

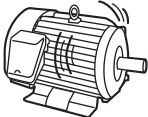
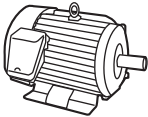
23 | Scheduling Operations

This chapter explains the basic operations for the time and day scheduling feature and how to turn on the specified bit for scheduling.

Please start by reading “23.1 Settings Menu” (page 23-2) and then turn to the corresponding page.

23.1	Settings Menu	23-2
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23.1 Settings Menu

Turning ON/OFF a Motor at the Designated Time	
 When the designated start time is reached...   Start Running Power turns ON and the motor starts.	 Setup Procedure (page 23-3)
 When the designated termination time is reached...   Stop Running Power turns OFF and the motor stops.	

Changing the Temperature at the Designated Time	
 When the designated start time is reached...  D100 : 100°C The running mode temperature setting is written. 	 Setup Procedure (page 23-7)
 When the designated termination time is reached...  D100 : 40°C The standby temperature setting is written. 	

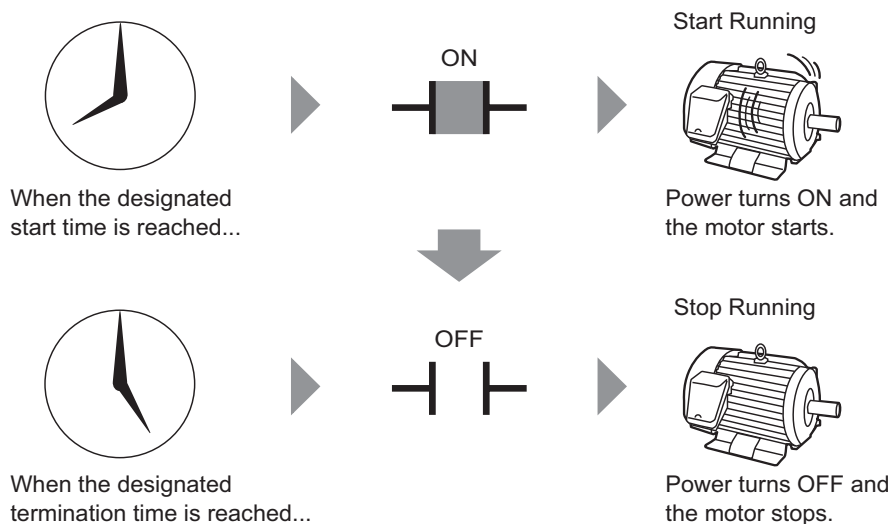
23.2 Turning ON/OFF a Motor at the Designated Time

23.2.1 Setup Procedure

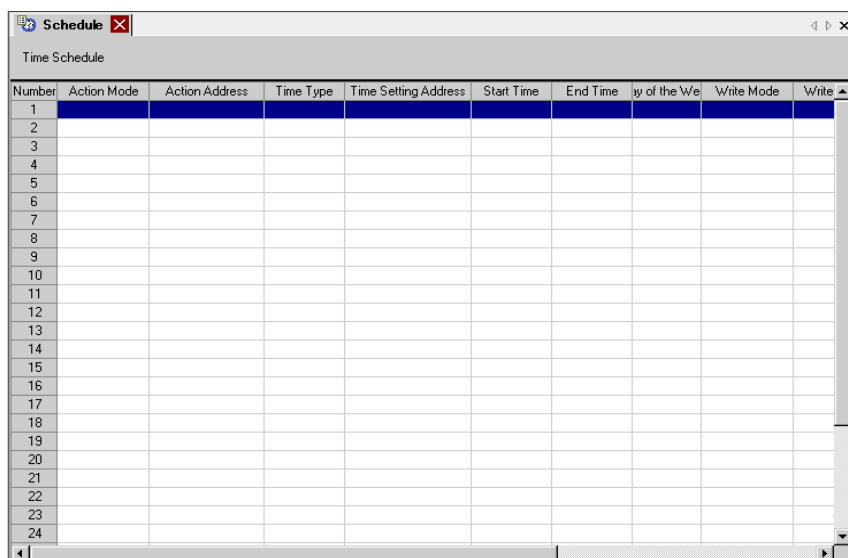
NOTE

- Please refer to the settings guide for details.
 "23.4 Common Time Schedule Settings Guide" (page 23-11)

The motor power (M100) is run from Monday to Friday, 8:00 to 17:00. Here is the setting procedure for turning ON the bit address M100 at the start time (8:00) and OFF at the end time (17:00).

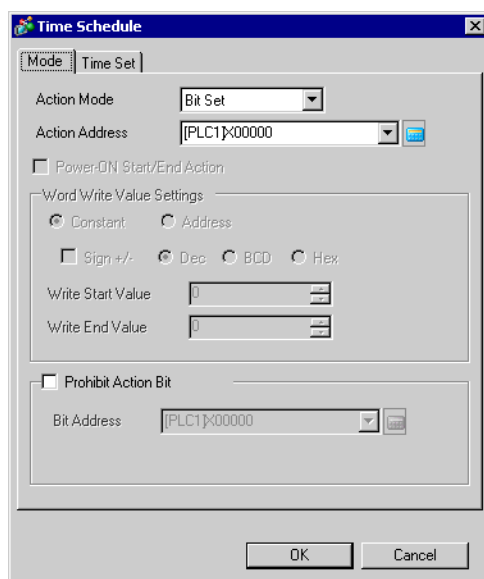


- 1 From the [Common Settings (R)] menu, select [Time Schedule (F)] or click  from the toolbar. The Time Schedule tab appears.



Number	Action Mode	Action Address	Time Type	Time Setting Address	Start Time	End Time	Day of the Week	Write Mode	Write
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

- 2 Click the row of the schedule number you want to register (for example, Number 1). The settings dialog box appears.



Time Schedule

Mode | Time Set

Action Mode: Bit Set

Action Address: [PLC1]X00000

☐ Power-ON Start/End Action

Word Write Value Settings

☒ Constant ☐ Address

☐ Sign +/- ☒ Dec ☐ BCD ☐ Hex

Write Start Value: 0

Write End Value: 0

☐ Prohibit Action Bit

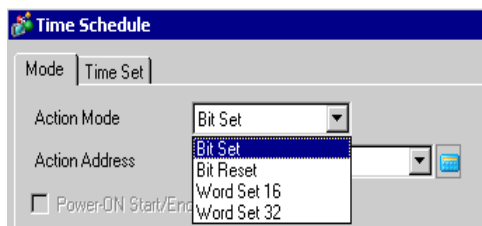
Bit Address: [PLC1]X00000

OK Cancel

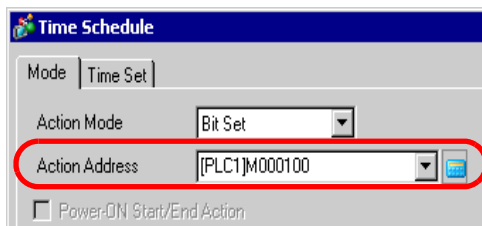
NOTE

- You can register up to 32 schedules (Number 1 to Number 32) in the schedule function.

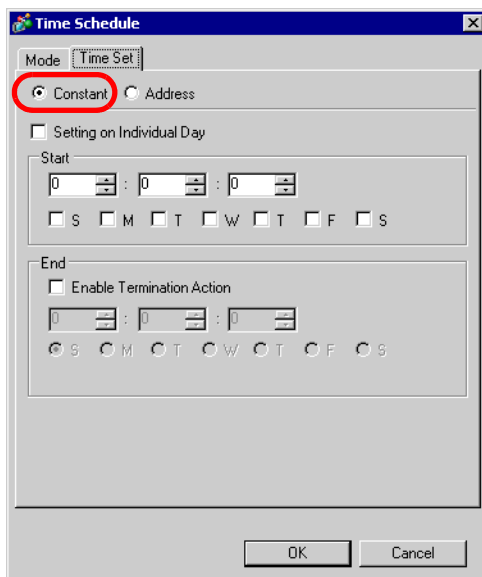
3 From [Mode], select [Bit Set].



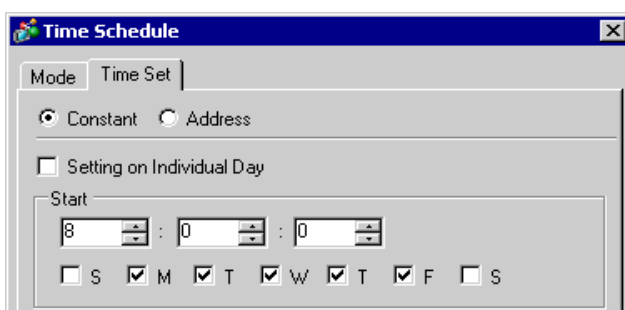
4 In [Action Address], set the target bit address (for example, M100).



5 Select the [Time Set] tab then select [Constant].



- Set the Start Time and Day. Set the Start Time as 8:00 and select the Monday to Friday check boxes. Clear the [Setting on Individual Day] check box.



Time Schedule

Mode Time Set

☒ Constant ☐ Address

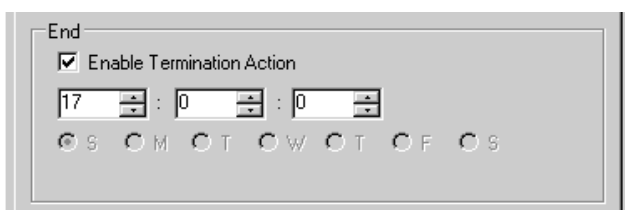
☐ Setting on Individual Day

Start

8 : 0 : 0

☐ S ☒ M ☒ T ☒ W ☒ T ☒ F ☐ S

- Set the end time. Select the [Enable Termination Action] check box and set the end time as 17:00.



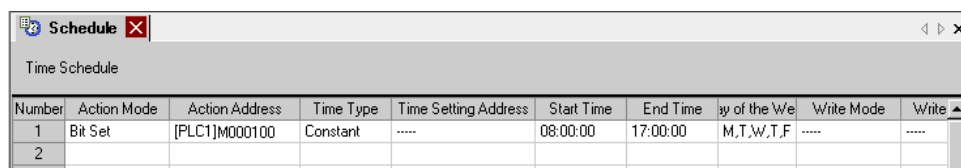
End

☒ Enable Termination Action

17 : 0 : 0

☐ S ☐ M ☐ T ☐ W ☐ T ☐ F ☐ S

- Click [OK]. The settings appear in the Schedule tab.



Number	Action Mode	Action Address	Time Type	Time Setting Address	Start Time	End Time	Day of the Week	Write Mode	Write
1	Bit Set	[PLC1]M000100	Constant	-----	08:00:00	17:00:00	M,T,W,T,F	-----	-----
2									

23.3 Changing the Temperature at the Designated Time

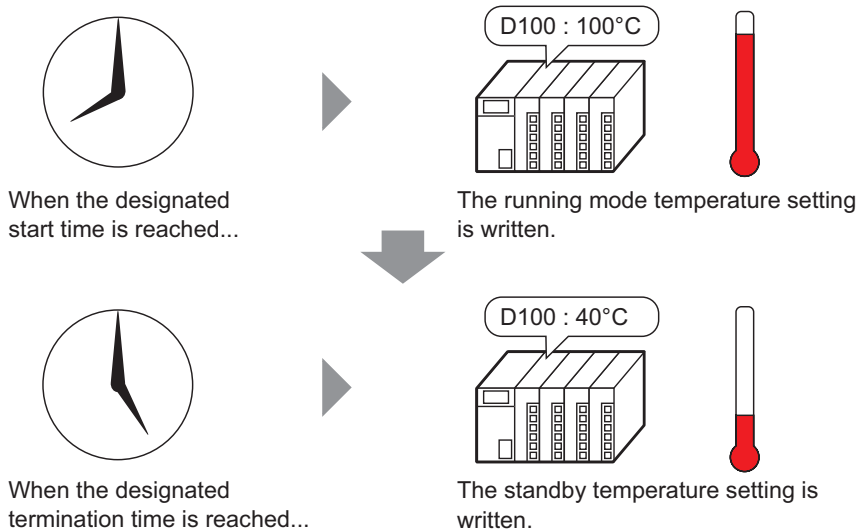
23.3.1 Setup Procedure

NOTE

- Please refer to the settings guide for details.

☞ “23.4 Common Time Schedule Settings Guide” (page 23-11)

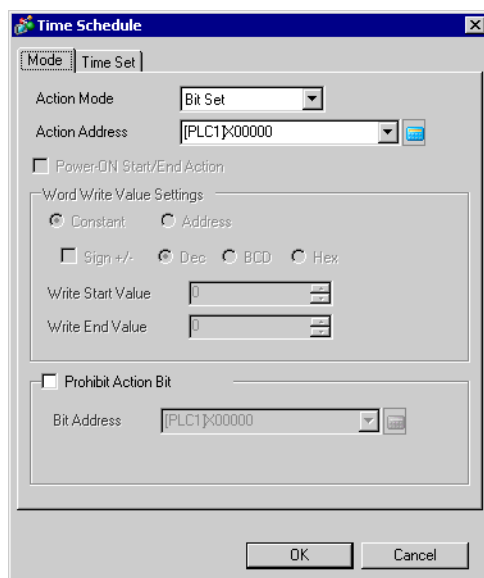
From Monday to Friday, a temperature setting of 100 is written to the word address D100 at the start time (8:00) for the running mode, and a temperature setting of 40 is written at the end time (17:00) for standby mode.



- 1 From the [Common Settings (R)] menu, select [Time Schedule (F)] or click  from the toolbar. The Time Schedule tab appears.

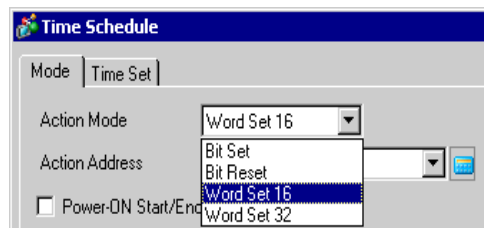
Schedule									
Time Schedule									
Number	Action Mode	Action Address	Time Type	Time Setting Address	Start Time	End Time	ay of the We	Write Mode	Write
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									

- Click the row of the schedule number you want to register (for example, Number 1). The settings dialog box appears.

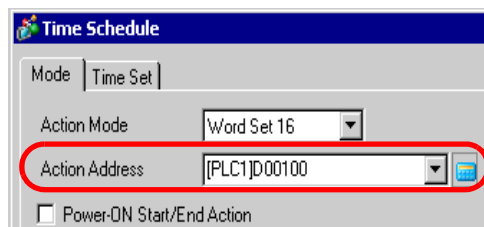
**NOTE**

- You can register up to 32 schedules (Number 1 to Number 32) in the schedule function.

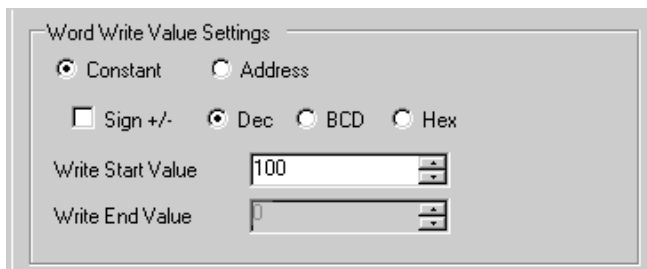
- From [Mode], select [Word Set 16].



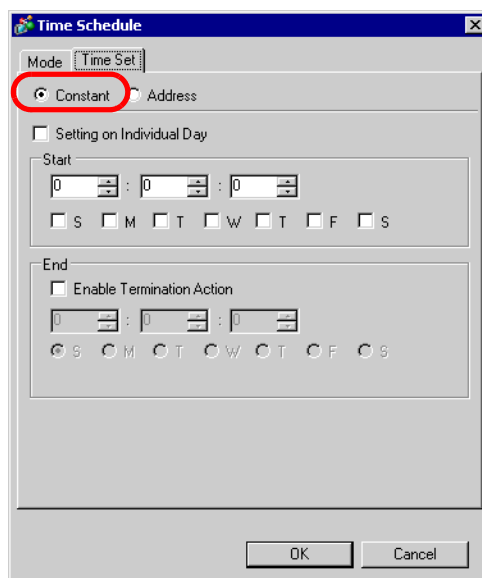
- In [Action Address], set the target bit address (for example, M100).



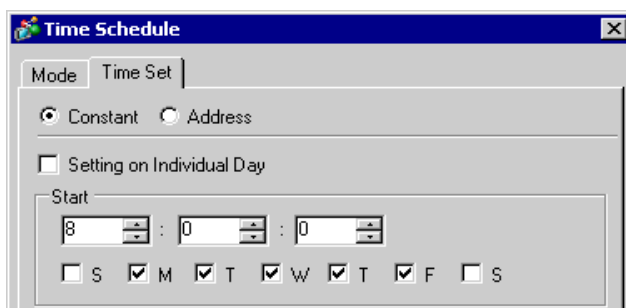
- 5 Select [Constant] and set the [Write Start Value] to "100".



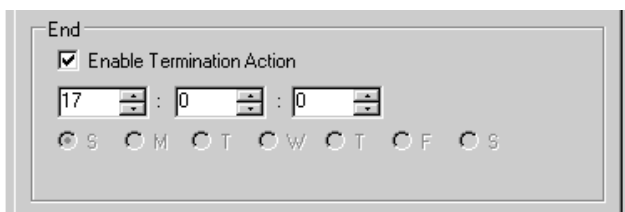
- 6 Select the [Time Set] tab then select [Constant].



- 7 Set the Start Time and Day. Set the Start Time as 8:00 and select the Monday to Friday check boxes. Clear the [Setting on Individual Day] check box.



- 8 Set the end time. Select the [Enable Termination Action] check box and set the end time as 17:00.



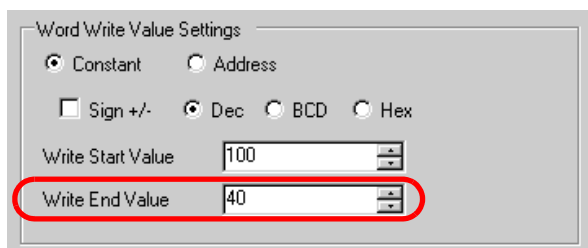
End

☒ Enable Termination Action

17 : 00

☐ S ☐ M ☐ T ☐ W ☐ T ☐ F ☐ S

- 9 Select the [Action] tab and set the [Write End Value] to "40".



Word Write Value Settings

☒ Constant ☐ Address

☐ Sign +/- ☒ Dec ☐ BCD ☐ Hex

Write Start Value 100

Write End Value 40

- 10 Click [OK]. The settings appear in the Schedule tab.

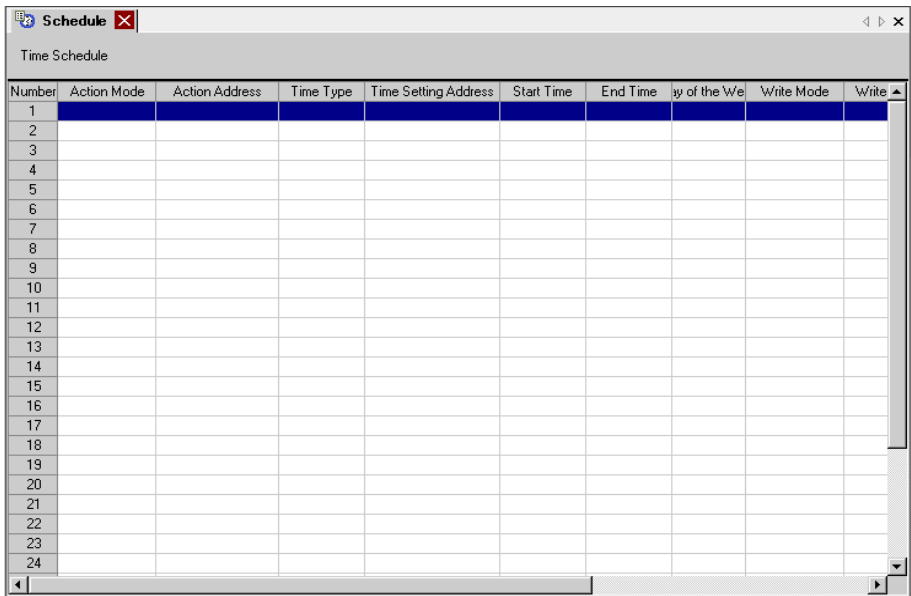
Schedule									
Time Schedule									
Number	Action Mode	Action Address	Time Type	Time Setting Address	Start Time	End Time	Day of the We	Write Mode	Write Value
1	Word Set 16	[PLC1]D00100	Constant	-----	08:00:00	17:00:00	M,T,W,T,F	Dec	100
2									
3									

23.4 Common Time Schedule Settings Guide

23.4.1 Time Schedule Tab

In the Schedule tab, you can view the schedule settings. Up to 32 schedules can be registered in each project.

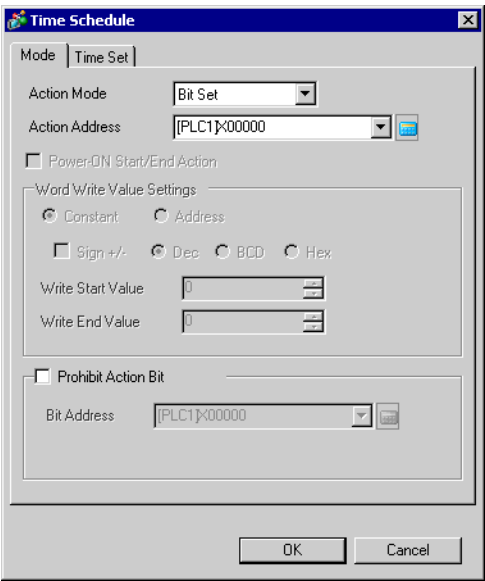
Open the Time Schedule dialog box by selecting one of the rows in the Schedule tab.



Number	Action Mode	Action Address	Time Type	Time Setting Address	Start Time	End Time	Day of the Week	Write Mode	Write
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

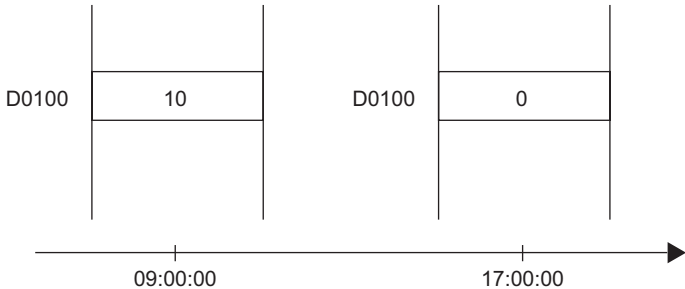
23.4.2 [Time Schedule] Dialog Box Settings Guide

■ Action

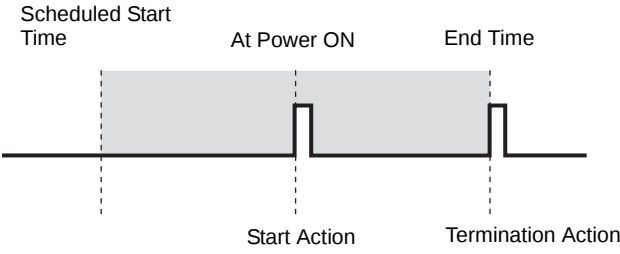
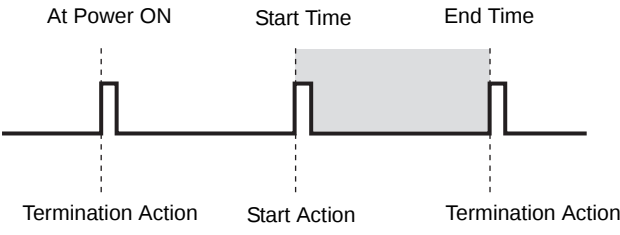


Setting	Description
Mode	Specify the type of operation that triggers the action. You can select: [Bit Set], [Bit Reset], [Word Set 16], or [Word Set 32].
Bit Set	At Start Time, the specified bit turns ON. At the End Time, the bit turns OFF. (Example): Start Time: 09:00:00 End Time: 17:00:00
Bit Reset	At the Start Time, the specified bit turns OFF. At the End Time, the bit turns ON. (Example): Start Time: 09:00:00 End Time: 17:00:00

Continued

Setting		Description
Mode	Word Set 16 Word Set 32	At the Start Time, the specified [Write Start Value] is written to the word address. At the End Time, the [Write End Value] is written. For example, Device Address: D0100 Start Value:10 End Value: 0 Start Time: 09:00:00 End Time: 17:00:00  The diagram illustrates a time-based schedule. A horizontal timeline starts at 09:00:00 and ends at 17:00:00, indicated by a right-pointing arrow. Two vertical lines mark these times. Between the 09:00:00 line and the 17:00:00 line, there are two horizontal bars representing the state of a word address. The first bar, starting at 09:00:00, contains the value '10'. The second bar, starting at 17:00:00, contains the value '0'. To the left of each bar is the label 'D0100', indicating the device address being controlled.
Action Address		Designate the address used to control the schedule.

Continued

Setting	Description
Power-ON Start/End Action	Select the action to perform when power is turned on. • At Enabled If the GP unit power is turned ON within the scheduled range, the action is performed. If the GP unit power is turned ON outside of the scheduled range, the termination action is performed. Inside the scheduled range  Outside the scheduled range  • At Disabled If power is turned ON but the time is later than the Start Time, the action is not automatically performed. However, the termination action is automatically performed. Also, if the termination action is not set, the schedule range is not recognized and the action is not performed.
Word Write Value Settings	These settings are active only when the Mode is set to [Word Set 16] or [Word Set 32].

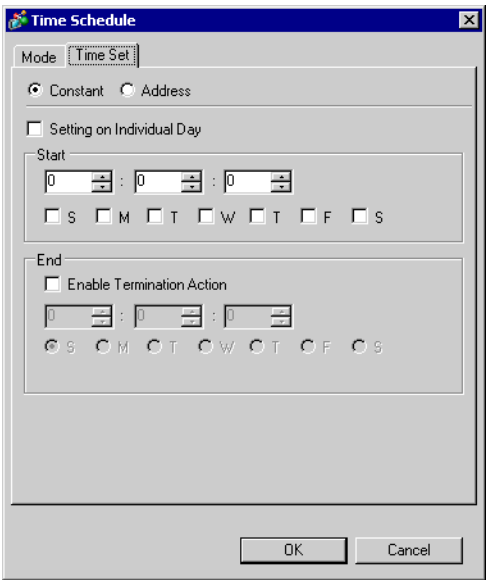
Continued

Setting		Description
	Constant/ Address	Select the method to set the [Write Start Value] and [Write End Value]. • Constant Write and designate a set constant. • Address Set the address that stores the value. You can change the [Write Start Value] and [Write End Value] by changing the value to store.
	Sign +/-	When [Constant] is selected, specify how to handle negative values.
	Dec/BCD/Hex	When [Constant] is selected, select the data format of [Write Start Value] and [Write End Value].
	Write Start Value	• For [Constant] Designates the value of the start time. • For [Address] Designates the address used to store the start time value.
	Write End Value	• For [Constant] Designates the value of the end time. • For [Address] Designates the address used to store the end time value. NOTE • You can use this option if the [Enable Termination Action] is selected on the [Time Settings] tab.
Prohibit Action Bit		Select to prohibit the schedule function. At the beginning of the schedule, the designated value is read out from the [Prohibit Action Bit] address. If the [Prohibit Action Bit] is ON, the schedule action is not performed.
	Bit Address	Choose an address for the [Prohibit Action Bit].

The settings range for [Write Start Value] and [Write End Value] differs depending on the specified data format and Sign +/-.

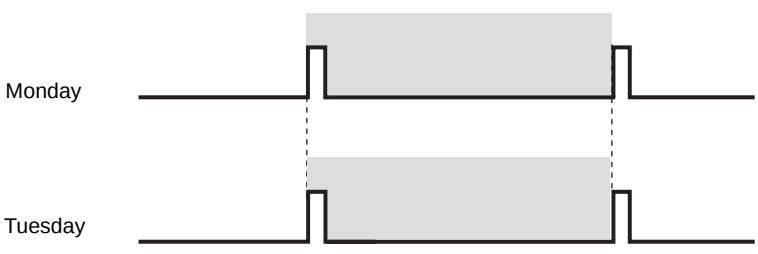
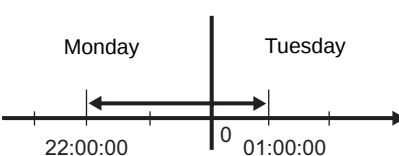
Mode	Data Type	Sign +/-	Setting Range
Word Set 16	Dec	Unchecked	0 to 65535
		Checked	-32,768 to 32,767
	BCD	-	0 to 9999
	Hex	-	0 to FFFF
Word Set 32	Dec	Unchecked	0 to 4294967295
		Checked	-2147483648 to 2147483647
	BCD	-	0 to 99999999
	Hex	-	0 to FFFFFFFF

■ Time Settings (When Constant is Selected)

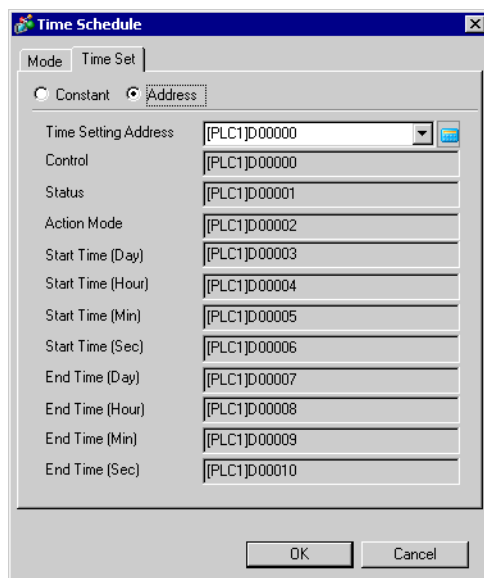


Setting	Description
Constant/Address	Select the method to set the Start Time and End Time. • Constant Specifies a fixed time and day. • Address Specifies the address which stores the data for the time and day. You can change the time and day by changing the data to store.
Setting on Individual Day	• At Enabled Can be set if the Time Schedule spans 2 or more days. Only one Start Day and End Day can be set. Start Action 9:00 Termination Action 17:00 Monday Tuesday NOTE • You must enter settings for the Start Time and End Time. • You cannot set the Start Time and End Time to the exact same day and time.

Continued

Setting	Description
Setting on Individual Day	- At Disabled A schedule that is 1 day (Start and End times are within 24 hours) can be entered. Multiple Start and End days can be selected. You can perform actions at the same time on multiple days. When specifying an End Time, enable [Enable Termination Action]. Start Action 9:00 Termination Action 17:00  NOTE - You cannot set the Start Time and End Time to the exact same day and time. - The Time Schedule is for one day only, so if the End Time is entered as being before the Start Time, the End Time is performed on the next day. (For example) Start Day: Monday Start Time: 22:00:00 End Time: 01:00:00 
Start	Choose the start time and day. When [Setting on Individual Day] is disabled, you must specify more than one day.
End	When [Enable Termination Action] is enabled, the End time can be specified. The day settings can only be set when [Setting on Individual Day] is enabled.

■ Time Settings (When Address is Selected)



Setting	Description
Time Setting Address	Designates the top address used to store time settings data read out from a device/PLC. The 10 word addresses are automatically allotted.
Control	Reads out the Mode, Start Time, and End Time. ☞ “◆ Control: Address (Time Setting Address+0)” (page 23-19)
Status	Turns a bit ON after the [Control] time data readout is completed or if the time data entered is incorrect. ☞ “◆ Status (Time Setting Address+1)” (page 23-19)
Action Mode	Designates [Enable Termination Action] and [Setting on Individual Day]. ☞ “■ Time Settings (When Constant is Selected)” (page 23-16) ☞ “◆ Mode (Time Setting Address+2)” (page 23-20)
Start Time (Day)	Designates the start day. ☞ “◆ Start/End Day (Start Day: Time Setting Address +3, End Day: Time Setting Address +7)” (page 23-21)
Start Time (Hour)	Designates the start time. ☞ “◆ Start/End Time: (Start Time: Time Setting Address +4 to +6, End Time: Time Setting Address +8 to +10)” (page 23-21)
Start Time (Min)	
Start Time (Seconds)	
End Time (Day)	Designates the end day. ☞ “◆ Start/End Day (Start Day: Time Setting Address +3, End Day: Time Setting Address +7)” (page 23-21)
End Time (Hour)	Designates the end time. ☞ “◆ Start/End Time: (Start Time: Time Setting Address +4 to +6, End Time: Time Setting Address +8 to +10)” (page 23-21)
End Time (Min)	
End Time (Seconds)	

◆ **Control: Address (Time Setting Address+0)**

When the Time Acquisition Request bit's ON (0 to 1) is detected, the Mode, Start Time, and End Time are read out.

15	01	00	Bit
Reserved (0 Fixed)			0

Bit 00: Time Acquisition Request Bit (0: No action, 1: Perform Time Read)

NOTE

- Data is not read out regularly from the Time Setting Address mode (address +2) to the End Time (Seconds) (address +10). When reflecting Time Settings data changes in the GP unit, be sure to turn ON (0→1) the Control (address +0) Time Acquisition Request Bit.

◆ **Status (Time Setting Address+1)**

After the Control time data readout is completed, the GP unit will turn the Time Acquisition Completion Bit ON (0→1). Also, if the entered time data is incorrect, the Error Notification Bit will simultaneously turn ON (0→1).

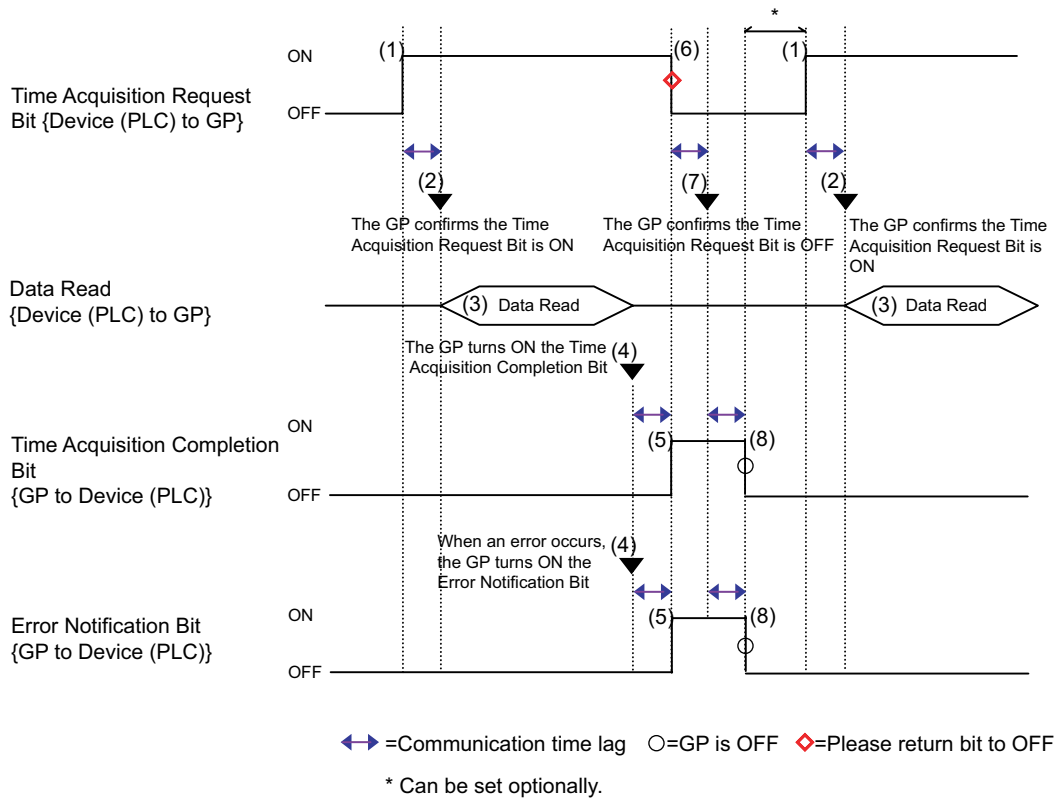
15	02	01	00	Bit
Reserved (0 Fixed)				0
				0

Bit 00: Time Acquisition Completion Bit (0: Either Time Acquisition is being performed or had not yet been performed, 1: Time Data Acquisition Completed)

Bit 01: Error Notification Bit (0: Time data is being replaced with correct data. Time data contains an error.)

NOTE

- Once the Time Acquisition Completion bit's rise (trigger) is recognized by the Device/PLC, be sure to turn the control Time Acquisition Request bit OFF (1→0). Once this bit is turned OFF (1→0), the Status Time Acquisition Completion bit and the Error Notification are simultaneously turned OFF (1→0).



◆ Mode (Time Setting Address+2)

Enable and disable the Termination Time Action and the Individual Day settings. Regardless of the Termination Time Action status, the indirectly designated time data (11 word addresses in the Time Setting Address) are read out.

15	02	01	00	Bit
Reserved (0 Fixed)				0
				0

Bit 00: Termination Time Action Setting (0: None, 1: Used)
 Bit 01: Individual Day Specification Mode (0:None, 1: Used)

NOTE

- If a [0] (Not Used) is entered in the Individual Day Specification mode, the End Time data are read but ignored.
- If a [1] (Used) is entered in the Individual Day Specification mode, be sure to enter all Start and End time information. If 2 or more of the Start/End Day bits turn ON simultaneously, an error occurs.

◆ **Start/End Day (Start Day: Time Setting Address +3, End Day: Time Setting Address +7)**

Designates the day used as a trigger for the Start/Termination Action.

15	07	06	05	04	03	02	01	00	Bit
Reserved (0 Fixed)		Sat.	Fri.	Thu.	We d.	Tue s.	Mon .	Sun .	

Bit 00:	Sunday (0: None, 1: Designate)
Bit 01:	Monday (0: None, 1: Designate)
Bit 02:	Tuesday (0: None, 1: Designate)
Bit 03:	Wednesday (0: None, 1: Designate)
Bit 04:	Thursday (0: None, 1: Designate)
Bit 05:	Friday (0: None, 1: Designate)
Bit 06:	Saturday (0: None, 1: Designate)

◆ **Start/End Time: (Start Time: Time Setting Address +4 to +6, End Time: Time Setting Address +8 to +10)**

Set the time values used for the Start/Termination Actions in the following ranges.

Hour: 0-23

Min.: 0-59

Seconds: 0-59

If you specify a value outside of the range, an error will occur.

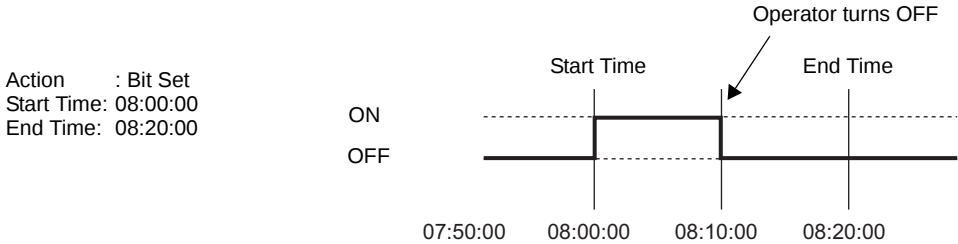
NOTE

- Time data are specified with binary input. They cannot be specified with BCD input.
- The End Time depend on the Mode (address +2) setting. Also, the Termination Time Action setting (bit 00) available depends on the Individual Day Specification mode (bit 01) used.

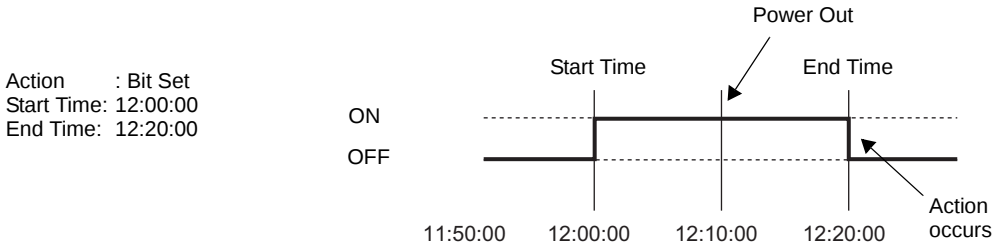
Individual Day Specification	Used	Not Used	
Termination Time Action Setting	Used	Used	Not Used

23.5 Restrictions

- You can register a maximum of 32 time schedules.
- The Time Schedule features are one time actions. When the Start Time is reached, the designated device address is written to just once. The write action is not repeated.



- Write Start/End Value (for the address setting), and the Prohibit Action Bit monitoring are read only once, at the beginning of the Time Schedule. Since regular readout is not possible, there may be a slight data communication delay that causes a slight delay in the Start Time.
- When changing GP Time Settings, the range of the schedule's Start and End Times is recognized. If the edited item is inside the scheduled range, the start action is performed. If the termination action is not set, the range cannot be confirmed and this action is not performed.
- If the Start Time Action is completed and then a power out rage occurs, the range is recognized and the Termination Action is performed at the End Time.



- When the same Start Times and End Times appear in multiple schedules, they are handled in order, starting from the smallest schedule number.
- When the Time Settings are specified as Address, only the control address' data is regularly read. When there are multiple schedules with Time Settings specified as Address, there may be an effect on the GP actions because each schedule's control address is read regularly.
- When the Time Settings are specified as Address, control address' readout speed is once every 500ms. When the Control Address bit 00 (Time Acquisition Request Bit) turns ON, a delay of up to 500ms may occur before the Status Address and onwards data is read out space. Also, when multiple schedules are set, if multiple control address' bit 00 (Time Acquisition Request Bits) simultaneously turn ON, delay may occur before an action is performed.
- When the Time Settings are specified as Address and you specify a Start Time or End Time that is outside the value range, the times may not function properly. Also, BCD input cannot be used.