Chapter 9

Data Collection Screen

9.1

Data Collection Screen

Explains the collect data screen.

What is a Data Collection Screen ?

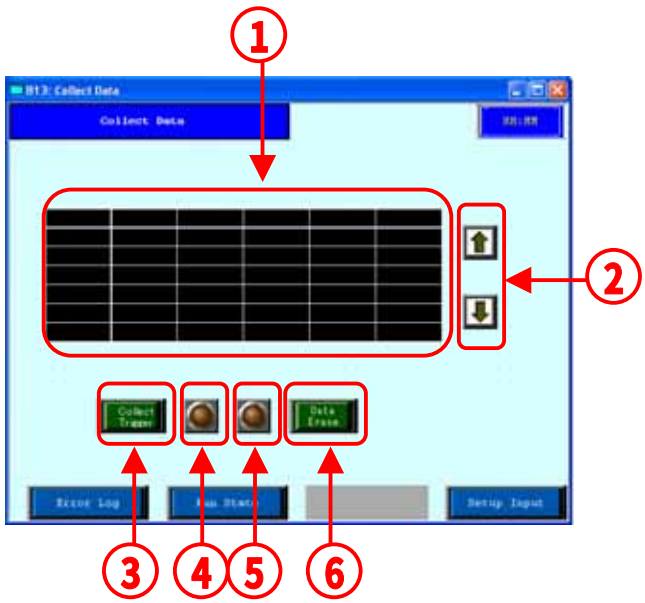
• What is it useful?

The data related to the controller can be collected in the GP anytime.
The collected data can be displayed on the GP or used for management of production results by saving on the CF card and copying to the computer.

• Notes (When creating the screen)

The collected data is saved in the backup SRAM in GP.
The capacity of the backup SRAM will differ based on the type of GP machine.
Please set the logging parameter by consideration the SRAM capacity.
(For example: Repeating data with 20 words for 100 times (one block) will take about 5 KB)
Please refer to the [Tag Reference Manual] for details about the formula.

• About the data collection screen



① Collected data is displayed on the screen

② Touch to scroll the list of collected data

③ Data is collected every time it is touched

④ Lights up every time one set of data has been collected

⑤ Lights up when the data for the frequency that was set is collected

⑥ Touch to erase the collected data.

9.2

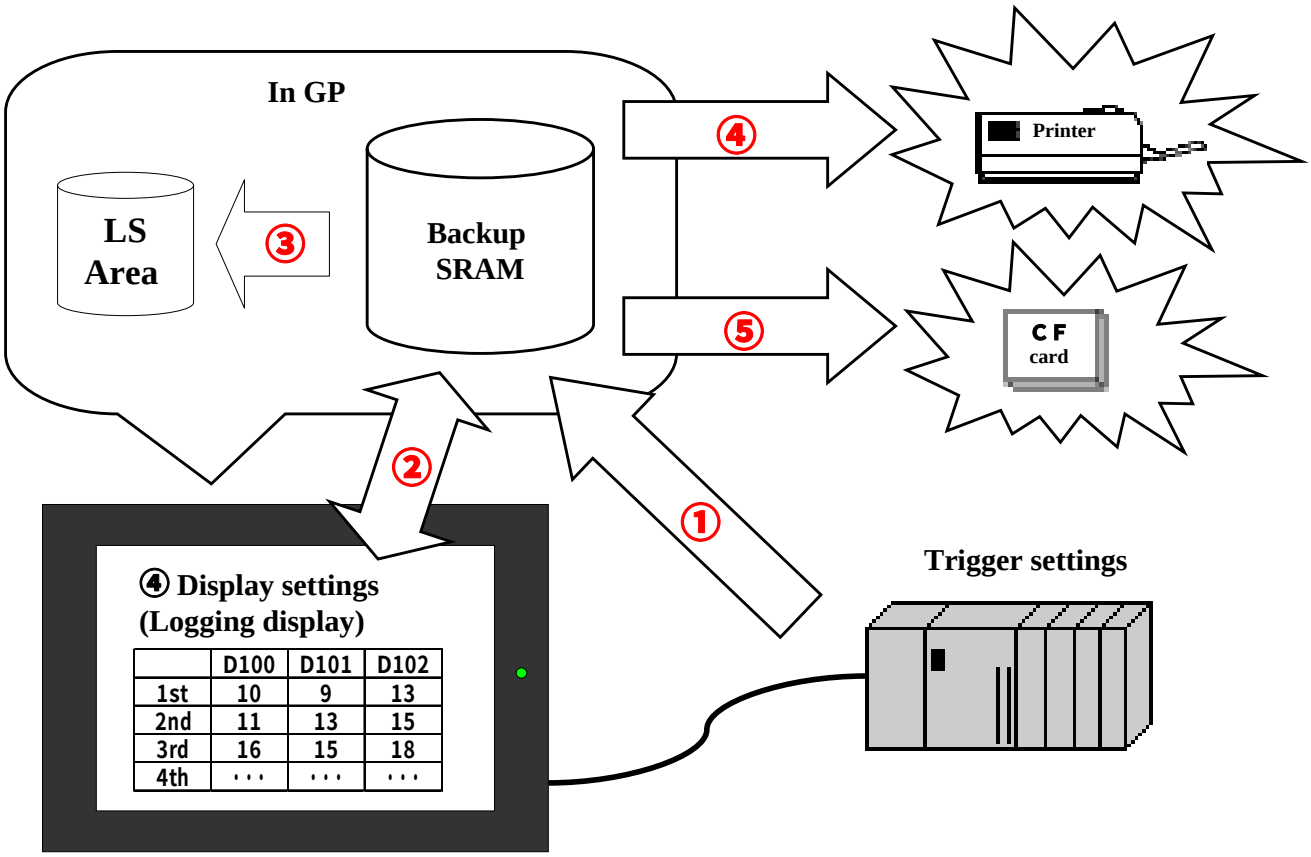
Displaying Collected Data

Explains the method for displaying the collected data on the screen.

Collecting the data

• Data Logging is used to collect and save the connector data in the display.
The data logging function can be used to save to the connector data in the display at specified periods (weekly) or also anytime.
The logged data can be displayed on the screen, printed, or saved in the CF card.

• Image for logging function



① **Trigger settings:** Set the address to the connecter to be logged to and to the collection trigger.

② **Display settings:** The logging data can be displayed on GP using the logging display.

③ **Write to LS settings:** The logging data written to LS in GP can be collected, and displayed as numerical display, bar chart, or line chart.

④ **Print settings:** The logging data can be printed using the printer.

⑤ **CF card save settings:** The logging data can be saved in the CF card in CSV format.

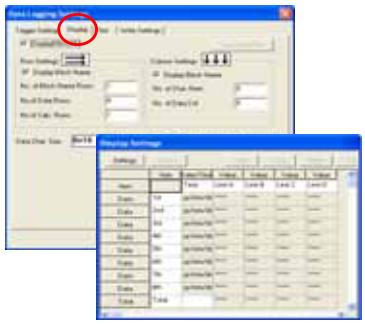
MS Excel can be used for the CSV file. (Refer to P7-62)

Settings for data collection

① Select [Data Logging Settings] from the project manager.

※The screen editor must be closed when setting logging.

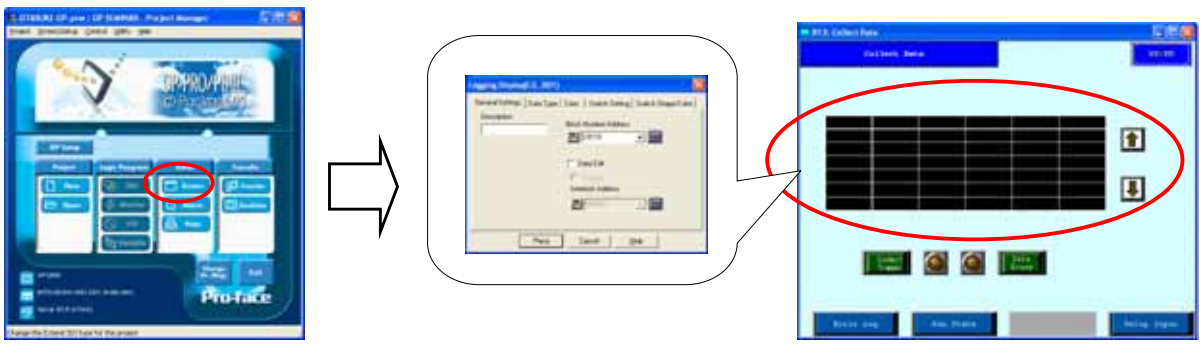
Use the [Trigger Settings] tab to set the range of data to be collected and the timing



Use the [Display] tab to set the format for display of collected data.

※Set other items if required.

② Open the screen editor and place the logging display on the base screen



③ Transmit the screen data to GP.

Example for display of logging display on the GP screen

	Time	Line A	Line B	Line C	Line D
1st	11:50:00	100	200	300	400
2nd	12:00:00	101	201	301	401
3rd	12:10:00	102	202	302	402
4th					
5th					
Total		303	603	903	1203

Collect Trigger | Data Erase

Trigger Settings

(1) Selecting the data logging settings

① Select [Data Logging Settings] from [Screen/ Setup] on the menu bar.

(2) Contents of trigger settings (bit method)

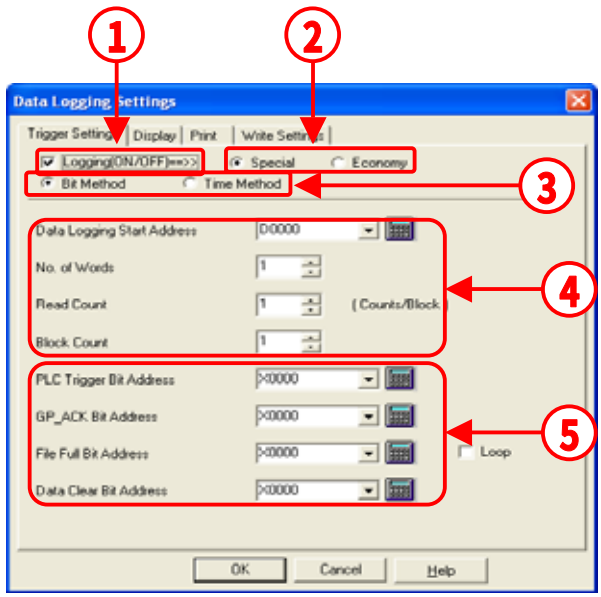
① Select to set the logging operations.

② **Special Mode:** Sets up to 32 words.

Economy Mode: The settings contents are restricted but up to 255 words can be set as the logging word count.

③ **Bit Method:** Sets the bit that becomes the trigger for starting logging. If bit is [ON], the data can be collected at any time.

Time Method: Collects the data at the specified interval. The data can be collected at fixed weekly periods.



④ **Data Logging Start Address:** Sets the start address for data logging.

No. of Words: Sets the count of the words to be logged.

Read Count: Sets the logging frequency for one block.

Block Count: Sets the number of blocks.

⑤

PLC Trigger Bit Address: Sets the trigger address to start logging.

GP_ACK Bit Address: Sets the bit address to be turned [ON] every time data is saved.

File Full Bit Address: Sets the bit address to be turned [ON] when [Frequency] x [Block Count] is saved.

Data Clear Bit Address: Sets the bit address to clear the logged data. Turn [ON] to clear the data.

Loop: Performed by overwriting the new data on the old when the settings frequency (block count) is acquired.

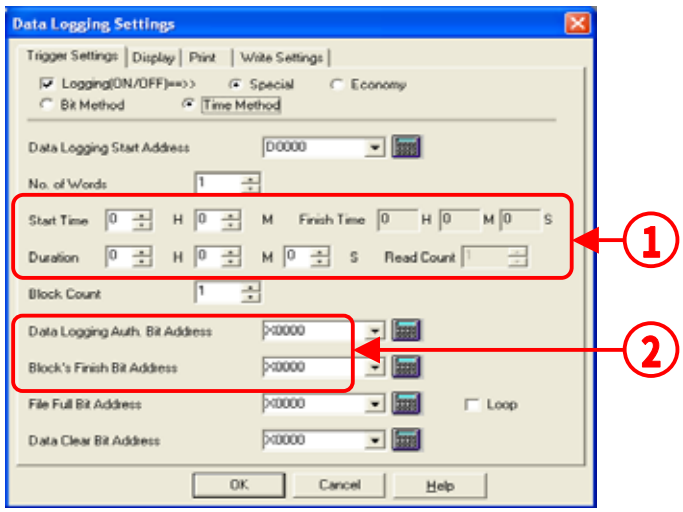
(3) Contents of Trigger Settings (Time Method)

①

Start Time: Sets the time to start logging

Duration: Sets the duration for logging. The logging data from start time to finish time is handled as one block in time method.

Read Count: Sets the frequency for collecting data for one block. The finish time is automatically decided based on the frequency that is set.



②

Data Logging Auth. Bit Address: Sets the bit address to allow logging.Data is not logged if the specified bit address is [OFF] even if the time to start the process has been reached.

Block's Finish Bit Address: Sets the bit address to be turned [ON] when one block is logged.

Hint

Hint for setting logging ①

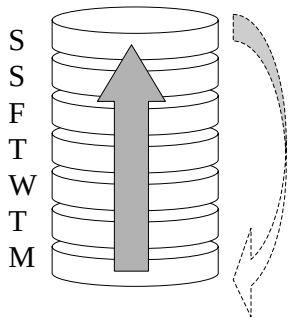
First, fix the size of data to be logged. Maximum count is up to 255 words.
(Special mode and economy mode)

• If within 32 words • • • Special Mode

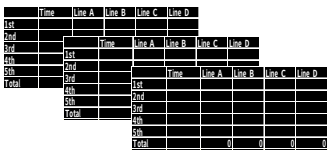
※The logging data can be partitioned into **blocks.**
->The data group with the same frequency is classified into multiple units (blocks)
The display on screen can also be broken up for every block.
※**With or without loop operations** can be selected.
->The "settings frequency x block count" is logged. Then, after the start time of the next trigger, the first data is overwritten. This is called a loop operation.
The new data is ignored if "without loop operation" is selected.

Example: Logging five times a day is divided into seven blocks, one for each day and loop operations are performed every week.

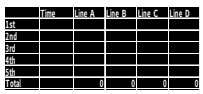
Five times/ a day x seven blocks = 35 times/ week



If "with look operation" is specified, after the seven blocks are logged, the oldest data gets overwritten with new data.



Mon Tues Wed • • • Sun



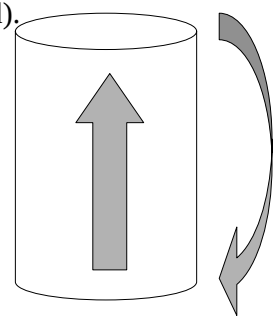
The screen display can be switched for every block.

• If within 255 words • • • Economy Mode

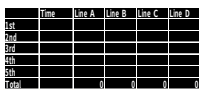
The number of logging words is increased but the blocks are not partitioned (fixed as one block)
Loop operations will be performed. (Fixed).

Example: Data is logged 100 times,from 101th time the first data is overwritten

100 times/ 1 block



After logging for the pre-determined times, the old data will definitely be overwritten with the new



Only one block is displayed on the screen

Hint

Hint for setting logging ②

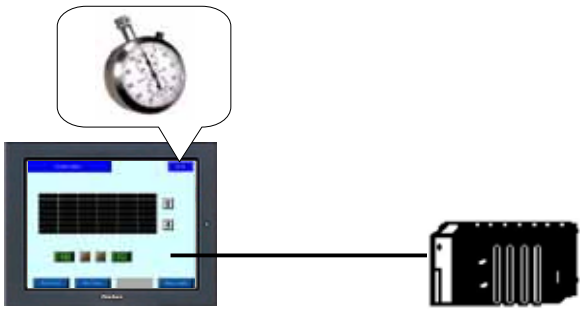
Decide the logging timing (bit method and time method)

- **Bit Method:** Logs every time the specified bit is [ON].
  Logs one by one for every time the bit in PLC is [ON].

->If you have decided the block count and existence of the loop operation, set the four bit addresses shown below.

- PLC Trigger Bit Address <- Logs every time it is [ON]
- GP_ACK Bit Address <- GP is automatically turned [ON] every time one save process is completed.
- File Full Bit Address <- GP is automatically turned [ON] every time saving for the pre-determined frequency is completed.
- Data Clear Bit Address <- Clears the data in SRAM

- **Time method: Logging at the set time**
  It monitors the internal GP timer and performs logging at the set time.
  Example: Optional times or periods like 5:00 pm everyday, every ten minutes, every one hour, etc.



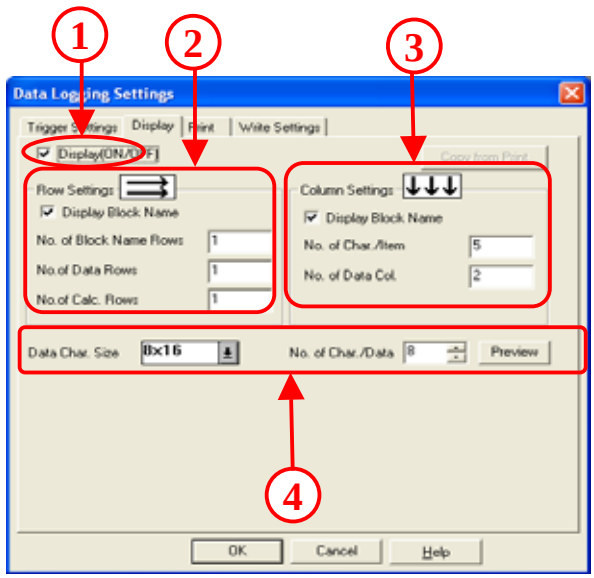
-> If you have decided the start time, finish time, frequency, block count and existence of loop operations, etc., set the four bit addresses shown below.

- Logging Auth. Bit Address <- Performs logging at the pre-determined time when it is [ON]
- Block's Finish Bit Address <- GP is automatically turned [ON] every time 17 blocks have been finished.
- Block Full Bit Address <- GP is automatically turned [ON] when the pre-determined save frequency is completed.
- Data Clear Bit Address <- Clears the data in SRAM

※ Please refer to pages 9 – 26 for logging operations in GP using the PLC radar program

Display settings

(1) Selecting display settings



① Set to display the collected data on the screen and to save the data in the CF card.

② **Display Block Name:** Set to input and display the block name

No. of Block Name Rows: Set to display the block name in multiple rows.

No. of Data Rows: Set to display the number of rows of data

No. of Calc. Rows: Set the number of rows for calculation

③ **Display Block Name:** Set to input and display the block name

No. of Char/ Item: Set the maximum character count for the block name

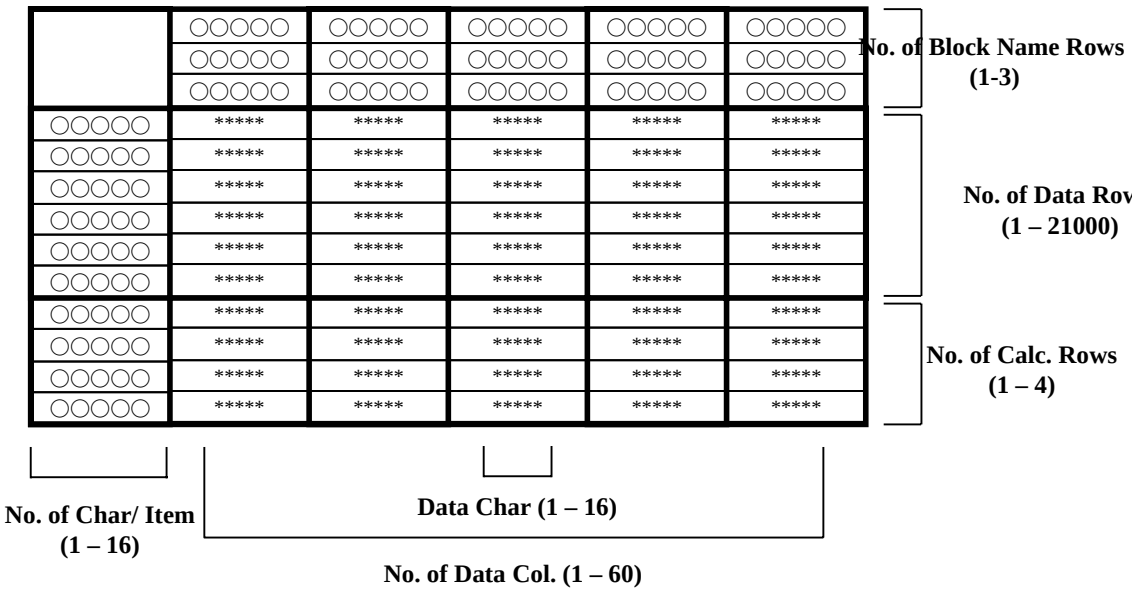
No. of Data Col.: Set the number of columns for display of data

④ **Data Char. Size:** Set the character size for display of data

No. of Char/ Data: Set the character count for display of data

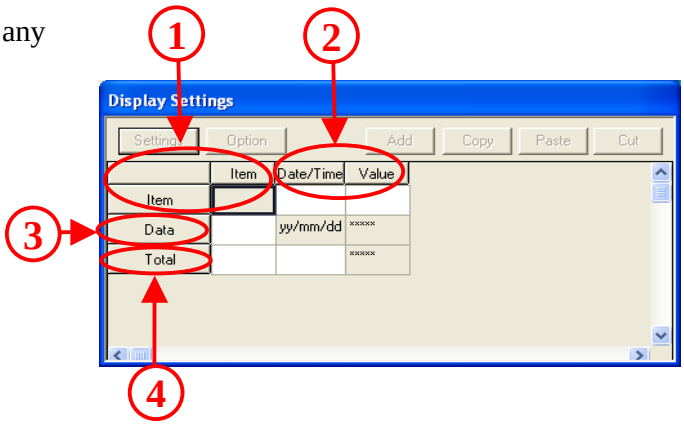
Preview: The set contents can be displayed and confirmed

<Settings for display of row/ column settings>



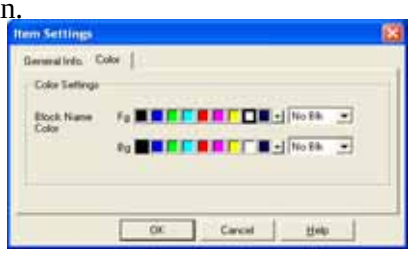
(2) Contents of display settings

Set the display format for the collected data. Input any character for fixed display in the outlined cell.



1

Set the color for displaying the item row and column.



2

Select from [Value], [Time] and [Char Column] for classification of every column.

Value: Select the data type, size/ style, and alarm settings separately.

Date/Time: Select between display of [Date] or [Time] in the data format and set the character count and color in size/ style.

Char. Col: Set the character count and display color in size/ style.

3

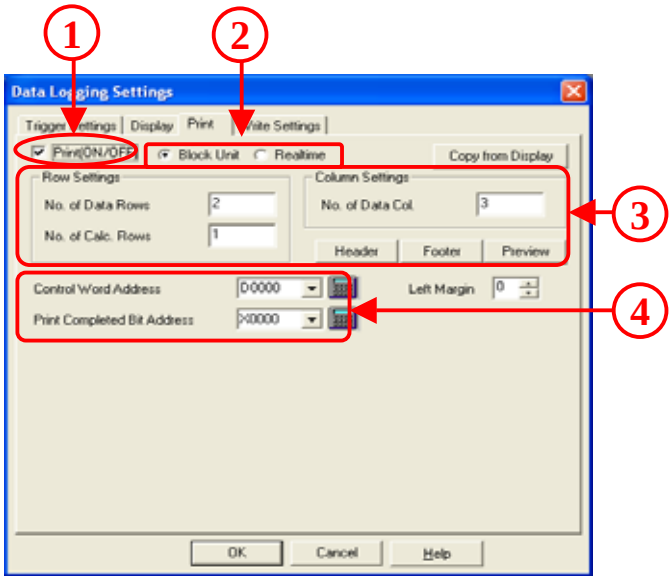
Select from [Data] and [Char Col.] for classification of every column.

4

Select the data calculation settings from [Total], [Average], [Max.], or [Min.] and set the individual size/ style and alarm settings.

Print Settings

(1) Contents of print settings



① Select to print the collected data using the printer connected to GP.

② **Block Unit:** Select to print in block units. Printing is performed using the [Control Word Address].

Realtime: Print for every logging.

※Only [Realtime] will be enabled if [Loop] is specified.

③ Select the count of rows and columns to be printed.

④ **Control Word Address:** Set the word address that operates print

Print Completed Bit Address: The bit address set here turns [ON] when print is completed.

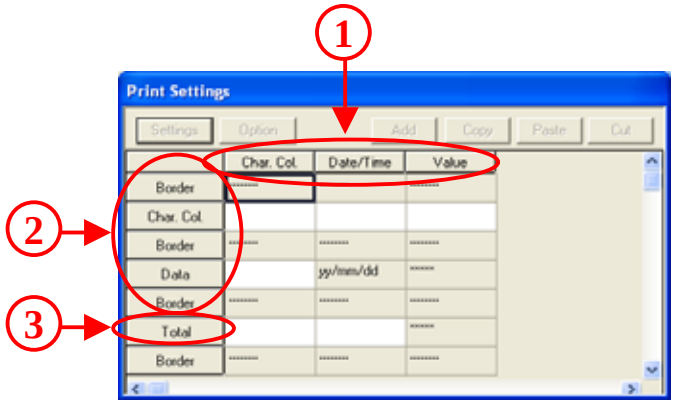
※ This setting is enabled only for [Block Unit]

(2) Contents of print settings

Sets the display data. Character strings can be input in the outlined cell.

① ----------

Select classification of every column from [Numerical Value], [Date/Time], [Char. Col.] or [Border].



Numerical Value: Set data format, [Size/ Style], and alarm settings separately.

Date/ Time: Select whether to display [Date] or [Time] in data format and set the character count and color in size/ style.

Char. Col.: Set the character count and display color for size/ style.

Border: No special settings

② ----------

Select classification of every row from [Data], [Char Col.] or [Border].

③ ----------

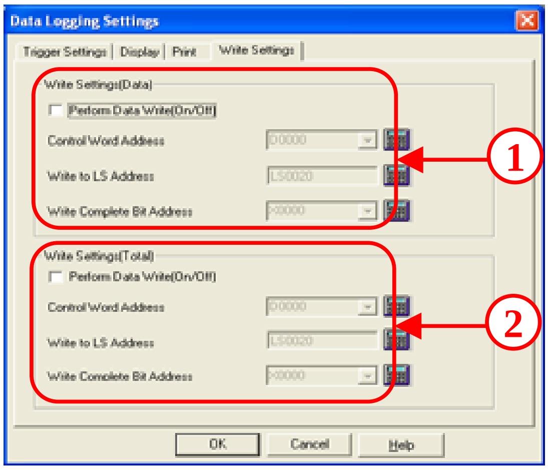
Select data calculation settings from [Total], [Average], [Max.], or [Min.] and set the [Size/ Style].

解説

Write to LS Settings

(1) Contents of writing to LS area settings

Numerical values or graphs can be displayed and the logging data can be collected by writing the data in the LS area.



①

Store the logging data in LS area.

Control Word Address: Set the control address when writing the logged data to LS area.

Write to LS Address: Set the start address for the LS address that is the write destination.

Write Complete Bit Address: Set the bit address that is turned [ON] when the data is written to the LS address. After bit address ON has been detected, turn the bit [OFF] in the PLC.

②

The calculation data for the columns for every numerical value can be stored in the LS area in batches (block unit)

Control Word Address: Set the control address when writing the calculated data to LS area.

Write to LS Address: Set the start address for the write destination LS area.

Write Complete LS Address: Set the bit address to be turned [ON] when data is written to LS area. After bit address ON has been detected, turn the bit OFF in the PLC

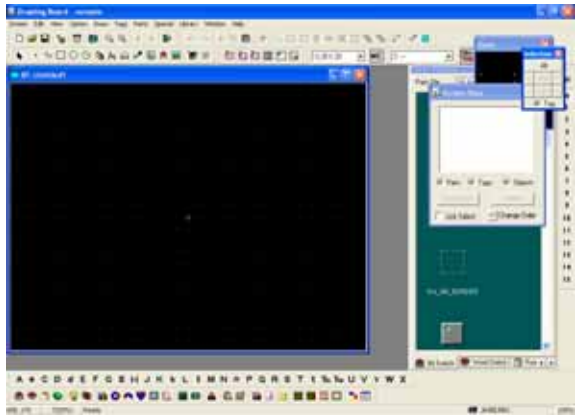
Setting the Logging Display

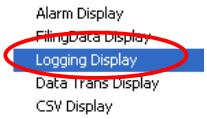
- The data collected in the format set in the logging settings can be displayed and edited in GP using logging display. Here, we shall explain the contents to be set in the logging display.

(1) Selecting the logging display

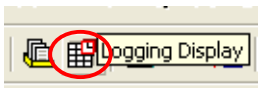
①

Open the base screen from screen editor and select [Logging Display] from [Parts] in menu bar.

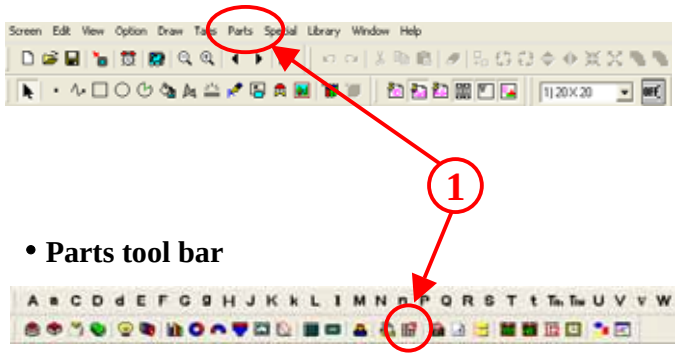




Or, click the [Logging Display] icon.



• Menu bar



• Parts tool bar

(2) Contents of general settings

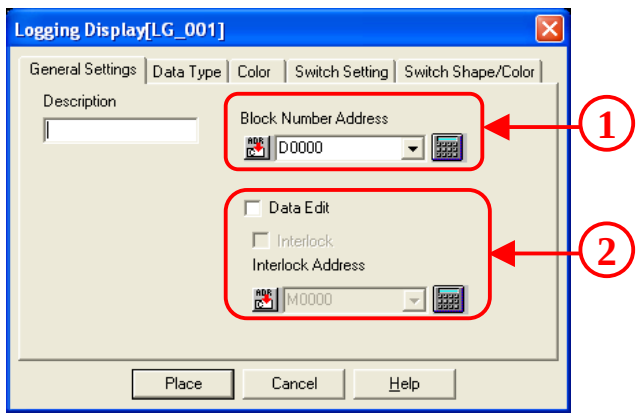
①

Set the word address that stored the block number to be displayed.

②

Data Edit: If selected, the data can be edited by touching the displayed data. ※

Interlock Address: Set Yes/ No for interlocking when editing the data. If enabled, the data can be edited only when the interlock address is [ON].

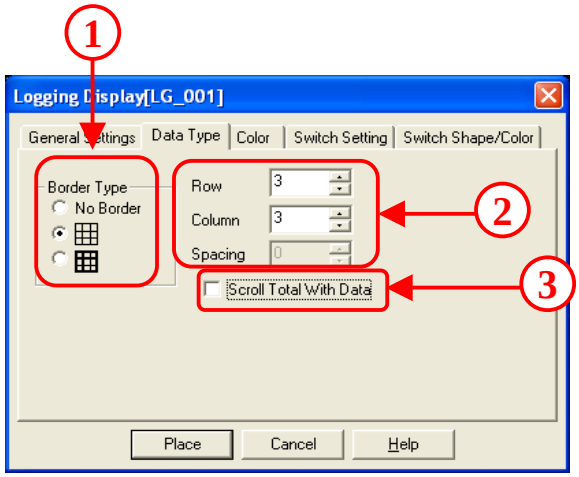


※A special keyboard from the [Place Library] is used here. It is not used in this tutorial.

(3) Contents of general settings

①

Set the border type of the display area.



②

Row: Set the number of rows of items to be displayed. Range is (0 –40)

Column: Set the number of columns of items to be displayed. Range is (0-25)

Spacing: Set the row spacing in dot units. Range is (0-10)

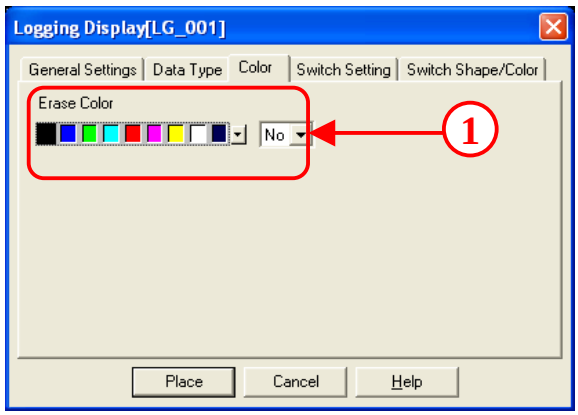
③

Set whether to scroll the total when scrolling the data.
If disabled, the total row is not displayed on the regular screen when scrolling the display screen.

(4) Contents of color settings

①

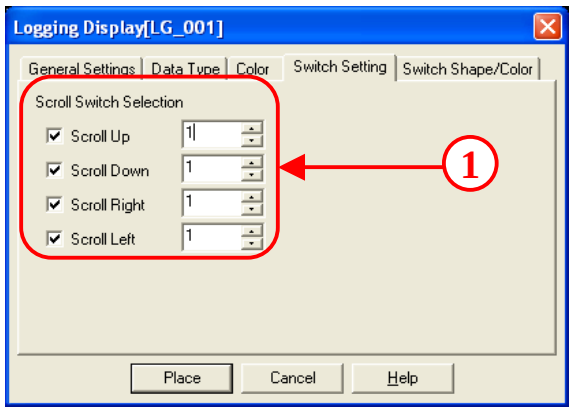
Set the color used when the data display in the logging display is cleared.



(5) Contents of switch settings

①

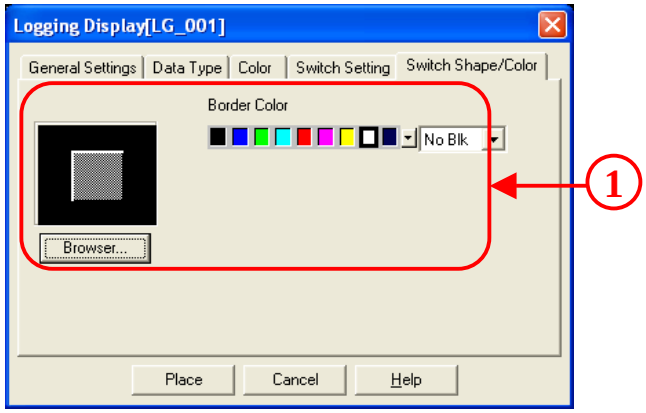
Select the special scroll switch when scrolling the data display in the logging display and set the scroll count.



(6) Setting contents of switch shape/ color

①

Set the shape and color of the special switch placed automatically.



Let us create the data collection screen

Explains the method for creating the collect data screen.

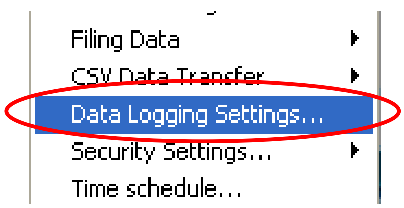
[Settings flow]

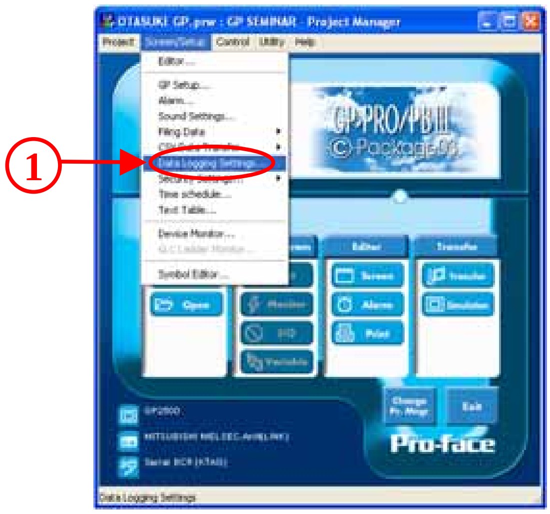
1. Set logging
2. Open the base screen [B13].
3. Set/ place the logging display

(1) How to open the logging settings

①

Select [Data Logging Settings] from [Screen/ Setup] in the menu bar





(2) How to set the logging operation

①

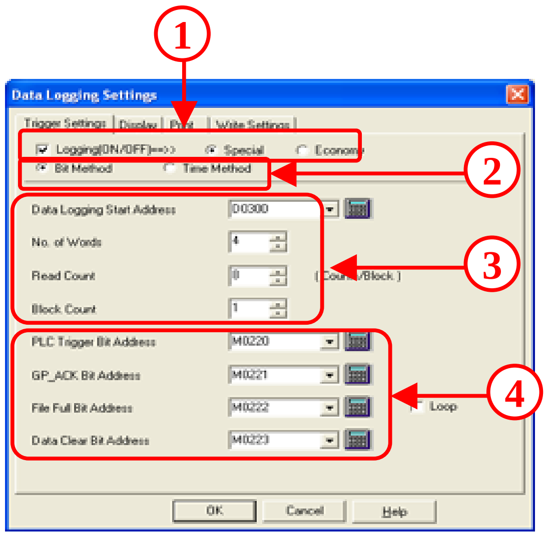
Select [Logging ON/OFF] and select [Special].

②

Select [Bit Method]

③

Set [Data Logging Start Address] as [D300], [No. of Words] as [4], [Read Count] as [8], and [Block Count] as [1].



④

Set [PLC Trigger Bit Address] as [M220], [GP_ACK Bit Address] as [M221], [File Full Bit Address] as [M222], and [Data Clear Bit Address] as [M223].

(3) How to set the display format

① –

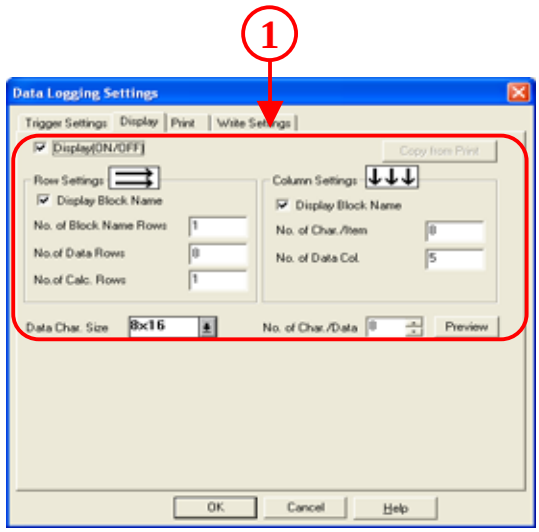
Select the [Display] tab and enable [Display ON/OFF].

Set the [Row Settings] and [Column Settings] as shown below.

<Row Settings> <Column Settings>

No. of Block Name Rows:1 No. of Char/ Item: 8
No. of Data Rows: 8 No. of Data Col.: 5
No of Calc. Rows: 1

Data Size: 1x1 (f)
No. of Char. Data: 8



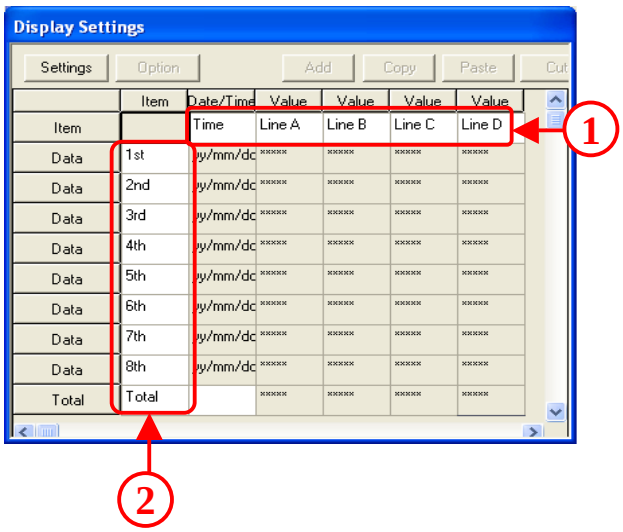
(4) How to input the block name

① –

Input the block names in every column.
Starting from left, input [Time], [Line A], [Line B], [Line C], and [Line D].

② –

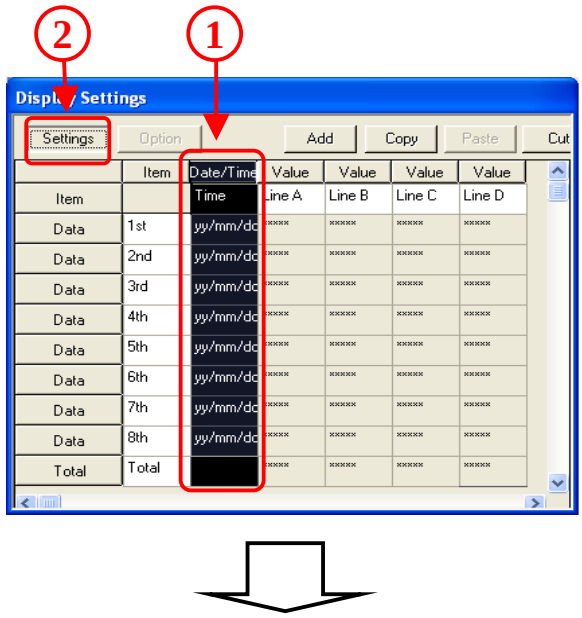
Input the block names in every row.
Starting from top, input [1st], [2nd], [3rd], [4th], [5th], [6th], [7th], [8th], and [Total].



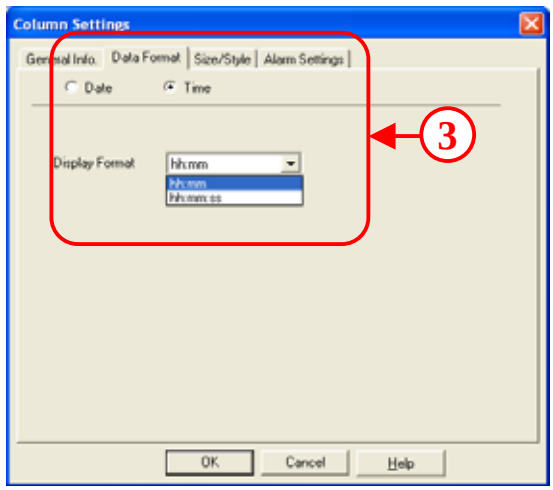
(5) How to set the time display

① Click the character mass for [Date/Time (Time)] and select the whole column.

② Click the [Settings] icon.

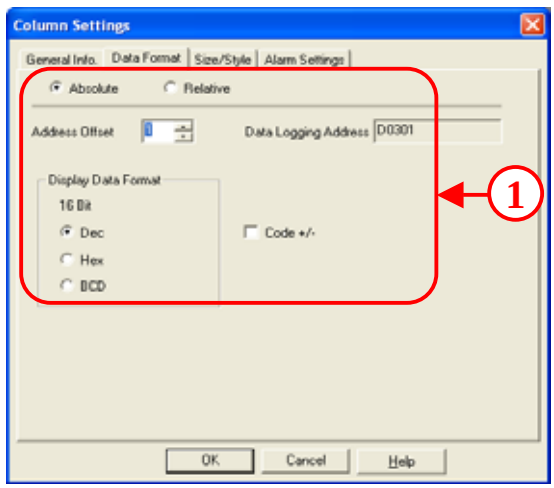


③ Click the [Data Format] tab and select [Time]. Select [hh:mm] as [Display Format] and click [OK].
Click [OK] after the settings are complete.



(6) How to set the display of numerical values

As with the [Time] column, click the mass for [Numerical Value](Line B) characters and select the whole column. Then, click [Settings].



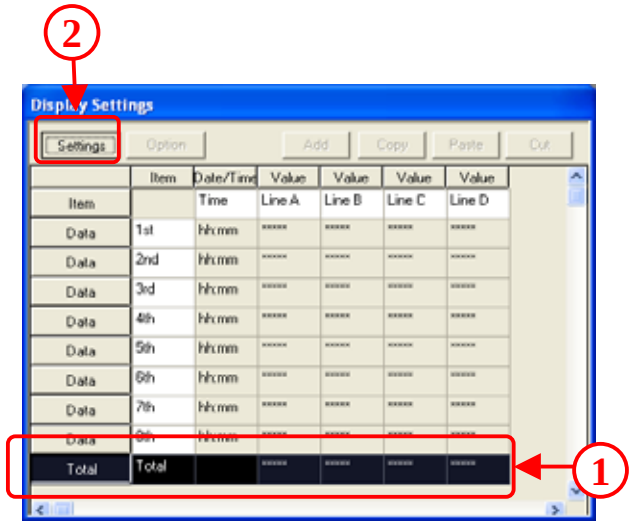
① Click the [Data Format] tab and set [1] in [Address Offset]. Then, click [OK].
As with the address offset for [Line B], set [2] in the address offset for [Line C], and [3] in the address offset for [Line D].

※ If the address offset is not set, the logging start address data for all the columns
is displayed.

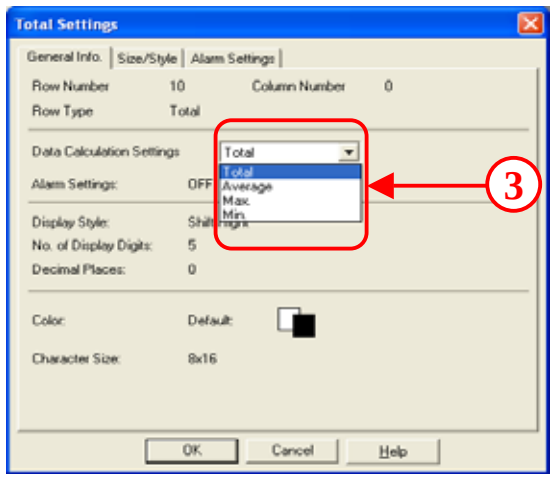
(7) How to set the calculation display

① Click the [Calculation (Total)] mass and select all the rows.

② Click the [Settings] icon.

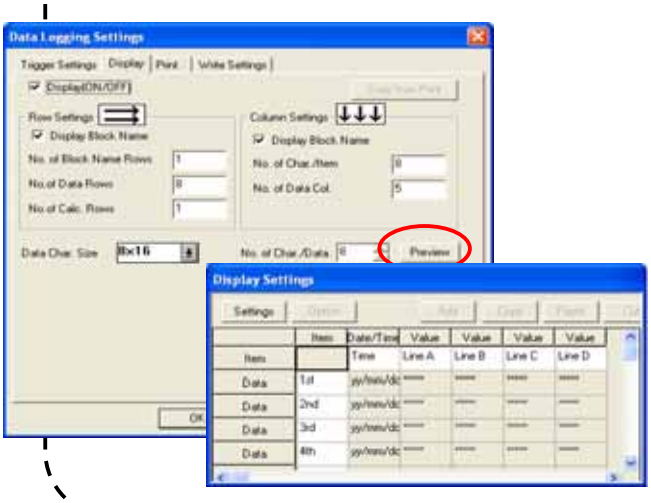


③ Select [Total] and click [OK].

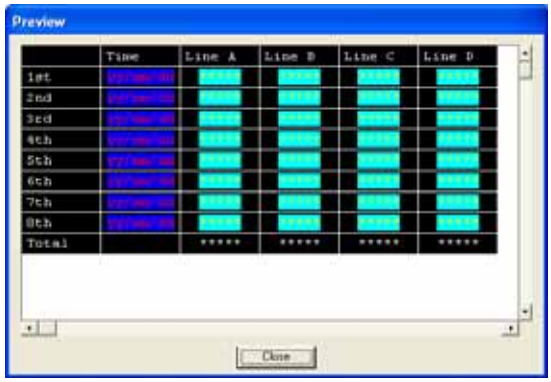


Hint

• Click [Preview] to check the finished re-image for the display format set here as shown below.



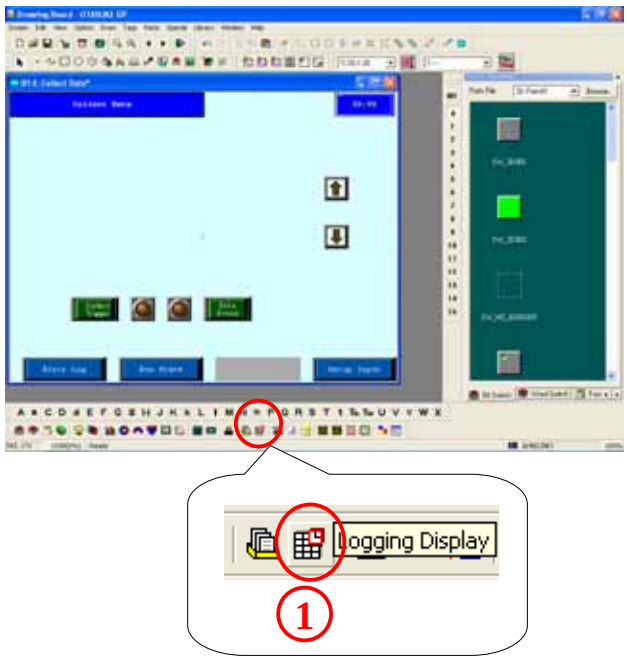
Preview <Example>



(8) How to select the logging display

① – – – – – – – – – – – – – –

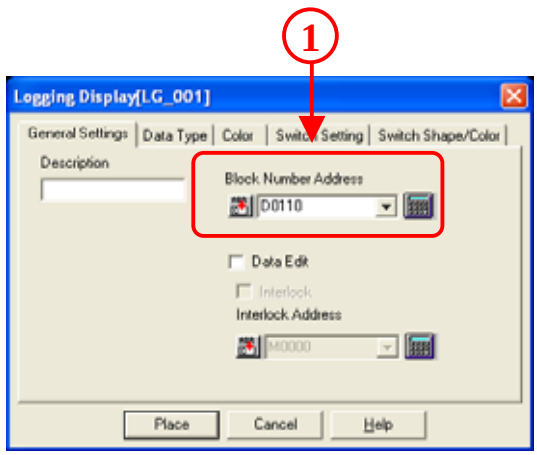
Open the screen editor and place the [Logging Display] in the base screen # 13.



(9) How to set the information

① – – – – – – – – – – – – – – – – – –

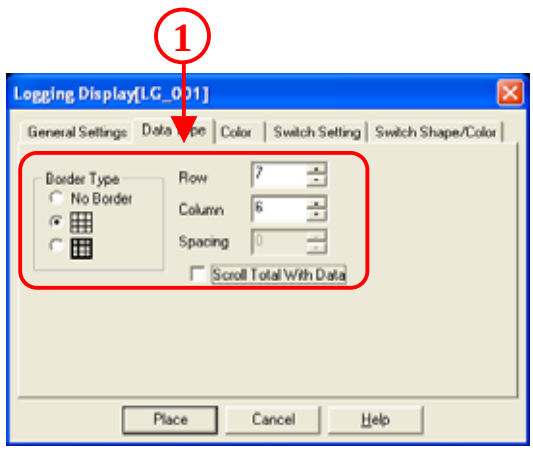
Set the [Block Number Address] as [D110].



(10) How to set the display format

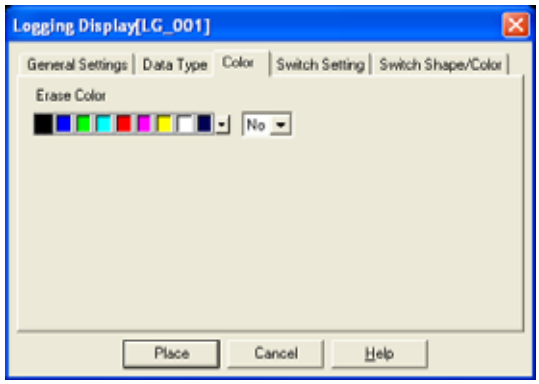
① – – – – – – – – – – – – – – – – –

Set the [Border Type] as you like.
Set the [Row] as [7] and the
[Column] as [6].



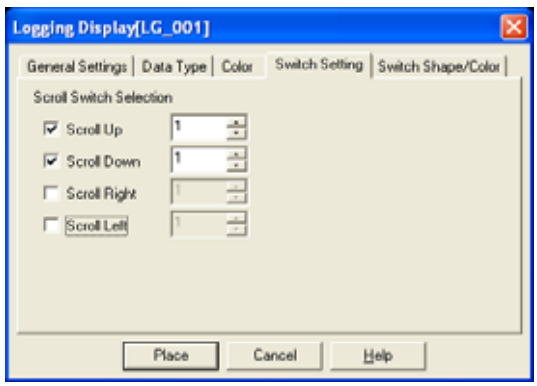
(11) How to set the color

① Set the [Erase Color] as you like.



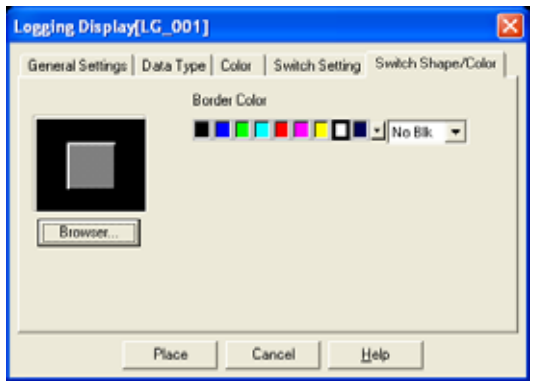
(12) How to set the switch

① Enable [Scroll Up] and [Scroll Down] and set the individual row count as [1].



(13) How to set the switch format/ color

① Select the switch picture as you like



(14) How to place the logging display

① Click [Place] to place the logging display and the switch.
Unselect the group to place/ edit individually.

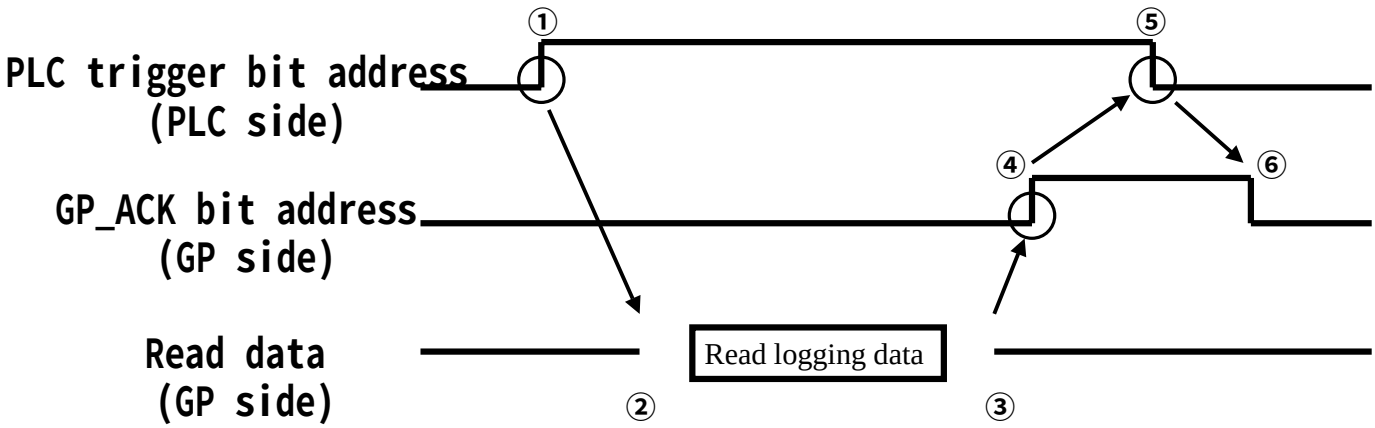
Hint

• The scroll key is unnecessary if it is possible to display the whole display range set in logging settings.

Precautions for logging from PLC to GP

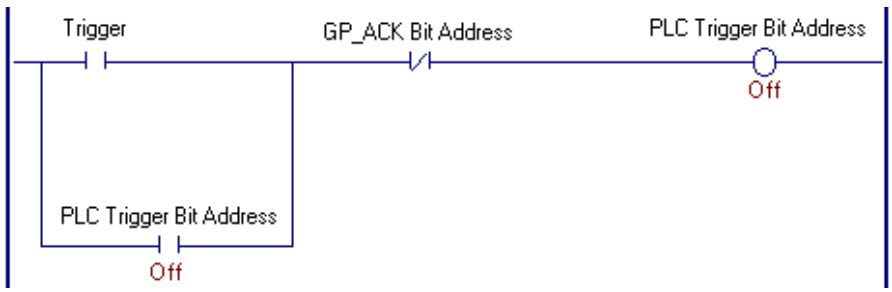
Please take care of the following points when logging to GP using the PLC radar program:

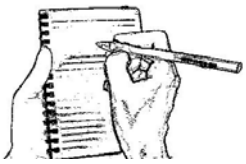
1: The PLC trigger address must be [ON] till the data is completely read by GP (= till GP_ACK bit address is ON). More the read data (logging word count), higher is the read time)
2: GP_ACK bit address is turned [OFF] automatically when the PLC trigger address turns [OFF].



① Turn the PLC trigger bit address [ON] on PLC side.
② GP starts reading the logging data
③ GP finishes reading the logging data
④ GP automatically turns the GP_ACK bit address [ON].
⑤ If it is found that the GP_ACK bit address on PLC side is [ON], it is turned [OFF].
⑥ If GP finds that the PLC trigger bit address is [OFF], it automatically turns the GP_ACK bit address [OFF].

• Example of radar program on PLC side





Notes: (Blank page. Please use for taking notes)