in quotation marks ‘ ‘ to the shifted JIS/ASCII codes and write the result to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	Shifted JIS/ASCII	128 bytes maximum Variable depending on the bytes of the text
F0+1		
:		
‘ ’	Text	128 bytes maximum

Example

$u100 = string

Text: string

CHR↓

$u100	7	4	7	3	HEX	ts
$u101	6	9	7	2	HEX	ir
$u102	6	7	6	E	HEX	gn
$u103	0	0	0	0	HEX	Null code

Supplemental remarks

- Regardless of the [Text Process] setting on the [Communication Setting] tab window in the [Device Connection Setting] dialog for PLC1, the data is stored in memory in the [LSB → MSB] sequence.
- A null code is added to the end. Even-number-byte text thereby uses one extra word.
- For the V8 series, the result of macro execution is stored in $s1057.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

CVFD

F0(D) <- F1 (F) F2 (D)

All models	○

Function: Convert floating decimal point → 32-bit binary

This macro command is used to convert the 32-bit single precision real number specified in [F1] to 32-bit binary data and store the result in [F0].
[F2] specifies the exponent of "10" at the time of conversion.
If [F2] = 0, rounding to the nearest whole number* is performed. If [F2] = 1, rounding to the nearest tenth* is performed. The result is stored in [F0].

* Rounding down and rounding up are also possible. Refer to page 4-48.

F1

31	30	29	-	24	23	22	21	-	5	4	3	2	1	0
Sign	Exponent							Mantissa						

Real number

0 < Exponent < 255	:	$(-1)^{Sign} \times (1 + Mantissa \times 2^{-23}) \times 2^{(Exponent - 127)}$
Exponent = 0, Mantissa ≠ 0	:	$(-1)^{Sign} \times (Mantissa \times 2^{-23}) \times 2^{-126}$
Exponent = 0, Mantissa = 0	:	0
Sign = 0, Exponent = 255, Mantissa = 0	:	∞
Sign = 1, Exponent = 255, Mantissa = 0	:	-∞
Exponent = 255, Mantissa ≠ 0	:	NaN

CVFD ↓

F0

31	30	29	-	5	4	3	2	1	0
2^{31}	2^{30}	2^{29}	-	2^5	2^4	2^3	2^2	2^1	2^0

BIN

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	–2147483648 - 2147483647 (BIN)
F1	IEEE 32-bit single precision real number
F2	–32 - +32

Example

- $u100 (D) <- $u200 (F) 0 (D)

$u201,$u200

31	30	29	-	24	23	22	21	-	2	1	0
0	127							4194304			
Sign	Exponent							Mantissa			
$(-1)^0 \times (1 + 4194304 \times 2^{-23}) \times 2^{(127-127)} = 1.5$											

CVFD ↓

$u101,$u100

31	30	29	-	2	1	0
0	0	0	-	0	1	0
2_{DEC}						

- $u100 (D) <- $u200 (F) 1 (D)

$u201,$u200	31	30	29	-	24	23	22	21	-	2	1	0
	0	127							4194304			
	Sign	Exponent							Mantissa			
	$(-1)^0 \times (1 + 4194304 \times 2^{-23}) \times 2^{(127 - 127)} = 1.5$											

CVFD ↓

$u101,$u100	31	30	29	-	2	1	0
	0	0	0	-	1	1	1
	15_{DEC}						

Supplemental remarks

- You can select whether to round to the nearest whole number, round down or round up by specifying the appropriate value for $s99.*

Setting	Operation	
Other than 1 or 2	Round to the nearest whole number	0 - 4 : Round down 5 - 9 : Round up
1	Round down	
2	Round up	0: Round down Other than 0: Round up

* If [Retain compatibility with negative value handling of CVFD macro command] is checked in the [General Settings] tab window ([System Setting] → [Unit Setting] → [General Settings]), the action to round down is performed, irrespective of the value in memory at $s99.

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

CVDF

F0(F) <- F1 (D) F2 (D)

All models	○

Function: Convert 32-bit binary → floating decimal point

This macro command is used to convert the 32-bit binary data specified in [F1] to 32-bit single precision real number and store the result in [F0].
[F2] specifies the exponent of “10” at the time of conversion.

F1

31	30	29	-	5	4	3	2	1	0
2^{31}	2^{30}	2^{29}	-	2^5	2^4	2^3	2^2	2^1	2^0

BIN

CVDF ↓

F0

31	30	29	-	24	23	22	21	-	5	4	3	2	1	0
Sign	Exponent							Mantissa						

Real number

0 < Exponent < 255	:	$(-1)^{Sign} \times (1 + Mantissa \times 2^{-23}) \times 2^{(Exponent - 127)}$
Exponent = 0, Mantissa ≠ 0	:	$(-1)^{Sign} \times (Mantissa \times 2^{-23}) \times 2^{-126}$
Exponent = 0, Mantissa = 0	:	0
Sign = 0, Exponent = 255, Mantissa = 0	:	∞
Sign = 1, Exponent = 255, Mantissa = 0	:	-∞
Exponent = 255, Mantissa ≠ 0	:	NaN

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	–2147483648 - 2147483647 (BIN)
F2	–32 - +32

Example

- $u100 (F) <- $u200 (D) 0 (D)

$u201,$u200

31	30	29	-	2	1	0
00000001_{BIN}						

BIN

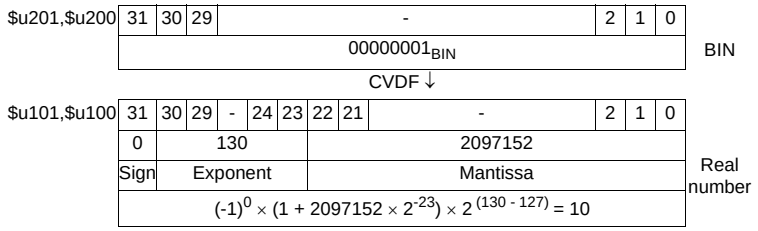
CVDF ↓

$u101,$u100

31	30	29	-	24	23	22	21	-	2	1	0
0	127					0					
Sign	Exponent					Mantissa					
$(-1)^0 \times (1 + 0 \times 2^{-23}) \times 2^{(127 - 127)} = 1$											

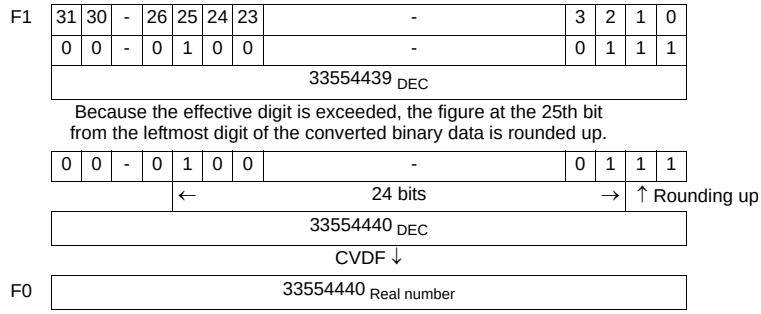
Real number

- $u100 (F) <- $u200 (D) 1 (D)



Supplemental remarks

The V series manipulates 32-bit single precision real numbers. Therefore, in the case of 24-bit binary data that exceeds the significant digit (−16777216 to 16777215 in the decimal system), the figure at the 25th bit from the leftmost digit of the converted binary data is rounded up and the figures at the 26th bit and after are truncated. Since the value obtained in the above manner is used for conversion to real number, an error is introduced.



- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

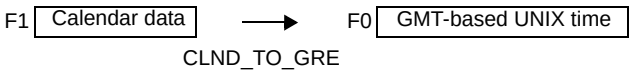
CLND_TO_GRE

CLND_TO_GRE F0 F1 F2

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Convert calendar data → GMT-based UNIX time

This macro is used to convert the calendar data [F1] in format [F2] to the UNIX time based on GMT, and to store the converted result in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	Time data 0	DEC only
F0+1	Time data 1	Time data 1 | Time data 0 GMT-based UNIX time from January 1, 1970
F1	4 or 2 digits: Year	
F1+1	1 - 12: Month	
F1+2	1 - 31: Day	
F1+3	0 - 23: Hour	
F1+4	0 - 59: Minute	
F1+5	0 - 59: Second	
F2	Data format for [F1] 0: DEC 1: BCD	

: ← V series (return data)

Example

The calendar data in $u200 - $u205 in DEC format, 17 (hour):25 (minutes):10 (seconds) on June 10 in 2010, is converted to the GMT-based UNIX time, and the converted result is stored in $u100 and $u101.

$u200 = 2010 (W)
$u201 = 6 (W)
$u202 = 10 (W)
$u203 = 17 (W)
$u204 = 25 (W)
$u205 = 10 (W)
$u300 = 0 (W)
CLND_TO_GRE $u100 $u200 $u300

The GMT-based UNIX time “1276190710 seconds” is obtained.

Time data 0 → $u100 = 8182 DEC
Time data 1 → $u101 = 19473 DEC

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

- When setting a numerical data display to show the converted result of calendar data, 3 (hour):14 (minutes):7 (seconds) on January 19, 2038 or after, enable the display to show 2-word long data without sign.
- This macro handles any year divisible by 4 as a leap year. For example, the year 2100 is recognized as a leap year though it is not so. Therefore, an error of one day will result.
- The calendar data displayable on the V8 unit ranges from January 1, 2006 to December 31, 2105. Any data outside this range cannot be converted with this macro correctly.

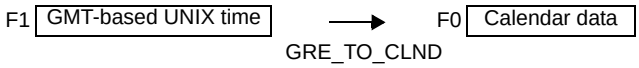
GRE_TO_CLND

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

GRE_TO_CLND F0 F1 F2

Function: Convert GMT-based UNIX time → calendar data

This macro is used to convert the UNIX time based on GMT in [F1] to the calendar data in format [F2], and to store the converted result in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	4 digits: Year	
F0+1	1 - 12: Month	
F0+2	1 - 31: Day	
F0+3	0 - 23: Hour	
F0+4	0 - 59: Minute	
F0+5	0 - 59: Second	
F0+6	0: Sunday 1: Monday 2: Tuesday 3: Wednesday 4: Thursday 5: Friday 6: Saturday	
F1	Time data 0	DEC only
F1+1	Time data 1	Time data 1 | Time data 0 GMT-based UNIX time from January 1, 1970
F2	Data format for [F0] 0: DEC 1: BCD	

: ← V series (return data)

Example

The GMT-based UNIX time, 1278663500 seconds, in $u200 is converted to the calendar data in DEC format, and the converted result is stored in $u100 and after.

GRE_TO_CLND $u100 $u200 0

The calendar data, “8 (hour):18 (minutes):20 (seconds) on Friday on July 9, 2010,” is obtained.

Year → $u100 = 2010 DEC
Month → $u101 = 7 DEC
Day → $u102 = 9 DEC
Hour → $u103 = 8 DEC
Minutes → $u104 = 18 DEC
Seconds → $u105 = 20 DEC
Day of the week → $u106 = 5 DEC

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

- This macro handles any year divisible by 4 as a leap year. For example, the year 2100 is recognized as a leap year though it is not so. Therefore, an error of one day will result.
- The calendar data displayable on the V8 unit ranges from January 1, 2006 to December 31, 2105. Any data outside this range cannot be converted with this macro correctly.

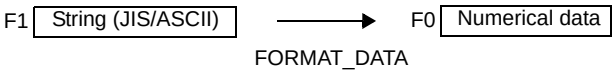
FORMAT_DATA

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

FORMAT_DATA F0 F1 F2

Function: Convert string → numerical data

This macro is used to convert the string [F1] according to the attributes [F2], and to store the converted result in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎		
F1	◎			
F2	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

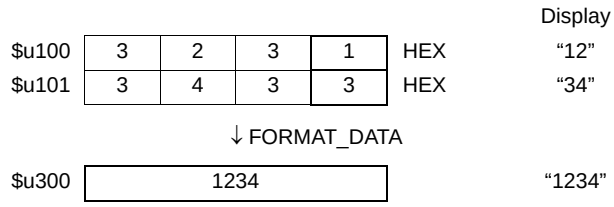
	Value	Remarks
F0	Target memory: BIN data	The number of words depends on [F2+1] (data length).
F1	Source memory: String (ASCII code)	The number of bytes depends on [F2+3] (character count). 32 bytes maximum (16 words) Character processing LSB → MSB fixed
F2	0: DEC without sign (decimal) 1: DEC with a negative sign (decimal) 2: DEC with a positive/negative sign (decimal) 3: HEX (hexadecimal) 4: OCT (octal) 5: BIN (binary) 6: FLOAT (real number)	Format for [F1] If “DEC with a negative sign” or “FLOAT” is selected for [F2] for the conversion of a positive value, add a space code (20H) to the leftmost position of the positive value. Otherwise, an error will result. A space code is not included in the number of digits. Example: For a string “123” to be converted, add a space to make it as “␣123”.
F2+1	0: 1 word 1: 2 words	Data length for [F0] If “FLOAT” is selected for [F2], specify “0”.
F2+2	0: DEC 1: BCD	Data format for [F0] If “HEX,” “OCT,” “BIN,” or “FLOAT” is selected for [F2], specify “0”.
F2+3	1 - 32: [F2] = 0, 1, 2, 5, or 6 1 - 8: [F2] = 3 1 - 11: [F2] = 4	Number of digits for [F1] A positive/negative sign and a decimal point are not included in the number of digits. Example: For a string “–12.3” to be converted, the number of digits is three.
F2+4	0 - 10: [F2] = 0, 1, or 2 0 - 31: [F2] = 6	Decimal place for [F1] Example: For a string “12.34” to be converted, specify two decimal places.
F2+5	0: With zero suppress 1: Without zero suppress	Format for [F1]

	Value	Remarks
F2+6	Valid only when F2+5 = 0 0: Leading spaces removed 1: Trailing spaces removed	Format for [F1] When a value in [F1] includes leading spaces, specify “0”. When a value in [F1] includes trailing spaces, specify “1”. Example: 0: ␣␣␣12 → 12 1: 12 ␣␣␣ → 12
F2+7	0 fixed	

Example

The string in $u100 is converted to the numerical data, and the converted result is stored in $u300.

- String “1234”: DEC without sign



$u00100 = ‘1234’ (STRING)
$u00200 = 0 (W) [DEC without sign]
$u00201 = 0 (W) [1 word]
$u00202 = 0 (W) [DEC]
$u00203 = 4 (W) [4 digits]
$u00204 = 0 (W) [Without decimal point]
$u00205 = 0 (W) [With zero suppress]
$u00206 = 0 (W) [Leading spaces removed]
$u00207 = 0 (W) [0 fixed]
FORMAT_DATA $u00300 $u00100 $u00200

The result “1234” is stored in $u300.

- String “12.34”: A positive value in DEC with a negative sign format and with two decimal places

$u00100 = ‘ ␣12.34’ (STRING)
; (For a positive value, add a space code 20H to the leftmost position.)
$u00200 = 1 (W) [DEC with a negative sign]
$u00201 = 0 (W) [1 word]
$u00202 = 0 (W) [DEC]
$u00203 = 4 (W) [4 digits]
$u00204 = 2 (W) [Two decimal places]
$u00205 = 0 (W) [With zero suppress]
$u00206 = 0 (W) [Leading spaces removed]
$u00207 = 0 (W) [0 fixed]
FORMAT_DATA $u00300 $u00100 $u00200

The result “1234” is stored in $u300.

- String “−12.34”: A negative value in DEC with a negative sign format and with two decimal places

  $u00100 = ‘−12.34’ (STRING)
  $u00200 = 1 (W) [DEC with a negative sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 4 (W) [4 digits]
  $u00204 = 2 (W) [Two decimal places]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 0 (W) [Leading spaces removed]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_DATA $u00300 $u00100 $u00200

  The result “−1234” is stored in $u300.

- String “1234”: FLOAT

  $u00100 = ‘ ␣1234’ (STRING)
  ;(For a positive value, add a space code 20H to the leftmost position.)
  $u00200 = 6 (W) [FLOAT]
  $u00201 = 0 (W) [0 fixed]
  $u00202 = 0 (W) [0 fixed]
  $u00203 = 4 (W) [4 digits]
  $u00204 = 0 (W) [Without decimal point]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 0 (W) [Leading spaces removed]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_DATA $u00300 $u00100 $u00200

  The result “1234” is stored in $u300 and $u301.

- String “001234”: DEC without sign format and without zero suppress

  $u00100 = ‘001234’ (STRING)
  $u00200 = 0 (W) [DEC without sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 6 (W) [6 digits]
  $u00204 = 0 (W) [Without decimal point]
  $u00205 = 1 (W) [Without zero suppress]
  $u00206 = 0 (W) [Leading spaces removed]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_DATA $u00300 $u00100 $u00200

  The result “1234” is stored in $u300.

- String “␣ ␣1234”: DEC without sign format and with two leading spaces

  $u00100 = ‘ ␣ ␣1234’ (STRING)
  $u00200 = 0 (W) [DEC without sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 6 (W) [6 digits]
  $u00204 = 0 (W) [Without decimal point]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 0 (W) [Leading spaces removed]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_DATA $u00300 $u00100 $u00200

  The result “1234” is stored in $u300.

- String “1234 ␣ ␣”: DEC without sign format and with two trailing spaces
  $u00100 = ‘1234 ␣ ␣’ (STRING)
  $u00200 = 0 (W) [DEC without sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 6 (W) [6 digits]
  $u00204 = 0 (W) [Without decimal point]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 1 (W) [Trailing spaces removed]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_DATA $u00300 $u00100 $u00200

  The result “1234” is stored in $u300.

Supplemental remarks

- If “HEX” is specified as an attribute for conversion, characters “A” - “F” of the source data is not case-sensitive.
- If this macro, with “FLOAT” specified as an attribute, results in underflow, “0” is obtained as the converted result.
- Conversion with this macro is in the order of LSB → MSB.
- The following PLCs provided with PLC-specific data format are capable of handling negative values in BCD with a sign format. When you run this macro using such a value with any of these PLCs, the internal memory is not valid for [F0]. Therefore, be sure to assign the PLC memory (specific to the PLC model) to [F0].
  - Fuji Electric: All of the MICREX-F series
  - Yaskawa: Memobus [Trans. Mode: Type 1]
  - Omron: All [Transmission Mode 2]
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

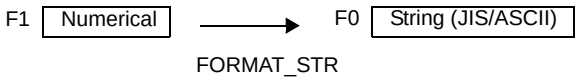
FORMAT_STR

FORMAT_STR F0 F1 F2

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Convert numerical data → string

This macro is used to convert the numerical data [F1] according to the attributes [F2], and to store the converted result in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎	◎		
F2	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

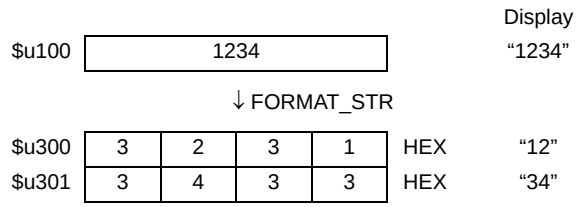
	Value	Remarks
F0	Target memory: String (ASCII code)	The number of bytes depends on [F2+3] (character count). 32 bytes maximum (16 words) Character processing LSB → MSB fixed
F1	Source memory: BIN data	The number of words depends on [F2+1] (data length).
F2	0: DEC without sign (decimal) 1: DEC with a negative sign (decimal) 2: DEC with a positive/negative sign (decimal) 3: HEX (hexadecimal) 4: OCT (octal) 5: BIN (binary) 6: FLOAT (real number)	Format for [F1] If “DEC with a negative sign” or “FLOAT” is selected for [F2] and the converted result is a positive value, a space code (20H) is added to the leftmost position of the positive value. Example: For numerical data “123” to be converted, a space is added to provide a converted result as “␣123”.
F2+1	0: 1 word 1: 2 words	Data length for [F1] If “FLOAT” is selected for [F2], specify “0”.
F2+2	0: DEC 1: BCD	Data format for [F1] If “HEX,” “OCT,” “BIN,” or “FLOAT” is selected for [F2], specify “0”.
F2+3	1 - 32: [F2] = 0, 1, 2, 5, or 6 1 - 8: [F2] = 3 1 - 11: [F2] = 4	Number of digits for [F0] A positive/negative sign and a decimal point are not included in the number of digits. If the number of digits specified for [F2+3] is smaller than that of the converted string, the result is given as a hyphen “-”. Example: For a string “-12.3” as the converted result, the number of digits is three.
F2+4	0 - 10: [F2] = 0, 1, or 2 0 - 31: [F2] = 6	Decimal place for [F0] Example: For a string “12.34” as the converted result, the number of digits is four and two decimal places are given.

	Value	Remarks
F2+5	0: With zero suppress 1: Without zero suppress	Format for [F0] Select whether to execute zero suppress. Example: For a string “00012” as the converted result, specify “1”.
F2+6	Valid only when F2+5 = 0 0: Leading spaces added 1: Trailing spaces added	Format for [F0] When inserting leading spaces in the value in [F0], specify “0”. When inserting leading spaces in the value in [F0], specify “1”. Example: 0: 12 → ␣␣12 1: 12 → 12␣␣
F2+7	0 fixed	

Example

The numerical data in $u100 is converted to a string according to the specified attributes, and the converted result is stored in $u300.

- Numerical data “1234”: DEC without sign



$u00100 = 1234 (W)
$u00200 = 0 (W) [DEC without sign]
$u00201 = 0 (W) [1 word]
$u00202 = 0 (W) [DEC]
$u00203 = 4 (W) [4 digits]
$u00204 = 0 (W) [Without decimal point]
$u00205 = 0 (W) [With zero suppress]
$u00206 = 0 (W) [Leading spaces added]
$u00207 = 0 (W) [0 fixed]
FORMAT_STR $u00300 $u00100 $u00200

The result “1234” is stored in $u300 and $u301.

- Numerical data “1234”: DEC without sign format and with zero suppress and leading spaces
$u00100 = 1234 (W)
$u00200 = 0 (W) [DEC without sign]
$u00201 = 0 (W) [1 word]
$u00202 = 0 (W) [DEC]
$u00203 = 6 (W) [6 digits]
$u00204 = 0 (W) [Without decimal point]
$u00205 = 0 (W) [With zero suppress]
$u00206 = 0 (W) [Leading spaces added]
$u00207 = 0 (W) [0 fixed]
FORMAT_STR $u00300 $u00100 $u00200

The result “␣␣1234” is stored in $u300 to $u302.

- Numerical data “1234”: DEC without sign format and with zero suppress and trailing spaces
  $u00100 = 1234 (W)
  $u00200 = 0 (W) [DEC without sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 6 (W) [6 digits]
  $u00204 = 0 (W) [Without decimal point]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 1 (W) [Trailing spaces added]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_STR $u00300 $u00100 $u00200

  The result “1234␣␣” is stored in $u300 to $u302.

- Numerical data “1234”: DEC without sign format and without zero suppress
  $u00100 = 1234 (W)
  $u00200 = 0 (W) [DEC without sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 6 (W) [6 digits]
  $u00204 = 0 (W) [Without decimal point]
  $u00205 = 1 (W) [Without zero suppress]
  $u00206 = 0 (W) [Leading spaces added]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_STR $u00300 $u00100 $u00200

  The result “001234” is stored in $u300 to $u302.

- Numerical data “12.34”: DEC with a negative sign format and with two decimal places
  $u00100 = 1234 (W)
  $u00200 = 1 (W) [DEC with a negative sign]
  $u00201 = 0 (W) [1 word]
  $u00202 = 0 (W) [DEC]
  $u00203 = 4 (W) [4 digits]
  $u00204 = 2 (W) [Two decimal places]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 0 (W) [Leading spaces added]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_STR $u00300 $u00100 $u00200

  The result “␣12.34” is stored in $u300 to $u302.
  (For a positive value, a space code 20H is added to the leftmost position.)

- Numerical data “1234.00”: FLOAT
  $u00100 = 1234 (D)
  $u00100(F) <- $u00100(D) 0 (D)
  $u00200 = 6 (W) [FLOAT]
  $u00201 = 0 (W) [0 fixed]
  $u00202 = 0 (W) [0 fixed]
  $u00203 = 6 (W) [6 digits]
  $u00204 = 2 (W) [Two decimal places]
  $u00205 = 0 (W) [With zero suppress]
  $u00206 = 0 (W) [Leading spaces added]
  $u00207 = 0 (W) [0 fixed]
  FORMAT_STR $u00300 $u00100 $u00200

  The result “␣1234.00” is stored in $u300 to $u303.
  (For a positive value, a space code 20H is added to the leftmost position.)

Supplemental remarks

- Conversion with this macro is in the order of LSB → MSB.
- A NULL code is added to the end of the string as a result of conversion. Even-number-byte string thereby uses one extra word.
- The following PLCs provided with PLC-specific data format are capable of handling negative values in BCD with a sign format. When you run this macro using such a value with any of these PLCs, the internal memory is not valid for [F1]. Therefore, be sure to assign the PLC memory (specific to the PLC model) to [F1].
  - Fuji Electric: All of the MICREX-F series
  - Yaskawa: Memobus [Trans. Mode: Type 1]
  - Omron: All [Transmission Mode 2]
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

4.8 Transfer

MOV

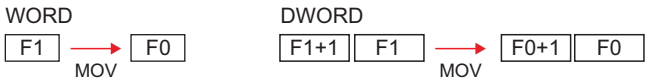
All models	○

F0 = F1 (W) . . . . . WORD

F0 = F1 (D) . . . . . DWORD

Function: Transfer

This macro command is used to transfer the data in memory at the address specified in [F1] to the address in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	○

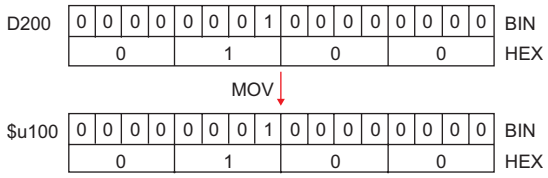
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

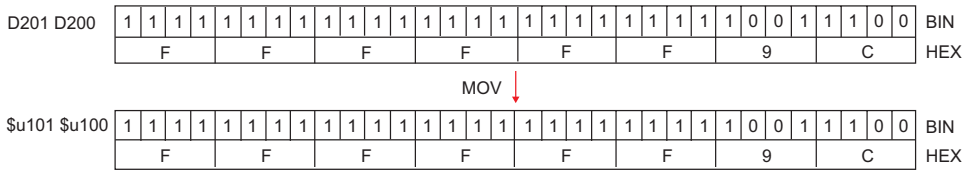
	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		

Example

- $u100 = PLC1 [D200] (W)



- $u100 = PLC1 [D200] (D)



Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

BMOV

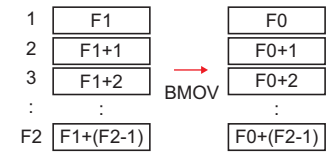
All models	○

F0 = F1 C : F2 (BMOV)(W) . . . . . WORD
F0 = F1 C : F2 (BMOV)(D) . . . . . DWORD

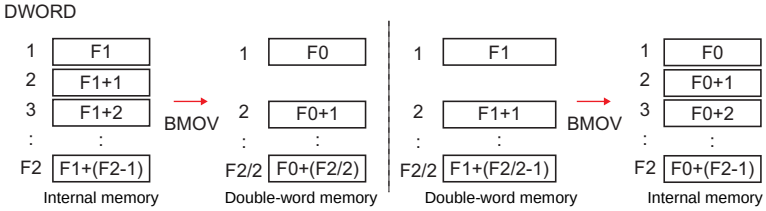
Function: Block transfer

This macro command is used to transfer the data at the location starting from the address specified in [F1] in a block to the top address in [F0]. The data count is specified in [F2].

WORD



DWORD



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

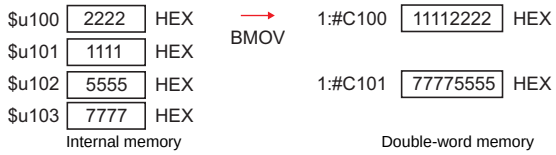
Setting range

	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2	0 - 4096	0 - 4096

Example

- $u100 = PLC1 [D200] C : 3 (BMOV) (W)

- PLC2 [1:#C100] = $u100 C : 4 (BMOV) (D) or
  PLC2 [1:#C100] = $u100 C : 3 (BMOV) (D)



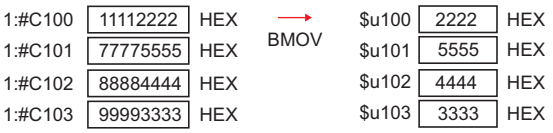
- $u100 = PLC2 [1:#C100] C : 4 (BMOV) (D) or
  $u100 = PLC2 [1:#C100] C : 3 (BMOV) (D)

Supplemental remarks

- If [☐ Permit Double-Word Transfer by BMOV] is not checked on the [General Settings] tab window ([System Setting] → [Unit Setting] → [General Settings]), DWORD cannot be selected.
  If BMOV in double-word memory is executed though the option is not checked, the following results:

  PLC2 [1:#C100] = $u100 C : 4 (BMOV)

  $u100 = PLC2 [1:#C100] C : 4 (BMOV)



- For the V8 series, the result of macro execution is stored in $s1057.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

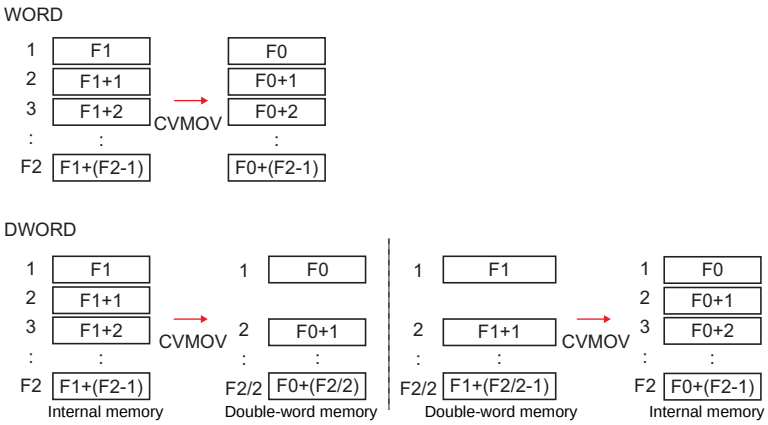
CVMOV

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

F0 = F1 C : F2 (CVMOV)(W). . . . . WORD
F0 = F1 C : F2 (CVMOV)(D) . . . . . DWORD

Function: Block transfer

This macro command is used to transfer the data at the location starting from the address specified in [F1] in a block to the top address in [F0]. The data count is specified in [F2]. Depending on the PLC models, data conversion takes place at the same time.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2	0 - 4096	0 - 4096

Example

Refer to the operation example applicable to your PLC model. If any PLC other than listed blow is in use, the operation identical to the BMOV command takes place.

Device selection (PLC)		Remarks	Operation
Fuji Electric	MICREX-F Series		2
	MICREX-F series T-link		
Hitachi	HIDIC-S10/2α, S10mini		1
	HIDIC-S10/2α, S10mini (Ethernet)		
	HIDIC-S10/4α		
	HIDIC-S10/ABS*		
	HIDIC-S10 (OPCN-1)*		
	HIDIC-S10V		
	HIDIC-S10V (Ethernet)		
OMRON	All models	[Transmission Mode: Transmission Mode 2] in the [Communication Setting] tab window	2
Siemens	S5*		1
	S5 PG Port*		
	S7		
	S7-300/400MPI		
	S7-300MPI (V-MPI)*		
	S7-300MPI (HMI ADP)*		
	S7-300MPI (PC ADP)*		
	S7-300MPI (Helmholz SSW7 ADP)*		
	S7 PROFIBUS-DP		
	TI500/505		
Yaskawa	Memobus	[Transmission Mode: Type 1] in the [Communication Setting] tab window	2
Universal PROFIBUS-DP		[Transmission Mode: Big Endian] in the [Communication Setting] tab window	1
Universal DeviceNet*			

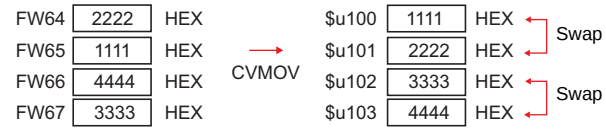
Device selection (temperature controller / servo / inverter)		Remarks	Operation
IAI	PCON/ACON/SCON(MODBUS RTU)		1
Yaskawa	E-POSI series*		1

* Incompatible with the V8

- Operation 1: With Hitachi's PLC selected as PLC1
  - $u100 = PLC1 [FW0064] C : 3 (CVMOV) (W)

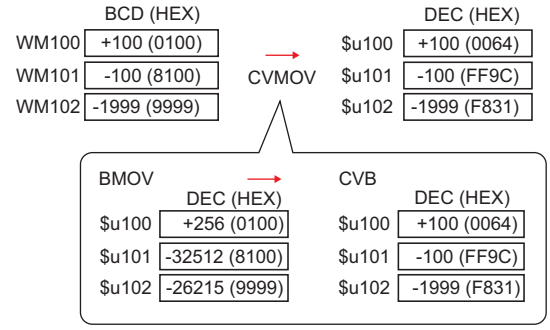
In the case of WORD, the operation identical to BMOV takes place.

  - $u100 = PLC1 [FW0064] C : 3 (CVMOV) (D) or
    $u100 = PLC1 [FW0064] C : 4 (CVMOV) (D)



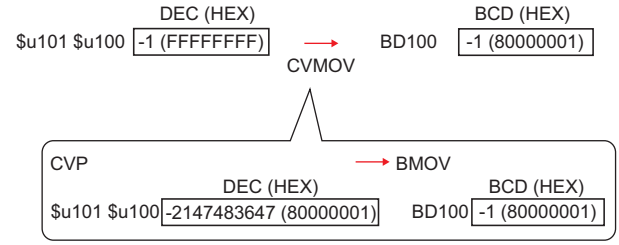
In the case of DWORD, a swap between the higher-order word and the lower-order word takes place.

- Operation 2: With Fuji's PLC selected as PLC2
  - $u100 =PLC2 [WM100] C : 3 (CVMOV) (W)



PLC-format data (BCD with signs) converted to binary data is stored.

  - PLC2 [BD100] = $u100 C : 2 (CVMOV) (D)



Binary data converted to PLC-format data (BCD with signs) is stored.

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

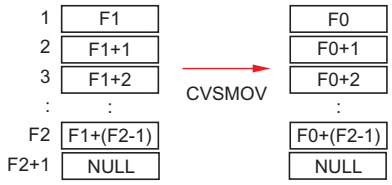
CVSMOV

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

F0 = F1 C : F2 (CVSMOV) (W) . . . . . WORD
F0 = F1 C : F2 (CVSMOV) (D) . . . . . DWORD

Function: Block transfer with text process conversion

This macro command is used to transmit the data at the location starting from the address specified in [F1] in a block to the top address in [F0]. The data count is specified in [F2]. In transfer from the internal memory to the PLCn memory, from the PLCn memory to the internal memory, or from PLCm memory to the PLCn memory, text conversion is executed at the same time.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	Text	102 bytes maximum (Varies depending on the bytes of the text)
F0+1		
:		
F1	Text	102 bytes maximum (Varies depending on the bytes of the text)
F1+1		
:		
F2	0 - 100	100 bytes maximum

Example

- When the [Communication Setting] → [Text Process] setting for the PLC that is the transfer destination (PLC3) is [MSB → LSB]:
  - PLC3 [D100] = $u100 C : 8 (CVSMOV) (W)

$u100	7	4	7	3	HEX	ts
$u101	6	9	7	2	HEX	ir
$u102	6	7	6	E	HEX	gn
$u103	0	0	0	0	HEX	Null code
	↓ CVSMOV					
D100	7	3	7	4	HEX	ts
D101	7	2	6	9	HEX	ir
D102	6	E	6	7	HEX	gn
D103	0	0	0	0	HEX	Null code

Supplemental remarks

- A null code is added to the end. Even-number-byte text thereby uses one extra word.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

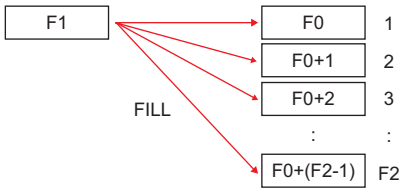
FILL

F0 = F1 C : F2 (FILL)

All models	○

Function: Transfer all

This macro command is used to write the data specified in [F1] to the words starting from the address in [F0]. The number of the words is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎*1		
F1	○			○
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

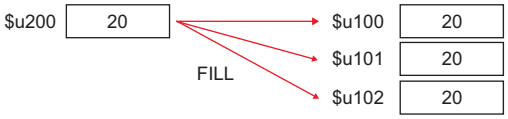
*1 Available only with the V8 series/TELLUS3 HMI

Setting range

	WORD
F0	0000 - FFFF (HEX)
F1	
F2	0 - 4096

Example

- $u100 = $u200 C : 3 (FILL)



Supplemental remarks

- When “PLC memory” is specified for [F0] with the V8 series, code conversion is not performed.
- For the V8 series, the result of macro execution is stored in $s1057. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

4.9 Comparison

CMP

IF (F0 condition F1) LB F2 (W) . . . . . WORD
IF (F0 condition F1) LB F2 (D) . . . . . DWORD

All models	○

Function: Comparison

This macro command is used to compare the data with signs specified in [F0] and [F1] and to execute a jump to the label in [F2] if the comparison satisfies the condition.

Conditions

Symbol	Contents
==	Equal
!=	Different
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			○
F1	◎			○
F2				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2	0 - 127	0 - 127

Example

- IF ($u100 == 500) LB 0 (W)
  RET
  LB0
  :

  If $u100 = 500, a jump to LB0 (label 0) takes place and then macro execution proceeds to the next line.
  If $u100 ≠ 500, macro execution proceeds to the next line. In this example, RET terminates the macro.

Supplemental remarks

- A label (LB) must be specified as the jump target. If no label exists, error 83 (there is no destination label for the jump) will be detected by error check on MONITOUCH.
- For the V8 series, the result of macro execution is stored in $s1058. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

TST

IF condition (F0 & F1) LB F2 (W) . . . . . WORD
IF condition (F0 & F1) LB F2 (D). . . . . DWORD

All models	○

Function: Comparison with 0

This macro command is used to compare the result of [F0] ANDed with [F1] with "0", and to execute a jump to the label specified in [F2] if the comparison satisfies the condition.

Conditions

Conditions	Contents
ZERO	0
NON ZERO	Other than 0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			○
F1	◎			○
F2				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD
F0	0000 - FFFF (HEX)	00000000 - FFFFFFFF (HEX)
F1		
F2	0 - 127	0 - 127

Example

- IFNZ ($u100 & 8000H) LB0 (W)
  RET
  LB0
  :

  If bit 15 at $u100 is set (ON), a jump to LB0 (label 0) takes place and then macro execution proceeds to the next line.
  If bit 15 at $u100 is reset (OFF), macro execution proceeds to the next line. In this example, RET terminates the macro.

Supplemental remarks

- A label (LB) must be specified as the jump target. If no label exists, error 83 (there is no destination label for the jump) will be detected by error check on MONITOUCH.
- For the V8 series, the result of macro execution is stored in $s1058.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

IF
ELSE
ENDIF

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

IF (F0 (condition 1) F1) (W) . . . . . WORD
IF (F0 (condition 1) F1) (D). . . . . .DWORD
IF (condition 2) (F0) (B) . . . . . .BIT
(1)
ELSE
(2)
ENDIF

Function: Conditional branch

The above-mentioned macro commands for data in WORD and DWORD formats are used to compare [F0] and [F1], and to execute processing (1) if true, or (2) if false.

The macro command for data in BIT format is used to compare [F0] and condition 2, and to execute processing (1) if true, or (2) if false.

Processing of “ELSE” and (2) can be omitted.

Conditions 1

Symbol	Contents
==	Equal
!=	Different
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

Conditions 2

Symbol	Contents
ZERO	0
NON ZERO	Other than 0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	○
F1	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	WORD	DWORD	BIT
F0	–32768 - +32767 (Decimal system with signs)	–2147483648 - +2147483647 (Decimal system with signs)	0, 1
F1			–

Example

- Comparison of data in WORD format
  IF ($u100 < 10) (W)
  $u100 = $u100 + 1 (W)
  ELSE
  $u100 = 0 (W)
  ENDIF
  “$u100 = $u100 + 1” is executed when $u100 is smaller than 10. When $u100 is 10 or more, “$u100 = 0” is executed.

- Comparison of data in BIT format
  IFNZ ($u100-00) (B)
  $u100 = $u100 + 1 (W)
  ELSE
  $u100 = 0 (W)
  ENDIF
  If $u100-00 is ON, $u100 = $u100 + 1 is executed. If $u100-00 is OFF, $u100 = 0 is executed.

Restrictions

IF-ELSE-ENDIF commands can be nested up to 8 levels.

Supplemental remarks

- An error occurs to the macro editor when any of the following conditions is met.
  1. When IF-ELSE-ENDIF commands are nested beyond 8 levels;

     Ex.:
     ```
     IF ($u100 > 0)
     IF ($u100 < 10)
           :
     IF ($u200 == 1)
     ENDIF
     ```
     ✖ There are 9 or more IF commands between IF-ENDIF commands.

  2. When the number of IF commands is not the same as the one of ENDIF commands;

     Ex.:
     ```
     IF ($u100 == 0)
     IF ($u100 == 0)
     ENDIF
     ```
     ✖ There are two IF commands while there is one ENDIF command.

  3. When the number of IF commands is not the same as the one of ELSE commands;

     Ex.:
     ```
     IF ($u100 == 0)
     ELSE
     ELSE
     ENDIF
     ```
     ✖ There is one IF command while there are two ELSE commands.

  4. When FOR and NEXT commands are specified in a series of IF-ELSE-ENDIF commands.

     Ex.:
     ```
     IF ($u100 == 0)
     FOR 10
     ELSE
     ENDIF
     NEXT
     ```
     ✖ Only ELSE and ENDIF commands are specified between FOR and NEXT commands.

- The result of macro execution is stored in $s1059.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error*

* When reading from [F0] and [F1] ends in failure, an error occurs and “–1” is stored in $s1059.
When an execution error occurs, it is regarded as a fault.

4.10 Macro Operation Control

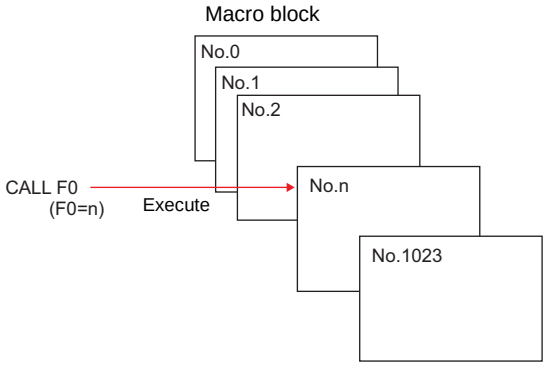
CALL

All models	○

CALL F0

Function: Macro block number designation

This macro command is used to execute the macro block specified in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

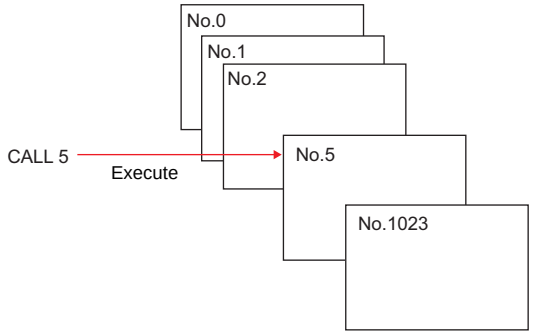
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 1023

Example

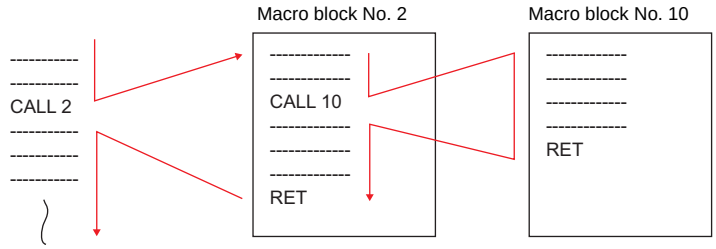
- CALL 5



Supplemental remarks

- If the macro block number called by CALL is not registered, an error check triggers a warning.

- The macro command can be nested up to 8 levels.
  Ex.) 2 levels



- For the V8 series, the result of macro execution is stored in $s1059.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Error (nesting of 9 or more levels / number of executed macro lines of 16001 or greater, etc.)

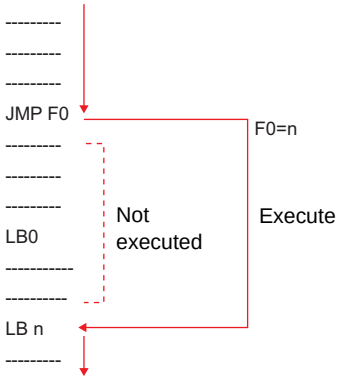
JMP

All models	○

JMP LB F0

Function: Unconditional jump

This macro command is used to execute a jump to the label specified in [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0				○

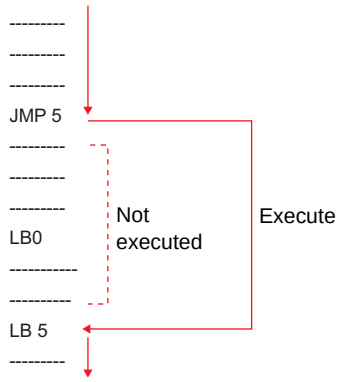
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 127

Example

- JMP LB5



Supplemental remarks

- A label (LB) must be specified as the jump target. If no label exists, error 83 (there is no destination label for the jump) will be detected by error check on MONITOUCH.
- For the V8 series, the result of macro execution is stored in $s1059. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Error (number of executed macro lines of 16001 or greater, etc.)

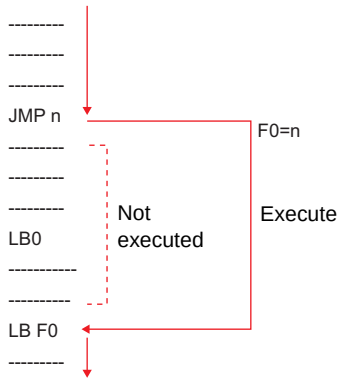
LABEL

All models	○

LB F0:

Function: Label number

This macro command is used to create jump target labels for CMP, TST, and JMP.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 127

Supplemental remarks

- A label (LB) must be specified as the jump target. If no label exists, error 83 (there is no destination label for the jump) will be detected by error check on MONITOUCH.
- For the V8 series, the result of macro execution is stored in $s1059. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Error (number of executed macro lines of 16001 or greater, etc.)

FOR/NEXT

All models	○

FOR F0

NEXT

Function: FOR - NEXT

This macro command is used to execute a loop between FOR and NEXT the number of times specified in [F0].

```
FOR F0
    $u300 = $u300+5   ← The loop executes the number
NEXT                    of times specified in F0.
```

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 65535

Example

```
$u300 = 0 (W)
$u301 = 0 (W)
FOR 3
    $u300 = $u300 + 1 (W)

    FOR $u400
        $u301 = $u301 + 5 (W)
    NEXT

NEXT
```

If $u400 = 5, the loop is executed 5 times.

The loop is executed 3 times.

- Result
  $u300 = 3
  $u301 = 75

Supplemental remarks

- Loop between FOR and NEXT can be nested* up to 8 levels. Nesting beyond 8 levels triggers error 81 (macro: FOR-NEXT command number is wrong) as a result of error check on MONITOUCH.
  * Nesting means incorporating a FOR-NEXT loop into a loop of the same kind.

```
:
FOR 2
:
 FOR 3
  :
 NEXT
:
NEXT
:
```

- For the V8 series, the result of macro execution is stored in $s1059. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Error (nesting of 9 or more levels / number of executed macro lines of 16001 or greater, etc.)

RET

All models	○

RET

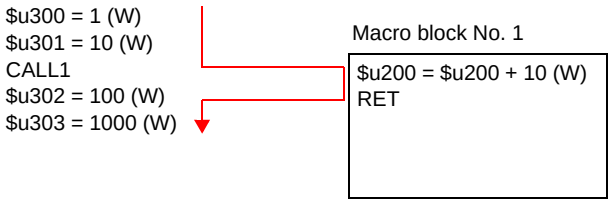
Function: Macro finish

This macro command is used to finish a macro. Any lines after RET are not executed.

```
$u300 = 1 (W)        ← Execute
$u301 = 10 (W)       ← Execute
RET                  ← Finish
$u302 = 100 (W)      ← Not executed
$u303 = 1000 (W)     ← Not executed
```

Supplemental remarks

- In the case of a macro block called by CALL, RET executes a return to the original sequence.



SWRET

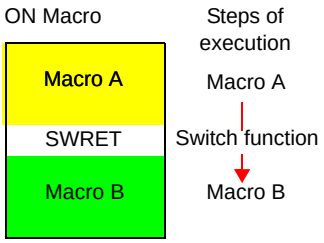
SWRET

All models	○

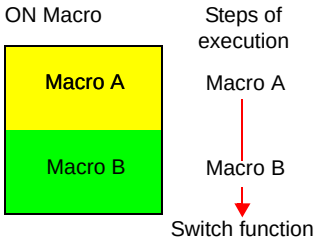
Function: Execute switch function

This macro command is used in a switch ON macro.

- With SWRET:
  Processing takes place in the order of the interruption of the macro, the execution of the switch function, and the execution of the remaining program of the macro.

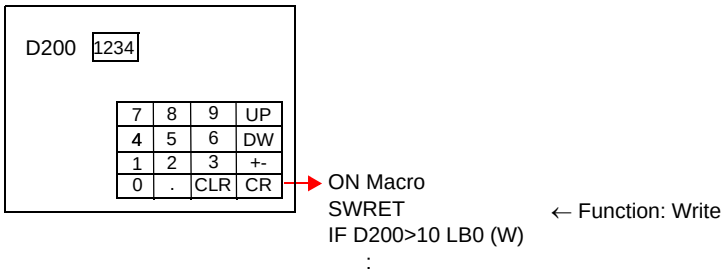


- Without SWRET:
  Processing takes place in the order of the execution of the switch ON macro and the execution of the switch function.



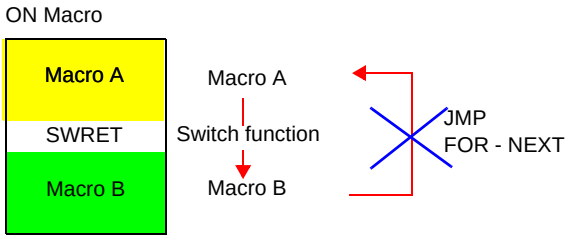
Example

- In a case where a macro runs based on the result written by the ENT key (in the entry mode) to the entry target D200, executing the switch function (for writing) by SWRET is required.



Supplemental remarks

- The macro command is valid in switch ON macros.
  The command, however, is not executed normally in the following cases:
  - SWRET exists in a macro block called by CALL.
  - JMP or FOR-NEXT triggers a movement to a label before the execution of SWRET.



WAIT

V4	○

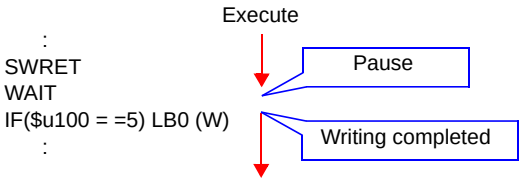
WAIT

Function:

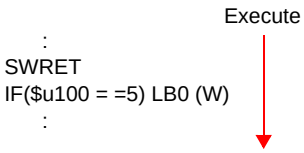
If a switch having the write function is used for writing to the internal memory and if this switch's ON macro uses the data written to the internal memory, macro execution is caused to pause until the end of writing is notified.
Macro execution proceeds to the next command when the completion of writing is notified.

Example

- With WAIT
  In accordance with WAIT, macro execution pauses, waiting for the notification of writing completion from the PLC.



- Without WAIT:
  Macro execution proceeds to the next command without waiting for the notification of writing completion from the PLC.



Supplemental remarks

- The macro command is used combined with SWRET in a switch ON macro.

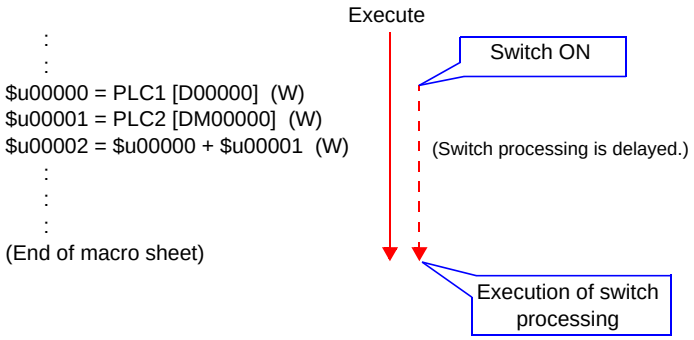
EN_INT

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

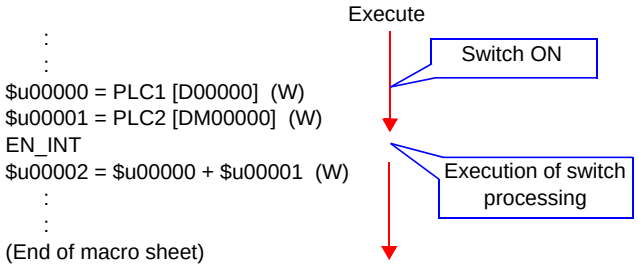
EN_INT

Function: Enabling interruption of switch processing

If a switch on the V series unit is pressed during the execution of macro processing, the switch processing is not executed immediately but is delayed until completion of the macro sheet.



When this command is executed while switch processing is pending, macro processing is suspended while the switch processing is executed. On completion of the switch processing macro execution is continued from the point of suspension.



Supplemental remarks

- If there is no switch processing pending, nothing happens in response to this command.

4.11 FROM Backup

In the FP-ROM (flash memory) for the V series screen data, its empty area can be used to back up the PLC memory, internal memory, and memory card. A maximum of 16k words can be allocated to the backup area.

FROM_WR

FROM_WR F0 F1

All models	○

Function: Write to FROM

This macro command is used to write the data of words starting from the address specified in [F0] to the FP-ROM. The number of the words is specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Address in each device
F1	1 - 16384 (= 16k words)

Supplemental remarks

- When using the macro command, go to the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting] → [General Settings]). On the window, check [☐ Use Internal Flash ROM as Back-up Area].
  * Checking this option reduces the available screen data capacity by 128 kbytes.
- Each FP-ROM allows 100,000 write operations.
  (Each execution of FROM_WR is counted as one time, regardless of the number of words.) It is thereby recommended that backup data be read after power-on and be written before power-off.
- Do not execute FROM_WR in every cycle using a CYCLE macro, etc.
- Writing to FP-ROM takes three to five seconds.
- The result of macro execution is stored in $s728.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

FROM_RD

All models	○

FROM_RD F0 F1

Function: Read from FROM

This macro command is used to read the data of words from the FP-ROM into the address specified in [F0]. The number of the words is specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Address in each device
F1	1 - 16384 (= 16k words)

Supplemental remarks

- When using the macro command, go to the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting] → [General Settings]). On the window, check [☐ Use Internal Flash ROM as Back-up Area].
  * Checking this option reduces the available screen data capacity by 128 kbytes.
- Do not execute FROM_RD in every cycle using a CYCLE macro, etc.
- The result of macro execution is stored in $s728.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

4.12 Printer

The following macro commands are used to send commands to the printer connected with the V series:

MR_OUT

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

MR_OUT F0

Function: Execution of MR400 format table call setting number

This macro command is used to print the data in the format table (call setting number) specified in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	1- 128: Format table (call setting) number

Example

- MR_OUT 50
  The above program prints the contents of the MR400 format table (call setting) No. 50.

Supplemental remarks

- The macro command is valid when “MR-400” is selected for [Type] in the [Printer] dialog ([System Setting] → [Device Connection Setting] → [Others] → [Printer]).
- For the V8 series, the result of macro execution is stored in $s1060. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

MR_REG

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

MR_REG F0

Function: Execution of the MR400 format table registration setting number

This macro command is used to write the data in the format table (registration setting number) specified in [F0] to the memory card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	○

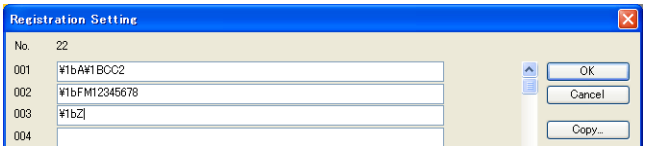
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	1 - 128: Format table (registration setting) number

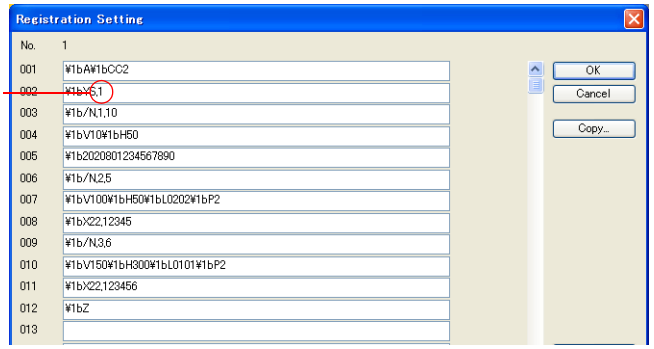
Example

- MR_REG 22



The memory card can be formatted.

- MR_REG 1



First: Format is registered given registration No. 1 in the MR400 memory card.
Second: The format of registration No. 1 is printed out so that it can be viewed for check.

Supplemental remarks

- The macro command is valid when “MR-400” is selected for [Type] in the [Printer] dialog ([System Setting] → [Device Connection Setting] → [Others] → [Printer]).
- For the V8 series, the result of macro execution is stored in $s1060.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

OUT_PR

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

OUT_PR F0 F1

Function: Command output to printer

This macro command is used to send [F1]-specified bytes of data from the address in [F0] to the printer.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Command for each printer
F0+1	
:	
F0+(F1/2-1)	
F1	1 - 255: Number of bytes

Example

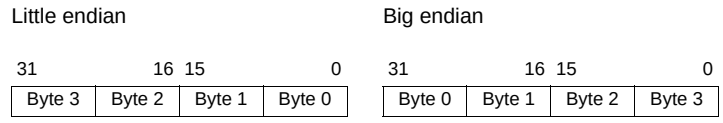
- Paper feed and auto cut are performed on the CBM (293) printer.
  From the command table in the CBM printer manual:
  Print and pitch paper feed: 1BH4AHn (paper feed n/360 in.)
  Auto cutter drive partial cut: 1BH6DH
  Code to be sent to the printer: 1BH 4AH 96H 1BH 6DH
  n = 150

```
Macro
    $u100 = 4A1BH
    $u101 = 1B96H
    $u102 = 006DH
    OUT_PR $u100 5
```

} Set in the little endian* system.

Supplemental remarks

- Little endian:
  Two-byte or more data is divided in units of one byte at the time of transfer.
  This divided data is recorded or transmitted from the least significant byte.



- Available command varies depending on the printer model.
  The V series does not check the validity of the command before transmitting the command. Refer to the instruction manual for the printer and set the command correctly.
- For the V8 series, the result of macro execution is stored in $s1060.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

4.13 Video

Video

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	○
V710S	○
V710T	○
V710C	
V708S	○
V708C	
V706T	
V706C	
V706M	
V612T	○
V612C	
V610S	○
V610T	○
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

Video MEMORY F1 . . . . . Memory designation

Function 1: Size

This macro command is used to change the video display to the size specified in [F1+1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

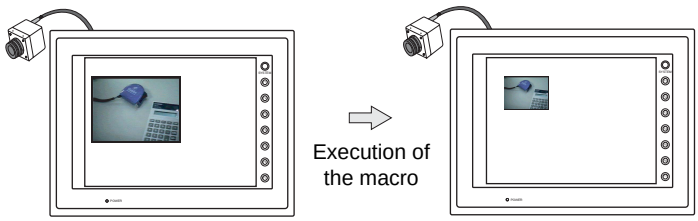
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	0: Size
F1+1	0: 160 × 120
	1: 320 × 240
	2: 640 × 480
	3: 640 × 240

Example

- $u100 = 0 (W) [Size]
  $u101 = 0 (W) [160 × 120]
  Video MEMORY $u100



The above program changes the video display size to 160 × 120.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 2: Size (dot)

This macro command is used to change the video display to the size specified in [F1+1] and [F1+2] (dot units).

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	7: Size (dot)
F1+1	1: ⋮ Width 800:
F1+2	1: ⋮ Height 600:

Example

- $u100 = 7 (W) [Size (dot)]
  $u101 = 100 (W) [Width 100]
  $u101 = 75 (W) [Height 75]
  Video MEMORY $u100

  The above program changes the video display size to 100 × 75.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected for [Multimedia] on the V8 series.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 3: Channel

This macro command is used to change the video display to the channel specified in [F1+1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

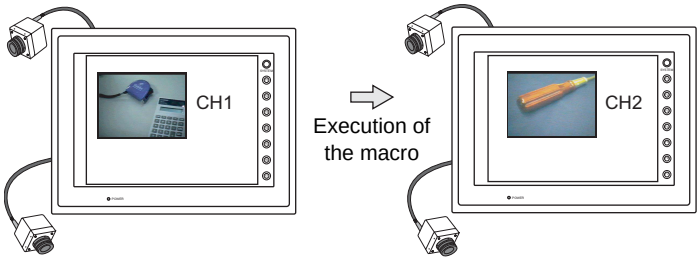
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	1: Channel
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH

Example

- $u100 = 1 (W) [Channel]
  $u101 = 2 (W) [2CH]
  Video MEMORY $u100



The above program changes the video display to channel 2.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected for [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 4: Dithering

This macro command is used to switch on/off the dithering of video display.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	2: Dithering
F1+1	0: OFF
	1: ON

Example

- $u100 = 2 (W) [Dithering]
  $u101 = 0 (W) [OFF]
  Video MEMORY $u100

  The above program switches the dithering of video display to OFF.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- This function is invalid with the V8 series and V715.
  They operate with dither ON all the time.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 5: Brightness

This macro command is used to change the brightness of the video display to the value specified in [F1+1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	3: Brightness
F1+1	0: Dark ⋮ 255: Bright

Example

- $u100 = 3 (W) [Brightness]
  $u101 = 100 (W) [Brightness 100]
  Video MEMORY $u100

  The above program changes the brightness of video display to the level of 100.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 6: Contrast

This macro command is used to change the contrast of the video display to the value specified in [F1+1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	4: Contrast
F1+1	0: Low ⋮ 255: High

Example

- $u100 = 4 (W) [Contrast]
  $u101 = 150 (W) [Cotrast 150]
  Video MEMORY $u100

  The above program changes the contrast of video display to the level of 150.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 7: Color shade

This macro command is used to change the color shade of the video display to the value specified in [F1+1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	MEMORY
F1	5: Color shade
F1+1	0: Light ⋮ 255: Dark

Example

- $u100 = 5 (W) [Color shade]
  $u101 = 120 (W) [Color shade 120]
  Video MEMORY $u100

  The above program changes the color shade of video display to the level of 120.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 8: Save settings/reset to default

This macro command is used to save the current video settings or to reset them to the defaults.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Default	
F0	MEMORY	-	
F1	6: Video_INF	-	
F1+1	0: SAVE	-	
	1: DEFAULT	BRIGHT	V8/V7: 128 V6: 171
		CONTRAST	V8/V7: 128 V6: 24
		COLOR	V8/V7: 128 V6: 44

Example

- $u100 = 6 (W) [Video_INF]
  $u101 = 0 (W) [SAVE]
  Video MEMORY $u100

  The above program saves the video settings. The settings are maintained even after MONITOUCH is turned off.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected for [Multimedia].
- After the SAVE command has been executed, the video settings are maintained even after power-off.
- The execution of Video INF DEFAULT may cause MONITOUCH to pause approximately for one second.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video SIZE F1 . . . . . Command designation

Function: Size

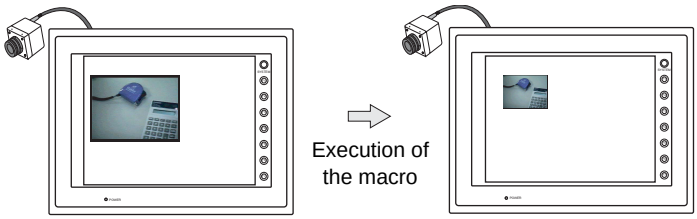
This macro command is used to change the video display to the size specified in [F1].

Setting range

F0	SIZE
F1	160 × 120 320 × 240 640 × 480 640 × 240

Example

- Video SIZE 160 × 120



The above program changes the video display size to 160 × 120.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video SIZE F1 F2 . . . . . .Command designation

Function: Size (dot)

This macro command is used to change the video display to the size specified in [F1] and [F2] (dot units).

Setting range

	Value
F0	Size (dot)
F1	1: ⋮ Width 800:
F2	1: ⋮ Height 600:

Example

- Video SIZE 100 75

  The above program changes the video display size to 100 × 75.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected for [Multimedia] on the V8 series.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video SEL_CH F1 . . . . . Command designation

Function: Channel

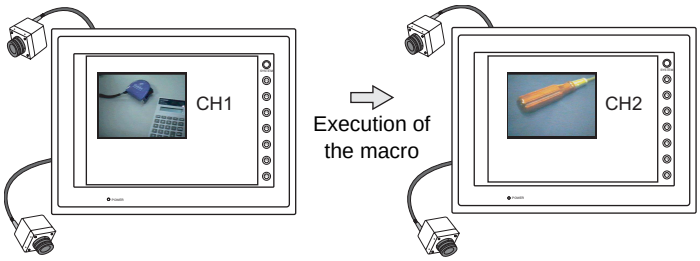
This macro command is used to change the video display to the channel specified in [F1].

Setting range

Memory	Data
F0	SEL_CH
F1	1 2 3 4

Example

- Video SEL_CH2



The above program changes the video display to channel 2.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video DITHER F1 . . . . . .Command designation

Function: Dithering

This macro command is used to switch on/off the dithering of video display.

Setting range

	Data
F0	DITHER
F1	OFF ON

Example

- Video DITHER OFF
  The above program switches the dithering of video display to OFF.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- This function is invalid with the V8 series and V715.
  They operate with dither ON all the time.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video BRIGHT F1 . . . . . Command designation

Function: Brightness

This macro command is used to change the brightness of the video display to the value specified in [F1].

Setting range

	Data
F0	BRIGHT
F1	0: Dark ⋮ 255: Bright

Example

- Video BRIGHT 100
  The above program changes the brightness of video display to the level of 100.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video CONTRAST F1 . . . . . .Command designation

Function: Contrast

This macro command is used to change the contrast of the video display to the value specified in [F1].

Setting range

	Data
F0	CONTRAST
F1	0: Low ⋮ 255: High

Example

- Video CONTRAST 150
  The above program changes the contrast of video display to the level of 150.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video COLOR F1 . . . . . Command designation

Function: Color shade

This macro command is used to change the color shade of the video display to the value specified in [F1].

Setting range

	Data
F0	COLOR
F1	0: Light ⋮ 255: Dark

Example

- Video COLOR 120
  The above program changes the color shade of video display to the level of 120.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video INF F1. . . . . .Command designation

Function: Save settings/reset to default

This macro command is used to save the current video settings or to reset them to the defaults.

Setting range

	Data	Default	
F0	INF	-	
F1	SAVE	-	
	DEFAULT	BRIGHT	V8/V7: 128 V6: 171
		CONTRAST	V8/V7: 128 V6: 24
		COLOR	V8/V7: 128 V6: 44

Example

- Video INF SAVE
  The above program saves the video settings. The settings are maintained even after MONITOUCH is turned off.

Supplemental remarks

- The macro command is valid when [Video Overlap] is selected from [Multimedia].
- After the SAVE command has been executed, the video settings are maintained even after power-off.
- The execution of Video INF DEFAULT may cause MONITOUCH to pause approximately for one second.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	○
V710S	○
V710T	○
V710C	
V708S	○
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

Video2 MEMORY F1 . . . . . Memory designation

Function 1: Single snap

This macro command is used to save the image in the channel specified in [F1+1] in the CF card under the file number specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

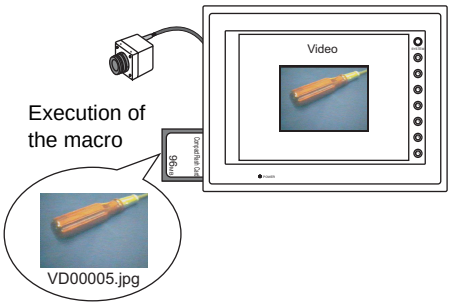
	Data
F0	MEMORY
F1	0: SNAP
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
	−1: Auto *1
F1+2	00000: File No. : : 32767 −1: Auto *2

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 Auto: File
If no file exists in the CF card, numbering the files to be stored increments from “0”. If some files already exist, numbering increments following the maximum of the existing file numbers.
When increment reaches [Maximum Number of Snap Files in Auto] in the [Video/RGB Setting] dialog, the action to be taken depends on which option is checked for [When the Snap File Limitation is Exceeded]. With [Stop] checked, no more execution of the macro command is enabled. With [Overwrite] checked, increment will be reset to “0” and the files will be overwritten.

Example

- $u100 = 0 (W) [SNAP]
  $u101 = 1 (W) [1CH]
  $u102 = 5 (W) [File No. 5]
  Video2 MEMORY $u100



Supplemental remarks

- The macro command is valid while a video image is displayed on the V series with a CF card inserted into it.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 2: Background snap

This macro command is used to save the image in the channel specified in [F1+1] at the size specified in [F1+3] in the CF card under the file number specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

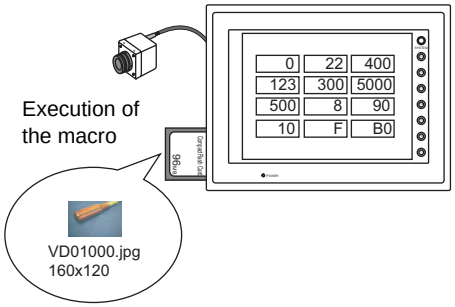
	Data
F0	MEMORY
F1	11: SNAP (background)
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
F1+2	00000: File No. : : 32767: −1: Auto *1
F1+3	0: 160 × 120
	1: 320 × 240
	2: 640 × 480
	3: 640 × 240 *2

*1 Auto: File
If no file exists in the CF card, numbering the files to be stored increments from “0”. If some files already exist, numbering increments following the maximum of the existing file numbers.
When increment reaches [Maximum Number of Snap Files in Auto] in the [Video/RGB Setting] dialog, the action to be taken depends on which option is checked for [When the Snap File Limitation is Exceeded]. With [Stop] checked, no more execution of the macro command is enabled. With [Overwrite] checked, increment will be reset to “0” and the files will be overwritten.

*2 The snap area is distinguished based on the value at $s957.

Example

- $u100 = 11 (W) [Background snap]
  $u101 = 1 (W) [1CH]
  $u102 = 1000 (W) [File No.]
  $u103 = 0 (W) [Size]
  Video2 MEMORY $u100



The above program saves the image of channel 1 in a size of 160 × 120 to the VD01000.jpg file.

Supplemental remarks

- The macro command is valid when a CF card is inserted into the V series.
- Even if no video item setting is made in the screen data, the macro command executes the background snap function for the specified channel.
- Regardless of $s931, superimposing of images is not performed.
- If PAUSE is being executed for the channel you specified, the macro command captures its image again and executes the background snap function.
- If the image of the channel specified is being zoomed in, zooming is canceled while the macro command is executing the background snap function.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 3: Strobe snap

This macro command is used to save strobe snap frames of the channel specified in [F1+1] in the CF card under the file number specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

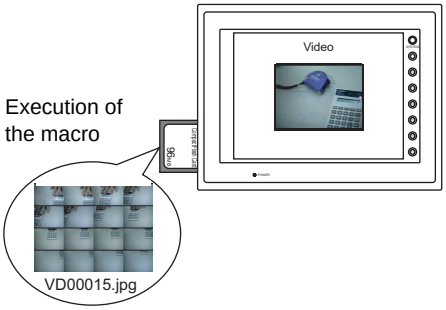
	Data
F0	MEMORY
F1	1: STROBE
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
	–1: Auto *1
F1+2	00000: File No. : : 32767: –1: Auto *2

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 Auto: File
If no file exists in the CF card, numbering the files to be stored increments from “0”. If some files already exist, numbering increments following the maximum of the existing file numbers.
When increment reaches [Maximum Number of Snap Files in Auto] in the [Video/RGB Setting] dialog, the action to be taken depends on which option is checked for [When the Snap File Limitation is Exceeded]. With [Stop] checked, no more execution of the macro command is enabled. With [Overwrite] checked, increment will be reset to “0” and the files will be overwritten.

Example

- $u100 = 1 (W) [STOROBE]
  $u101 = 1 (W) [1CH]
  $u102 = 15 (W) [File No.]
  Video2 MEMORY $u100



Supplemental remarks

- The macro command is valid while a video image is displayed on the V series with a CF card inserted into it.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 4: Resize

This macro command is used to resize a 640-×480-dot video image to the original size.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

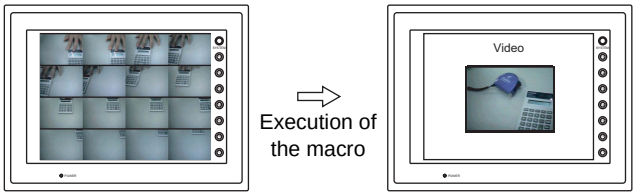
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	2: RE_SIZE

Example

- $u100 = 2 [RE_SIZE]
  Video2 MEMORY $u100



Supplemental remarks

- In addition to the RE_SIZE command, double-clicking a 640-×480-dot image resizes it to the original size.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 5: Zoom

This macro command is used to zoom into the image in the channel specified in [F1+1] to a size of 640 × 480 at the position specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

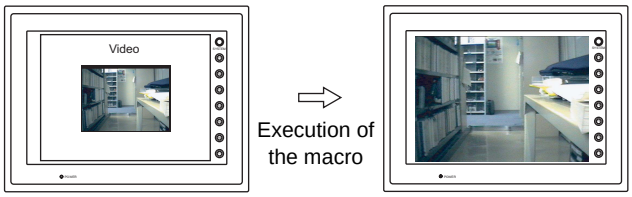
	Data
F0	MEMORY
F1	3: ZOOM
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
	−1: Auto *1
F1+2	0: Centering 1: Upper right *2 2: Upper left *2

*1 Auto: CH
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 These options can only be specified with the XGA/SVGA models. For VGA models, only centering is enabled.

Example

- $u100 = 3 (W) [ZOOM]
  $u101 = 1 (W) [1CH]
  $u102 = 0 (W) [Centering]
  Video2 MEMORY $u100



The above program zooms in the image of channel 1.

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 6: Brightness

This macro command is used to adjust the brightness of the video image of the channel specified in [F1+1] to the value specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	4: BRIGHT
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	−1: Auto *1
F1+2	0: Dark ⋮ 31: Bright

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- $u100 = 4 (W) [BRIGHT]
  $u101 = 1 (W) [1CH]
  $u102 = 10 (W)
  Video2 MEMOEY $u100

  The above program changes the brightness of the channel-1 image to the level of 10.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 7: Contrast

This macro command is used to adjust the contrast of the video image of the channel specified in [F1+1] to the value specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	5: CONTRAST
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	−1: Auto *1
F1+2	0: Low ⋮ 31: High

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- $u100 = 5 (W) [CONTRAST]
  $u101 = 1 (W) [1CH]
  $u102 = 10 (W)
  Video2 MEMORY $u100

  The above program changes the contrast of the channel-1 image to the level of 10.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 8: Color shade

This macro command is used to adjust the color shade of the video image of the channel specified in [F1+1] to the value specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	6: COLOR
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	−1: Auto *1
F1+2	0: Light ⋮ 31: Dark

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- $u100 = 6 (W) [COLOR]
  $u101 = 1 (W) [1CH]
  $u102 = 10 (W)
  Video2 MEMORY $u100

  The above program adjusts the color shade of the channel-1 image to the level of 10.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 9: Save settings/reset to default

This macro command is used to save the video settings of the channel specified in [F1+1] or to reset the settings to the defaults.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data	Default	
F0	MEMORY	-	
F1	7: VIDEOINF	-	
F1+1	1: 1CH	-	
	2: 2CH		
	3: 3CH		
	4: 4CH		
	5: 5CH (RGB only for V8)		
	6: 6CH (RGB only for V8)		
	−1: Auto *1		
F1+2	0: SAVE	-	
	1: DEFAULT	BRIGHT	16
		CONTRAST	16
		COLOR	16
		Clip start position	*2
		Clip size	

: ← V series (Return data)

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 The default settings for the clip start position and the clip size varies depending on the input signal. For more information, refer to the V8 Series Reference Manual.

Example

- $u100 = 7 (W) [VIDEOINF]
  $u101 = 1 (W) [1CH]
  $u102 = 0 (W)
  Video2 MEMORY $u100

  The above program saves the video settings for channel 1.

Supplemental remarks

- If the V series unit is turned off and on again after the execution of SAVE, the data is unaffected.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 10: Pause

This macro command is used to temporarily stop the video image of the channel specified in [F1+1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	8: PAUSE
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	–1: Auto *1

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- $u100 = 8 (W) [PAUSE]
  $u101 = 1 (W) [1CH]
  Video2 MEMORY $u100

  The above program causes the channel-1 image to pause.

Supplemental remarks

- During the execution of PAUSE, resizing is disabled.
- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 11: Pause cancel

This macro command is used to restart the video display that has been stopped by the PAUSE command.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	9: RESTART
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	−1: Auto *1

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- $u100 = 9 (W) [RESTART]
  $u101 = 1 (W) [1CH]
  Video2 MEMORY $u100

  This starts the channel 1 video display.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 12: Deletion

This macro command is used to delete the snap file VDxxxxx.jpg from the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	10: DELETE
F1+1	00000: File No. ⋮ 32767:

Example

- $u100 = 10 (W) [DELETE]
  $u101 = 1 (W) [File No.]
  Video2 MEMORY $u100

  The above program deletes the VD00001.jpg file from the CF card.

Supplemental remarks

- The macro command is valid when a CF card is inserted into the V series.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 13: Change continuous single snaps

This macro command is used to change the continuous single snapping of the channel specified in [F1+1] to the operation specified in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	12: SNAP_SEQ
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
F1+2	0: Stop
	1: Start

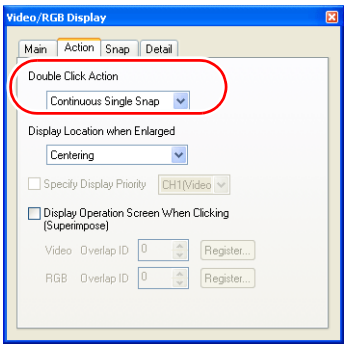
Example

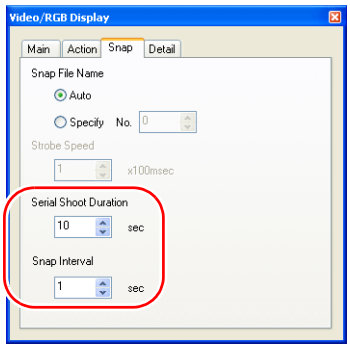
- $u100 = 12 (W) [RESTART]
  $u101 = 1 (W) [1CH]
  $u102 = 1 (W) [Start]
  Video2 MEMORY $u100

  This starts continuous snaps of channel 1.

Supplemental remarks

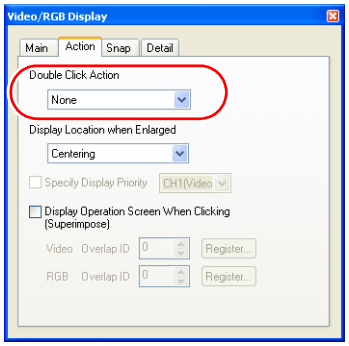
- The continuous single snap interval and the continuous single snap time are determined as shown below according to the setting item on the [Video/RGB Display] dialog.
  - When the specification for [Double Click Action] on the [Video/RGB Display] dialog is [Continuous Single Snap]:

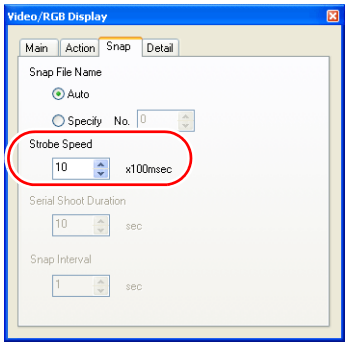




Serial Shoot Duration	Snap Interval
Set the time for [Serial Shoot Duration] on the [Snap] tab window	Set the time for [Snap Interval] on the [Snap] tab window

  - When the specification for [Double Click Action] on the [Video/RGB Display] dialog is other than [Continuous Single Snap]:





Serial Shoot Duration	Snap Interval
One minute (fixed)	Set the time for [Strobe Speed] on the [Snap] tab window

    * When one second or a shorter time is set, the time used is one second.

- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Function 14: Change clip start position

This macro command is used to change the image import start position (clip start position) for the channel specified in [F1+1] to the position specified in [F1+2] and [F1+3].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	13: CLIP_POS
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
F1+2	0: : 1023: Starting X coordinate
F1+3	0: : 767: Starting Y coordinate

Example

- $u100 = 13 (W) [CLIP_POS]
  $u101 = 1 (W) [1CH]
  $u102 = 100 (W) [Starting X coordinate: 100]
  $u103 = 150 (W) [Starting Y coordinate: 150]
  Video2 MEMORY $u100

  This changes the clip start position to (100, 150).

Supplemental remarks

- For more information on the clip start position, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 15: Change clip size

This macro command is used to change the import size (clip size) of the image of the channel specified in [F1+1] to the size specified in [F1+2] and [F1+3].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Data
F0	MEMORY
F1	14: CLIP_SIZE
F1+1	1: 1CH
	2: 2CH
	3: 3CH
	4: 4CH
	5: 5CH (RGB only for V8)
	6: 6CH (RGB only for V8)
F1+2	1 - 1024:Width
F1+3	1 - 768: Height

Example

- $u100 = 13 (W) [CLIP_SIZE]
  $u101 = 1 (W) [1CH]
  $u102 = 400 (W) [Width 400]
  $u103 = 300 (W) [Height 300]
  Video2 MEMORY $u100

  This changes the clip size to 400 × 300 dots.

  $u100 = 13 (W) [CLIP_POS]
  $u101 = 1 (W) [1CH]
  $u102 = 100 (W) [Starting X coordinate: 100]
  $u103 = 150 (W) [Starting Y coordinate: 150]
  Video2 MEMORY $u100

  This changes the clip start position to (100, 150).

Supplemental remarks

- For more information on the clip size, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

Execute the CLIP SIZE command, and then do the CLIP POS command. For more information on the CLIP POS command, refer to page 4-127.

Video2 SNAP F1 F2 . . . . . Command designation

Function: Single snap

This macro command is used to save the image in the channel specified in [F1] in the CF card under the file number specified in [F2].

Setting range

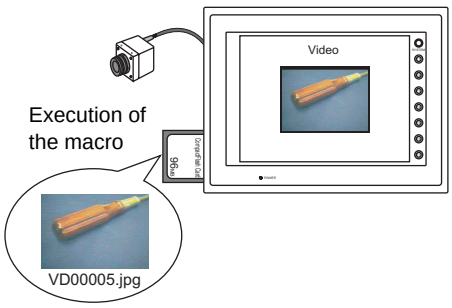
	Data
F0	SNAP
F1	CH1 CH2 CH3 CH4 CH5 (RGB only for V8) CH6 (RGB only for V8) Auto *1
F2	VD00000 : VD32767 Auto *2

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 Auto: File
If no file exists in the CF card, numbering the files to be stored increments from “0”. If some files already exist, numbering increments following the maximum of the existing file numbers.
When increment reaches [Maximum Number of Snap Files in Auto] in the [Video/RGB Setting] dialog, the action to be taken depends on which option is checked for [When the Snap File Limitation is Exceeded]. With [Stop] checked, no more execution of the macro command is enabled. With [Overwrite] checked, increment will be reset to “0” and the files will be overwritten.

Example

- Video2 SNAP CH1 VD00005



Supplemental remarks

- The macro command is valid while a video image is displayed on the V series with a CF card inserted into it.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 SNAP F1 F2 (size) . . . . . Command designation

Function: Background snap

This macro command is used to save the image of the channel specified in [F1] at any required size in the CF card under the file number specified in [F2].

Setting range

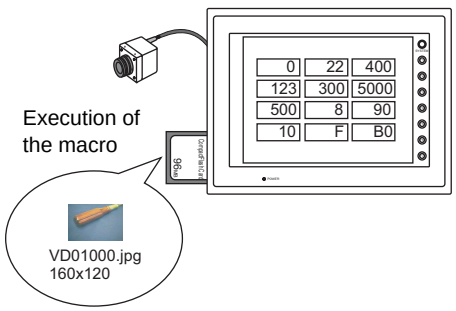
Memory	Data
F0	SNAP
F1	CH1 CH2 CH3 CH4 CH5 (RGB only for V8) CH6 (RGB only for V8)
F2	VD00000 : : VD32767 Auto *1
☑ Snap in Background	160 × 120 320 × 240 640 × 480 640 × 240 *2

*1 Auto: File
If no file exists in the CF card, numbering the files to be stored increments from “0”. If some files already exist, numbering increments following the maximum of the existing file numbers.
When increment reaches [Maximum Number of Snap Files in Auto] in the [Video/RGB Setting] dialog, the action to be taken depends on which option is checked for [When the Snap File Limitation is Exceeded]. With [Stop] checked, no more execution of the macro command is enabled. With [Overwrite] checked, increment will be reset to “0” and the files will be overwritten.

*2 The snap area is distinguished based on the value at $s957.

Example

- Video2 SNAP CH1 VD01000 160 × 120



The above program saves the image of channel 1 in a size of 160 × 120 to the VD01000.jpg file.

Supplemental remarks

- The macro command is valid when a CF card is inserted into the V series.
- Even if no video item setting is made in the screen data, the macro command executes the background snap function for the specified channel.
- Regardless of $s931, superimposing of images is not performed.
- If PAUSE is being executed for the channel you specified, the macro command captures its image again and executes the background snap function.
- If the image of the channel specified is being zoomed in, zooming is canceled while the macro command is executing the background snap function.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 STROBE CH FileNo. . . . . Command designation

Function: Strobe snap

This macro command is used to save the strobe snap frames of the channel specified in [F1] in the CF card under the file number specified in [F2].

Setting range

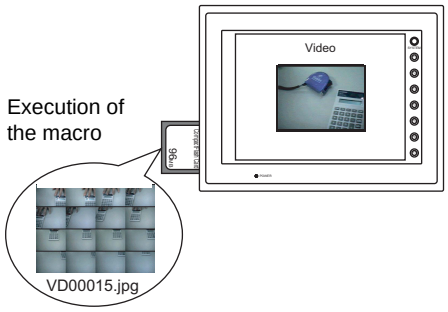
	Data
F0	STROBE
F1	CH1 CH2 CH3 CH4 CH5 (RGB only for V8) CH6 (RGB only for V8) Auto *1
F2	VD00000 : : VD32767 Auto *2

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 Auto: File
If no file exists in the CF card, numbering the files to be stored increments from “0”. If some files already exist, numbering increments following the maximum of the existing file numbers.
When increment reaches [Maximum Number of Snap Files in Auto] in the [Video/RGB Setting] dialog, the action to be taken depends on which option is checked for [When the Snap File Limitation is Exceeded]. With [Stop] checked, no more execution of the macro command is enabled. With [Overwrite] checked, increment will be reset to “0” and the files will be overwritten.

Example

- Video2 STROBE CH1 VD00015



Supplemental remarks

- The macro command is valid while a video image is displayed on the V series with a CF card inserted into it.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 RE_SIZE . . . . . Command designation

Function: Resize

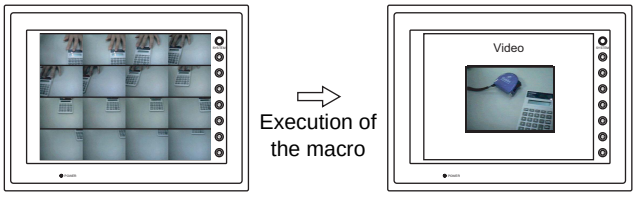
This macro command is used to resize a 640-×480-dot video image to the original size.

Setting range

	Data
F0	RE_SIZE

Example

- Video2 RE_SIZE



Supplemental remarks

- In addition to the RE_SIZE command, double-clicking a 640-×480-dot image resizes it to the original size.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 ZOOM F1 F2 . . . . . .Command designation

Function: Zoom

This macro command is used to zoom into the image in the channel specified in [F1] to a size of 640 × 480 at the position specified in [F2].

Setting range

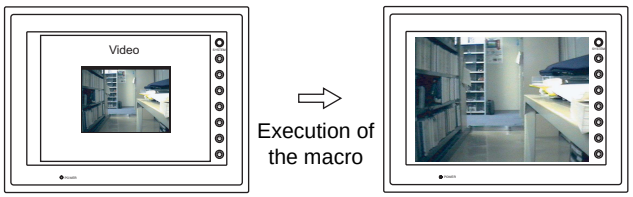
	Data
F0	ZOOM
F1	CH1 CH2 CH3 CH4 CH5 (RGB only for V8) CH6 (RGB only for V8) Auto *1
F2	Centering Upper right *2 Lower left *2

*1 Auto: CH
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 The options are enabled for XGA/SVGA only. For VGA, only centering is enabled.

Example

- Video2 ZOOM 1CH Centering



The above program zooms in the image of channel 1.

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 BRIGHT F1 F2 . . . . . Command designation

Function: Brightness

This macro command is used to adjust the brightness of the video image of the channel specified in [F1] to the value specified in [F2].

Setting range

	Data
F0	BRIGHT
F1	CH1 CH2 CH3 CH4 Auto *1
F2	0: Dark : 31: Bright

*1 Auto: CH

- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- Video2 BRIGHT CH1 10

  The above program changes the brightness of the channel-1 image to the level of 10.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 CONTRAST F1 F2 . . . . . .Command designation

Function: Contrast

This macro command is used to adjust the contrast of the video image of the channel specified in [F1] to the value specified in [F2].

Setting range

	Data
F0	CONTRAST
F1	CH1 CH2 CH3 CH4 Auto *1
F2	0: Low : 31: High

*1 Auto: CH

- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- Video2 CONTRAST CH1 10
  The above program changes the contrast of the channel-1 image to the level of 10.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 COLOR F1 F2 . . . . . Command designation

Function: Color shade

This macro command is used to adjust the color shade of the video image of the channel specified in [F1] to the value specified in [F2].

Setting range

	Data
F0	COLOR
F1	CH1 CH2 CH3 CH4 Auto *1
F2	0: Light : 31: Dark

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- Video2 COLOR CH1 10
  The above program adjusts the color shade of the channel-1 image to the level of 10.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 VIDEOINF F1 F2 . . . . . .Command designation

Function: Save settings/reset to default

This macro command is used to save the video settings of the channel specified in [F1] or to reset the settings to the defaults.

Setting range

	Data	Default	
F0	VIDEOINF	-	
F1	CH1 CH2 CH3 CH4 CH5 (RGB only for V8) CH6 (RGB only for V8) Auto *1	-	
F2	SAVE	-	
	DEFAULT	BRIGHT	16
		CONTRAST	16
		COLOR	16
		Clip start position	*2
		Clip size	

: ← V series (Return data)

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

*2 The default settings for the clip start position and the clip size varies depending on the input signal. For more information, refer to the V8 Series Reference Manual.

Example

- Video2 VIDEO_INF CH1 SAVE
  The above program saves the video settings for channel 1.

Supplemental remarks

- If the V series unit is turned off and on again after the execution of SAVE, the data is unaffected.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 PAUSE F1 . . . . . Command designation

Function: Pause

This macro command is used to temporarily stop the video image of the channel specified in [F1].

Setting range

	Data
F0	PAUSE
F1	CH1 CH2 CH3 CH4 Auto *1

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- Video2 PAUSE CH1
  The above program causes the channel-1 image to pause.

Supplemental remarks

- During the execution of PAUSE, resizing is disabled.
- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 RESTART F1 . . . . . .Command designation

Function: Pause cancel

This macro command is used to restart the video display that has been stopped by the PAUSE command.

Setting range

	Data
F0	RESTART
F1	CH1 CH2 CH3 CH4 Auto *1

*1 Auto: CH
- While [ZOOM] is executed, the channel set for [ZOOM] becomes the target for the macro command.
- When [Specify Display Priority] is checked, the specified channel becomes the target for the macro command.
- When one-channel display is selected in any cases except for the above, the channel of the image being displayed becomes the target for the macro command. When multiple-channel display is selected, the macro command is invalid.

Example

- Video2 RESTART CH1

  The above program restarts the channel-1 video display.

Supplemental remarks

- This function is only effective with the video channels (1CH to 4CH). It doesn't work with the RGB channels (5CH and 6CH).
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 DELETE F1 . . . . . Command designation

Function: Deletion

This macro command is used to delete the snap file VDxxxxx.jpg from the CF card.

Setting range

	Data
F0	DELETE
F1	VD00000 ⋮ VD32767

Example

- Video2 DELETE VD00001
  The above program deletes the VD00001.jpg file from the CF card.

Supplemental remarks

- The macro command is valid when a CF card is inserted into the V series.
- For the V8 series, the result of macro execution is stored in $s1061.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 SNAP_SEQ F1 F2 . . . . . .Command designation

Function: Change continuous single snaps

This macro command is used to change the continuous single snapping of the channel specified in [F1] to the operation specified in [F2].

Setting range

	Data
F0	SNAP_SEQ
F1	CH1 CH2 CH3 CH4 CH5 CH6
F2	START STOP

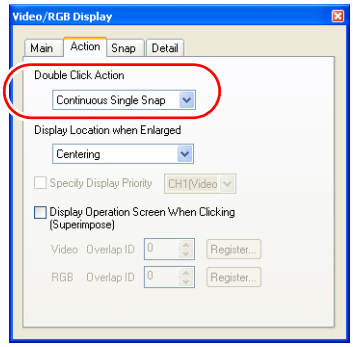
Example

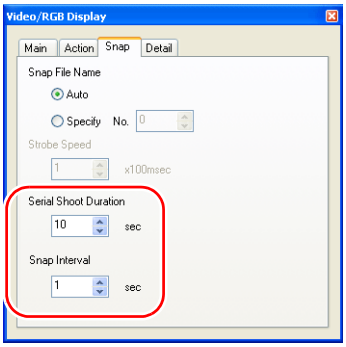
- Video2 SNAP_SEQ CH 1 START

  This starts continuous snaps of channel 1.

Supplemental remarks

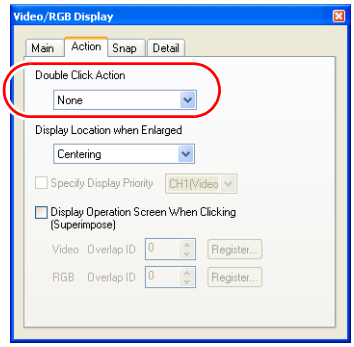
- This macro command is valid only for the V8 series.
- The continuous single snap interval and the continuous single snap time are determined as shown below according to the setting item on the [Video/RGB Display] dialog.
  - When the specification for [Double Click Action] on the [Video/RGB Display] dialog is [Continuous Single Snap]:

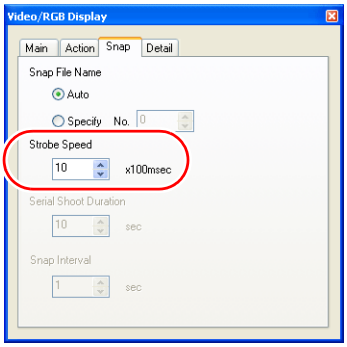




Serial Shoot Duration	Snap Interval
Set the time for [Serial Shoot Duration] on the [Snap] tab window	Set the time for [Snap Interval] on the [Snap] tab window

- When the specification for [Double Click Action] on the [Video/RGB Display] dialog is other than [Continuous Single Snap]:





Serial Shoot Duration	Snap Interval
One minute (fixed)	Set the time for [Strobe Speed] on the [Snap] tab window

* When one second or a shorter time is set, the time used is one second.

- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Video2 CLIP_POS F1 F2 F3 . . . . . .Command designation

Function: Change clip start position

This macro command is used to change the image import start position (clip start position) for the channel specified in [F1] to the position specified in [F2] and [F3].

Setting range

	Data
F0	CLIP_POS
F1	CH1 CH2 CH3 CH4 CH5 CH6
F2	0: ⋮ Starting X coordinate 1023:
F3	0: ⋮ Starting Y coordinate 767:

Example

- Video2 CLIP_POS CH 1 100 150

  This changes the clip start position to (100, 150).

Supplemental remarks

- This macro command is valid only for the V8 series.
- For more information on the clip start position, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Video2 CLIP_SIZE F1 F2 F3. . . . . Command designation

Function: Change clip size

This macro command is used to change the import size (clip size) of the image of the channel specified in [F1] to the size specified in [F2] and [F3].

Setting range

	Data
F0	CLIP_SIZE
F1	CH1 CH2 CH3 CH4 CH5 CH6
F2	1: ⋮ Width 1024:
F3	1: ⋮ Height 768:

Example

- Video2 CLIP_SIZE CH 1 400 300

  This changes the clip size to 400 × 300 dots.

  Video2 CLIP_POS CH 1 100 150

  This changes the clip start position to (100, 150).

Supplemental remarks

- This macro command is valid only for the V8 series.
- For more information on the clip size, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1061. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Restrictions

Execute the CLIP SIZE command, and then do the CLIP POS command. For more information on the CLIP POS command, refer to page 4-146.

4.14 PLC

PLC_CLND

PLC_CLND F0 PLC F1 F2 F3

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Calendar control function for PLC [F1]

This macro command is used to control the calendar for the PLC specified in [F1]. Depending on the value specified in [F0] it specifies reading or writing of the calendar data.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○
F1	○			○
F2	○			
F3	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	0: Calendar reading *1 1: Calendar writing (specified by user) *2 2: Calendar writing (by the system) *3	
F1	2 - 8: PLC number	
F2	0 - 31: PLC port number	Invalid with 1:1 connections
F2+1	0 - 255: PLC sub port number	Invalid with 1:1 connections Only valid for PLCs with sub port number designations
F3	0 - : Year (4-digit/2-digit)	
F3+1	1 - 12: Month	
F3+2	1 - 31: Day	
F3+3	0 - 23: Hour	
F3+4	0 - 59: Minute	
F3+5	0 - 59: Second	
F3+6	0: Sunday 1: Monday 2: Tuesday 3: Wednesday 4: Thursday 5: Friday 6: Saturday	Only valid with a read ([F0] = 0) setting Invalid with a write ([F0] = 1 or 2) setting because the calculation is done internally in the unit

* Details of calendar function specification

*1 When [F0] = 0: Calendar reading
When the connection method specified in [F1] is “1:1”, the calendar is read for the connected device and the information is saved in the [F3] memory. (The contents in the [F2] memory are ignored.)
When the connection method specified in [F1] is “1:n”, the calendar for the device with the port number specified in [F2] or the sub port number specified in [F2+1] is read and saved in the [F3] memory.
The V series system calendar is not changed by any command. To change the system calendar, use “ SYS (SET_SYS_CLND) F1” (page 4-296).

*2 When [F0] = 1: Calendar reading (specified by user)
When the connection method specified in [F1] is “1:1”, the calendar data in the [F3] memory is written to the connected device.
(The contents in the [F2] memory are ignored.)
When the connection method specified in [F1] is “1:n”, the calendar data specified in [F3] is written to the device with the port number specified in [F2] or the sub port number specified in [F2+1].

*3 When [F0] = 2: Calendar reading (by the system)
When the connection method specified in [F1] is “1:1”, the V series unit’s system calendar data is written to the connected device.
(The contents in the [F2] memory and the [F3] memory are ignored.)
When the connection method specified in [F1] is “1:n”, the system’s calendar data specified in [F3] is written to the device with the port number specified in [F2] or the sub port number specified in [F2+1].
(The contents in the [F3] memory are ignored.)

Example

- Setting the calendar for PLC2, port No. 1 to 20:00:00 on October 15, 2007

```
$u100 = 1 (W)        — [PLC port number: 1]
$u200 = 2007 (W)     ┐
$u201 = 10 (W)       │
$u202 = 15 (W)       │ [October 15, 2007, Monday, 20:00:00]
$u203 = 20 (W)       │
$u204 = 0 (W)        │
$u205 = 0 (W)        ┘
PLC_CLND  1  PLC2  $u100  $u200
SYS (SET_SYS_CLND) $u200 (V series calendar setting)
```

Supplemental remarks

- If the relevant device doesn’t incorporate a calendar, nothing happens in response to the command. (The V series automatically judges whether or not the device incorporates a calendar.)
- Nothing happens to the device whose link has been dead in response to the command.
- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2004	A PLC [F1] communication error has occurred during processing.
FFFF	Execution error

PLC_CTL

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

PLC_CTL PLC F0 F1 F2

Function: PLC [F1] control function

This macro command is used to control the operation specified in the words starting from the address in [F1] in relation to the PLC specified in [F0]. The number of words is specified in [F2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○
F1	○			
F2				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	1 - 8: PLC number
F1	0 - 31: PLC port number
F1+1	Command and others The items to be set differ depending on the device. For more information, refer to the V8 Series Connection Manual.
:	
F2	The number of words to be transferred

Example

- Bringing Omron's E5ZN (port No. 1) connected to the PLC2 to a state of RUN:
  $u100 = 1 (W) [PLC port number]
  $u101 = 30H (W) [Command]
  $u102 = 100H (W) [Operation command (RUN)]
  PLC_CTL PLC2 $u100 3

Contents	F0	F1 (=$u n) =$u100		F2
Operation command	1 - 8 (PLC1 - 8)	n =$u100	Port number*	3
		n+1 =$u101	Command: 0030H	
		n+2 =$u102	0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)	
			0100H: RUN 0101H: STOP	
			0200H: Multi-SP (Set point 0) 0201H: Multi-SP (Set point 1) 0202H: Multi-SP (Set point 2) 0203H: Multi-SP (Set point 3)	
			0300H: AT cancel 0301H: AT execution	
			0400H: Write mode (Backup) 0401H: Write mode (RAM)	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Move to set area 1	
			0800H: Move to protect level	

* 8000 (HEX): broadcasting

- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2002	Memory cannot be allocated.
2004	A PLC [F0] communication error has occurred during processing.

TBL_READ

TBL_READ F0 <- TABLE:PLC F1 : F2

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Device memory map memory read

This macro command is used to transfer the data at the addresses registered in the device memory map specified in [F2] of the PLC specified in [F1] to the addresses starting with the one specified in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	○			○
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Top memory address of the target
F1	1 - 8: PLC number
F2	0 - 31: Device memory map No.

Example

- Transferring the data of the addresses registered in device memory map No. 5 defined at PLC3 to $u500 onward
  TBL_READ $u500 <- TABLE : PLC3 : 5

Supplemental remarks

- As many addresses as the data count set in the device memory map must be allocated to the target memory, to which data will be transferred.
- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2001	Memory set in the device memory map does not exist.
2002	Memory cannot be allocated.
2004	A PLC [F1] communication error has occurred during processing.

TBL_WRITE

TBL_WRITE TABLE:PLC F1 : F0 <- F2

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Device memory map memory write

This macro command is used to transfer the data at the location starting from the address specified in [F2] to the memory registered in the device memory map [F0] for the PLC [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○
F1	○			○
F2	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 31: Device memory map No.
F1	1 - 8: PLC number
F2	Top memory address of the source

Example

- Transferring the data of $u500 onward to the addresses registered in device memory map No. 5 defined at PLC3
  TBL_WRITE TABLE : PLC3 : 5 <- $u00500

Supplemental remarks

- As many addresses as the data count set in the device memory map must be allocated to the target memory, to which data will be transferred.
- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2001	Memory set in the device memory map does not exist.
2002	Memory cannot be allocated.
2004	A PLC [F1] communication error has occurred during processing.

4.15 Temperature Control / PLC2Way

TEMP_READ

All V8 models	△
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	△
TELLUS2 HMI	○

TEMP_READ F0 <- TABLE : F1

Function: Device memory map memory read

This macro command is used to transfer the data in memory registered in the device memory map [F1] to the location starting from the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎ *	◎	
F1	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

* If the [F0] memory is specified as a PLC memory, it is fixed as PLC1.

Setting range

	Value
F0	Top memory address of the target
F1	0 - 31: Device memory map No. (for PLC2)

Example

- TEMP_READ PLC1 [D00000] = TABLE : 5
  The above program transfers the data at the addresses registered in device memory map No. 5 of PLC2 to D0 onward.

Supplemental remarks

- As many addresses as the data count set in the device memory map must be allocated to the target memory, to which data will be transferred.
- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2001	Memory set in the device memory map does not exist.
2002	Memory cannot be allocated.
2004	A PLC2 communication error has occurred during processing.

- For the V8 series with TELLUS version 3 in HMI mode, use “TBL_READ” (page 4-152).
  (The macro command explained on this page cannot be selected for the V8 series with TELLUS version 3 in HMI mode.)

TEMP_WRITE

All V8 models	△
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	△
TELLUS2 HMI	○

TEMP_WRITE TABLE : F0 <- F1

Function: Device memory map memory write

This macro command is used to transfer the data at the location starting from the address specified in [F1] to the memory registered in the device memory map [F0] for the PLC2.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○
F1	◎	◎ *	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

* If the [F1] memory is specified as a PLC memory, it is fixed as PLC1.

Setting range

	Value
F0	0 - 31: Device memory map No. (for PLC2)
F1	Top memory address of the source

Example

- TEMP_WRITE TABLE : 5 = PLC1 [D00000]
  The above program transfers the data of D0 onward of PLC1 to the addresses registered in device memory map No. 5 of PLC2.

Supplemental remarks

- As many addresses as the data count set in the device memory map must be allocated to the source memory, from which data will be transferred.
- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2001	Memory set in the device memory map does not exist.
2002	Memory cannot be allocated.
2004	A PLC2 communication error has occurred during processing.

- For the V8 series with TELLUS version 3 in HMI mode, use “TBL_WRITE” (page 4-153).
  (The macro command explained on this page cannot be selected for the V8 series with TELLUS version 3 in HMI mode.)

TEMP_CTL

All V8 models	△
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	△
TELLUS2 HMI	○

TEMP_CTL F0 F1

Function: PLC2 control function

This macro command is used to control the operation specified in the words starting from the top address in [F0] in relation to PLC2. The number of words is specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 31: Port number (PLC2)
F0+1	Command and others Setting items depend on the models. For more information, refer to the V8 Series Connection Manual
:	
F1	The number of words to be transferred

- The result of macro execution is stored in $s729.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (HEX)	Contents
2002	Memory cannot be allocated.
2004	A PLC2 communication error has occurred during processing.

- For the V8 series with TELLUS version 3 in HMI mode, use “PLC_CTL” (page 4-150).
  (The macro command explained on this page cannot be selected for the V8 series with TELLUS version 3 in HMI mode.)

4.16 Ethernet

SEND

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

SEND F0 C:F1 TO F2

Function: Transfer to server

This macro command is used to transfer the data of words starting from the address specified in [F0] to the server of the network table number in [F2]. The number of the words is specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎			○
F2	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

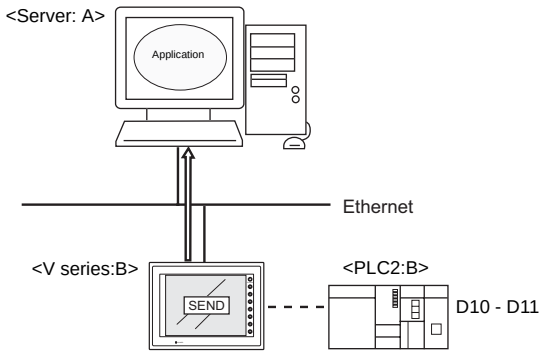
Setting range

	Value
F0	Top memory address of the source
F1	0 - 2000: The number of words to be transferred
F2	0 - 255: Transfer target (network table number) *

* In the case of V7/V6/TELLUS2 HMI, a maximum of 99 tables can be registered.

Example

- SEND PLC2 [D10] C:2 TO:3
  The above program transfers two words of data starting from D10 of PLC2:B to network table No. 3 (server A).



Supplemental remarks

The following describes the system memory associated with the SEND command. For more information, refer to the V8 Series Connection Manual.

Address	Contents	Remarks
$s512	Specify a port when two Ethernet ports are used	→V
$s514	Set the macro execution format (wait request)	→V
$s515	Store the result of macro execution	←V

EREAD

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

EREAD F0 = F1 C:F2 F3

Function: Read on the network

This macro command is used to read the data of words starting from the address specified in [F1] set in the [F3]-specified network table into the address in [F0]. The number of the words is specified in [F2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	◎			○
F3	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

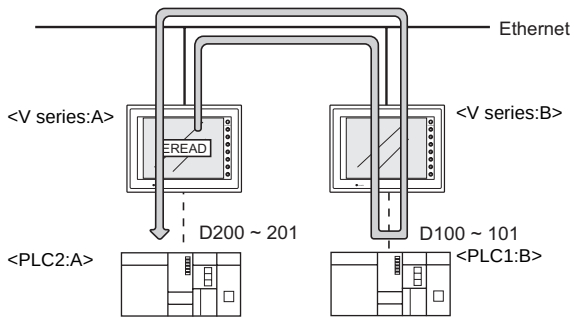
Setting range

	Value
F0	Top memory address of the target
F1	Top memory address of the source
F2	0 - 2000: The number of words to be transferred
F3	0 - 255: Transfer source (network table number) *

* In the case of V7/V6/TELLUS2 HMI, a maximum of 99 tables can be registered.

Example

- EREAD PLC1 [D200] = PLC1 [D100] C:2 5
  The above program reads two words of data starting from D100 of PLC2:B, which is connected to network table No. 5 (V series:B), into D200 onward of PLC1:A.



Supplemental remarks

The following describes the system memory associated with the EREAD command. For more information, refer to the V8 Series Connection Manual.

Address	Contents	Remarks
$s512	Specify a port when two Ethernet ports are used	→V
$s514	Set the macro execution format (wait request)	→V
$s515	Store the result of macro execution	←V

EWRITE

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

EWRITE F0 F1 = F2 C:F3

Function: Write on the network

This macro command is used to write data starting from the address specified in [F2] to the address specified in [F0] of the device connected to the network table number specified in [F1]. The number of words is specified in [F3].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎			○
F2	◎	◎	◎	
F3	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

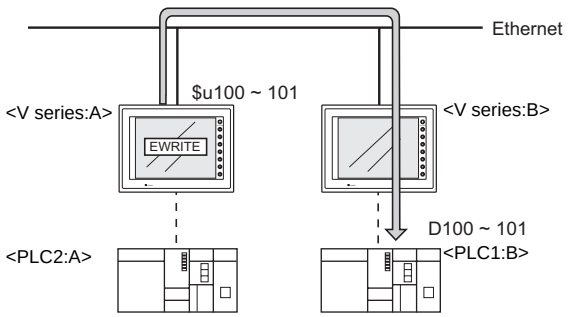
Setting range

	Value
F0	Top memory address of the target
F1	0 - 255: Transfer target (network table number) *
F2	Top memory address of the source
F3	0 - 2000: The number of words to be transferred

* In the case of V7/V6/TELLUS2 HMI, a maximum of 99 tables can be registered.

Example

- EWRITE PLC1 [D100] 5 = $u100 C:2
  The above program writes two words of data starting from $u100 of the V series:A to D100 onward of PLC2:B which is connected to network table No. 5 (V series:B).



Supplemental remarks

The following describes the system memory associated with the EWRITE command. For more information, refer to the V8 Series Connection Manual.

Address	Contents	Remarks
$s512	Specify a port when two Ethernet ports are used	→V
$s514	Set the macro execution format (wait request)	→V
$s515	Store the result of macro execution	←V

4.17 CF Card (Recipe)

LD_RECIPE

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

LD_RECIPE F0 F1

Function: Read CSV file

This macro command is used to transfer the CSV file specified in [F1] to the location starting from the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	○	○	○	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Transfer target address
F1	0000 - 9999: CSV file number

CSV file

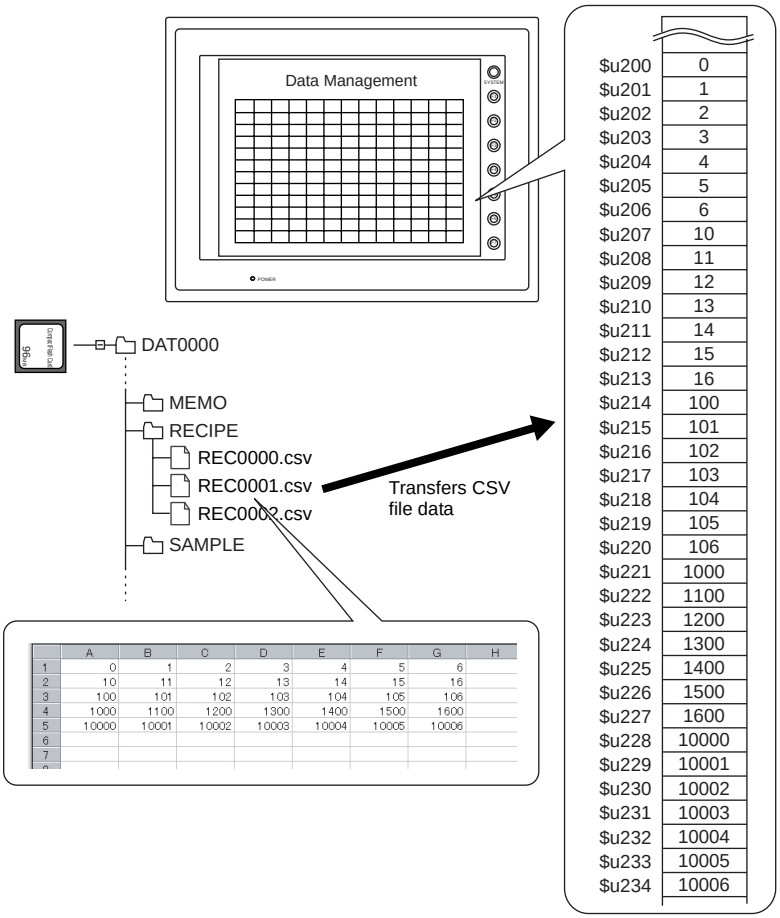
Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File No.

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

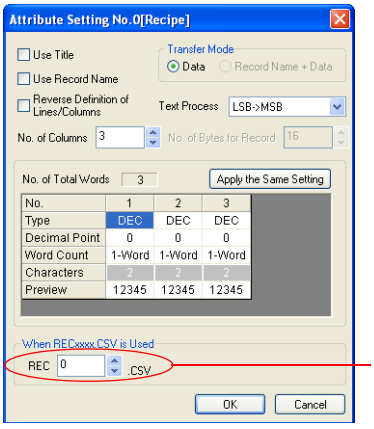
Example

- LD_RECIPE $u200 1
  The data in the REC0001.csv file is transferred to the location starting from $u200.



Supplemental remarks

- Attribute setting is required for each CSV file.



Attribute setting for the REC0000.csv file

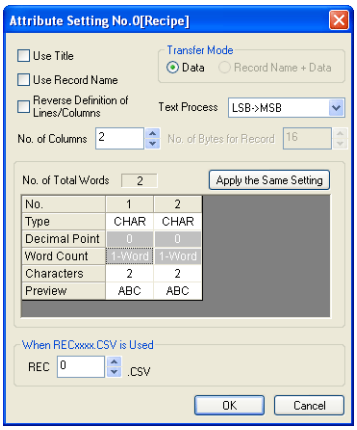
- For reading text, whether to convert a null to 20H (space) or read it as “00” can be selected.
  Go to the [General Setting] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting] → [General Settings]). On the tab window, check or uncheck [☐ Convert NULL to Space with the LD/RD Macro].

  Example:

  CSV file

  ```
  A,B,
  C,,
  ```

  Attribute



  Execution result

Storage memory	Checked	Unchecked
n	2041H	0041H
n+1	2042H	0042H
n+2	2043H	0043H
n+3	2020H	0000H
	A null is converted to 20H.	A null remains “00”.

- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

LD_RECIPE2

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

LD_RECIPE2 F0 F1 F2

Function: Read CSV file (attribute designation)

This macro command is used to transfer the CSV file specified in [F1] in the format of the attribute number in [F2] to the location starting from the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	○	○	○	○
F2	○	○	○	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Transfer target address
F1	0000 - 9999: CSV file number
F2	0 - 255: Attribute number

CSV file

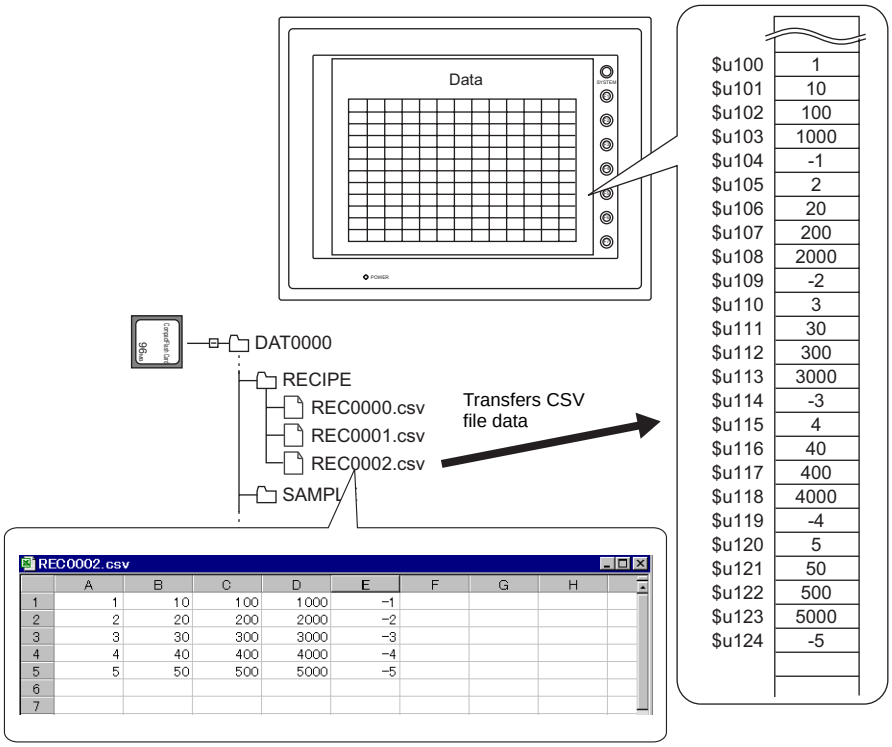
Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File No.

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

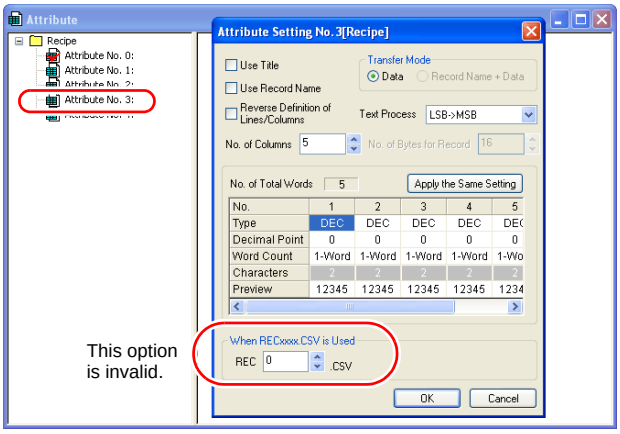
Example

- LD_RECIPE2 $u100 2 3
  The above program transfers the data in the REC0002.csv file in the format of attribute No. 3 to the location starting from $u100.



Supplemental remarks

- Attribute setting made in the same format as the CSV file is required.



- For reading text, whether to convert a null to 20H (space) or read it as “00” can be selected. For more information, refer to page 4-162.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

LD_RECIPESEL

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

LD_RECIPESEL F0 F1

Function: Read CSV file (in units of a cell)

This macro command is used to transfer part of the CSV file specified in [F1] to the location starting from the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

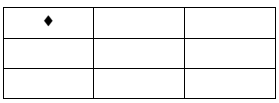
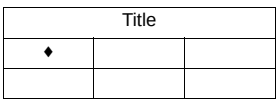
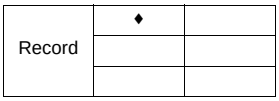
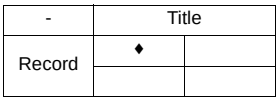
	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer source address	
F1	0000 - 9999: CSV file number	
F1+1	1 - 32767: Top line number	1 - 4096: Top line number
F1+2	0* - 4096: Top column number	0* - 4096: Top column number
F1+3	1 - 32767: Number of lines	1 - 4096: Number of lines
F1+4	1 - 4096: Number of columns	1 - 4096: Number of columns

* Specify “0” if you wish to transfer the record name as well. In that case, check [Record Name + Data] under [Transfer Mode] in the [Attribute Setting] dialog. The number of columns specified in F1+4 includes the cell of the record name.

CSV file

Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File No.

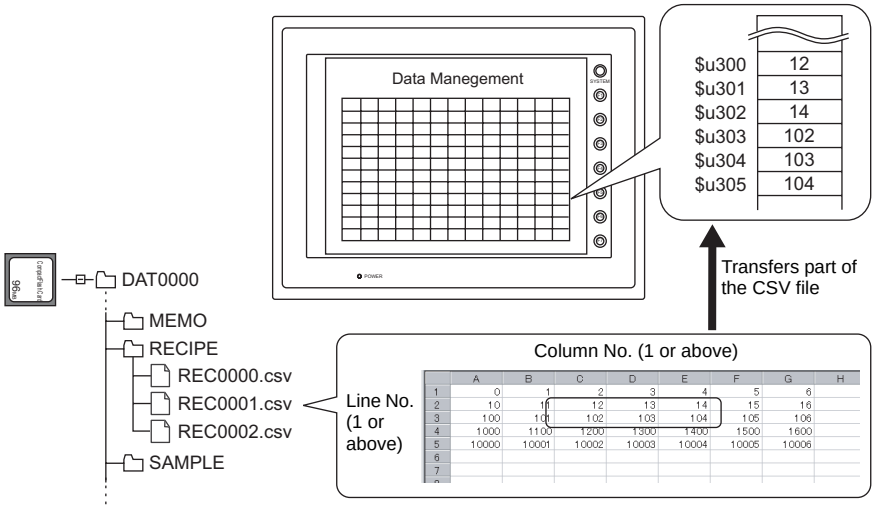
The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name		
☑ Record Name		

Example

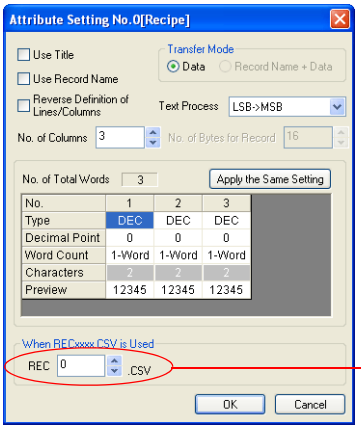
- $u100 = 1 (W) [File number 1]
  $u101 = 2 (W) [Top line number]
  $u102 = 3 (W) [Top column number]
  $u103 = 2 (W) [Number of lines]
  $u104 = 3 (W) [Number of columns]
  LD_RECIPESEL $u300 $u100

  The above program transfers part of the data in the REC0001.csv file to the location starting from $u300.



Supplemental remarks

- Attribute setting is required for each CSV file.



- For reading text, whether to convert a null to 20H (space) or read it as “00” can be selected. For more information, refer to page 4-162.

- Difference between reading one line and reading multiple lines

<table>
<tr><th></th><th>☐ Reverse Definition of Lines/ Columns</th><th>☑ Reverse Definition of Lines/ Columns</th></tr>
<tr><td>CSV</td><td>CSV file
<table><tr><th>DEC</th><th>CHAR</th><th>DEC</th></tr><tr><td>1</td><td>A</td><td>100</td></tr><tr><td>2</td><td>B</td><td>200</td></tr><tr><td>3</td><td>C</td><td>300</td></tr><tr><td>4</td><td>D</td><td>400</td></tr></table></td><td>CSV file
<table><tr><td>DEC</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>CHAR</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>DEC</td><td>100</td><td>200</td><td>300</td><td>400</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>One line</td><td>Reading one line and two columns from top line No. 2 and top column No.2
<table><tr><th>DEC</th><th>CHAR</th><th>DEC</th></tr><tr><td>1</td><td>A</td><td>100</td></tr><tr><td>2</td><td>B</td><td>200</td></tr><tr><td>3</td><td>C</td><td>300</td></tr><tr><td>4</td><td>D</td><td>400</td></tr></table></td><td>Reading one line and two columns from top line No. 2 and top column No.2
<table><tr><td>DEC</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>CHAR</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>DEC</td><td>100</td><td>200</td><td>300</td><td>400</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Two lines</td><td>Reading two lines and two columns from top line No. 2 and top column No. 2
<table><tr><th>DEC</th><th>CHAR</th><th>DEC</th></tr><tr><td>1</td><td>A</td><td>100</td></tr><tr><td>2</td><td>B</td><td>200</td></tr><tr><td>3</td><td>C</td><td>300</td></tr><tr><td>4</td><td>D</td><td>400</td></tr></table></td><td>Reading two lines and two columns from top line No. 2 and top column No. 2
<table><tr><td>DEC</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>CHAR</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>DEC</td><td>100</td><td>200</td><td>300</td><td>400</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>* Execute reading line by line (specifying multiple lines at one time is not allowed).</td></tr>
</table>

- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

LD_RECIPESEL2

LD_RECIPESEL2 F0 F1 F2

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Read CSV file (in units of a cell/attribute designation)

This macro command is used to transfer part of the CSV file specified in [F1] in the format of the attribute number in [F2] to the location starting from the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	○	○	○	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

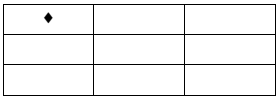
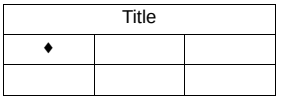
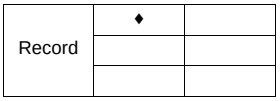
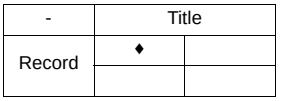
	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer target address	
F1	0000 - 9999: CSV file number	
F1+1	1 - 32767: Top line number	1 - 4096: Top line number
F1+2	0* - 4096: Top column number	0* - 4096: Top column number
F1+3	1 - 32767: Number of lines	1 - 4096: Number of lines
F1+4	1 - 4096: Number of columns	1 - 4096: Number of columns
F2	0 - 255: Attribute number	

* Specify “0” if you wish to transfer the record name as well. In that case, check [Record Name + Data] under [Transfer Mode] in the [Attribute Setting] dialog. The number of columns specified in F1+4 includes the cell of the record name.

CSV file

Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File number

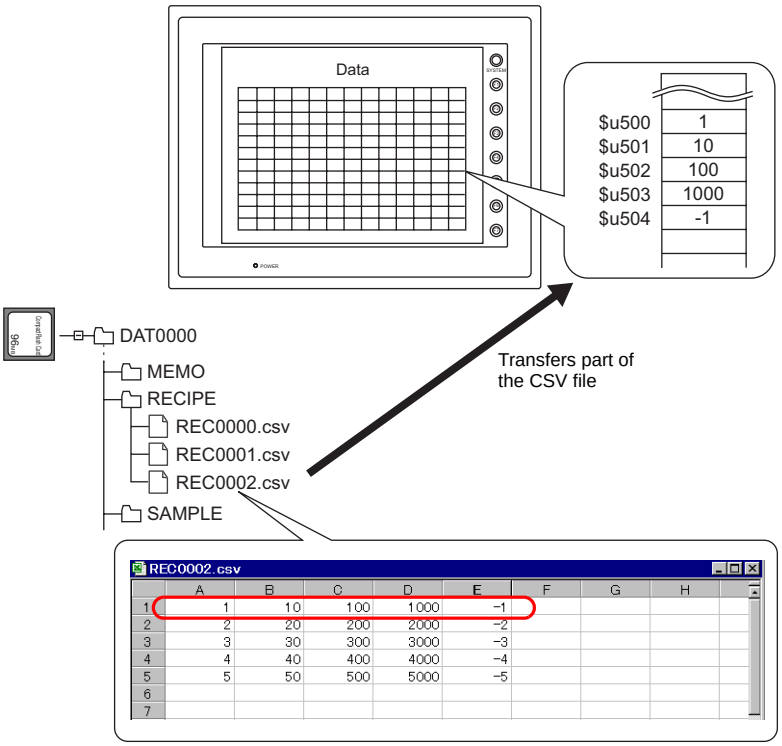
The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name		
☑ Record Name		

Example

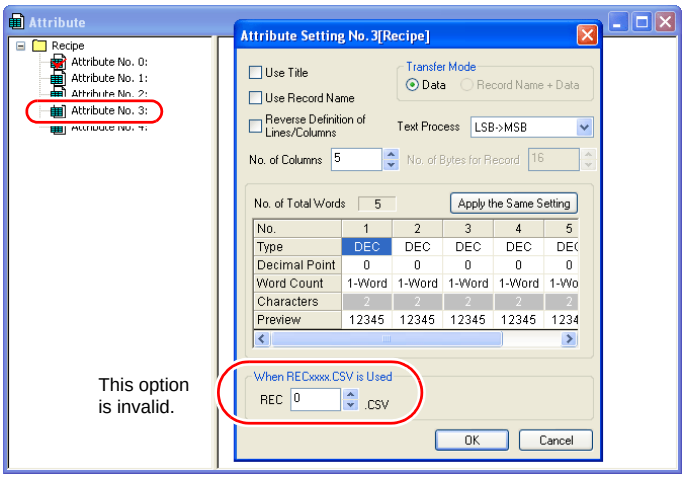
- $u100 = 2 (W) [File number]
  $u101 = 1 (W) [Top line number]
  $u102 = 1 (W) [Top column number]
  $u103 = 1 (W) [Number of lines]
  $u104 = 5 (W) [Number of columns]
  LD_RECIPESEL2 $u500 $u100 3

  The above program transfers part of the data in the REC0002.csv file in the format of attribute No. 3 to the location starting from $u500.



Supplemental remarks

- Attribute setting made in the same format as the CSV file is required.



- For reading text, whether to convert a null to 20H (space) or read it as “00” can be selected. For more information, refer to page 4-162.
- Difference between reading one line and reading multiple lines

	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
CSV	CSV file DEC CHAR DEC 1 A 100 2 B 200 3 C 300 4 D 400	CSV file DEC 1 2 3 4 CHAR A B C D DEC 100 200 300 400
One line	Reading one line and two columns from top line No. 2 and top column No. 2 DEC CHAR DEC 1 A 100 2 B ~~200~~ 3 C 300 4 D 400	Reading one line and two columns from top line No. 2 and top column No. 2 DEC 1 2 3 4 CHAR A ~~B~~ ~~C~~ D DEC 100 200 300 400
Two lines	Reading two lines and two columns from top line No. 2 and top column No. 2 DEC CHAR DEC 1 A 100 2 ~~B~~ ~~200~~ 3 ~~C~~ ~~300~~ 4 D 400	Reading two lines and two columns from top line No. 2 and top column No. 2 DEC 1 2 3 4 CHAR A ~~B~~ ~~C~~ D DEC 100 ~~200~~ ~~300~~ 400 * Execute reading line by line (specifying multiple lines at one time is not allowed).

- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SV_RECIPE

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

SV_RECIPE F0 F1 F2

Function: Save to CSV file

This macro command is used to save the data of words starting from the address specified in [F0] to the CSV file in [F2]. The number of the words is specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	○	○	○	○
F2	○	○	○	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Transfer source address
F1	1 - 4096: Word count
F2	0000 - 9999: CSV file number

CSV file

Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File number

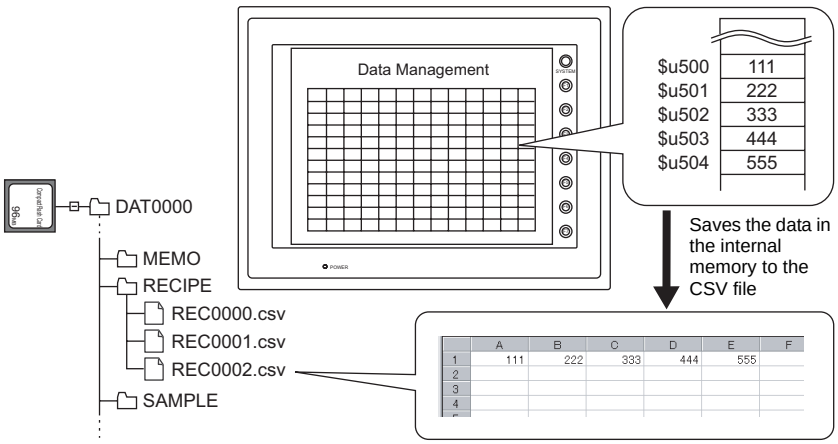
The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

Example

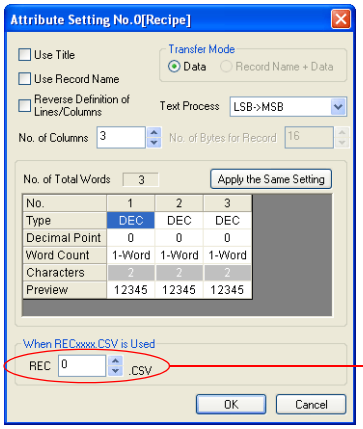
- SV_RECIPE $u500 5 2

  The above program saves the five-word data at $u500 - 504 to the REC0002.csv file.



Supplemental remarks

- Attribute setting is required for each CSV file.



Attribute setting for the REC0002.csv file

- If the specified CSV file does not exist on the CF card, a new file will be created. Creating the CSV file in advance is not necessary.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SV_RECIPE2

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

SV_RECIPE2 F0 F1 F2 F3

Function: Save to CSV file (attribute designation)

This macro command is used to save the data of words starting from the address specified in [F0] in the format of the attribute number in [F3] to the CSV file in [F2]. The number of the words is specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	○	○	○	○
F2	○	○	○	○
F3	○	○	○	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Transfer source address
F1	1 - 4096: Word count
F2	0000 - 9999: CSV file number
F3	0 - 255: Attribute number

CSV file

Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv

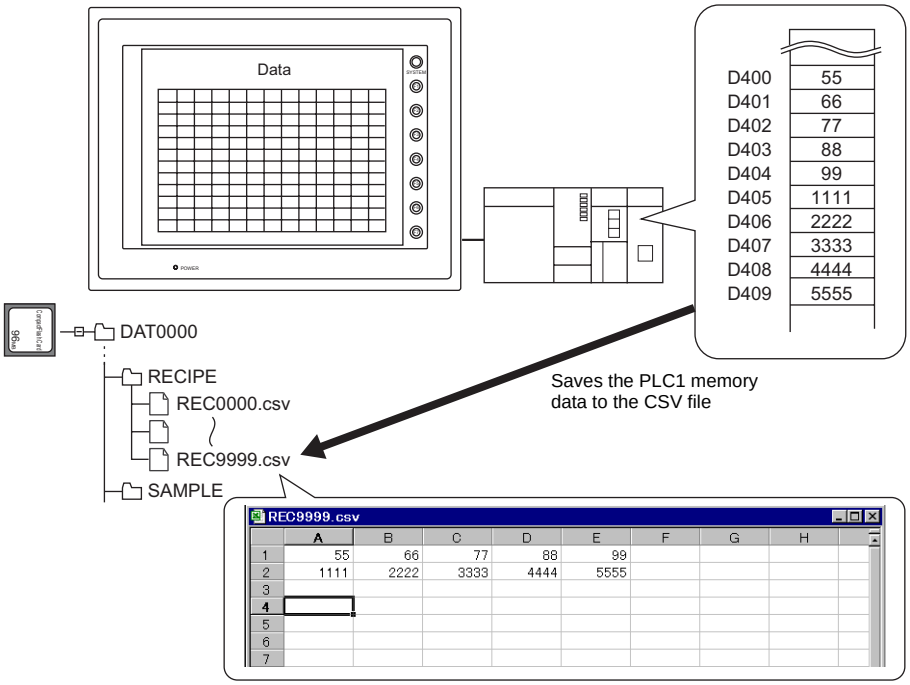
0000 - 9999: File No.

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

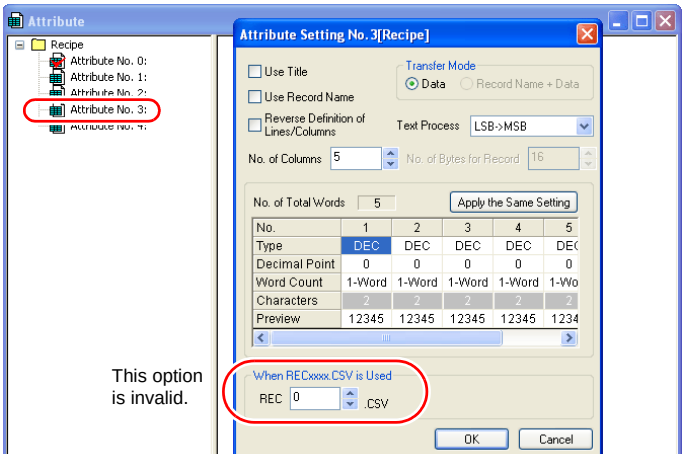
Example

- SV_RECIPE2 PLC[D400] 10 9999 3
  The above program saves the ten-word data at D400 - 409 of the PLC1 in the format of attribute No. 3 to the REC9999.csv file.



Supplemental remarks

- Attribute setting made in the same format as the CSV file is required.



- If the specified CSV file does not exist on the CF card, a new file will be created. Creating the CSV file in advance is not necessary.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SV_RECIPESEL

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

SV_RECIPESEL F0 F1

Function: Save to CSV file

This macro command is used to save the data at the location starting from the address specified in [F0] to the specified line/column in the CSV file in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

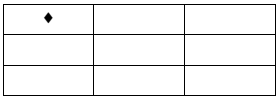
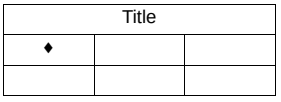
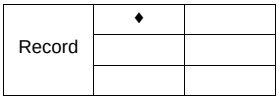
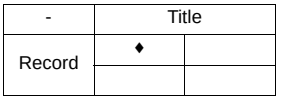
	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer source address	
F1	0000 - 9999: CSV file number	
F1+1	1 - 32767: Top line number	1 - 4096: Top line number
F1+2	0* - 4096: Top column number	0* - 4096: Top column number
F1+3	1 - 4096: Number of lines	1 - 4096: Number of lines
F1+4	1 - 4096: Number of columns	1 - 4096: Number of columns

* Specify “0” if you wish to transfer the record name as well. In that case, check [Record Name + Data] under [Transfer Mode] in the [Attribute Setting] dialog. The number of columns specified in F1+4 includes the cell of the record name.

CSV file

Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File No.

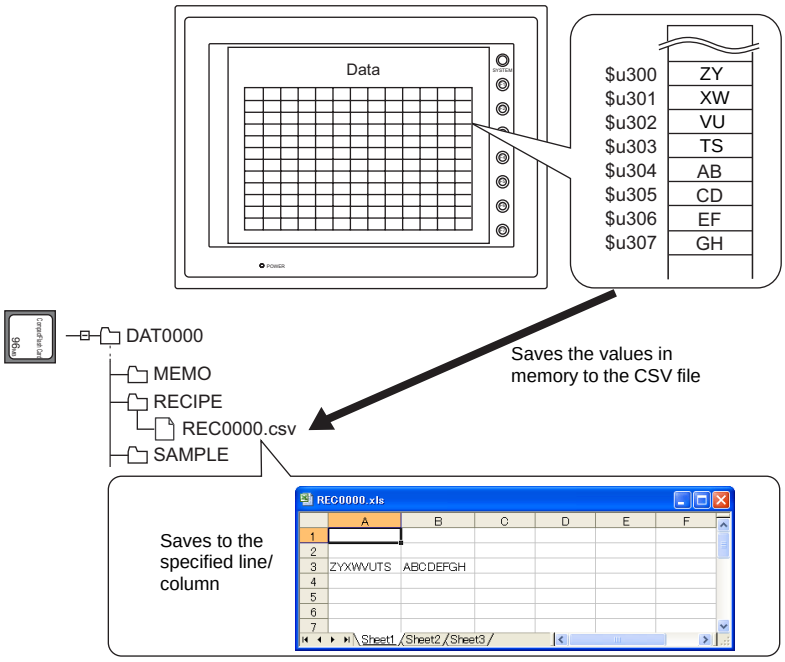
The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name		
☑ Record Name		

Example

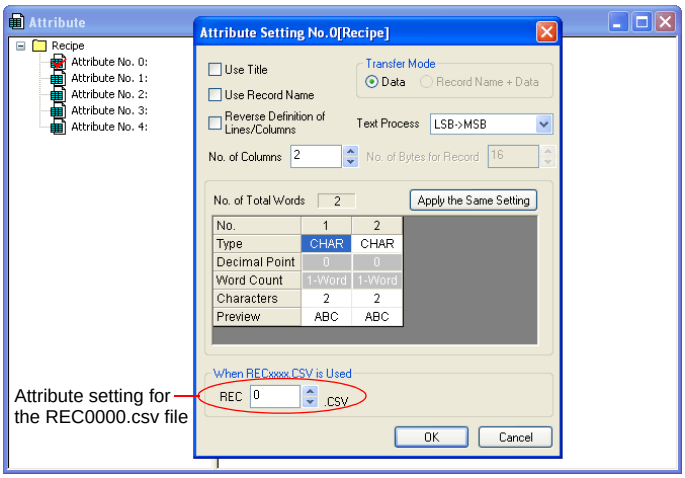
- $u100 = 0 (W) [File number]
  $u101 = 3 (W) [Top line number]
  $u102 = 1 (W) [Top column number]
  $u103 = 1 (W) [Number of lines]
  $u104 = 2 (W) [Number of columns]
  SV_RECIPESEL $u300 $u100

  The above program saves the data at the location starting from $u300 to line No. 3 in the REC0000.csv file.



Supplemental remarks

- Attribute setting is required for each CSV file.



- If the specified CSV file does not exist on the CF card, a new file will be created. Creating the CSV file in advance is not necessary.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SV_RECIPESEL2

SV_RECIPESEL2 F0 F1 F2

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Save to CSV file (attribute designation)

This macro command is used to save the data at the location starting from the address specified in [F0] in the format of the attribute number in [F2] to the specified line/column in the CSV file in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	○	○	○	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer source address	
F1	0000 - 9999: CSV file number	
F1+1	1 - 32767: Top line number	1 - 4096: Top line number
F1+2	0* - 4096: Top column number	0* - 4096: Top column number
F1+3	1 - 4096: Number of lines	1 - 4096: Number of lines
F1+4	1 - 4096: Number of columns	1 - 4096: Number of columns
F2	0 - 255: Attribute number	

* Specify “0” if you wish to transfer the record name as well. In that case, check [Record Name + Data] under [Transfer Mode] in the [Attribute Setting] dialog. The number of columns specified in F1+4 includes the cell of the record name.

CSV file

Storage target: \(access folder)\RECIPE
File name: \RECxxxx.csv
0000 - 9999: File No.

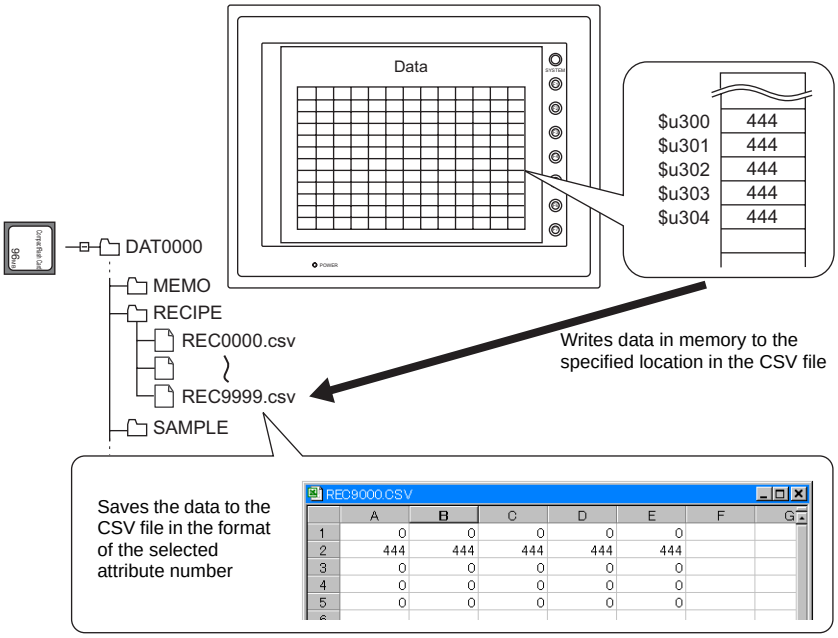
The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

Example

- $u100 = 9000 (W) [File number]
  $u101 = 2 (W) [Top line number]
  $u102 = 1 (W) [Top column number]
  $u103 = 1 (W) [Number of lines]
  $u104 = 5 (W) [Number of columns]
  SV_RECIPESEL2 $u300 $u100 3

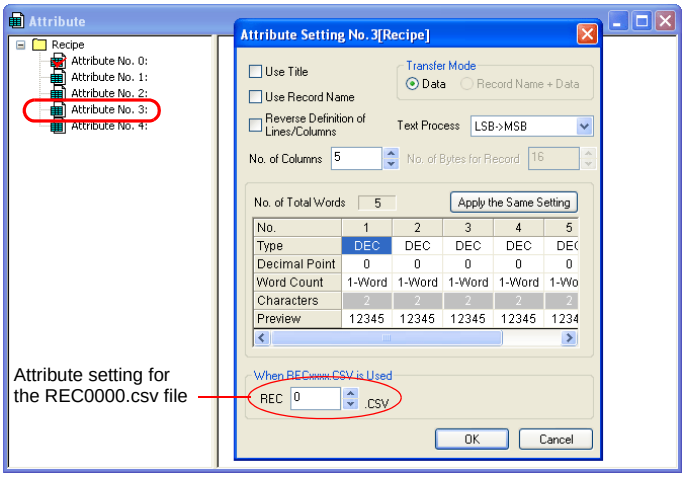
  The above program saves the data at the location starting from $u300 in the format of attribute No. 3 to line No. 2 in the REC9000.csv file.



	A	B	C	D	E	F	G
1	0	0	0	0	0		
2	444	444	444	444	444		
3	0	0	0	0	0		
4	0	0	0	0	0		
5	0	0	0	0	0		

Supplemental remarks

- Attribute setting made in the same format as the CSV file is required.



- If the specified CSV file does not exist on the CF card, a new file will be created. Creating the CSV file in advance is not necessary.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SET_RECIPEFOLDER SET_RECIPEFOLDER F0

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Folder designation

This macro command is used to designate the folder storing CSV files in [F0].

Available memory

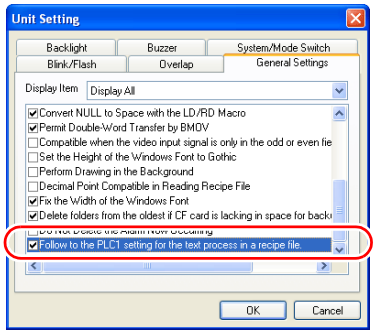
	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	ASCII code (8 one-byte upper-case alphanumeric characters): Access target folder name*
F0+1	
F0+2	
F0+3	

* Text processing (LSB → MSB or MSB → LSB) for the folder name is determined whether [Follow to the PLC1 setting for the text process in a recipe file.] on the [General Settings] tab window that is displayed by [System Setting] → [Unit Setting] is checked or not.



☑ Follow to the PLC1 setting for the text process in a recipe file.	☐ Follow to the PLC1 setting for the text process in a recipe file.
Text processing specified for the PLC1	Fixed to “LSB → MSB”

For the V7 series, text processing for the recipe file is performed according to the selection under [Text Process] in the [Detail] tab window in the [Communication Parameters] dialog ([System Setting] → [PLC Communication] → [Communication Parameter]).

Example

- $u100 = 4154H (W)
  $u101 = 4752H (W)
  $u102 = 5445H (W)
  $u103 = 0000H (W)
  SET_RECIPEFOLDER $u100

  54 41 52 47 45 54 = TARGET (ASCII)

  The above program specifies the folder at \(access folder)\RECIPE\TARGET.

- The CHR or STRING macro command will simplify the designation of a folder if it is a fixed name.
  - (When text processing is performed according to the setting on the PLC1: use a “CHR” command.)
    $u100 = ’TARGET’
    SET_RECIPEFOLDER $u100
  - (When “LSB → MSB” is selected: use a “STRING” command.)
    $u100 = ‘TARGET’ (STRING)
    SET_RECIPEFOLDER $u100

Supplemental remarks

- Four consecutive words starting from the address in [F0] are used. Be sure that these words are not already used elsewhere.
- Once the macro command is executed, the effect is maintained until any of the following takes place.
  - Turning off the power
  - Switching the V series from a state of RUN to STOP ([Main Menu] screen)
  - Removing the CF card

  Execute the macro command again after any of the above or if you access a CSV file in a different folder.
- For the V8 series, the result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

RD_RECIPE_FILE RD_RECIPE_FILE F0 F1

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Read CSV file

This macro command is used to transfer all data in the CSV file specified in [F1] to the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Transfer target memory
F1	ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name*
F1+1	
F1+2	
F1+3	

* For details on text processing of the file name, refer to “Supplemental remarks” on Page 4-185.

CSV file

Storage target: \(access folder)\RECIPE\(arbitrary folder)
File name: \xxxxxxxx.csv

8 one-byte upper-case alphanumeric characters or less

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title / ♦
☑ Record Name	Record / ♦	- / Title / Record / ♦

Example

- $u100 = 'TARGET'
  SET_RECIPEFOLDER $u100
  $u110 = 5250H (W)
  $u111 = 444FH (W)
  $u112 = 4355H (W)
  $u113 = 3154H (W)
  RD_RECIPE_FILE PLC1 [D200] $u110

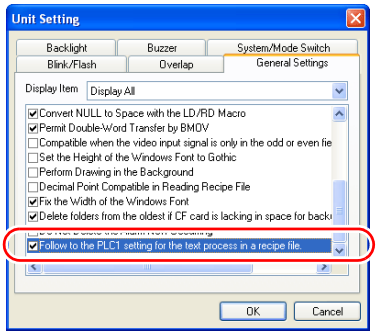
  Not required if SET_FOLDER has already been executed

  50 52 4F 44 55 43 54 31 = PRODUCT1 (ASCII)

  The above program transfers all data in the PRODUCT1.csv file stored in the TARGET folder to PLC1: D200.

Supplemental remarks

- Four consecutive words starting from the address in [F1] are used. Be sure that these words are not already used elsewhere.
- If the CSV file specified in [F1] does not exist, a card read error occurs ($s497 = 16).
- For reading text, whether to convert a null to 20H (space) or read it as "00" can be selected. For more information, refer to page 4-162.
- Text processing (LSB → MSB or MSB → LSB) for the file name is determined whether [Follow to the PLC1 setting for the text process in a recipe file.] on the [General Settings] tab window that is displayed by [System Setting] → [Unit Setting] is checked or not.



Memory designation	☑ Follow to the PLC1 setting for the text process in a recipe file.	☐ Follow to the PLC1 setting for the text process in a recipe file.
Internal memory	Text processing specified for the PLC1	Fixed to "LSB → MSB"
PLC 1 - 8 memory	Text processing specified for the PLC1	Text processing specified for each PLC

For the V7 series, text processing for the recipe file is performed according to the selection under [Text Process] in the [Detail] tab window in the [Communication Parameters] dialog ([System Setting] → [PLC Communication] → [Communication Parameter]).

- For the V8 series, the result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

RD_RECIPE_LINE RD_RECIPE_LINE F0 F1 F2 F3

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Read CSV file (line designation)

This macro command is used to transfer the data of specified lines in the [F1]-specified CSV file to the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	◎	◎	◎	○
F3	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer target memory	
F1	ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name*	
F1+1		
F1+2		
F1+3		
F2	1 - 32767: Top line	1 - 4096: Top line
F3	1 - 32767: Final line	1 - 4096: Final line

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

CSV file

Storage target: \(access folder)\RECIPE\(arbitrary folder)
File name: \xxxxxxxx.csv

8 one-byte upper-case alphanumeric characters or less

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

Example

- $u100 = 'TARGET'
  SET_RECIPEFOLDER $u100
  $u110 = 5250H (W)
  $u111 = 444FH (W)
  $u112 = 4355H (W)
  $u113 = 3154H (W)
  RD_RECIPE_LINE PLC1 [D200] $u110 3 3

  Not required if SET_FOLDER has already been executed

  50 52 4F 44 55 43 54 31 = PRODUCT1 (ASCII)

  The above program transfers line No. 3 (record No. 3) data in the PRODUCT1.csv file stored in the TARGET folder to PLC1: D200.

Supplemental remarks

- Four consecutive words starting from the address in [F1] are used. Be sure that these words are not already used elsewhere.
- If the CSV file specified in [F1] does not exist, a card read error occurs ($s497 = 16).
- For reading text, whether to convert a null to 20H (space) or read it as "00" can be selected. For more information, refer to page 4-162.
- Difference between reading one line and reading multiple lines

	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
CSV	CSV file DEC CHAR DEC 1 A 100 2 B 200 3 C 300 4 D 400	CSV file DEC 1 2 3 4 CHAR A B C D DEC 100 200 300 400
One line	Reading based on top line No. 2 and final line No. 2 DEC CHAR DEC 1 A 100 ~~2 B 200~~ 3 C 300 4 D 400	Reading based on top line No. 2 and final line No. 2 DEC 1 2 3 4 CHAR ~~A B C D~~ DEC 100 200 300 400
Two lines	Reading based on top line No. 2 and final line No. 3 DEC CHAR DEC 1 A 100 ~~2 B 200~~ ~~3 C 300~~ 4 D 400	Reading based on top line No. 2 and final line No. 3 DEC 1 2 3 4 CHAR ~~A B C D~~ DEC ~~100 200 300 400~~ * Execute reading line by line (specifying multiple lines at one time is not allowed).

- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

RD_RECIPE_COLUMN RD_RECIPE_COLUMN F0 F1 F2 F3

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Read CSV file (column designation)

This macro command is used to transfer the data of specified columns in the [F1]-specified CSV file to the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	◎	◎	◎	○
F3	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer target memory	
F1	ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name*	
F1+1		
F1+2		
F1+3		
F2	0: Column of record name 1 - 4096: Top column of data	
F3	0: Column of record name 1 - 4096: Final column of data	

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

CSV file

Storage target: \(access folder)\RECIPE\(arbitrary folder)
File name: \xxxxxxxx.csv

8 one-byte upper-case alphanumeric characters or less

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

Example

- $u100 = 'TARGET'
  SET_RECIPEFOLDER $u100
  $u110 = 5250H (W)
  $u111 = 444FH (W)
  $u112 = 4355H (W)
  $u113 = 3154H (W)
  RD_RECIPE_COLUMN PLC1 [D300] $u110 5 5

  Not required if SET_FOLDER has already been executed

  50 52 4F 44 55 43 54 31 = PRODUCT1 (ASCII)

  The above program transfers column No. 5 data in the PRODUCT1.csv file stored in the TARGET folder to PLC1: D300.

Supplemental remarks

- Four consecutive words starting from the address in [F1] are used. Be sure that these words are not already used elsewhere.
- If the CSV file specified in [F1] does not exist, a card read error occurs ($s497 = 16).
- For reading text, whether to convert a null to 20H (space) or read it as "00" can be selected. For more information, refer to page 4-162.
- Difference between reading one column and reading multiple columns

	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
CSV	CSV file DEC CHAR DEC 1 A 100 2 B 200 3 C 300 4 D 400	CSV file DEC 1 2 3 4 CHAR A B C D DEC 100 200 300 400
One line	Reading based on top column No. 2 and final column No. 2 DEC CHAR DEC 1 A 100 2 B 200 3 C 300 4 D 400	Reading based on top column No. 2 and final column No. 2 DEC 1 2 3 4 CHAR A B C D DEC 100 200 300 400
Two lines	Reading based on top column No. 2 and final column No. 3 DEC CHAR DEC 1 A 100 2 B 200 3 C 300 4 D 400 * Execute reading column by column (specifying multiple columns at one time is not allowed).	Reading based on top column No. 2 and final column No. 3 DEC 1 2 3 4 CHAR A B C D DEC 100 200 300 400

- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

WR_RECIPE_FILE　WR_RECIPE_FILE F0 F1

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Save to CSV file

This macro command is used to save the data at the location starting from the address specified in [F0] to the CSV file in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Transfer source memory
F1	ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name*
F1+1	
F1+2	
F1+3	

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

CSV file

Storage target: \(access folder)\RECIPE\(arbitrary folder)
File name: \xxxxxxxx.csv

8 one-byte upper-case alphanumeric characters or less

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title / ♦
☑ Record Name	Record / ♦	- / Title / Record / ♦

Example

- $u100 = ‘TARGET’
  SET_RECIPEFOLDER $u100
  $u110 = 5250H (W)
  $u111 = 444FH (W)
  $u112 = 4355H (W)
  $u113 = 3754H (W)
  WR_RECIPE_FILE PLC1 [D200] $u110

  Not required if SET_FOLDER has already been executed

  50 52 4F 44 55 43 54 37 = PRODUCT7 (ASCII)

  The above program overwrites the PRODUCT7.csv file stored in the TARGET folder with the data at the location starting from PLC1: D200.

Supplemental remarks

- Four consecutive words starting from the address in [F1] are used. Be sure that these words are not already used elsewhere.
- If the CSV file specified in [F1] does not exist, a card read error occurs ($s497 = 16).
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

WR_RECIPE_LINE　WR_RECIPE_LINE F0 F1 F2 F3

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Save to CSV file (line designation)

This macro command is used to save the data at addresses starting from the one specified in [F0] in a specified line, or an additional final line, of the CSV file specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	◎	◎	◎	○
F3	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer source memory	
F1 F1+1 F1+2 F1+3	ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name *1	
F2	1 - 32767: Top line -1: Additional final line*2	1 - 4096: Top line
F3	1 - 32767: Final line -1: Additional final line*2	1 - 4096: Final line

*1 For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.
*2 An additional final line is only saved if “-1” is set for both F2 and F3.

CSV file

Storage target: \(access folder)\RECIPE\(arbitrary folder)
File name: \xxxxxxxx.csv

8 one-byte upper-case alphanumeric characters or less

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

Example

- $u100 = 'TARGET'
  SET_RECIPEFOLDER $u100 — Not required if SET_FOLDER has already been executed
  $u110 = 5250H (W)
  $u111 = 444FH (W)
  $u112 = 4355H (W)
  $u113 = 3754H (W) — 50 52 4F 44 55 43 54 37 = PRODUCT7 (ASCII)
  WD_RECIPE_LINE PLC1 [D200] $u110 3 3

  The above program overwrites line No. 3 in the PRODUCT7.csv file stored in the TARGET folder with the data at the location starting from PLC1: D200.

Supplemental remarks

- Four consecutive words starting from the address in [F1] are used. Be sure that these words are not already used elsewhere.
- If the specified CSV file does not exist, specifying "1" or "–1" for [F2] creates a new file. If [F2] ≠ 1, a card read error ($s497 = 16) occurs.
  However, when [Reverse Definition of Lines/Columns] is checked, use "WR_RECIPE_COLUM" to create a new file.
- When setting "–1" for [F2] and [F3] and adding an additional final line, make sure that the number of lines does not exceed 32767. The macro will not operate correctly on files with more than 32767 lines.
- For the V8 series, the result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

WR_RECIPE_COLUMN WR_RECIPE_COLUMN F0 F1 F2 F3

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Save to CSV file (column designation)

This macro command is used to save the data at the location starting from the address in [F0] to the specified column in the F1-specified CSV file.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	◎	◎	◎	○
F3	◎	◎	◎	○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	☐ Reverse Definition of Lines/ Columns	☑ Reverse Definition of Lines/ Columns
F0	Transfer source memory	
F1	ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name*	
F1+1		
F1+2		
F1+3		
F2	0: Column of record name 1 - 4096: Top column of data	
F3	0: Column of record name 1 - 4096: Final column of data	

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

CSV file

Storage target: \(access folder)\RECIPE\(arbitrary folder)
File name: \xxxxxxxx.csv

8 one-byte upper-case alphanumeric characters or less

The designation of the line numbers in a CSV file differs, depending on the options selected in the [Attribute Setting] dialog. The ♦ mark indicates the position of line No. 1 and column No. 1 in a CSV file.

	☐ Use Title	☑ Use Title
☐ Record Name	♦	Title ♦
☑ Record Name	Record ♦	- Title Record ♦

Example

- $u100 = 'TARGET'
  SET_RECIPEFOLDER $u100 — Not required if SET_FOLDER has already been executed
  $u110 = 5250H (W)
  $u111 = 444FH (W)
  $u112 = 4355H (W)
  $u113 = 3754H (W) — 50 52 4F 44 55 43 54 37 = PRODUCT7 (ASCII)
  WR_RECIPE_COLUMN PLC1 [D300] $u110 5 5

  The above program overwrites column No. 5 in the PRODUCT7.csv file stored in the TARGET folder with the data at the location starting from PLC1: D300.

Supplemental remarks

- Four consecutive words starting from the address in [F1] are used. Be sure that these words are not already used elsewhere.
- If the CSV file specified in [F1] does not exist, a card read error occurs ($s497 = 16).
- When [Reverse Definition of Lines/Columns] is checked, if [F2] = 1 is specified a new CSV file is created.
- For the V8 series, the result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

GET_RECIPE_FILEINFO GET_RECIPE_FILEINFO F0 F1 F2

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: CSV file information

This macro command is used to store the number of lines/columns of the F1-specified CSV file in memory at the address in [F2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎	◎	◎	○
F1	◎	◎	◎	
F2	◎	◎	◎	

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0: Number of lines 1: Number of columns
F1	0000 - 9999: CSV file number designation (RECxxxx.csv) –1 (FFFFH): CSV file name designation (xxxxxxxx.csv)
F1+1	Valid if F1 = –1 ASCII code (8 one-byte upper-case alphanumeric characters): CSV file name*
F1+2	
F1+3	
F1+4	
F2	Information storage memory

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

Example

- CSV file number designation

```
$u100 = 0 (W)        [Line]
$u200 = 1 (W)        [File number]
GET_RECIPE_FILEINFO $u100 $u200 $u300
```

The above program stores the number of lines of the REC0001.CSV file located in the RECIPE folder in memory at $u300.

- CSV file name designation

```
$u400 = 'TEST'                          ] Not required if SET_FOLDER has
SET_RECIPEFOLDER $u400                  ] already been executed
$u100 = 1 (W)        [Column]
$u200 = -1 (W)       [File name]
$u201 = 'SUBDATA'    [File name]
GET_RECIPE_FILEINFO $u100 $u200 $u300
```

The above program reads the number of columns in the SUBDATA.CSV file located in the TEST folder from the attribute setting and stores it in memory at $u300.

Supplemental remarks

- When a CSV file name is specified, the next four consecutive words starting from the address in [F1+1] are used. Be sure that these words are not already used elsewhere.

- If [Use Title] is checked in the [Attribute Setting] dialog, the number of lines to be stored does not include the line of the title.
- If [Use Record Name] is checked in the [Attribute Setting] dialog, the number of columns to be stored does not include the column of the record name.
- In the event of storing the number of columns with [Reverse Definition of Lines/Columns] unchecked or storing the number of lines with [Reverse Definition of Lines/Columns] checked in the [Attribute Setting] dialog, the data is stored based on the readout from the dialog.
- $s990 stores the result of macro execution.

Code (DEC)	Contents
0	Normal
1	F0 parameter invalid
2	F1 parameter invalid
3	F2 parameter invalid
4	F3 parameter invalid
5	Error found during accessing the specified file
6	Unable to process the specified file

- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

4.18 CF Card (Sampling)

SMPL_BAK

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

SMPL_BAK F0 . . . . . With V8/TELLUS3

Function: Save backup (bin file)

This macro command is used to create a backup file for the sampling data in the buffer number specified in [F0] and save it in a “year, month and date” folder in the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 11: Buffer number

File

Storage destination: \access folder\SAMPLE\(year and month folder)\(year, month and date folder)

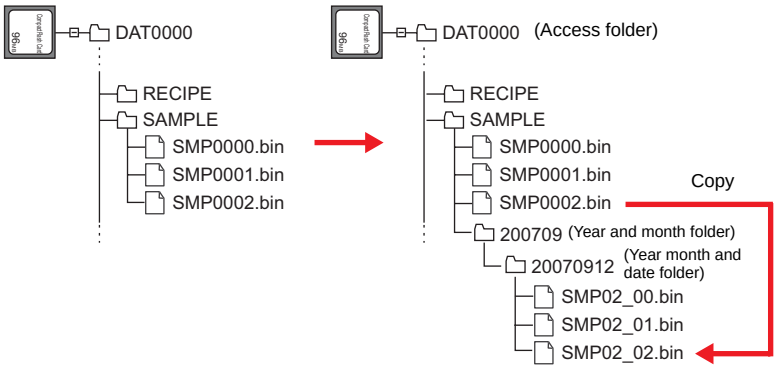
File name: \SMPxx_xx.bin

00 - 99: Backup times

00 - 11: Buffer number

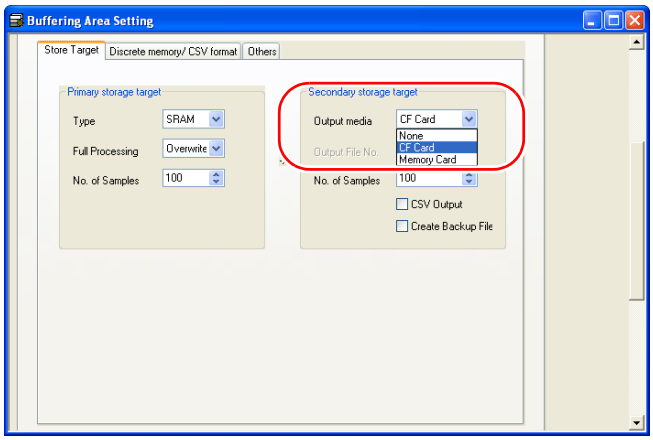
Example

- SMPL_BAK 2
  The above program creates a backup file for buffering area 2 (SMP0002.bin) on September 12, 2007.



Supplemental remarks

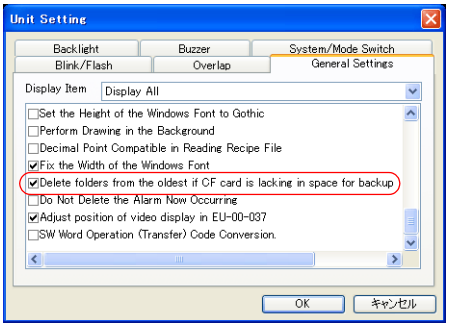
- The macro command is valid when [CF Card] or [Memory Card] is selected for [Secondary storage target] in the [Buffering Area Setting] → [Store Target] tab window.



- Data stored in a primary storage is saved in a backup file after output.
- When data is backed up for the hundredth time under the same date, the last (99th) backed up data is overwritten to save it.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

- The action to be taken associated with an insufficient available space on the CF card is selectable in the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting]).



SMPL_BAK F0 . . . . . .With V7/V608CH/TELLUS2

Function: Save backup (bin file)

This macro command is used to make a backup file of the buffer No. [F0] sampling data and save the file to the year-month-day folder placed on the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 11 : Buffer number

File

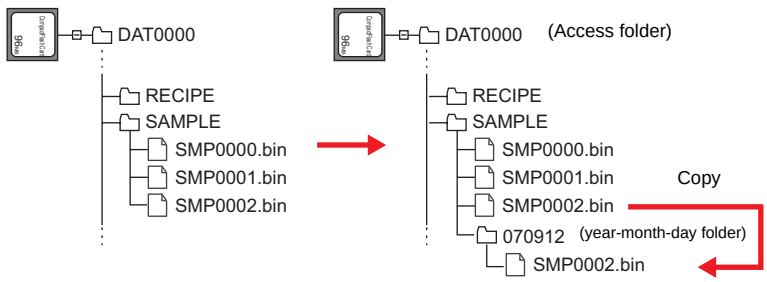
Storage target: \access folder\SAMPLE\year-month-day folder
File name : \SMP xxxx.bin

0000 - 0011: Buffer number

Example

- SMPL_BAK 2

  The above program creates a backup file of buffering area 2 (SMP0002.bin) on September 12, 2007.



Supplemental remarks

- The macro command is valid when [CF Card] is checked under [Store Target] in the [Buffering Area Setting] dialog ([System Setting] → [Buffering Area Setting]).
- When a cache is in use, output from the cache is produced before the backup is saved.
- If the same year-month-day folder already exists, an additional folder named “(date)-n” (“n” in the range of 1 to 9 and A to Z, to be allocated in sequence) will be created.
- If there is already a folder named “(date)-Z”, the existing folders from the first date folder will be overwritten.
- The action to be taken associated with an insufficient available space on the CF card is selectable in the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting]). (V7 series only)

SMPL_CSV

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

SMPL_CSV F0. . . . . .With V8/TELLUS3

Function: Create CSV file

This macro command is used to convert a sampling data in the buffer number specified in [F0] to the CSV format and save it in a “SAMPLE” folder in the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 11: Buffer number

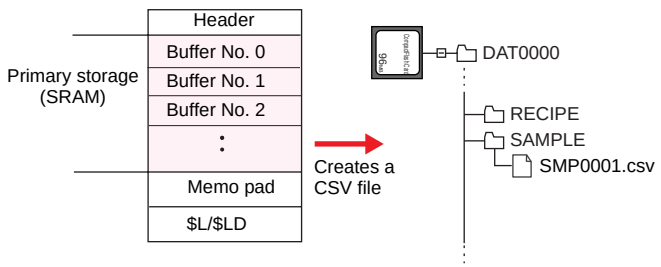
File

Storage target: \(Access folder)\SAMPLE
File name: \SMPxxxx.csv
0000 - 0011: Buffer number

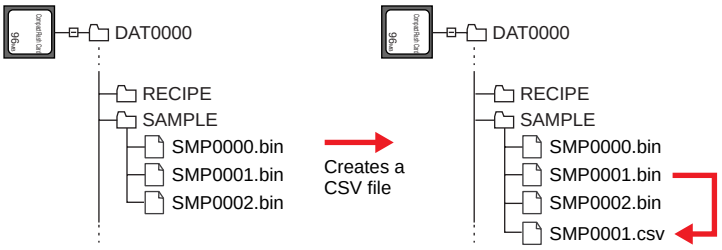
Example

- SMPL_CSV 1
  The above program converts the data in buffering area 1 to the CSV format (SMP0001.CSV) and saves it.

When [SRAM] is selected as the primary storage and [None] is selected for the secondary storage:

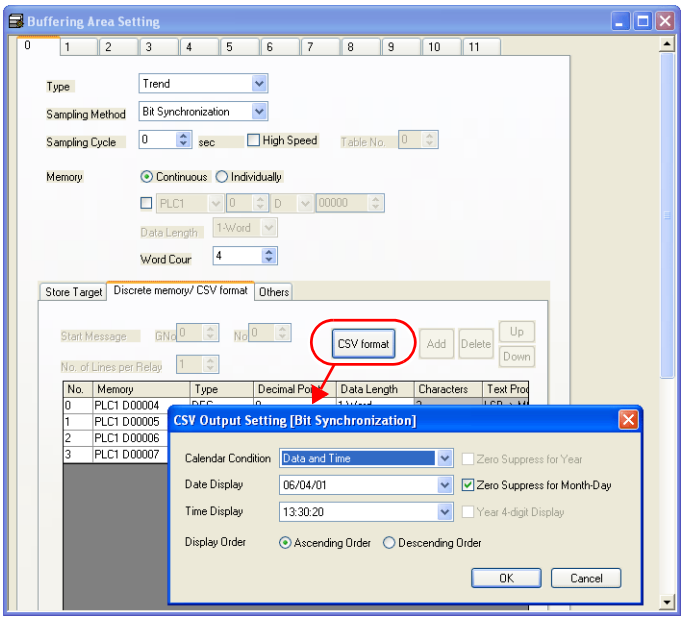


When [SRAM] is selected as the primary storage and [CF Card] is selected for the secondary storage:



Supplemental remarks

- When [CF Card] or [Memory Card] is selected for the secondary storage, data stored in a primary storage is saved as a CSV-format file after output.
- A [CSV format] setting is required for each buffer number.



- If the same file already exists, it will be overwritten.
- If the buffer is empty, no CSV file will be created.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SMPL_CSV F0. . . . . With V7/V608CH/TELLUS2

Function: Create CSV file

This macro command is used to convert the buffer No. [F0] sampling data to the CSV format and save the file to the SAMPLE folder placed on the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 11: Buffer number

File

Storage target: \access folder\SAMPLE
File name: \SMPxxxx.csv

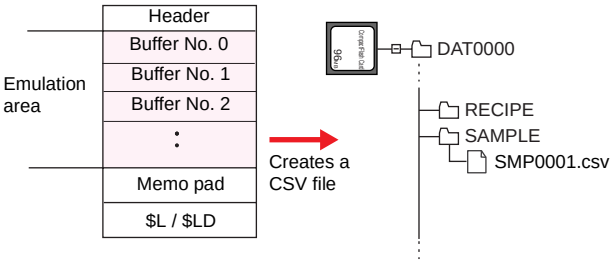
0000 - 0011: Buffer number

Example

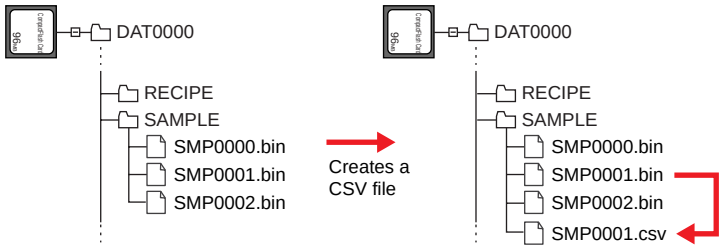
- SMPL_CSV 1

  The above program converts the data of buffering area 1 to the CSV format (SMP0001.CSV) and saves the file.

Store Target: SRAM



Store Target: CF Card



Supplemental remarks

- The macro command is valid when [SRAM/CF Card] is checked under [Store Target] in the [Buffering Area Setting] dialog ([System Setting] → [Buffering Area Setting]).
- Attribute setting is required for each buffer number.
- If the specified file already exists, it will be overwritten.
- If the buffer is empty, no CSV file will be created.

SMPL_CSV2

All V8 models	○
All V7 models	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	

SMPL_CSV2 F0 F1

Function: Create CSV file (file name designation)

This macro command is used to convert the buffering area No. [F0] sampling data to the CSV format under the name [F1] and save the file in the SAMPLE folder placed on the CF card. If the specified file does not exist, a new file will be created.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			○
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 11: Buffering area number
F1	ASCII code (64 one-byte uppercase alphanumerics at the maximum): CSV file name

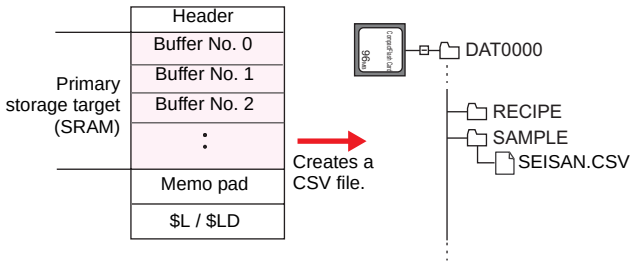
File

Storage target: \access folder\SAMPLE
File name: xxxxxxxx.csv

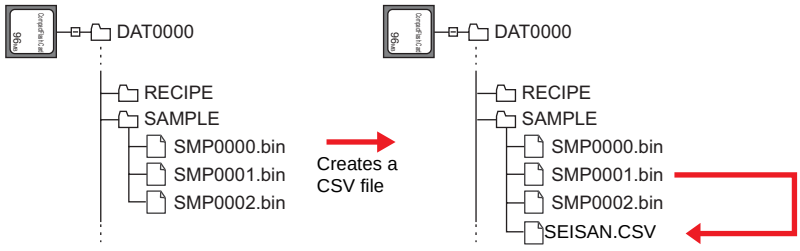
Example

- The file named “SEISAN.CSV” is created from the data in buffering area No. 1.
  $u00100 = ‘SEISAN’ (STRING)
  SMPL_CSV2 1 $u00100
  File name designation
  Buffering area number designation

In the case of [Primary storage target: SRAM] and [Secondary storage target: None]:



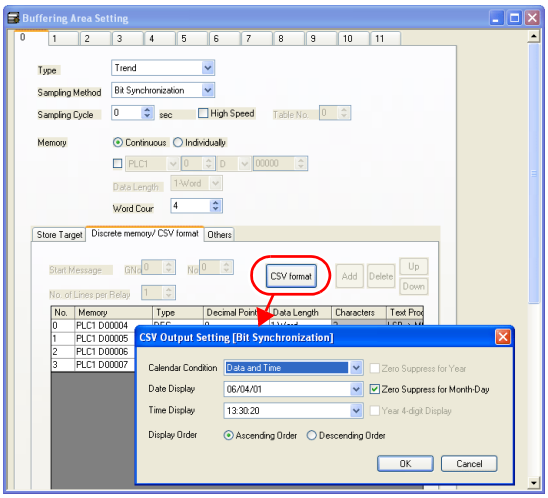
In the case of [Primary storage target: SRAM] and [Secondary storage target: CF Card]:



* If [☐ Insert/Overwrite together with STRING Command] is checked in the [Memory Setting] or [Macro Editing Support] dialog, the macro command STRING can also be registered.
For more information on STRING, refer to page 4-46.

Supplementary remarks

- When the CF card or the memory card is selected as the secondary storage target, the data saved to the primary storage target is output first and then saved as a CSV file.
- The [CSV format] setting must be made for each buffer number.



- If the specified file already exists, it will be overwritten.
- If the buffer is empty, no CSV file will be created.
- A full pathname can be specified for [F1].
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

- These symbols, [\], [/], [:], [*], [?], ["], [<], [>] and [|], are not usable for a file name.

SMPL_SAVE

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

SMPL_SAVE . . . . . .With V8/TELLUS3

Function: Save data stored in the primary storage

This macro command is used to store the sampling data stored in a primary storage (DRAM/SRAM) in a medium (CF card / memory card) serving as the secondary storage, at any required timing.

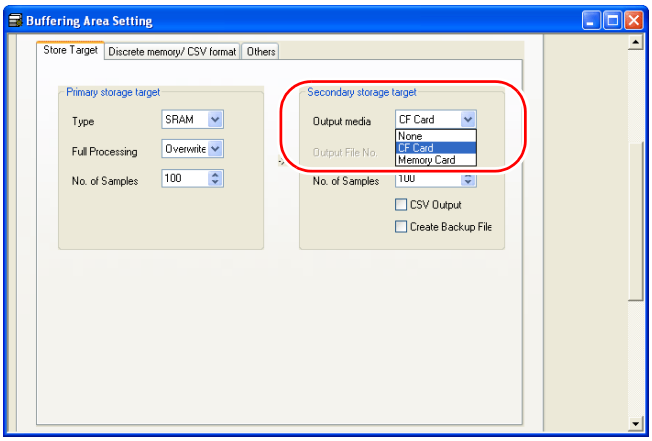
File

Storage target: \access folder\SAMPLE
File name: \SMPxxxx.bin

0000 - 0011: Buffer number

Supplemental remarks

- The macro command is valid when [CF Card] or [Memory Card] is selected for [Secondary storage target] in the [Buffering Area Setting] → [Store Target] tab window.



- Data stored in a primary storage is saved in a backup file after output.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SMPL_SAVE. . . . . .With V7/V608CH/TELLUS2

Function: Save cached data

This macro command is used to save the sampling data in the cache to the CF card at the desired set timing.

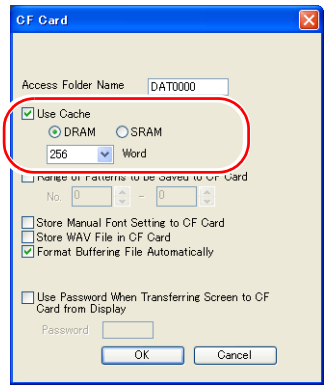
File

Storage target: \access folder\SAMPLE
File name: \SMPxxxx.bin

0000 - 0011: Buffer number

Supplemental remarks

- This macro command is valid on the conditions that [Store Target: CF Card] is checked in the [Buffering Area Setting] dialog and [Use Cache] is checked in the [CF Card] dialog (both dialogs are accessible from [System Setting]).



SMPLCSV_BAK

SMPLCSV_BAK F0 . . . . . .With V8/TELLUS3

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Save backup (CSV file)

This macro command is used to convert a sampling data in the buffer number specified in [F0] to the CSV format and save it in a “year, month and date” folder in the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

Memory	Value
F0	0 - 11: Buffer number

File

Storage destination: \access folder\SAMPLE\(year and month folder)\(year-month and date folder)

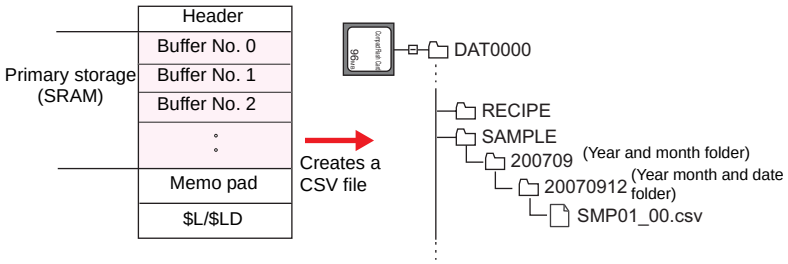
File name: \SMPxx_xx.csv

00 - 99: Backup times
00 - 11: Buffer number

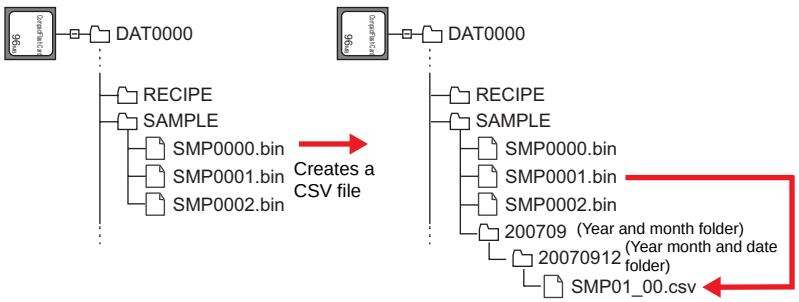
Example

- SMPLCSV_BAK 1
  The above program creates a CSV file for buffering area 1 (SMP0001.bin) on September 12, 2007.

When [SRAM] is selected as the primary storage and [None] is selected for the secondary storage:

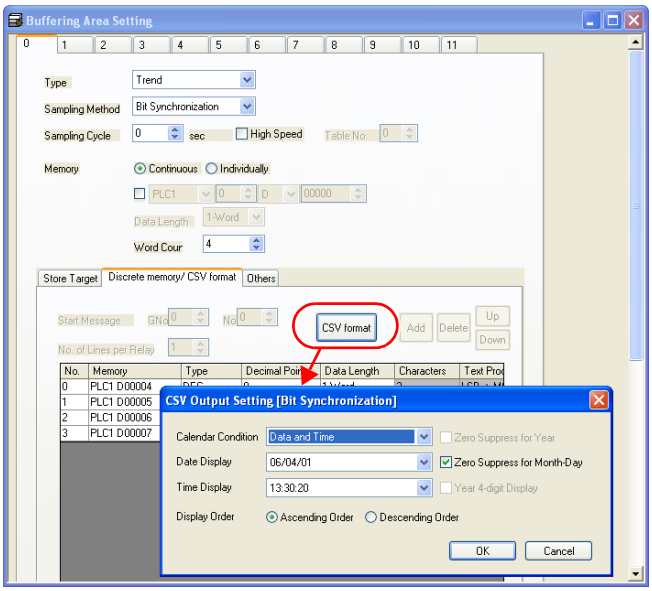


When [SRAM] is selected as the primary storage and [CF Card] is selected for the secondary storage:



Supplemental remarks

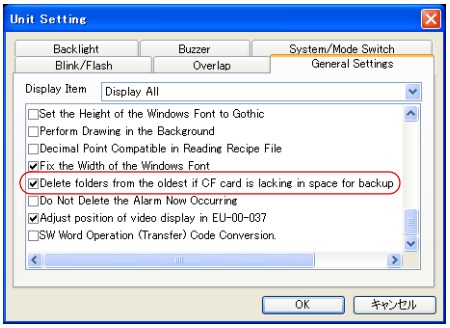
- When [CF Card] or [Memory Card] is selected for the secondary storage, data stored in a primary storage is saved as a CSV-format file after output.
- A [CSV format] setting is required for each buffer number.



- When data is backed up for the hundredth time under the same date, the last (99th) backed up data is overwritten to save it.
- If the buffer is empty, no CSV file will be created.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

- The action to be taken associated with an insufficient available space on the CF card is selectable in the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting]).



SMPLCSV_BAK F0 . . . . . With V7/V608CH/TELLUS2

Function: Save backup (CSV file)

This macro command is used to convert the buffer No. [F0] sampling data to the CSV format and save the file to the year-month-day folder placed on the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

Memory	Value
F0	0 - 11: Buffer number

File

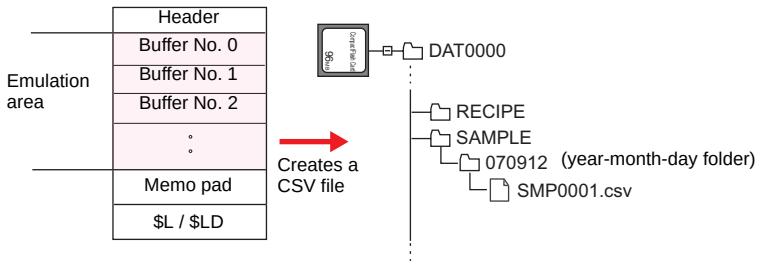
Storage target: \access folder\SAMPLE\year-month-day folder
File name: \SMP xxxx.csv

0000 - 0011: Buffer number

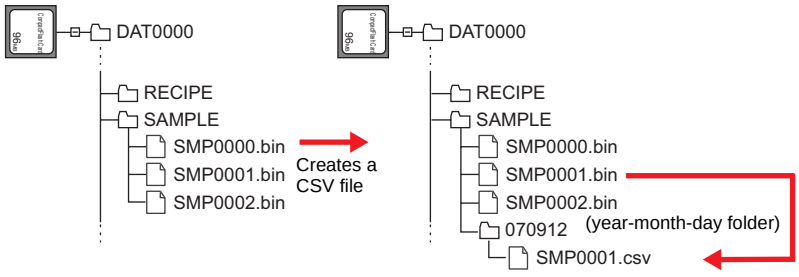
Example

- SMPLCSV_BAK 1
  The above program creates the CSV file of buffering area 1 (SMP0001.bin) in the year-month-day folder on September 12, 2007.

Store Target: SRAM

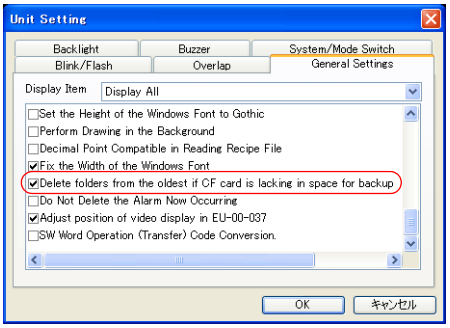


Store Target: CF Card



Supplemental remarks

- The macro command is valid when [SRAM/CF Card] is checked under [Store Target] in the [Buffering Area Setting] dialog ([System Setting] → [Buffering Area Setting]).
- Attribute setting is required for each buffer number.
- If the same year-month-day folder already exists, an additional folder named “(date)-n” (“n” in the range of 1 to 9 and A to Z, to be allocated in sequence) will be created.
- If there is already a folder named “(date)-Z”, the existing folders from the first date folder will be overwritten.
- If the buffer is empty, no CSV file will be created.
- The action to be taken associated with an insufficient available space on the CF card is selectable in the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting]). (V7 series only)



SMPLCSV_BAK2

All V8 models	○
All V7 models	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	

SMPL_CSVBAK2

Function: Create CSV backup file (file name designation)

This macro command is used to convert the buffering area No. [F0] sampling data to the CSV format under the name [F1] and save the file in the year-month-day folder in the SAMPLE folder placed on the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			○
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 11: Buffering area number
F1	ASCII code (64 one-byte uppercase alphanumerics at the maximum): CSV file name

File

Storage target: \access folder\SAMPLE\year-month folder\year-month-day folder
File name: \xxxxxxxx _ xx . csv
00 - 99: Backup count
File name

Example

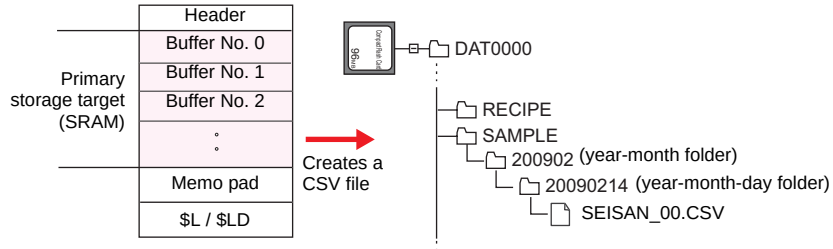
- A CSV file is created for buffering area No. 1 backup.
  February 14, 2009, file name “SEISAN.CSV”

  $u00100 = ‘SEISAN’ (STRING)
  SMPL_CSVBAK2 1 $u00100

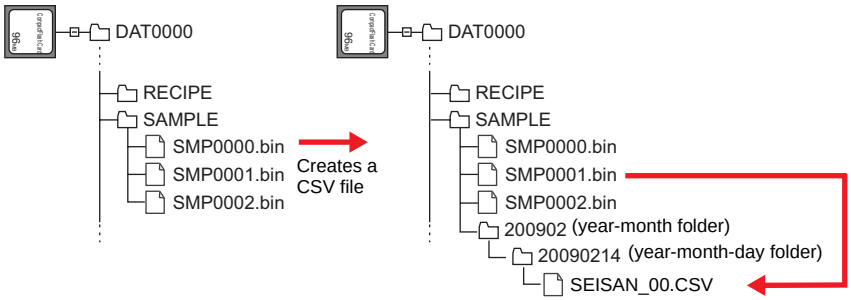
  File name designation
  Buffering area number designation

* If [☐ Insert/Overwrite together with STRING Command] is checked in the [Memory Setting] or [Macro Editing Support] dialog, the macro command STRING can also be registered.
For more information on STRING, refer to page 4-46.

In the case of [Primary storage target: SRAM] and [Secondary storage target: None]:



In the case of [Primary storage target: SRAM] and [Secondary storage target: CF Card]:

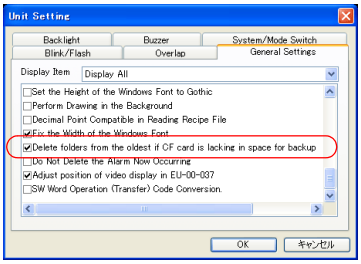


Supplemental remarks

- When the CF card or the memory card is selected as the secondary storage target, the data saved to the primary storage target is output first and then saved as a CSV file.
- The [CSV format] setting must be made for each buffer number. (Refer to page 4-206.)
- If backup is repeated more than 100 times for a file given the same date, the final 99th backup file will be overwritten.
- If the buffer is empty, no CSV file will be created.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

- The action to be taken associated with an insufficient available space on the CF card is selectable in the [General Settings] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting]).



Restrictions

- These symbols, [\], [/], [:], [*], [?], ["], [<], [>] and [|], are not usable for a file name.

4.19 CF Card (Others)

HDCOPY

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	○
TELLUS2 HMI	○

HDCOPY

Function: Hardcopy

This macro command is used to save the image of the screen displayed at the time of the macro execution to the CF card.

Storage target

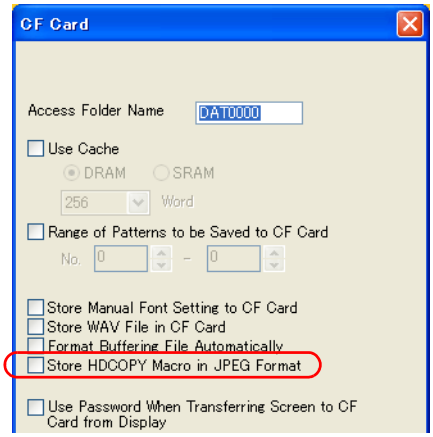
Storage target: \access folder\HDCOPY
File name: \HDxxxx.jpg (V Series : 64k-/32k-/128-color display)
\HDxxxx.bin (V Series : 128-color display)
\HDxxxx.bmp (TELLUS)

0000 - 1023: Screen number

Supplemental remarks

- One file saves one screen. If a screen file you wish to save already exists in the CF card, the file will be overwritten.
- For the V series with 128-color display, the option to select the file format is provided. The file format can be selected in the [CF Card] dialog.

  To go to the option [☐ Store HDCOPY Macro in JPEG Format], select [CF Card Setting] from the [System Setting] menu.



  Unchecked:
  The image is saved as a BIN file.
  When using the file as the image data, convert it to a bitmap file with the CF card manager.
  Checked:
  The image is saved as a JPEG file.

- For the V8 series, the result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

The superimposed image cannot be transparent.

HDCOPY2

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

HDCOPY2 F0

Function: Hardcopy

This macro command is used to save the image of the screen displayed at the time of the macro execution with the backup number specified in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			○

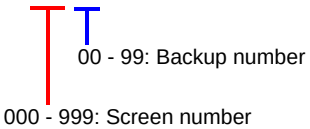
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0 - 99: Backup number

Storage target

Storage target: \(access folder)\HDCOPY
File name: \HDxxx-yy.jpg (V Series : 64k-/32k-/128-color display)
\HDxxx~yy.bin (V Series : 128-color display)
\HDxxx~yy.bmp (TELLUS)



00 - 99: Backup number

000 - 999: Screen number
(Screen Nos. 1000 - 1023 invalid)

Supplemental remarks

- With the use of backup numbers, a maximum of 100 hardcopy images can be saved per screen. You can, therefore, view time-series variations in these images.
- For the V series with 128-color display, the option to select the file format is provided. The file format can be selected in the [CF Card] dialog. Refer to page 4-215.
- For the V8 series, the result of macro execution is stored in $s1062. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

The superimposed image cannot be transparent.

HDCOPY3

All V8 models	○
All V7 models	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	

HDCOPY3

Function: Hardcopy (file name designation)

This macro command is used to save the screen image (JPEG) displayed at the time of the macro execution, under the file name [F0], to the CF card.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	ASCII code (64 one-byte uppercase alphanumerics at the maximum): CSV file name

File

Storage target: \access folder\HDCOPY
File name: \xxxxxxxx.JPG (V Series : 64K-/32K-/128-color display)
\xxxxxxxx.BIN (V Series : 128-color display)
\xxxxxxxx.BMP (TELLUS)

File name

Example

- The file named “SCREEN10.JPG” is created.
  $u00100 = ‘SCREEN10’ (STRING)
  HDCOPY3 $u00100

  Designation of a file name

  * If [☐ Insert/Overwrite together with STRING Command] is checked in the [Memory Setting] or [Macro Editing Support] dialog, the macro command STRING can also be registered. For more information on STRING, refer to page 4-46.

Supplemental remarks

- One file saves one screen. If a screen file you wish to save already exists on the CF card, the file will be overwritten.
- If 128-color display is selected for the V8 series, the format of the file to be stored can be selected. When selecting a file format, click [System Setting] → [CF Card Setting] and go to [☐ Store HDCOPY Macro in JPEG Format]*.
  * If this option is unchecked, the BIN format is adopted for file saving. For using a BIN file as image data, conversion into bitmap by the CF Card Manager is required.
- A full pathname can be specified for [F0].
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

Restrictions

- These symbols, [\], [/], [:], [*], [?], ["], [<], [>] and [|], are not usable for a file name.
- The superimposed image cannot be transparent.

SET_DRIVE

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	
TELLUS2 HMI	

SET_DRIVE F0

Function: Select drive

This macro command is used to select the CF card drive when the CF card is accessed by a macro command.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Drive name specification* A: USB-FDD drive B: (Not used) C: Built-in CF card drive D: Memory drive connected to a USB port

* The drive name must be followed by a colon.
For details on text processing of the drive name, refer to “Supplemental remarks” on page 4-185.

Example

- $u0010 = ‘D:’
  SET_DRIVE $u0010

  The above program switches access to the D drive (memory drive connected to a USB port).

Supplemental remarks

- If the drive name specification is illegal, no operation takes place.
- For the V8 series, the result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

- A drive change due to this macro command occurs only when any recipe macro command is executed.
  No drive change will be made for sampling data storage and macro commands other than that which is recipe-related.
- After the drive has been changed with this command, files under the “access folder name” set with [System Setting] → [CF Card Setting] are accessed. To change the folder to be accessed for a recipe-related macro, use a “ SET_RECIPEFOLDER” command (page 4-182).

COPY_FILE

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

COPY_FILE F0 F1

Function: Copy file

This macro command is used to copy the file specified in [F0] to the file specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

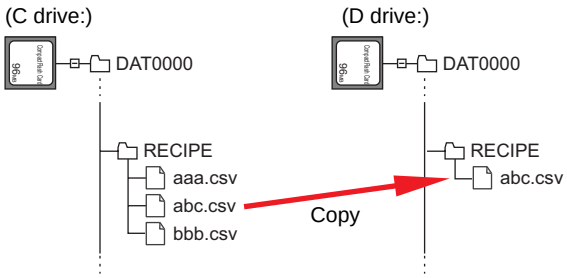
	Value
F0	Full path name of the copy source*
F1	Full path name of the copy destination*

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

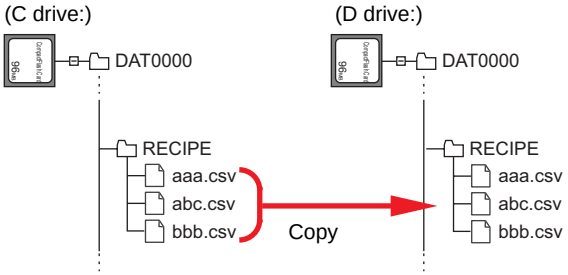
Example

- Operation 1
  The program below copies “C:\DAT0000\RECIPE\abc.csv” to “D:\DAT0000\RECIPE\abc.csv”.

  - $u00100 = ‘C:\DAT0000\RECIPE\abc.csv’
    $u00200 = ‘D:\DAT0000\RECIPE\’
    COPY_FILE $u00100 $u00200



- Operation 2
  The program below copies all files stored in “C:\DAT0000\RECIPE\” to “D:\DAT0000\RECIPE\”.
  - $u00100 = ‘C:\DAT0000\RECIPE*.*’
    $u00200 = ‘D:\DAT0000\RECIPE\’
    COPY_FILE $u00100 $u00200



Supplemental remarks

- When an asterisk “*” is specified for the copy source filename (F0) or extension name, all of the files or files with all extensions are copied. The contents of subfolders are also copied.
- If the filename of the copy destination (F1) is omitted, the data is copied to the same filename.
- If the full path name is illegal, no operation takes place.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

MOVE_FILE

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

MOVE_FILE F0 F1 F2

Function: Move file

This macro command is used to move the file or folder [F0] to the path [F1]. File renaming is also possible.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1	○			
F2	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

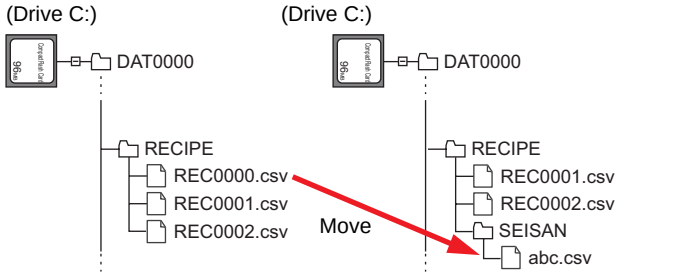
Setting range

	Value	Remarks
F0	Source full pathname (within 255 alphanumerics)*	Drive designation A: USB-FDD drive B: (not used) C: Built-in CF card drive D: Memory connected to USB port
F1	Target full pathname (within 255 alphanumerics)*	
F2	0 fixed	

* For details on text processing of the file name, refer to “Supplemental remarks” on page 4-185.

Example

- Movement from “C:\DAT0000\RECIPE\REC0000.csv” to “C:\DAT0000\RECIPE\SEISAN\abc.csv”:
  $u00100 = ‘C:\DAT0000\RECIPE\REC0000.csv’
  $u00200 = ‘C:\DAT0000\RECIPE\SEISAN\abc.csv’
  MOVE_FILE $u00100 $u00200



* The file “REC0000.csv” is deleted.

Supplemental remarks

- If an illegal full pathname is specified, this macro command does not work. An error will result.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

- In the case of a read-only file movement between drives, the file is copied to the target location, and the file at the original location is not deleted.
- A folder to be moved is allowed to contain a maximum of 5 hierarchical levels under the folder. If files or folders at further lower levels exist under the folder, the folder and the files/folders placed under it are copied to the target location, but those at the original location are not deleted.

Restrictions

- Use alphanumerics to specify full pathnames as the source and the target. If any characters other than alphanumerics are used, the function of this macro command is not assured.
- Wildcard characters (such as “*” and “?”) cannot be used for full pathnames as the source and the target.

READ_FILE

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

READ_FILE F0 F1 F2 F3

Function: Read universal file

This macro command is used to read the file [F0] in binary format and to store the obtained data in memory [F1] and after.
It is also possible to acquire the size of the file [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1	◎			
F2	○			
F3	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value		Remarks
	File read	File size acquisition	
F0	Source full pathname (within 255 alphanumerics)		Drive designation A: USB-FDD drive B: (not used) C: Built-in CF card drive D: Memory connected to USB port
F1	Storage memory	0 fixed	
F2	0 - 10485760 bytes: Size	0 fixed	DEC
F2+1			
F2+2	0 - 10485760 bytes: Offset from the top of the file	0 fixed	DEC
F2+3			
F2+4	0 fixed		
F3	Read data size storage memory (Data size successfully read)	File size storage memory	
F3+1			

: ← V series (return data)

Example

- File read
  The file “ABC.DAT” is read from its 11th byte by 512 bytes into $u1000 - $u1255.

```
$u00100 = ‘C:\DAT0000\ABC\ABC.DAT’   [Source full pathname]
$u00200 = 512 (D)                    [Size]
$u00202 = 10 (D)                     [Offset]
$u00204 = 0 (W)                      [0 fixed]
READ_FILE $u00100 $u01000 $u00200 $u00300
```

- File size acquisition
  The size of the file “ABC.DAT” is read into $u300.

```
$u00100 = ‘C:\DAT0000\ABC\ABC.DAT’     [Source full pathname]
$u00200 = 0 (D)                        [0 fixed]
$u00202 = 0 (D)                        [0 fixed]
$u00204 = 0 (W)                        [0 fixed]
READ_FILE $u00100 $u01000 $u00200 $u00300
```

Supplemental remarks

- If any characters other than alphanumerics are used to specify a source full pathname, this macro command may not work normally. Be sure to use alphanumerics.
- Wildcard characters (such as “*” and “?”) cannot be used for a full pathname as the source.
- If the file specified as the source does not exist, an error will result.
- If an illegal full pathname is specified, this macro command does not work. An error will result.
- In the event of an error during file reading, the data having been read is stored in memory. However, the size of the data does not affect the successfully read data size in [F3] and [F3+1].
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

WRITE_FILE

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

WRITE_FILE F0 F1 F2

Function: Write to universal file

This macro command is used to write the data from memory [F1] and after in binary format to the file [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1	◎			
F2	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value			Remarks
	New creation	Overwriting	Addition	
F0	Target full pathname			Drive designation A: USB-FDD drive B: (not used) C: Built-in CF card drive D: Memory connected to USB port
F1	Source memory			
F2	0 fixed	1 fixed	2 fixed	
F2+1	0 - 10485760 bytes: Size			DEC
F2+2				
F2+3	0 fixed	0 - 10485760 bytes: Offset from the top of the file	0 fixed	
F2+4				
F2+5	0 fixed			

Example

- New creation
  The 512 bytes of data in $u1000 - $u1255 is written to the new file “ABC.DAT” created in the folder “ABC”.

```
$u00100 = ‘C:\DAT0000\ABC\ABC.DAT’   [Target full pathname]
$u00200 = 0 (W)                      [0: New creation]
$u00201 = 512 (D)                    [Size]
$u00203 = 0 (D)                      [0 fixed]
$u00205 = 0 (W)                      [0 fixed]
WRITE_FILE $u00100 $u01000 $u00200
```

- Overwriting
  The 33rd byte and after in the existing file “ABC.DAT” is overwritten with the 16 bytes of data in $u1000 - $u1007.

```
$u00100 = ‘C:\DAT0000\ABC\ABC.DAT’    [Target full pathname]
$u00200 = 1 (W)                       [1: Overwriting]
$u00201 = 16 (D)                      [Size]
$u00203 = 32 (D)                      [Offset]
$u00205 = 0 (W)                       [0 fixed]
WRITE_FILE $u00100 $u01000 $u00200
```

- Addition
  The 512 bytes of data in $u1000 - $u1255 is added to the existing file “ABC.DAT”.

```
$u00100 = ‘C:\DAT0000\ABC\ABC.DAT’    [Target full pathname]
$u00200 = 2 (W)                       [2: Addition]
$u00201 = 512 (D)                     [Size]
$u00203 = 0 (D)                       [0 fixed]
$u00205 = 0 (W)                       [0 fixed]
WRITE_FILE $u00100 $u01000 $u00200
```

Supplemental remarks

- If the name of a new file you intend to create is already used, delete the existing file first and create a new file.
- If the size specified with [F2+1] and [F2+2] is zero for a new file, an empty file will be created.
- If the file you specified for overwriting or data addition does not exist, an error will result.
- Wildcard characters (such as “*” and “?”) cannot be used for a full pathname as the target, to which data is written.
- If an illegal full pathname is specified, this macro command does not work. An error will result.
- In the event of an error during writing to a file, the data having been written remains in the file.
- The result of macro execution is stored in $s1062.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

4.20 Real No. Arithmetical Operation

F_ADD(+)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

F0 = F1 + F2 (F)

Function: Real number addition

This macro command is used to write the result of [F1] real number data plus [F2] real number data to [F0].

DWORD

	F1+1	F1
+	F2+1	F2
	F0+1	F0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

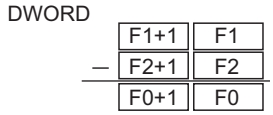
F_SUB(-)

F0 = F1 - F2 (F)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Real number subtraction

This macro command is used to write the result of [F1] real number data minus [F2] real number data to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

F_MUL(X)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

F0 × F2 (F)

Function: Real number multiplication

This macro command is used to write the result of [F1] real number data multiplied by [F2] real number data to [F0].

DWORD

	F1+1	F1
×	F2+1	F2
	F0+1	F0

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

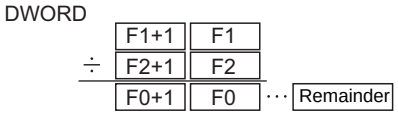
F_DIV(/)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

F0 = F1 / F2 (F)

Function: Real number division

This macro command is used to write the result of [F1] real number data divided by [F2] real number data to [F0].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			○
F2	◎			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
3	Calculation operation error
–1	Execution error

4.21 Real No. Statistics

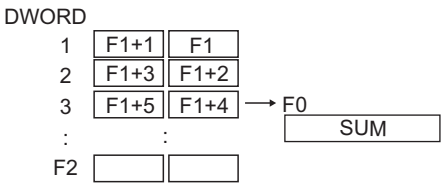
F_SUM

F0 = F_SUM (F1 C:F2) (F)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Sum of real number data

This macro command is used to sum the real number data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	0 - 512

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

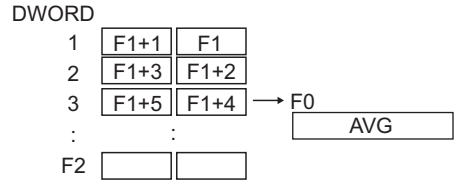
F_AVG

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

F0 = F_AVG (F1 C:F2) (F)

Function: Average of real number data

This macro command is used to average the real number data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	0 - 512

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

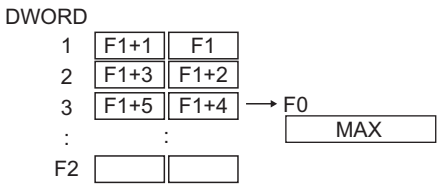
F_MAX

F0 = F_MAX (F1 C:F2) (F)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Maximum of real number data

This macro command is used to find the maximum of the real number data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	0 - 512

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

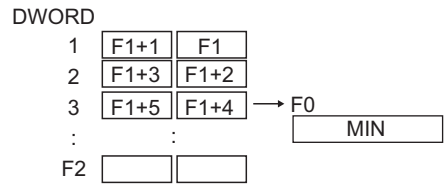
F_MIN

F0 = F_MIN (F1 C:F2) (F)

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Minimum of real number data

This macro command is used to find the minimum of the real number data at the location starting from the address specified in [F1] and write the result to [F0]. The data count is specified in [F2].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	IEEE 32-bit single precision real number
F1	
F2	0 - 512

Supplemental remarks

- For more information on the IEEE 32-bit single precision real numbers, refer to the V8 Series Reference Manual.
- For the V8 series, the result of macro execution is stored in $s1056. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
1	Overflow
2	Underflow
–1	Execution error

4.22 Others

;(Comment)

; (Comment)

All models	○

Function: Comment

This is treated as a comment line. No command processing is required.

BRIGHT

V815X	○
V812S	○
V810S	○
V810T	○
V810C	○
V808S	○
V808C	○
V806T	○
V806C	
V806M	
V808CH	○ *
V715X	○
V712S	○
V710S	○
V710T	○
V710C	○
V708S	○
V708C	
V706T	○
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	○
V606eM	○
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

BRIGHT F0

Function: Brightness adjustment

This command is used to change the brightness of the TFT display to the level specified in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	V8/V7 series	V606e
F0	0: Bright ⋮ 127: Dark	0: Dark ⋮ 127: Bright

Supplemental remarks

- With the V7 or V8 series, the current brightness is output to $s956.
  With the model V606e, however, the output mentioned above is not available.
- When the macro command is executed, communication will pause for several hundred milliseconds to allow for saving the setting value to the FROM.
  Avoid the frequent use of the macro command.
- Continued use at a low brightness will somewhat shorten the backlight life.
- If MONITOUCH set to a low brightness is turned off, the backlight may not light up at the next power-on.
- For the V8 series, the result of macro execution is stored in $s1063.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

* For the model V808CH, this macro command is valid for the hardware version “b” and later and the system program version 1.670 and later.

GET_MSGBLK

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

GET_MSGBLK F0 F1

Function: Message acquisition

This macro command is used to store the [F1]-specified message (text) in [F0] memory using ASCII/shifted JIS codes.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1	○			○

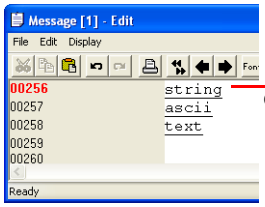
○: Setting enabled (indirect designation disabled) ◎: Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Storage memory
F1	0 - 32767: Message No.

Example

- $u00050 = 256 (W)
  GET_MSGBLK $u00100 $u00050



GET_MSGBLK

$u100	7	4	7	3	HEX	ts
$u101	6	9	7	2	HEX	ir
$u102	6	7	6	E	HEX	gn
$u103	0	0	0	0	HEX	Null code

The above program stores message No. 256 (= GNo. 1 and line No. 0) in memory at $u100 and after using shifted JIS codes.

Supplemental remarks

- Regardless of the [Text Process] setting on the [Communication Setting] tab window in the [Device Connection Setting] dialog for PLC1, the data is stored in memory in the [LSB → MSB] sequence.
- A null code is added to the end. Even-number-byte text thereby uses one extra word.
- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

PLC_ULR

All V8 models	○
All V7 models	○
All V6 models	○
TELLUS3 HMI	○
TELLUS2 HMI	○

PLC_ULR F0 F1

Function: Read user log

This macro command is used to read the user log of the PLC with the port number / CPU number specified in [F0] of the PLC1 into the address specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			
F1	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

		Value		Remarks
Memory information definition	F0	Higher-order	01 - 1F: Port number	Setting required only for 1:n connection
		Lower-order	00 : CPU No.1 01 : CPU No.2 02 : CPU No.3 03 : CPU No.4	
	F0+1	−1: Reading the number of user log registrations 0: Reading the most recent user log 1 - 63: Reading user log No. n		
Reading the number of registrations	F1	Number of registrations (decimal)		Stored also in the special register Z105
	F1+1			
Log read	F1	0: Normal −1: Error		"−1" to be stored if no data exists in the user log specified in F0 or a communication error occurs
	F1+1	Year (ASCII)		
	F1+2	Month (ASCII)		
	F1+3	Day (ASCII)		
	F1+4	Hour (ASCII)		
	F1+5	Minute (ASCII)		
	F1+6	Second (ASCII)		
	F1+7	Main code (decimal)		
	F1+8	Sub-code (decimal)		

:← V series (Return data)

Example

If a user log reading results in “05/10/19 11 : 20 : 34 +1 +23”, its format for storage is as the following:

	Storage format
m+0	0
m+1	3530HEX (= 05DEC)
m+2	3031HEX (= 10DEC)
m+3	3931HEX (= 19DEC)
m+4	3131HEX (= 11DEC)
m+5	3032HEX (= 20DEC)
m+6	3433HEX (= 34DEC)
m+7	1DEC
m+8	23DEC

Supplemental remarks

- The macro command is valid only when Yokogawa’s FA-M3xxx is selected as the PLC1.
- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

RECONNECT

All V8 models	○
All V7 models	○
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	○
V606eM	○
V609E	
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

RECONNECT F0

Function: Multi-drop reconnection (PLC1)

This macro command is used to establish a connection again to the ports specified in [F0] or the sub ports specified in [F0+1] when a multi-drop connection is set at the PLC1.
When "−1" is specified for [F0], reconnection with all ports is established, and when "−1" is specified for [F0+1], reconnection with all sub ports is established.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	0 - 255: PLC port number	−1: All port numbers designation
F0+1	0 - 255: PLC sub-port number	−1: All sub-port numbers designation

Supplemental remarks

- This command is only valid when a multi-drop connection (1:n) is set at PLC1. To re-establish a connection other than with PLC1, use a " RECONNECT_EX" command (page 4-241).
- The macro command is used in the event of a communication fault.
- Reconnection with the specified port is performed only once.
- When reconnection is successful, the "interrupted" information in system memory ($s114 to 159) and 8-way communication memory ($p[1] : 10 to 25) in the PLC1 are cleared.
- For the V8 series, the result of macro execution is stored in $s1063.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

RECONNECT_EX

RECONNECT_EX PLC F0 F1

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Reconnection

This macro command is used to establish a connection again with the port number [F1] or the sub-port number [F1+1] specified in [F0] of the PLC.
When "−1" is specified for [F1], reconnection with all ports is established, and when "−1" is specified for [F1+1], reconnection with all sub ports is established.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○
F1	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	1 - 8: PLC number	
F1	0 - 255: PLC port number	−1: All port numbers designation
F1+1	0 - 255: PLC sub-port number	−1: All sub-port number designation

Supplemental remarks

- The macro command is used in the event of a communication fault.
- Reconnection with the specified port and the specified sub-port is performed only once.
- When reconnection is successful, the "interrupted" information in 8-way communication memory ($p[F0] : 10 to 25) in the PLC is cleared. For the PLC1, the "interrupted" information in system memory ($s114 to 129) is also cleared at the same time.
- For the V8 series, the result of macro execution is stored in $s1063.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SAMPLE

SAMPLE F0 F1 F2

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	

Function: Sampling data acquisition

This macro command is used to store the sampling data specified in [F2] of the sampling buffer number specified in [F1] at the address specified in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	○			
F2	○			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

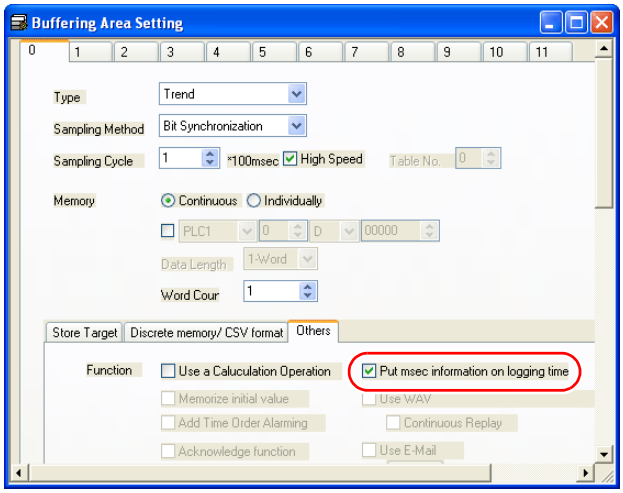
	Value		
F0	Storage memory		
F1	0: Cursor specification 1: Buffer specification		
F1+1	([F1] = 0)	([F1] = 1)	
	0: Base 1 - 3: Overlap ID No.	0 - 11: Buffer No.	
F1+2	0 - 255: ID No. of the item displayed	Not used	
F2	0: Acquisition of sampling data 1: Acquisition of average / maximum / minimum / total data 2: Acquisition of alarm data		
F2+1	([F2] = 0)	([F2] = 1)	([F2] = 2)
	0: With no time data 1: With time data	0 - : Word No.	Not used

1. Acquiring sampling data (with no time data)
   - When [F1] = 0
     When an item of the specified sampling is selected (the cursor is displayed), the data at the cursor position is stored.
     When an item of the specified sampling is not displayed (the cursor is not displayed), the most recent sampling data is stored.
   - When [F1] = 1
     The most recent sampling data is stored.
   - Specify the sampling data to be acquired in [F1+1] and [F1+2].
   - Set “0” for [F2] and [F2+1].
   - The following data is stored in the [F0] memory.

Memory	Contents	Word Count
F0	Sampling data (1)	1
F0+1	Sampling data (2)	1
F0+2	Sampling data (3)	1
:	:	:
F0 + (sampling word count – 1)	Sampling data (sampling word count)	1

* When the [Type] setting for the specified buffering area is other than [Trend], no operation takes place.

2. Acquiring sampling data (with time data)
   - When [F1] = 0
     When an item of the specified sampling is selected (the cursor is displayed), the data at the cursor position is stored.
     When an item of the specified sampling is not displayed (the cursor is not displayed), the most recent sampling data is stored.
   - When [F1] = 1
     The most recent sampling data is stored.
   - Specify the sampling data to be acquired in [F1+1] and [F1+2].
   - Set “0” for [F2] and “1” for [F2+1].
   - The data stored in the [F0] memory differs according to whether the [Put msec infomation on logging time] checkbox on the [Others] tab window in the [Buffering Area Setting] dialog is checked or unchecked.



- When [Put msec infomation on logging time] is unchecked:

Memory	Contents	Word Count
F0	Sampling time (Greenwich data)	2
F0+2	Sampling data (1)	1
F0+3	Sampling data (2)	1
:	:	:
F0 + (2 + sampling word count – 1)	Sampling data (sampling word count)	1

- When [Put msec infomation on logging time] is checked:

Memory	Contents	Word Count
F0	Sampling time (Greenwich data)	2
F0+2	Sampling time in msec (0 - 999)	1
F0+3	Sampling data (1)	1
F0+4	Sampling data (2)	1
:	:	:
F0 + (3 + sampling word count – 1)	Sampling data (sampling word count)	1

* When the [Type] setting for the specified buffering area is other than [Trend], no operation takes place.

3. Acquiring average / maximum / minimum / total data
   - Specify the sampling data to be acquired in [F1+1] and [F1+2].
   - Set “1” for [F2].
   - Set the number of words for [F2+1].
   - The following data is stored in the [F0] memory.

Memory	Contents	Word Count
F0	Average	2
F0+2	Maximum	2
F0+4	Minimum	2
F0+6	Total	2
F0+8	Result of overflow 0: No overflow 1: Overflow occurred	1

   * If the [Type] setting for the specified buffering area is other than [Trend], or the [Use a Calculation Operation] checkbox on the [Other] tab window in the [Buffering Area Setting] dialog is unchecked, no operation takes place.

4. Acquiring alarm information
   - Specify the sampling data to be acquired in [F1+1] and [F1+2].
   - Set “2” for [F2].
   - The following data is stored in the [F0] memory.

Memory	Contents	Word Count
F0	Automatic operation time	2
F0+2	Automatic operation stop time	2
F0+4	Program stop time	2
F0+6	Number of stops	1
F0+7	Rate of operation	1

   * When the [Type] setting is other than [Alarm] and the [Sampling Method] setting is other than [Alarm Tracking], no operation takes place.

Supplemental remarks

- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SEARCH_FILE

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

SEARCH_FILE F0 F1

Function: JPEG file search

This macro command is used to search for JPEG file numbers in the SNAP/JPEG folder stored in the CF card based on the specified increments and store the result in memory at the address in [F0].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	◎			
F1	◎			

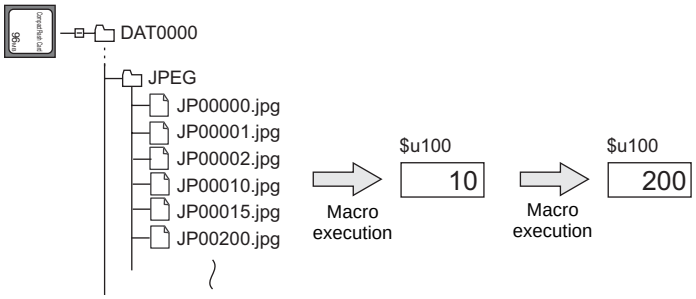
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	Search result (file number) storage memory
F1	0: Searches the JPEG folder for JPxxxxx.jpg file 1: Searches the SNAP folder for VDxxxxx.jpg file
F1+1	0 - 32767: Search start file number
F1+2	−32767 - 32767: Increments

Example

- $u200 = 0 (W) [JPEG folder search]
  $u201 = 0 (W) [Search start file No. 0]
  $u202 = 10 (W) [Increments 10]
  SEARCH_FILE $u100 $u200
  $u201 = $u100 (W)



Supplemental remarks

- The macro command is valid even if no JPEG display item exists on the screen.
- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

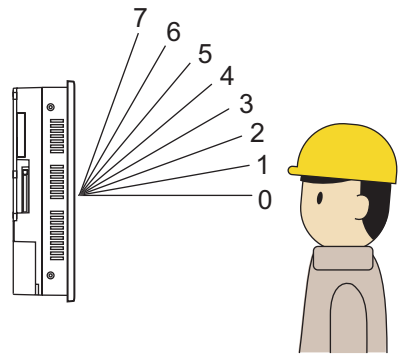
ADJ_ANGLE

All V8 models	
V715X	
V712S	
V710S	
V710T	
V710C	○
V708S	
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

ADJ_ANGLE F0

Function: Adjust viewing angle

This macro command is used to change the viewing angle adjustment value to the one specified in [F0].



* The default is “0”.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

Memory	Value
F0	0 - 7: Viewing angle adjustment value

Supplemental remarks

- The macro command is valid for V710C only.
- To save the ADJ_ANGLE setting to the V series, use SAVE _ANGLE. When the V series is turned off without executing the SAVE_ANGLE command following the ADJ_ANGLE command, the viewing angle is reset to the one that was valid before the execution of the ADJ_ANGLE command.
- $s958 stores the current viewing angle adjustment value 0 - 7.
- In addition to the macro command, the function switch is also available to adjust the viewing angle.

SAVE_ANGLE

All V8 models	
V715X	
V712S	
V710S	
V710T	
V710C	○
V708S	
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

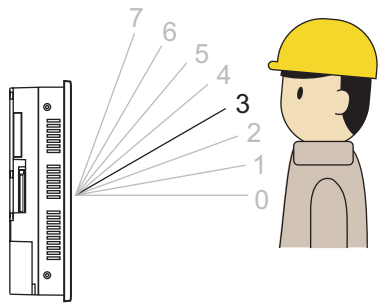
SAVE_ANGLE

Function: Save viewing angle adjustment value

This macro command is used to store the viewing angle adjustment value set by the ADJ_ANGLE command in the FROM.

Example

Adjusting the viewing angle suitable for operation in position 3



* The default is “0”.

1. Execute a macro ADJ_ANGLE 3.
2. Execute a macro SAVE_ANGLE.

Supplemental remarks

- The macro command is valid for V710C only.
- When the SAVE_ANGLE command is executed, the communication (serial, Ethernet) is temporarily interrupted. Do not execute the SAVE_ANGLE command frequently.

ADJ_VOLUME

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	
V710S	
V710T	
V710C	
V708S	
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

ADJ_VOLUME F0 F1 F2

Function: Volume adjustment

This macro command is used to change the volume of the channel specified in [F0] to the value specified in [F1]/[F2].

	Volume adjustment value	Volume
High	7	0dB
↑	6	-3dB
↑	5	-6dB
↑	4	-9dB
↑	3	-12dB
↑	2	-15dB
↑	1	-18dB
Low	0	-21dB

* The default is “4” (−9 dB).

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0	○			○
F1	○			○
F2	○			○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

Memory	Value
F0	0: L channel 1: R channel 2: Both channels L and R
F1	0 - 7: Volume adjustment for L channel
F2	0 - 7: Volume adjustment for R channel

Supplemental remarks

- This command is valid only for the V8 series and V715X.
- To save the ADJ_VOLUME setting to the V series, use SAVE _VOLUME. When the V series is turned off without executing the SAVE_VOLUME command following the ADJ_VOLUME command, the viewing angle is reset to the one that was valid before the execution of the ADJ_VOLUME command.
- The current volume adjustment value (0 - 7) for the L channel is stored in $s1001. The current volume adjustment value (0 - 7) for the R channel is stored in $s1002.
- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SAVE_VOLUME

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	
V710S	
V710T	
V710C	
V708S	
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

SAVE_VOLUME

Function: Save volume adjustment value

This macro command is used to save the volume adjustment value set by the “ADJ_VOLUME” command in FROM.

Example

- ADJ_VOLUME 2 6 6
  SAVE_VOLUME

  The above program sets the volume for both L and R channels to 6.

Supplemental remarks

- This command is valid only for the V8 series and V715X.
- When the SAVE_VOLUME command is executed, the communication (serial, Ethernet) is temporarily interrupted. Do not execute the SAVE_VOLUME command frequently.
- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

TREND REFRESH TREND REFRESH F0 F1

All models	○

Function: Trend sampling

The macro command is used to refresh the display of trend sampling specified in [F0] and [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F0				○
F1				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	0: Base 1: Overlap ID 0 2: Overlap ID 1 3: Overlap ID 2
F1	0 - 255: ID

Supplemental remarks

- The macro command is valid for trend sampling only.
- If memory addresses are specified in trend sampling settings for [Graph Min. Value] and [Graph Max. Value], and [Scale: Max.] and [Scale: Min.], refreshing the trend sampling display is required each time data at any of these addresses varies.
- For the V8 series, the result of macro execution is stored in $s1063. When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (SET_SCRN) F1

Function: Screen number designation

This macro command is used to display the screen specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	SET_SCRN
F1	0 - 1023: Screen number

Example

- $u100 = 55 (W) [Screen number]
  SYS (SET_SCRN) $u100

  The above program displays screen No. 55.

Supplemental remarks

- If a screen number that does not exist is specified in [F1], the macro command is disabled.
- The macro command is invalid in screen OPEN, screen CLOSE, overlap library OPEN, overlap library CLOSE, and initial macros.
- The macro command is valid only once in a macro created on the macro edit sheet. Its execution timing is set at the end of the macro on the edit sheet.
- Do not execute the macro command in every cycle using a CYCLE macro or an event timer macro.
- For the V8 series, the result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

SYS (SET_MOVLP) F1

All models	○

Function: Multi-overlap/global overlap setting

This macro command is used to display the overlap library specified in F1+1 on the overlap ID in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	Dot (unit: 4 × 1)	Line/column (unit 8 × 20)
F0	SET_MOVLP	
F1	0 - 3: Overlap ID	
F1+1	0 - 1023: Overlap library number	
F1+2	0 - 1023: X coordinate	0 - 127: X coordinate
F1+3	0 - 767: Y coordinate	0 - 38: Y coordinate

Example

- $u100 = 2 (W) [Overlap ID]
  $u101 = 12 (W) [Overlap library number]
  $u102 = 50 (W) [X coordinate]
  $u103 = 5 (W) [Y coordinate]
  SYS (SET_MOVLP) $u100

  Line/Column:
  The above program displays overlap ID2 and overlap library No. 12 at the coordinates X: 400 and Y: 100.

  Dot:
  The above program displays overlap ID2 and overlap library No. 12 at the coordinates X: 48* and Y: 5.
  * Since four dots are treated as one unit on the X axis, any value in the range of “48” to “51” on the axis is regarded as “48”.

Supplemental remarks

- The macro command is valid when [Internal] is checked under [Designate] in the [Multi-Overlap] or [Global Overlap Setting] dialog.
- If [F1]>3, the macro command is disabled.
- If an overlap library number specified in [F1+1] does not exist, the macro command is disabled.
- If the specified X and Y coordinates are outside the permissible ranges, the display appears in the lower right corner of the screen.
- The macro command is invalid in a screen CLOSE macro and an initial macro.
- The macro command is valid only once in a macro created on the macro edit sheet for each overlap ID. Its execution timing is set at the end of the macro on the edit sheet.
- Use the OVLP_SHOW command to turn off the multi-overlap or global overlap.
- Do not execute the macro command in every cycle using a CYCLE macro or an event timer macro.

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All models	○

SYS (OVLP_SHOW) F1

Function: Overlap ON/OFF

This macro command is used to show/hide the overlap ID specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	OVLP_SHOW
F1	0 - 3: Overlap ID
F1+1	0: OFF (non-display) 1: ON (display)

Example

- $u100 = 2 (W) [Overlap ID]
  $u101 = 0 (W) [OFF]
  SYS (OVLP_SHOW) $u100

  The above program turns off overlap ID2.

- $u100 = 2 (W) [Overlap ID]
  $u101 = 1 (W) [ON]
  SYS (OVLP_SHOW) $u100

  The above program turns on overlap ID2.

Supplemental remarks

- If [F1]>3, the macro command is disabled.
- If F1+1 = 0, the macro command is valid for normal, call-, multi-, and global ([Designate]: [Internal]) overlaps.
- The macro command is invalid in screen CLOSE, overlap library CLOSE and initial macros.
- The macro command is valid only once in a macro created on the macro edit sheet for each overlap ID. Its execution timing is set at the end of the macro on the edit sheet.
- Do not execute the macro command in every cycle using a CYCLE macro or an event timer macro.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All models	○

SYS (OVLP_POS) F1

Function: Overlap relocation

This macro command is used to move the overlap ID specified in [F1] to the coordinates X in [F1+1] and Y in [F1+2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	Dot (unit: 4 × 1)	Line/column (unit 8 × 20)
F0	OVLP_POS	
F1	0: Overlap ID 0 1: Overlap ID 1 2: Overlap ID 2 3: Overlap ID 3	
F1+1	0 - 1023: X coordinate	0 - 127: X coordinate
F1+2	0 - 767: Y coordinate	0 - 38: Y coordinate

Example

- $u100 = 2 (W) [Overlap ID]
  $u101 = 50 (W) [X coordinate]
  $u102 = 5 (W) [Y coordinate]
  SYS (OVLP_POS) $u100

  Line/Column:
  The above program moves overlap ID2 to coordinates X: 400 and Y: 100.

  Dot:
  The above program moves overlap ID2 to coordinates X: 48* and Y: 5.
  * Since four dots are treated as one unit on the X axis, any value in the range of “48” to “51” on the axis is regarded as “48”.

Supplemental remarks

- If [F1]>3, the macro command is disabled.
- In the event of a normal or a call-overlap, the macro command is enabled also to display the overlap.
- The X and Y coordinates specified by the macro command take effect until the screen is switched. If OVLP_SHOW is executed after OVLP_POS, the overlap appears at the coordinates specified by OVLP_POS.
- The macro command is invalid in screen OPEN, screen CLOSE, overlap library CLOSE and initial macros.
- The macro command is valid only once in a macro created on the macro edit sheet for each overlap ID. Its execution timing is set at the end of the macro on the edit sheet.
- Do not execute the macro command in every cycle using a CYCLE macro or an event timer macro.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (GET_MSG) F1

Function: Message acquisition

This macro command is used to store the F1-specified message in memory at the $u address in F1+1 using ASCII/shifted JIS codes.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

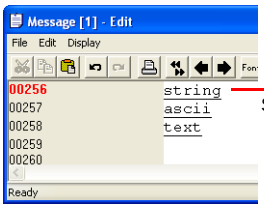
Setting range

	Value	
	V8/V7	V6
F0	GET_MSG	
F1	0 - 32767: Message number	0 - 6143: Message number
F1+1	0 - 16383: Storage memory No.	
$u[F1+1] ⋮	Shifted JIS/ASCII 50 words maximum	

:← V series (Return data)

Example

- $u50 = 256 (W) [Message number]
  $u51 = 100 (W) [Storage memory No.]
  SYS (GET_MSG) $u50



SYS(GET_MSG)

$u100	7	3	7	4	HEX	ts
$u101	7	2	6	9	HEX	ir
$u102	6	E	6	7	HEX	gn
$u103	0	0	0	0	HEX	Null code

The above program stores message No. 256 (= GNo. 1 and line No. 0) in memory at $u100 and after using shifted JIS codes.
The above program shows the case when [MSB → LSB] is selected for [Text Process] on the [Communication Setting] tab window in the [Device Connection Setting] dialog for the PLC1.

Supplemental remarks

- Swap between the higher-order byte and the lower-order byte can be set by selecting an option for [Text Process] on the [Communication Setting] tab window in the [Device Connection Setting] dialog.
- Regardless of the setting above, use a “ GET_MSGBLK” command (page 4-237) for storing data by [LSB → MSB].
- A null code is added to the end. Even-number-byte text thereby uses one extra word.

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

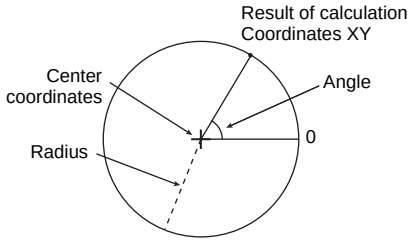
SYS

SYS (GET_XY) F1

All models	○

Function: Acquisition of X and Y coordinates on circumference

This macro command is used to calculate X and Y coordinates from a radius, an angle and, center coordinates.



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

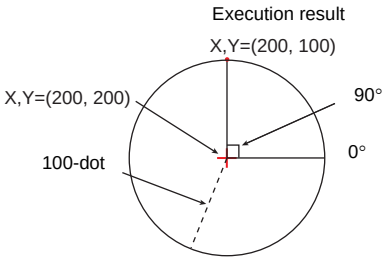
	Value
F0	GET_XY
F1	0 or above: Radius
F1+1	0 to 3600: Angle (0.1-degrees)
F1+2	0 or above: Center coordinate X
F1+3	0 or above: Center coordinate Y
F1+4	0 or above: X coordinate
F1+5	0 or above: Y coordinate

:← V series (Return data)

Example

- $u100 = 100 (W) [Radius]
  $u101 = 900 (W) [Angle]
  $u102 = 200 (W) [X coordinate of the center]
  $u103 = 200 (W) [Y coordinate of the center]
  SYS (GET_XY) $u100

  On the circumference of a circle 100 dots in radius with the center at coordinates X: 200 and Y: 200, the above program calculates the X and Y coordinates of the point at an angle of 90 degrees.
  X coordinate: $u104 = 200
  Y coordinate: $u105 = 100



Supplemental remarks

- If a value specified for the angle is 3,600 or above, the value is corrected to the remainder as the result of division by 3,600.

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All V8 models	○
All V7 models	○
All V6 models	○
TELLUS3 HMI	△
TELLUS2 HMI	△

SYS (SET_BZ) F1

Function: Buzzer control

This macro command is used to control the buzzer of MONITOUCH.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	SET_BZ	
F1	0: Normal 1: Error 2: Sound change	
F1+1	0: Standard 1: Short 2: None 3: Continuous*	Setting required if F1 = 2

* Incompatible with TELLUS versions 2 and 3

Example

- $u100 = 2 (W) [Sound change]
  $u101 = 2 (W) [None]
  SYS (SET_BZ) $u100

  The above program turns off the MONITOUCH buzzer.

Supplemental remarks

- The [Buzzer] tab window setting in the [Unit Setting] dialog ([System Setting] → [Unit Setting] → [Buzzer]) takes effect only at the time of initial connection of MONITOUCH.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (GET_TIME) F1

Function: System time acquisition

This macro command is used to acquire values from the timer that increments by one at 10-ms intervals after power-on.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	GET_TIME
F1	0 - 4294967295 (×10 msec)
F1+1	

:← V series (Return data)

Example

- SYS(GET_TIME) $u100
  The above program acquires the time that has elapsed after power-on.

  $u100 = 27900 (W)
  279000 msec = 279 sec = 4 minutes 39 seconds

Supplemental remarks

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (STA_TIME) F1

SYS (CHK_TIME) F1

Function: Timer setting

STA_TIME starts the timer. CHK_TIME confirms a time-out.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

- STA_TIME

	Value	Remarks
F0	STA_TIME	
F1	Time-out flag 0: Counting 1: Time-out	
F1+1	0: Timer type 0	F1 = 1: Stops the timer
	1: Timer type 1	F1 = 1: Updates the timer start time
F1+2	0 - 65535: Time-out time	×10 ms
F1+3	Timer start time	

:← V series (Return data)

- CHK_TIME
  For [F1], use the same memory as for STA_TIME.

Example

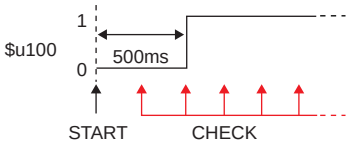
<Timer type 0>

- OPEN macro
  $u101 = 0 (W) [Timer type]
  $u102 = 50 (W) [Time-up time]
  SYS (STA_TIME) $u100

  The above program starts the timer type 0, for which a 500-ms time-out period is set.
  $u103 =current time and $u100=0 are set.

- CYCLE macro
  SYS (CHK_TIME) $u100

  $u100 = 0
  ↓ Lapse of 500 ms
  $u100 = 1 (W)
  (End)

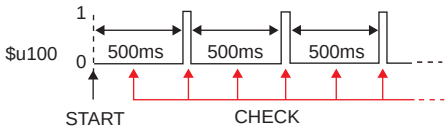


<Timer type 1>

- OPEN macro
  $u101 = 1 (W) Timer type
  $U102 = 50 (W) Time-up time
  SYS (STA_TIME) $u100

  The above program starts the timer type 1, for which a 500-ms time-out period is set.
  $u103 =current time and $u100=0 are set.

- CYCLE macro
  SYS (CHK_TIME) $u100
  IF ($u100! = 0) LB 0
  RET
  LB0
  $u200 = $u200+1 (W)
  RET



  $u100 = 0
  ↓ Lapse of 500 ms
  $u100 = 1 and $u200 = 1 are set.
  ↓
  $u103 =current time and $u100=0 are set.
  ↓ Lapse of 500 ms
  $u100 = 1 and $u200 = 2 are set.
  ↓
  (Repetition)

Supplemental remarks

- The timer base is set to 10 ms.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All models	○

SYS (GET_CLND) F1

Function: Calendar acquisition

This macro command is used to acquire the values of the system calendar.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	GET_CLND	
F1	0 or above:	Year (4-digit)
F1+1	1 - 12:	Month
F1+2	1 - 31:	Day
F1+3	0 - 23:	Hour
F1+4	0 - 59:	Minute
F1+5	0 - 59:	Second
F1+6	0: 1: 2: 3: 4: 5: 6:	Sunday Monday Tuesday Wednesday Thursday Friday Saturday

:← V series (Return data)

Example

- SYS (GET_CLND) $u100

$u100 = 2005
$u101 = 7
$u102 = 15
$u103 = 15
$u104 = 25
$u105 = 41
$u106 = 5

[July 15, 2005 Friday 15:25:41]

Supplemental remarks

- The calendar is acquired not from a PLC or other external device but from the V series unit.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All V8 models	○
All V7 models	○
All V6 models	○
TELLUS3 HMI	
TELLUS2 HMI	

SYS (SET_CLND) F1

Function: Calendar setting

This macro command is used to set the values of eight words starting from the address specified in [F1] to the system calendar. When MONTOUCH is connected with PLC1 including the calendar function, this macro command also sets the PLC1's calendar.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	SET_CLND	
F1	0 or above: Year (4-digit/2-digit)	
F1+1	1 - 12: Month	
F1+2	1 - 31: Day	
F1+3	0 - 23: Hour	
F1+4	0 - 59: Minute	
F1+5	0 - 59: Second	
F1+6	Day of the week	Invalid; to be automatically calculated by MONITOUCH
F1+7	0 - 31: PLC port number	For 1:n connection only

Example

- $u100 = 2005 (W)
  $u101 = 7 (W)
  $u102 = 15 (W)
  $u103 = 15 (W)
  $u104 = 0 (W)
  $u105 = 0 (W)
  [July 15, 2005 Friday 15:00:00]
  SYS (SET_CLND) $u100

  The above program sets the calendars in the V series and the PLC1 to July 15, 2005 on Friday at 15:00:00.

Supplemental remarks

- When setting calendar data for PLC 2 to 8, use a macro command " PLC_CLND" (page 4-148).
- When setting calendar data only for the V series, use a macro command " SYS (SET_SYS_CLND) F1" (page 4-296).
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

SYS (SET_BUFNO) F1

All models	○

Function 1: Trend sampling/data sampling

This macro command is used to store the average, maximum, minimum, and total of sampling buffer word Nos. 0 - 31 located in the F1-specified buffer in system memory at $s180 - 435.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	SET_BUFNO
F1	0 - 11: Buffer number
$s180 - 181	Buffer word No. 0 Average
$s182 - 183	Buffer word No. 0 Maximum
$s184 - 185	Buffer word No. 0 Minimum
$s186 - 187	Buffer word No. 0 Total
$s188 - 195	Buffer word No. 1 Average/maximum/minimum/total
$s196 - 203	Buffer word No. 2 Average/maximum/minimum/total
$s204 - 211	Buffer word No. 3 Average/maximum/minimum/total
$s212 - 219	Buffer word No. 4 Average/maximum/minimum/total
$s220 - 227	Buffer word No. 5 Average/maximum/minimum/total
$s228 - 235	Buffer word No. 6 Average/maximum/minimum/total
$s236 - 243	Buffer word No. 7 Average/maximum/minimum/total
$s244 - 251	Buffer word No. 8 Average/maximum/minimum/total
$s252 - 259	Buffer word No. 9 Average/maximum/minimum/total
$s260 - 267	Buffer word No. 10 Average/maximum/minimum/total
$s268 - 275	Buffer word No. 11 Average/maximum/minimum/total
$s276 - 283	Buffer word No. 12 Average/maximum/minimum/total
$s284 - 291	Buffer word No. 13 Average/maximum/minimum/total
$s292 - 299	Buffer word No. 14 Average/maximum/minimum/total
$s300 - 307	Buffer word No. 15 Average/maximum/minimum/total
$s308 - 315	Buffer word No. 16 Average/maximum/minimum/total
$s316 - 323	Buffer word No. 17 Average/maximum/minimum/total
$s324 - 331	Buffer word No. 18 Average/maximum/minimum/total
$s332 - 339	Buffer word No. 19 Average/maximum/minimum/total
$s340 - 347	Buffer word No. 20 Average/maximum/minimum/total
$s348 - 355	Buffer word No. 21 Average/maximum/minimum/total
$s356 - 363	Buffer word No. 22 Average/maximum/minimum/total
$s364 - 371	Buffer word No. 23 Average/maximum/minimum/total
$s372 - 379	Buffer word No. 24 Average/maximum/minimum/total
$s380 - 387	Buffer word No. 25 Average/maximum/minimum/total
$s388 - 395	Buffer word No. 26 Average/maximum/minimum/total

	Value
$s396 - 403	Buffer word No. 27 Average/maximum/minimum/total
$s404 - 411	Buffer word No. 28 Average/maximum/minimum/total
$s412 - 419	Buffer word No. 29 Average/maximum/minimum/total
$s420 - 427	Buffer word No. 30 Average/maximum/minimum/total
$s428 - 435	Buffer word No. 31 Average/maximum/minimum/total

:← V series (Return data)

Example

- $u100 = 5 (W) [Buffer number]
  SYS (SET_BUFNO) $u100

  The above program stores the average, maximum, minimum and total of buffer words located in buffer No. 5 in memory at $s180 to 435.

Supplemental remarks

- The macro command is valid when [Use a Calculation Operation] is checked on the [Others] tab window in the [Buffering Area Setting] dialog. If the option is checked for two or more buffers, the buffer given the smallest number is selected as default.
- The macro command does not work if no display area exists on the screen.
- Sampling buffer word Nos. 32 to 127 are not available with the macro command.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

Function 2: Alarm function

This macro command is used to store the information on the alarm function in the F1-specified buffer in memory at $s436 - 443.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	SET_BUFNO
F1	0 - 11: Buffer number
$s436 - 437	Automatic operation time
$s438 - 439	Automatic operation stop time
$s440 - 441	Program stop time
$s442	Number of stops
$s443	Rate of operation XX.X

:← V series (Return data)

Example

- $u100 = 4 (W) [Buffer number]
  SYS (SET_BUFNO) $u100

  The above program stores the information on the alarm function in buffer No. 4 in memory at $s436 - 443.

Supplemental remarks

- The macro command is valid when [Alarm Tracking] is selected for [Sampling Method] in the [Buffering Area Setting] dialog.
- For more information on each data item, refer to the V8 Series Reference Manual.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
-1	Execution error

SYS

All V8 models	○
All V7 models	○
All V6 models	○
TELLUS3 HMI	○
TELLUS2 HMI	○

SYS (GET_SMPL) F1

Function: Sampling data acquisition

This macro command is used to store the data on the specified sampling number located in the specified buffer in memory at the $u address in F1+2.

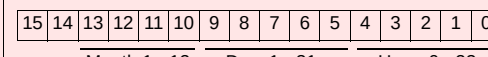
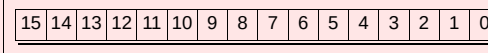
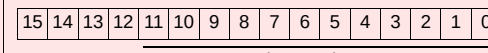
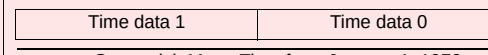
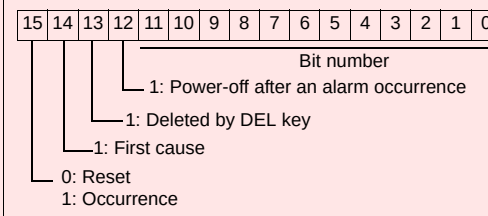
Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

		Value
F0		GET_SMPL
F1		0 - 11: Buffer number
F1+1		0 or above: Sample number
F1+2		0 - 16383: Storage memory No. n
Bit synchronization/Constant sampling/ Device memory map	$u n	Time data 0 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Month 1 - 12 / Day: 1 - 31 / Hour: 0 - 23
	$u n+1	Time data 1 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Minutes & seconds (unit: seconds) [Time data 1] ÷ [60] = [A] remainder [B] [A] : minutes [B] : seconds
	$u n+2 $u n+3 :	Sampling data (maximum number of buffer words: 128 words)
Alarm logging	$u n	Time data 0 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Month 1 - 12 / Day: 1 - 31 / Hour: 0 - 23
	$u n+1	Time data 1 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Minutes & seconds (unit: seconds)
	$u n+2	Sampling bit number 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0: OFF 1: ON Bit number

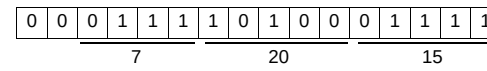
		Value
Time order alarming	$u n	Time data 0 
	$u n+1	Time data 1 
	$u n+2	Sampling relay number 
Alarm tracking	$u n	Time data 0
	$u n+1	Time data 1 
	$u n+2	Sampling bit information 

:← V series (Return data)

Example

- $u100 = 3 (W) [Buffer number]
  $u101 = 0 (W) [Sample number]
  $u102 = 200 (W) [Storage memory]
  SYS (GET_SMPL) $u100

  The above program stores the sampling information on sampling No. 0 located in buffer No. 3 in memory at $u200.
  In the case of time order alarming:
  $u200 = 1E8F $_{HEX}$
  $u201 = 06B4 $_{HEX}$
  $u202 = 0002 $_{HEX}$
  20 July, 15:28:36 relay No. 2 ON



Supplemental remarks

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All models	○

SYS (GET_SCUR) F1

Function: Cursor point acquisition

This macro command is used to store the sampling number and the cursor address associated with the sampling data being displayed.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	GET_SCUR	
F1	0: Base 1: Overlap ID 0 2: Overlap ID 1 3: Overlap ID 2	
F1+1	0 - 255 : ID	
F1+2	0: Cursor non-display	The most recent information to be stored in F1+3 and F1+4
	1: Cursor display	The cursor information to be stored in F1+3 and F1+4
F1+3	0 or above: Sample number	Used by GET_SMPL
F1+4	0 or above: Cursor address	Sampling number comparison*

:← V series (Return data)

* Whether or not the acquired sampling number is the same as that previously acquired is checked.
Even if the sampling number remains the same, any change in the cursor address means that the data to be fetched has also changed.
Contrary, even if the sampling number has changed, no change in the cursor address means that the data to be accessed also remains the same.

Example

- $u100 = 0 (W) [Base]
  $u101 = 1 (W) [ID]
  SYS (GET_SCUR) $u100

  The above program acquires the cursor point of the sampling data (ID 1) on the base screen.

  $u102 = 1 [Cursor being displayed]
  $u103 = 28 [Sample number]
  $u104 = 39 (W) [Cursor address]

Supplemental remarks

- The macro command is valid when [Bit Synchronization], [Constant Sampling], or [Device Memory Map] is selected for [Sampling Method].
- If the sampling number is “5” at the time of the execution of GET_SCUR, the sampling count (numerical data display) on the screen shows “6”.
  This results from the fact that the cursor point starts from “0” and the sampling count (numerical data display) starts from “1”.

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (GET_BUF) F1

Function: Alarm mask information acquisition

This macro command is used to access message numbers that are set to no storage in memory from the message group specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
	V8/V7	V6
F0	GET_BUF	
F1	0 - 127: Message GNo.	0 - 23: Message GNo.
F1+1	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 15 — Line No. 0	
F1+2	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 31 — Line No. 16	
F1+3	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 47 — Line No. 32	
F1+4	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 63 — Line No. 48	
F1+5	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 79 — Line No. 64	
F1+6	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 95 — Line No. 80	
F1+7	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 111 — Line No. 96	
F1+8	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 127 — Line No. 112	
F1+9	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 143 — Line No. 128	

	Value	
	V8/V7	V6
F1+10	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 159 — Line No. 144	
F1+11	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 175 — Line No. 160	
F1+12	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 191 — Line No. 176	
F1+13	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 207 — Line No. 192	
F1+14	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 223 — Line No. 208	
F1+15	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 239 — Line No. 224	
F1+16	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Line No. 255 — Line No. 240	

:← V series (Return data)

Example

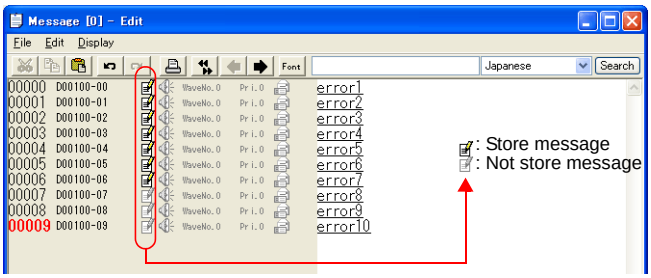
- $u100 = 3 (W) [Message GNo.]
  SYS (GET_BUF) $u100

  The above program accesses messages that are set to no storage in memory from the message group No. 3.

  $u101 = F005 $_{HEX}$ [Message No. 0, 2, 15]
  $u102 = 0001 $_{HEX}$ [Message No. 16]
  :

Supplemental remarks

- Whether or not to store messages in memory is selected in the [Message Edit] window.
  From the [Display] menu, select [Alarm]. Click the desired icons in the window.



- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

SYS (DSP_DATA) F1

All models	○

Function: Show/hide numerical data display

This macro command is used to show/hide numerical data displays placed in the specified location (ID).

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	DSP_DATA
F1	0: Base 1: Overlap ID 0 2: Overlap ID 1 3: Overlap ID 2 4: Data block No. 0 5: Data block No. 1 6: Data block No. 2 7: Data block No. 3
F1+1	0 - 255: ID
F1+2	0: Not display 1: Display

Example

- $u100 = 0 (W) [Base]
  $u101 = 1 (W) [ID]
  $u102 = 0 (W) [Not display]
  SYS (DSP_DATA) $u100

  The above program hides all numerical data displays of ID 1 on the base screen.

Supplemental remarks

- The macro command is valid for numerical data displays only. It cannot be used for character and message displays.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (CHG_DATA) F1

Function: Change numerical data display property

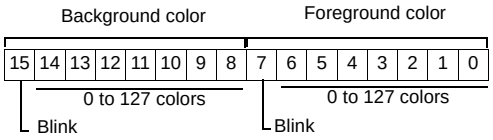
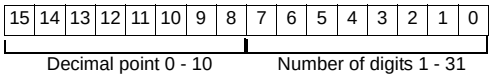
This macro command is used to change the properties of the numerical data displays placed in the specified location (ID).

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	CHG_DATA
F1	0: Base 1: Overlap ID 0 2: Overlap ID 1 3: Overlap ID 2 4: Data block No. 0 5: Data block No. 1 6: Data block No. 2 7: Data block No. 3
F1+1	0 - 255: ID
F1+2	0: Without signs 1: With signs 2: With sign (+) 3: HEX 4: OCT 5: BIN
F1+3	Color  Color / Code (HEX): Black 00; Blue 01; Red 02; Magenta 03; Green 04; Cyan 05; Yellow 06; White 07
F1+4	Decimal point and number of digits 

Example

The above program changes the properties of the numerical data display of ID1 placed on the base screen.

- Type: HEX
- Background color: Black
- Foreground color: Green
- Decimal Point: None
- Number of digits: 5

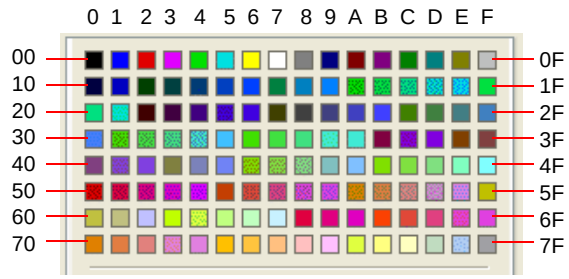
```
$u200 = 0 (W)        [Base]
$u201 = 1 (W)        [ID]
$u202 = 0 (W)        [Not display]
SYS (DSP_DATA) $u200

$u100 = 0 (W)        [Base]
$u101 = 1 (W)        [ID]
$u102 = 3 (W)        [Type]
$u103 = 0004H (W)    [Color]
$u104 = 0005H (W)    [Decimal point and number of digits]
SYS (CHG_DATA) $u100 macro execution

$u200 = 0 (W)        [Base]
$u201 = 1 (W)        [ID]
$u202 = 1 (W)        [Display]
SYS (DSP_DATA) $u200
```

Supplemental remarks

- The macro command is valid for numerical data displays only. It cannot be used for character and message displays.
- When using this macro command, be sure to execute the command DSP_DATA to redisplay the data. For more information on DSP_DATA, refer to page 4-276.
- Even on MONITOUCH with 32k- or 64k-color display, 128 colors + blink ([Custom Color] → [Palette 1]) are available with the macro command.
- 128-color codes
  The boxes on the palette are provided with their individual codes.



- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	○
V608CH	
TELLUS3 HMI	○
TELLUS2 HMI	○

SYS (STA_LIST) F1

Function: Data sheet print

This macro command is used to print data sheets.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

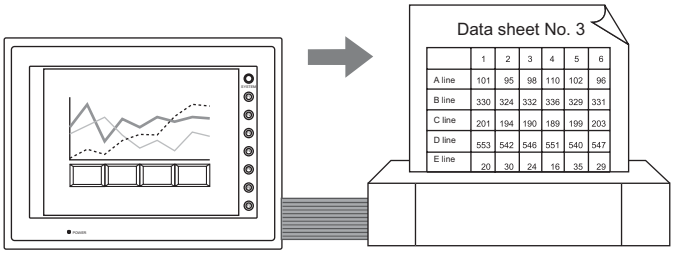
Setting range

	Value	
F0	STA_LIST	
F1	0 - 1023:	Print start number
F1+1	1 - 1023:	Number of pages to be printed

Example

- $u100 = 3 (W) [Print start number]
  $u101 = 1 (W) [Number of pages to be printed]
  SYS (STA_LIST) $u100 macro execution

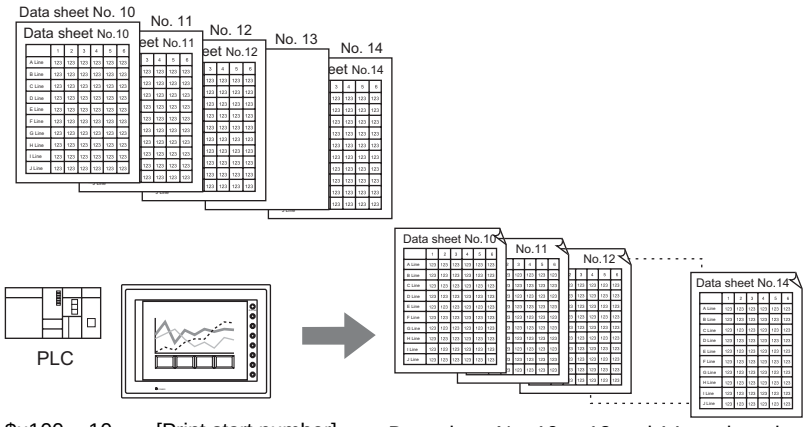
  The above program prints data sheet No. 3.



Supplemental remarks

- If nothing is registered on a data sheet, specifying the page of this sheet does not produce a printout of it.

[Data Sheet Edit]



$u100 = 10 [Print start number]
$u101 = 5 [Number of pages to be printed]
SYS (STA_LIST) $u100

Data sheet No. 10 to 12 and 14 can be printed. The page that is not stored, No. 13, is ignored, and four pages are output.

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	○
V710S	○
V710T	○
V710C	
V708S	○
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	○
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

SYS (RGB_CHG) F1

Function: Change RGB input parameter

This macro command is used to change the RGB parameter set on the RGB input screen (on the [Main Menu] screen) between [Setting 1] and [Setting 2].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	RGB_CHG
F1	0: Setting 1 1: Setting 2

Example

- $u100 = 1 (W) [Setting 2]
  SYS (RGB_CHG) $u100

  The above program changes the RGB parameter from [Setting 1] to [Setting 2].

Supplemental remarks

- If the frequency is different between [Setting 1] and [Setting 2]:
  MONITOUCH selects [Setting 1] or [Setting 2] automatically.
- If the frequency is the same between [Setting 1] and [Setting 2]:
  At power-on, [Setting 1] always takes effect. Afterward, [Setting 1] or [Setting 2] can be selected by the macro command.
- This macro command is valid when “GU-01” or “GU-10” unit is used.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	○
V710S	○
V710T	○
V710C	
V708S	○
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	○
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

SYS (SET_RGB) F1

Function 1: Switch from/to RGB input screen

This macro command is used to switch between the RGB input screen and the RUN screen.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	SET_RGB
F1	0: OFF (RUN screen) 1: ON (RGB input screen)

Example

- $u100 = 0 (W) [RUN screen display]
  SYS (SET_RGB) $u100

  The above program switches from the RGB input screen to the RUN screen.

Supplemental remarks

- In addition to the macro command, bit 12 in the read area “n+1” is also available to switch to/from the RGB input screen.
- While the bit in the read area is set (ON), the macro command is invalid.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	○
V712S	
V710S	
V710T	
V710C	
V708S	
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

Function 2: Snap/delete RGB input screen

This macro command is used to snap and delete the RGB screen.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	SET_RGB	
F1	2: Snap (turn the RGB screen ON and snap it) 3: File delete (delete the JPEG file generated by snapping)	
F1+1	(F1 = 2)	(F1 = 3)
	File No.: (0 - 32767 / -1 [AUTO])	File No.: (0 - 32767)

JPEG file

Storage target: \(access folder)\SNAP
File name: \VDxxxx.jpg

0000 - 9999: File No.

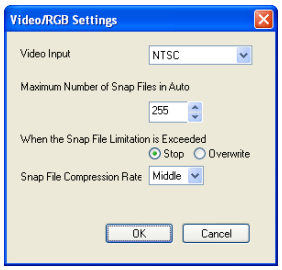
Example

- $u100 = 2 (W) [Snap]
  $u101 = 0 (W) [Specify file No. 0.]
  SYS (SET_RGB) $u100

  The above program saves the currently displayed RGB input screen as VD0000.jpg.

Supplemental remarks

- This function can be used only with the V8 series and the V715X.
- When the file number is set to [AUTO] for the snap operation, if no file exists the file number is generated by incrementing from [0000], while if files exist it is generated by incrementing from the number following the current maximum number.
  However, the numbers must be within the range determined by [Maximum Number of Snap Files in Auto] under [System Setting] → [Unit Setting] → [Video/RGB].



- When the number set for [Maximum Number of Snap Files in Auto] has been reached, operation proceeds in accordance with the specification ([Stop] or [Overwrite]) for [When the Snap File Limitation is Exceeded] under [System Setting] → [Unit Setting] → [Video/RGB]. When [Overwrite] is selected, the number is reset to “0000” and the operation proceeds.

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

V815X	○
V812S	○
V810S	○
V810T	○
V810C	
V808S	○
V808C	
V806T	
V806C	
V806M	
V808CH	
V715X	
V712S	
V710S	
V710T	
V710C	
V708S	
V708C	
V706T	
V706C	
V706M	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

Function 3: RGB input channel selection

This macro command is used to select the display in the read area, or to select the channel when the RGB input signal is switched using the “SET_RGB” macro command. It also selects the applicable channel for the touch switch emulation function.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	SET_RGB
F1	8: CH selection (selects the RGB channel)
F1+1	5: RGB IN1 6: RGB IN2

Example

- $u100 = 8 (W) [RGB input channel selection]
  $u101 = 6 (W) [Specify RGB IN2.]
  SYS (SET_RGB) $u100

  The above program switches to RGB IN2.

Supplemental remarks

- This function can be used only when the “GU-11” unit is attached to the V8 series.
- The default is [RGB IN1].
- The setting is maintained until the power is turned OFF. When the power goes OFF the setting is cleared and the default is set.
- This macro command is invalid if [☐ Use Touch Switch] and [☐ 2Port] are checked. These options appear for [Touch Switch] under [Others] in the [Device Connection Setting] dialog.
  For more information on touch switch emulation, refer to the V8 Series Reference Manual.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All V8 models	○
All V7 models	○
All V6 models	○
TELLUS3 HMI	
TELLUS2 HMI	

SYS (SET_BKLT) F1

Function: Backlight control

This macro command is used to control the backlight.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	SET_BKLT	
F1	0: OFF 1: ON	
	2: OFF time change	Valid when [Auto 1/2/3] is selected
F1+1	0 - 65535: OFF time (sec)	Setting required if F1 = 2

Example

- $u100 = 0 (W) [OFF]
  SYS (SET_BKLT) $u100

  The above program turns off the backlight.

Supplemental remarks

- When [Always ON] is selected for [Action] on the [Backlight] tab window in the [Unit Setting] dialog ([System Setting] → [Unit Setting]), the macro command is invalid.
- While bit 11 in the read area “n+1” is set (ON), the macro command is invalid.
- Do not execute the macro command in macros to be executed constantly using a CYCLE macro, an interval timer, or an event timer macro.
- The use of a switch ON macro to execute a backlight turn-on command will not be possible.
- At power-on, the backlight is restored to the status as set in [Backlight] tab window (initial status) in the [Unit Setting] dialog ([System Setting] → [Unit Setting]). The internal memory $L is available to retain the value set with this macro command. By using the initial macro at power-on, this macro command is executable according to the value you stored with $L.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (RESTART) F1

Function: Restart

This macro command is used to restart the V series when the time (in seconds) specified in [F1] has elapsed.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	RESTART
F1	0 - 60: Time (sec)

Example

- $u100 = 10 (W) [sec]
  SYS (RESTART) $u100

  The above program maintains the check screen for 10 seconds and then switches it to the RUN screen.

Supplemental remarks

- When the macro command has been executed, the data in the internal memory $u becomes “0”.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

V815X	
V812S	
V810S	
V810T	
V810C	
V808S	
V808C	
V806T	
V806C	○
V806M	○
V808CH	
V715X	
V712S	
V710S	
V710T	
V710C	
V708S	
V708C	○
V706T	
V706C	○
V706M	○
V612T	
V612C	○
V610S	
V610T	
V610C	○
V608C	○
V606iT	
V606iC	○
V606iM	○
V606C	○
V606M	○
V606eC	○
V606eM	○
V609E	
V608CH	○
TELLUS3 HMI	
TELLUS2 HMI	

SYS (CONTRAST) F1

Function: Contrast adjustment

This macro command is used to adjust the contrast.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	CONTRAST	
F1	0: UP 1: DOWN 2: CENTER	
F1+1	0 - 100	Invalid if F1 = 2

Example

- $u100 = 1 (W) [DOWN]
  $u101 = 10 (W) [10 levels]
  SYS (CONTRAST) $u100

  The above program lowers the contrast by 10 levels from the current level.

Supplemental remarks

- The macro command is valid for STN display only.
- In addition to the macro command, the SYSTEM, F2, F3, and F4 switches are also available to adjust the contract.
- When the power is turned off and on again after a contrast adjustment, the contrast level set finally takes effect.
- If a V706C/M or V606e is in use, the macro command will cause a communication pause for several hundred milliseconds because of storing the setting value in the FROM. Avoid the frequent use of the macro command.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All models	○

SYS (CHG_LANG) F1

Function: Language change

This macro command is used to switch the language displayed on MONITOUCH to the language specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

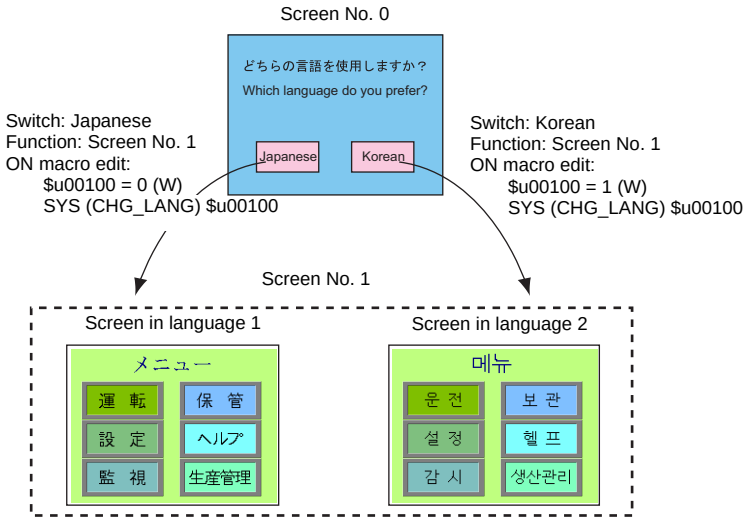
○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	CHG_LANG
F1	0: Language 1 1: Language 2 2: Language 3 : 13: Language 14 14: Language 15 15: Language 16

Example

In the example below, the ON macros for the screen change switches are used to switch between two languages.



Supplemental remarks

- When the screen is switched, the language also switches.
  To change the language on the same screen, use the “SYS(RESET_SCRN)” command (page 4-291).
- At power-on, the language as specified for [Initial Interface Language] in the [Font Setting] dialog takes effect (initial status).

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All V8 models	○
All V7 models	○
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

SYS (RESET_SCRN) F1

Function: Redisplay screen

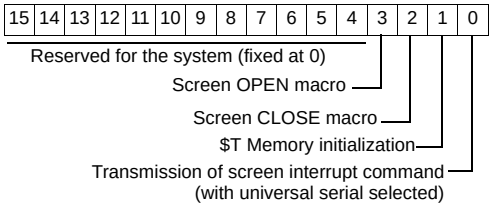
This macro command is used to reset the currently displayed screen. It is convenient for switching languages and for switching the display of screen libraries.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	RESET_SCRN
F1	Bit OFF (0) : Executed Bit ON (1) : Disabled  * Multiple bits can be specified at the same time.

Example

- $u100 = 0H (W)
  SYS (RESET_SCRN) $u100

  Close macro, open macro, and internal memory $T are initialized and the screen currently displayed is reset.
- $u100 = CH (W)
  SYS (RESET_SCRN) $u100

  The screen currently displayed is reset without executing close macro and open macro.

Supplemental remarks

- The macro command is invalid in screen OPEN, screen CLOSE, overlap library OPEN, overlap library CLOSE, and initial macros. Executing these error results in failure.
- The macro command is valid only once in a macro created on the macro edit sheet. Its execution timing is set at the end of the macro on the edit sheet.
- When screen internal switching is disabled (the 13th bit of read area n+1 is ON), the macro is invalid.
- [Function: Return] for the switch is valid even after using this command.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All V8 models	○
All V7 models	○
V612T	○
V612C	○
V610S	○
V610T	○
V610C	○
V608C	○
V606iT	○
V606iC	○
V606iM	○
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	
TELLUS3 HMI	
TELLUS2 HMI	

SYS (GET_STATUS_FL) F1

Function: FL-Net information acquisition

This macro command is used to acquire the FL-Net node information.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

		Value
F0		GET_STATUS_FL
Local node information	F1	0: Local node information
	$s627	Local node FA link status
	$s628	Local node status
	$s629	Local node FL-Net status
	$s646	Current permissible time for refresh cycle
	$s654	Current minimum permissible frame interval
Guest node information	F1	1 - 254: Guest node information
	$s647	Guest node number
	$s648	Host status
	$s649	Guest node area 1 top address
	$s650	Guest node area 1 data size
	$s651	Guest node area 2 top address
	$s652	Guest node area 2 data size
	$s653	Guest node FA link status

:← V series (Return data)

Example

- $u100 = 0 (W)
  SYS (GET_STATUS_FL) $u100

  The above program acquires the local node information.

- $u100 = 2 (W)
  SYS (GET_STATUS_FL) $u100

  The above program acquires node No. 2 information.

Supplemental remarks

- The macro command is valid for FL-Net communication only.
- For more information, refer to the Specifications for Communication Unit FL-Net.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

V815X	
V812S	
V810S	
V810T	
V810C	
V808S	
V808C	
V806T	
V806C	
V806M	
V808CH	○
All V7 models	
V612T	
V612C	
V610S	
V610T	
V610C	
V608C	
V606iT	
V606iC	
V606iM	
V606C	
V606M	
V606eC	
V606eM	
V609E	
V608CH	○
TELLUS3 HMI	
TELLUS2 HMI	

SYS (SET_DSW) F1

Function: Deadman switch setting

This macro command is used to set the deadman switch for V808CH/V608CH.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	SET_DSW
F1	0: Invalid 1: Valid

Example

- $u100 = 1 (W) [Valid]
  SYS (SET_DSW) $u100

  The above program enables the deadman switch.

Supplemental remarks

- The macro command is valid for V808CH/V608CH only.
- In addition to the macro command, [Handy-Sized Display Setting] ([System Setting] → [Unit Setting] → [Handy-Sized Display Setting]) is also available to enable/disable the deadman switch.
  At power-on, [Handy-Sized Display Setting] takes effect (initial status). If you wish to change the status during RUN, use the macro command. Note that setting by the macro command is restored to the initial status by turning off the power.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
−1	Execution error

SYS

All V8 models	○
All V7 models	○
All V6 models	○
TELLUS3 HMI	○
TELLUS2 HMI	○

SYS (OUT_ENQ) F1

Function 1: Universal serial (interrupt)

This macro command is used to execute an interrupt.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	OUT_ENQ	
F1	10 - 2F $_{HEX}$: ENQ No.	
F1+1	Transfer format 0: Numerical 1: Characteristic	
F1+2	1 - 16384: Word count	If F1+1 = 1
	2 - 32768: Number of bytes	If F1+1 = 1
F1+3	Top address number	
F1+4	0: Non-wait	Executes the next macro
	1: Wait	Executes the next macro after a transmission is complete

Example

The following programs transmit the specified data to the host when the character display ($u200) shows “ABCD.”

- Transfer data format: Numerical
  $u100 = 10H (W) [ENQ No.]
  $u101 = 0 (W) [Numerical]
  $u102 = 2 (W) [Word count]
  $u103 = 200 (W) [Top address]
  $u104 = 0 (W) [Non-wait]
  SYS (OUT_ENQ) $u100 Macro execution

  Data received at the host: 3431343234333434H

- Transfer data format: Characteristic
  $u100 = 10H (W) [ENQ No.]
  $u101 = 1 (W) [Characteristic]
  $u102 = 4 (W) [Number of bytes]
  $u103 = 200 (W) [Top address number]
  $u104 = 0 (W) [Non-wait]
  SYS (OUT_ENQ) $u100

  Data received at the host: 41424344H

Supplemental remarks

- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

All V8 models	
All V7 models	○
All V6 models	○
TELLUS3 HMI	
TELLUS2 HMI	

Function 2: A-link+Net10 (network designation)

This macro command is used to designate a target network, with which a connection will be established.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	Remarks
F0	OUT_ENQ	
F1	0: Fixed	
F1+1	2: Fixed	
F1+2	System code 1: NET/10 2: NET II (/B)	
F1+3	0: Fixed	If F1+2 = 2
	1: Network number	If F1+2 = 2

Example

- $u100 = 0 (W) [Fixed]
  $u101 = 2 (W) [Fixed]
  $u102 = 1 (W) [NET/10]
  $u103 = 3 (W) [Network number]
  SYS (OUT_ENQ) $u100

  According to the above program, the PLC connected to the V series accesses the PLC NET 10 on network No. 3.

Supplemental remarks

- The macro command is valid when [A-link + Net10] is selected for [Select PLC1 Type].
- Be sure to use the macro command in an OPEN macro for the screen. If it is used in any other way, the network will change immediately after the command is executed and a communication error will result.
- For more information, refer to the V8 Series Connection Manual.
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

SYS

All V8 models	○
All V7 models	
All V6 models	
TELLUS3 HMI	
TELLUS2 HMI	

SYS (SET_SYS_CLND) F1

Function: System calendar setting

This macro command is used to set the values of seven words starting from the address specified in [F1] to the system calendar.
The PLC calendar is not changed.

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1	◎			

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value	
F0	SET_SYS_CLND	
F1	0 - : Year (4-digit/2-digit)	
F1+1	1 - 12: Month	
F1+2	1 - 31: Day	
F1+3	0 - 23: Hour	
F1+4	0 - 59: Minute	
F1+5	0 - 59: Second	
F1+6	Day of the week	Invalid; to be automatically calculated by MONITOUCH

Example

- $u100 = 2005 (W)
  $u101 = 7 (W)
  $u102 = 15 (W)
  $u103 = 15 (W)
  $u104 = 0 (W)
  $u105 = 0 (W)

  July 15, 2005 Friday 15:00:00

  SYS (SET_SYS_CLND) $u00100

  The above program sets the calendars in MONITOUCH to July 15, 2005 on Friday at 15:00:00.

Supplemental remarks

- When setting calendar data for PLC 1 to 8, use a macro command " PLC_CLND" (page 4-148).
- The result of macro execution is stored in $s72.
  When the execution of the macro is normally complete, the value at the address is not updated. Therefore, before macro execution, resetting the value at the address to zero is recommended.

Code (DEC)	Contents
–1	Execution error

HMI-FUNC

All V8 models	
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

HMI-UserFunc (F1 , “ ”)

Function: DLL function execution

This macro command is used to execute the function in the dll file loaded to the table specified in [F1].

Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	HMI_UserFunc
F1	000: Table number ⋮ 255
Text	Function name

Example

- HMI_UserFunc (000, “DspMsg”)
  - 000: Number of the table including the dll file, in which the function is defined
  - DspMsg: Function defined in the dll file

Table No.	dll	Function defined in dll file
000	Test2.dll	DspMsg
001	Test1.dll	aa
⋮	⋮	⋮
255		

Macro execution →

Supplemental remarks

- This macro command is valid, provided that either “TELLUS Ver. 3” or “TELLUS” is selected in the [Edit Model Selection] dialog.
- It is necessary to load the dll file by HMI-LoadDll in advance.

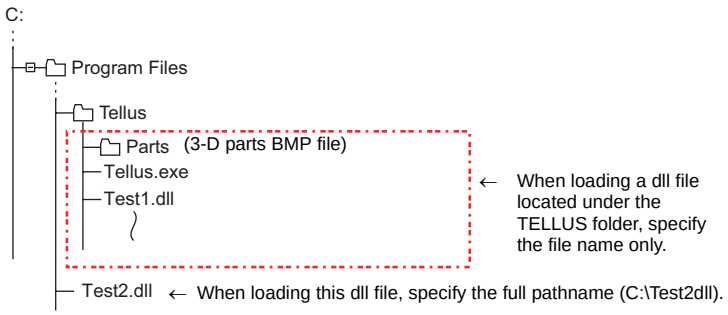
HMI-FUNC

HMI-LoadDll (F1 , “ ”)

All V8 models	
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

Function: Load DLL file

This macro command is used to load a dll file prepared by users to the table specified in [F1].



Available memory

	Internal memory	PLC 1 - 8 memory	Memory card	Constant
F1				○

○ : Setting enabled (indirect designation disabled)
◎ : Setting enabled (indirect designation enabled)

Setting range

	Value
F0	HMI_LoadDll
F1	000: Table number ⋮ 255
Text	Location of dll file (path)

Example

- HMI_LoadDll (000, “C:\Test2.dll”)

Enter the full pathname to designate the location of the dll file to be loaded.
* If the desired dll file is stored in the folder where TELLUS is installed, specify the file name only.
HMI_LoadDll (001, “Test1.dll”)

Table number, to which the dll file will be loaded

Supplemental remarks

- This macro command is valid, provided that either “TELLUS Ver. 3” or “TELLUS” is selected in the [Edit Model Selection] dialog.
- When executing the function in the loaded dll file, use HMI_UserFunc.
- Once a dll file is loaded, the function in the file can be executed by HMI_UserFunc repeatedly as desired in, for example, an initial macro.

HMI-FUNC

All V8 models	
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

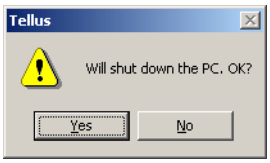
HMI-ShutDown

Function: Computer shutdown

This macro command is used to shut down the computer.

Example

- HMI-ShutDown



Supplemental remarks

- This macro command is valid, provided that either “TELLUS Ver. 3” or “TELLUS” is selected in the [Edit Model Selection] dialog.
- If the macro command is executed on a panel computer without the power-off function, the message indicating that the computer is ready to be turned off appears.

HMI-FUNC

All V8 models	
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

HMI-UserExe (“ ”)

Function: Application file execution

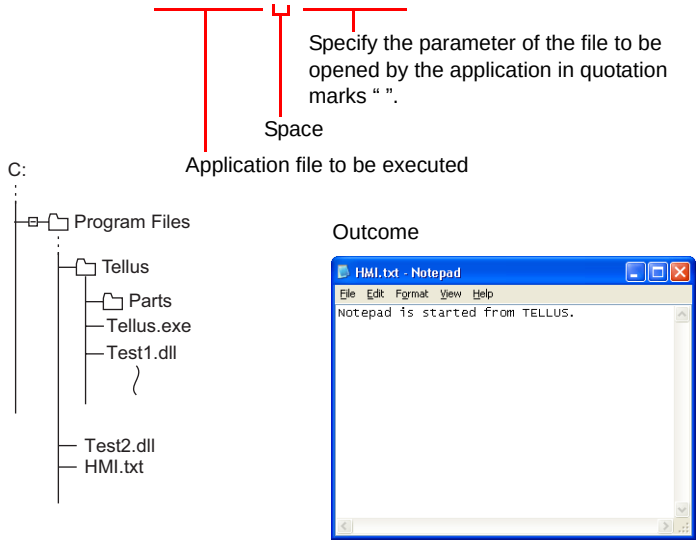
This macro command is used to execute an exe file.

Setting range

	Value
F0	HMI_UserExe
Text	exe file and the parameter of the file to be executed concurrently

Example

- HMI_UserExe (“notepad.exe “C:\HMI.txt””)



Supplemental remarks

- This macro command is valid, provided that either “TELLUS Ver. 3” or “TELLUS” is selected in the [Edit Model Selection] dialog.

HMI-FUNC

All V8 models	
All V7 models	
All V6 models	
TELLUS3 HMI	○
TELLUS2 HMI	○

HMI-Close

Function: TELLUS termination

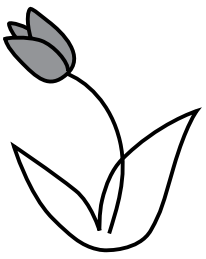
This macro command is used to terminate the Tellus HMI mode.

Supplemental remarks

- This macro command is valid, provided that either “TELLUS Ver. 3” or “TELLUS” is selected in the [Edit Model Selection] dialog.

MEMO

Please use this page freely.



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