

Schedules

1. Introduction

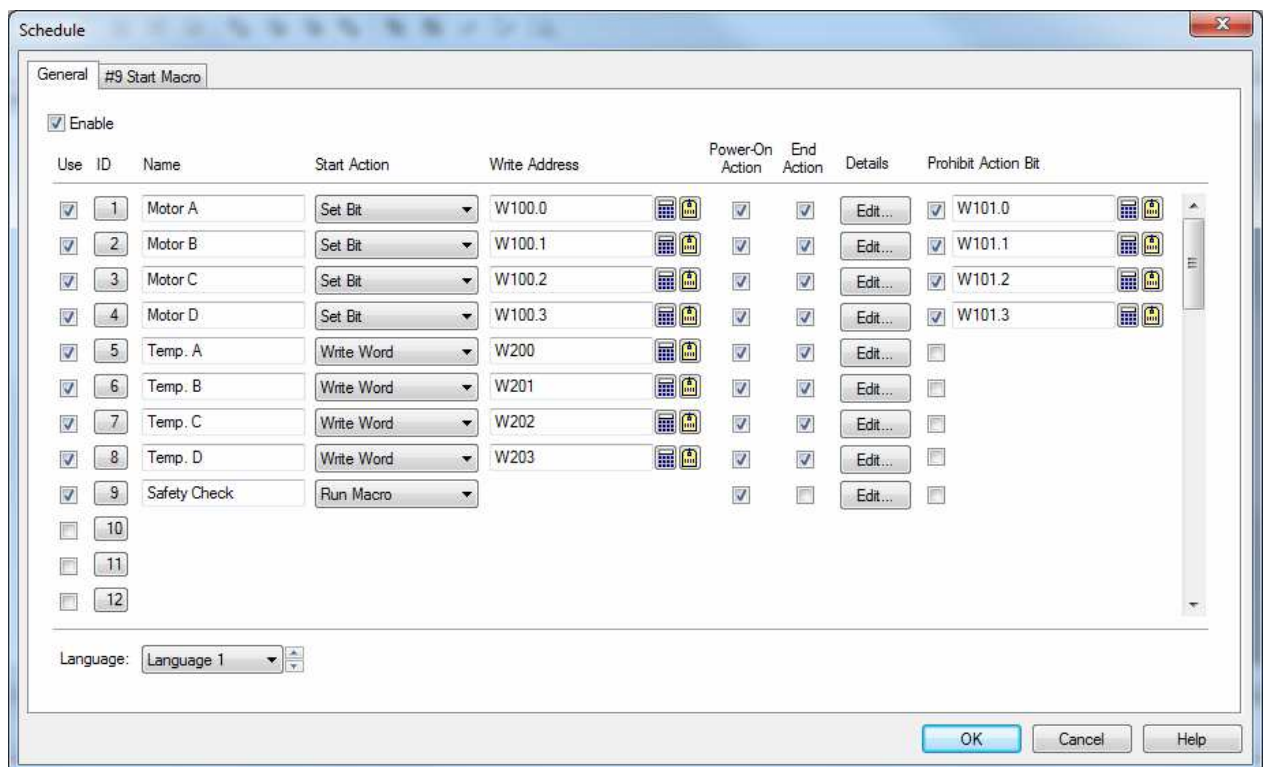
The schedule function allows the HMI to perform a specified operation at the designated time. For example, the HMI can turn on a motor at the designated start time and turn off that motor at the designated end time. Another example is that the HMI can set the running mode temperature at the designated start time of a process and reset the temperature to the standby temperature at the designated end time of that process. Up to 48 schedules (Number 1 to Number 48) can be registered in a panel application. Each schedule can be programmed to either change the value of a specified PLC location or execute a specified macro at the designated time.

To allow the operators to view/change the settings of the schedules, the Schedule Setting Table screen object is available for you to use it in your application.

2. Schedule Dialog Box

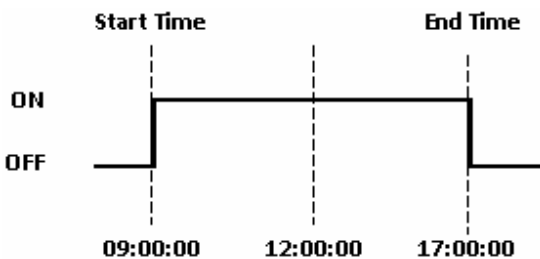
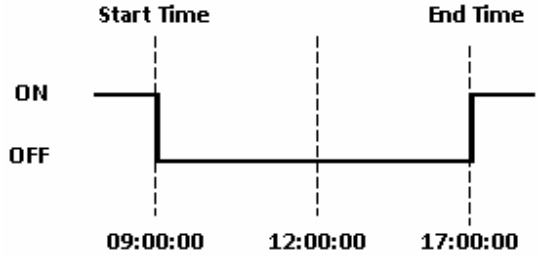
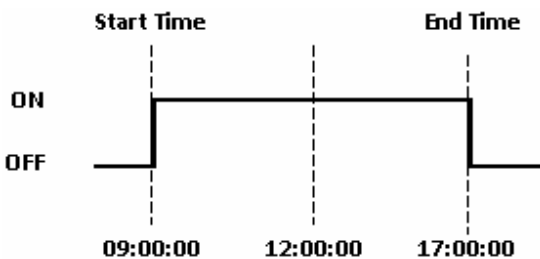
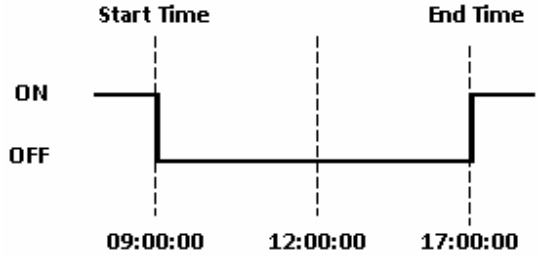
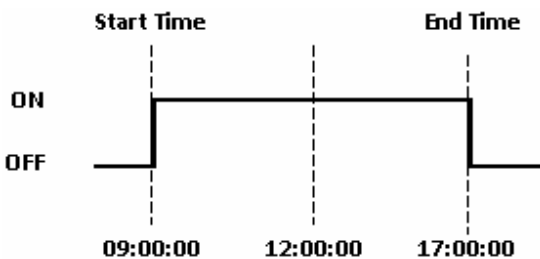
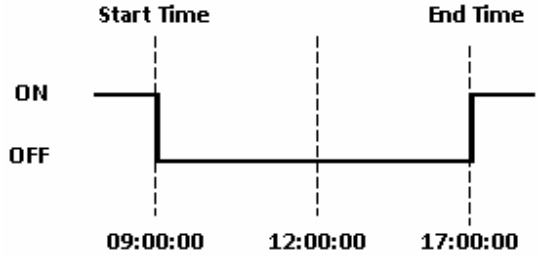
In the Schedule dialog box, you can view the schedule settings. To open the Schedule dialog box of a panel application, use one of the following two methods:

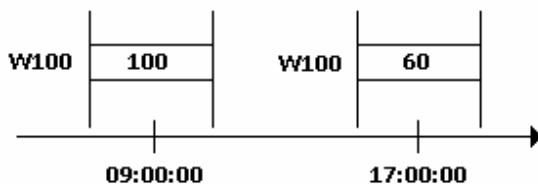
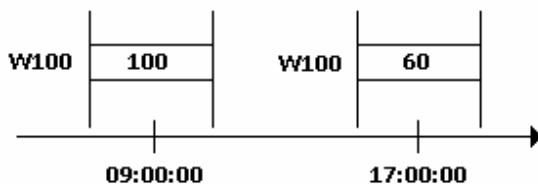
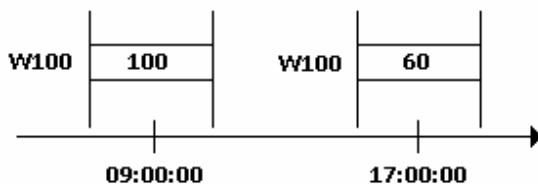
- 1) In the Project Manager window, double-click Setup->Schedule of the concerned panel application.
- 2) In the menu bar, click Panel ->Schedule. Note that the concerned panel application must be the current panel application or you will be working on the current panel application instead of the concerned panel application.

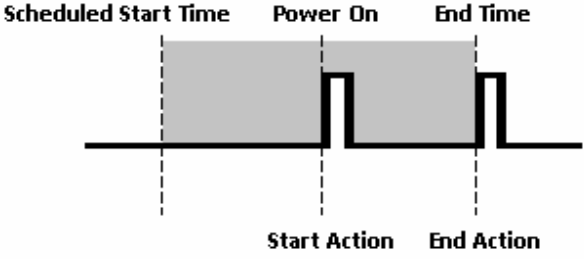
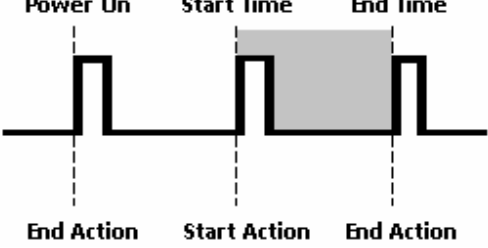


To enable the schedule function for the application, check the Enable box in the dialog box.

The following describes how to set up a time schedule.

Item	Description						
Use	To register the schedule, check the Use box of the schedule first. During project development, you can un-register the schedule temporarily by un-checking the Use box. The entered settings will not be lost after un-checking.						
ID	The pre-assigned identifier of the schedule.						
Name	Specify the schedule name for each language. The schedule name will be shown on the Schedule Setting Table screen object. The maximum length of a schedule name is 24 characters. To select the language you are working on, use the Language combo box on the bottom of the dialog box.						
Start Action	<p>Specify the action you want the HMI to perform at the Start time and the End time. The following table describes the five options.</p> <table> <tr> <th>Action</th><th>Description</th></tr> <tr> <td>Set Bit</td><td> <p>Sets the specified bit to On at the Start Time. If the End Action is selected, it resets the specified bit to Off at the End Time.</p> <p>Example Start Time: 09:00:00 End Time: 17:00:00</p>  </td></tr> <tr> <td>Reset Bit</td><td> <p>Resets the specified bit to Off at the Start Time. If the End Action is selected, it sets the specified bit to On at the End Time.</p> <p>Example Start Time: 09:00:00 End Time: 17:00:00</p>  </td></tr> </table>	Action	Description	Set Bit	<p>Sets the specified bit to On at the Start Time. If the End Action is selected, it resets the specified bit to Off at the End Time.</p> <p>Example Start Time: 09:00:00 End Time: 17:00:00</p> 	Reset Bit	<p>Resets the specified bit to Off at the Start Time. If the End Action is selected, it sets the specified bit to On at the End Time.</p> <p>Example Start Time: 09:00:00 End Time: 17:00:00</p> 
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	<table><tr><td>Write Word</td><td><p>Writes the Start Value to the specified word at the Start Time. If the End Action is selected, it writes the End Value to the specified word at the End Time.</p><p>Example Start Time: 09:00:00 End Time: 17:00:00 Start Value: 100 End Value: 60 Write Address: W100</p></td></tr><tr><td>Write 32-bit Word</td><td>Writes the Start Value to the specified double-word at the Start Time. If the End Action is selected, it writes the End Value to the specified double-word at the End Time.</td></tr><tr><td>Run Macro</td><td>Runs the specified Start Macro at the Start Time. If the End Action is selected, it runs the specified End Macro at the End Time. The corresponding Start Macro tab is added to the dialog box when the Run Macro action is selected. You can edit the Start Macro in the Start Macro tab. When the End Action is selected, the corresponding End Macro tab is added to the dialog box when the End Action is selected. You can edit the End Macro in the End Macro tab.</td></tr></table> <p>Note: The Start Time, End Time, Start Value, and End Value mentioned in the above table are specified in the Schedule Settings dialog box.</p>	Write Word	<p>Writes the Start Value to the specified word at the Start Time. If the End Action is selected, it writes the End Value to the specified word at the End Time.</p> <p>Example Start Time: 09:00:00 End Time: 17:00:00 Start Value: 100 End Value: 60 Write Address: W100</p> 	Write 32-bit Word	Writes the Start Value to the specified double-word at the Start Time. If the End Action is selected, it writes the End Value to the specified double-word at the End Time.	Run Macro	Runs the specified Start Macro at the Start Time. If the End Action is selected, it runs the specified End Macro at the End Time. The corresponding Start Macro tab is added to the dialog box when the Run Macro action is selected. You can edit the Start Macro in the Start Macro tab. When the End Action is selected, the corresponding End Macro tab is added to the dialog box when the End Action is selected. You can edit the End Macro in the End Macro tab.						
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Write Address	<table><tr><td colspan="2">Specify the target address for the desired action.</td></tr><tr><td>For Action</td><td>Address Type</td></tr><tr><td>Set Bit</td><td>Bit address</td></tr><tr><td>Reset Bit</td><td>Bit address</td></tr><tr><td>Write Word</td><td>An address that can refer to a 16-bit datum</td></tr><tr><td>Write 32-bit Word</td><td>An address that can refer to a 32-bit datum</td></tr></table>	Specify the target address for the desired action.		For Action	Address Type	Set Bit	Bit address	Reset Bit	Bit address	Write Word	An address that can refer to a 16-bit datum	Write 32-bit Word	An address that can refer to a 32-bit datum
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Reset Bit	Bit address												
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Write 32-bit Word	An address that can refer to a 32-bit datum												

Power-On Action	<p>Select the action to perform when the power is turned on.</p> <div data-bbox="379 353 1436 734"> <p>Power-On Action is Enabled (Checked)</p> <p>If the HMI is turned on inside of the scheduled range, the Start Action is performed.</p>  </div> <div data-bbox="379 734 1436 1137"> <p>If the HMI is turned on outside of the scheduled range and the End Action is enabled, the End Action is performed.</p>  </div> <div data-bbox="379 1171 1436 1249"> <p>Power-On Action is Disabled (Unchecked)</p> <p>If the End Action is enabled, the End Action is performed when the HMI is turned on.</p> </div>												
End Action	<p>Check the item to enable the End Action. If the End Action is enabled, the HMI will do one of the following operations at the designated End Time according to the selected Start Action.</p> <table border="1" data-bbox="379 1379 1436 1630"> <thead> <tr> <th>Start Action</th><th>End Action</th></tr> </thead> <tbody> <tr> <td>Set Bit</td><td>Resets the specified bit to Off at the End Time.</td></tr> <tr> <td>Reset Bit</td><td>Sets the specified bit to On at the End Time.</td></tr> <tr> <td>Write Word</td><td>Writes the End Value to the specified word at the End Time.</td></tr> <tr> <td>Write 32-bit Word</td><td>Writes the End Value to the specified double-word at the End Time.</td></tr> <tr> <td>Run Macro</td><td>Runs the specified End Macro.</td></tr> </tbody> </table>	Start Action	End Action	Set Bit	Resets the specified bit to Off at the End Time.	Reset Bit	Sets the specified bit to On at the End Time.	Write Word	Writes the End Value to the specified word at the End Time.	Write 32-bit Word	Writes the End Value to the specified double-word at the End Time.	Run Macro	Runs the specified End Macro.
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Run Macro	Runs the specified End Macro.												
Details	<p>Click the Edit button to open the Schedule Details dialog box. You can specify the Start Time, End Time, Start Value, and End Value of the schedule in the Schedule Details dialog box.</p>												
Prohibit Action Bit	<p>Select to prohibit the schedule function by using the specified Prohibit Action Bit. At the Start Time, the value of the Prohibit Action Bit is read before the start action is performed. If the value is on, the schedule action is not performed for the current cycle.</p>												

3. Schedule Details Dialog Box

In the Schedule Details dialog box, you can specify the Start Time/Date, End Time/Date, Start Value, and End Value of a schedule. To open the Schedule Details dialog box of a schedule, click the Edit button of the schedule in the Schedule dialog box.

Example 1

- 1) The time range starts at 09:00:00 on Monday and ends at 17:00:00 on Thursday.
- 2) The operators are allowed to modify the time range by using the Schedule Setting Table at runtime.
- 3) The Start Value and End Value are floating point numbers. When the schedule starts, the HMI outputs the Start Value read from the internal words \$U120 and \$U121 to the specified Write Address. When the schedule ends, the HMI outputs the End Value read from the internal words \$U122 and \$U123 to the specified Write Address.

The screenshot shows the 'Schedule Details' dialog box. It includes a 'Schedule No.' field with the value '5'. The 'Special Day' checkbox is unchecked. Under 'Time Range', the 'Constant' radio button is selected, and the 'Changeable with Schedule Setting Table' checkbox is checked. The 'Individual start and end days' checkbox is also checked. The 'Start Time' is set to 09:00:00 and the 'Start Day' is MON. The 'End Time' is set to 17:00:00 and the 'End Day' is THU. In the 'Output Value' section, the 'Variable' radio button is selected, the 'Data Type' is 32-Bit Floating Point, the 'Start Value' is \$U120, and the 'End Value' is \$U122. 'OK' and 'Cancel' buttons are located at the bottom right.

Example 2

- 1) The time range can be set by a device/PLC. The memory block starts at W100 of the PLC will be used for setting the time range.
- 2) Before a valid time range is set at runtime, the default time range specified in the dialog box will be used. The default time range starts at 09:00:00 and ends at on every weekday.
- 3) The operators are allowed to modify the time range by using the Schedule Setting Table at runtime.
- 4) The Start Value and End Value are 16-bit unsigned integers. When the schedule starts, the HMI outputs the Start Value read from the PLC word location W30 to the specified Write Address. When the schedule ends, the HMI outputs the End Value read from the PLC word location W31 to the specified Write Address.

Schedule Details

Schedule No.: 7

☐ Special Day

Time Range

☐ Constant ☒ Variable

☒ Changeable with Schedule Setting Table

Time Setting Address: W100

☒ Default Time

☐ Individual start and end days

Start Time: 09 : 00 : 00

End Time: 17 : 00 : 00

Applied Days:

☐ SUN ☒ MON ☒ TUE ☒ WED ☒ THU ☒ FRI ☐ SAT

Output Value

☐ Constant ☒ Variable

Data Type: 16-Bit Unsigned Integer

Start Value: W30

End Value: W31

OK Cancel

Example 3

- 1) The time range starts at 07:30:00 and ends at 20:30:00 on January 1st.
- 2) It is not allowed to modify the time range in the Schedule Setting Table at runtime.
- 3) The Start Value and End Value are 16-bit unsigned integers. When the schedule starts, the HMI writes 100 to the specified Write Address. When the schedule ends, the HMI writes 60 to the specified Write Address.

Schedule Details

Schedule No.: 8

☒ Special Day Month: 1 Day: 1

Time Range

☒ Constant ☐ Variable

☐ Changeable with Schedule Setting Table

Start Time: 07 : 30 : 00

End Time: 20 : 30 : 00

Output Value

☒ Constant ☐ Variable

Data Type: 16-Bit Unsigned Integer

Start Value: 100

End Value: 60

OK Cancel

The following describes the items in the Schedule Details dialog box.

Item		Description
Schedule No.		The number of the concerned schedule. The field is read only.
Special Day		Select to make the schedule valid only for the specified day.
Month		The month of the Special Day.
Day		The day of the Special Day.
Time Range	Constant	Select to make the time range non-settable by a device/PLC.
	Variable	Select to make the time range settable by a device/PLC.
Changeable with Schedule Setting Table		Select to allow the operators to change the time range by using the Schedule Setting Table at runtime.
Time Setting Address		Specify the starting address of the Time Setting Block that the device/PLC will use to set the time range of the schedule. See section 3.1 for the details of the Time Setting Block.
Default Time		Select to allow the schedule to have a default time range. This item is visible only when the Variable is selected for the Time Range. The HMI will use the default time range for the schedule if there is no valid time range set by the PLC or by the operator yet.
Individual start and end days		Select to indicate that the start day and end day of the schedule are different.
Start Time		The start time of the schedule.
Start Day		The start day of the schedule. The item is visible when the “Individual start and end days” is selected.
End Time		The end time of the schedule.
End Day		The end day of the schedule. The item is visible when the “Individual start and end days” is selected.
Applied Days		Select the day or days in a week that the schedule will apply.
Output Value	Constant	Select this item to indicate that the start value and the end value are constants.
	Variable	Select this item to indicate that the start value and the end value are to be read from the specified addresses.
Data Type		Specify the data type of the start and end values.
Start Value		Specify the start value or the address to get the start value.
End Value		Specify the end value or the address to get the end value.

3.1 Time Setting Block

The following table shows the word arrangement of the Time Setting Block.

Word No.	Usage
0	Time Setting Control Word
1	Time Setting Status Word
2	Action Mode
3	Start Day or the month of the Special Day
4	Start Time (Hour)
5	Start Time (Min.)
6	Start Time (Sec.)
7	End Day or the day of the Special Day
8	End Time (Hour)
9	End Time (Min.)
10	End Time (Sec.)

Time Setting Control Word (Word 0 of Time Setting Block)

Bit	15																	1	0
																			0
																			0

Bit 0: Time Acquisition Request Bit

When the HMI detects that the Time Acquisition Request Bit turns on (from 0 to 1), it reads out from word 2 to word 10 of the Time Setting Block to get the Action Mode, the Start Time, and the End Time for the schedule.

Time Setting Status Word (Word 1 of Time Setting Block)

Bit	15																	2	1	0
																			0	0

Bit 0: Time Acquisition Completion Bit

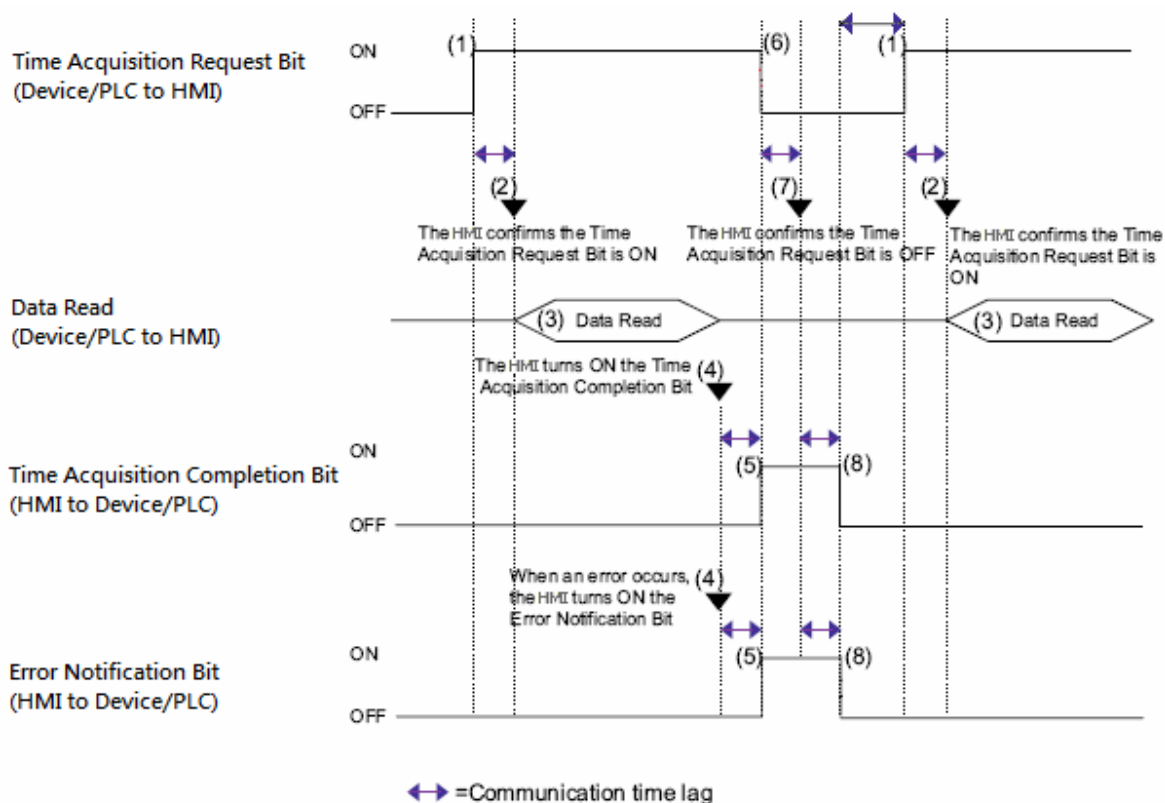
- 0: Either Time Acquisition is being performed or have not been performed
- 1: Time Acquisition completed

Bit 1: Error Notification Bit

- 0: Time data is being replaced with correct data
- 1: Time data contains an error

Note:

- 1) The device/PLC must turn the Time Acquisition Request Bit off (1 to 0) when recognizes that the Time Acquisition Completion Bit turns on (0 to 1)
- 2) When the HMI detects that the Time Acquisition Request Bit is turned off (1 to 0), it turns off the Time Acquisition Completion Bit and Error Notification Bit immediately.



Action Mode (Word 2 of Time Setting Block)

Bit	15	2	1	0
	Reserved (Must be 0)			0 0

Bit 0: End Action Bit

- 0: Disable the End Action of the schedule
- 1: Enable the End Action of the schedule

Bit 1: Individual Day Specification Bit

- 0: The Start Day and End Day of the schedule are the same.
- 1: The Start Day and End Day of the schedule are different.

Note:

If Individual Day Specification Bit is 1 and two or more of the Start/End Day bits turn on simultaneously, an error occurs.

Start/End Day (Start Day: Word 3 of Time Setting Block, End Day: Word 7 of Time Setting Block)

Designate the day used as a trigger for the Start/End Action.

Bit	15		07	06	05	04	03	02	01	00
	Reserved (Must be 0)			Sat.	Fri.	Thu.	Wed.	Tue.	Mon.	Sun.

Bit 00: Sunday (0: None, 1: Designate)

Bit 00: Monday (0: None, 1: Designate)

Bit 00: Tuesday (0: None, 1: Designate)

Bit 00: Wednesday (0: None, 1: Designate)

Bit 00: Thursday (0: None, 1: Designate)

Bit 00: Friday (0: None, 1: Designate)

Bit 00: Saturday (0: None, 1: Designate)

Note: If the schedule is configured for the Special Day, the high byte of word 3 (Start Day) should contain the month (1-12) of the Special Day and the low byte of word 3 should contain the day (1-31) of the Special Day. The content of word 7 (End Day) should be 0.

	High byte (Bit 15-8)	Low byte (Bit 7-0)
Start Day:	Month of the Special Day (1-12)	Day of the Special Day (1-31)
End Day:	0	

Start Time (Hour) (Word 4 of Time Setting Block)

Hour: 0-23

Start Time (Min.) (Word 5 of Time Setting Block)

Minute: 0-59

Start Time (Sec.) (Word 6 of Time Setting Block)

Second: 0-59

End Time (Hour) (Word 8 of Time Setting Block)

Hour: 0-23

End Time (Min.) (Word 9 of Time Setting Block)

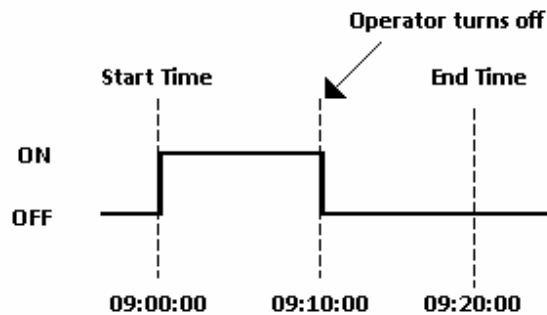
Minute: 0-59

End Time (Sec.) (Word 10 of Time Setting Block)

Second: 0-59

4. Restrictions

- 1) You can register up to 48 time schedules.
- 2) 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.



- 3) The Start Value and the Prohibit Action Bit are read only once at the beginning of the time range. Since regular readout is not possible, there may be a slight data communication delay that causes a slight delay in the Start Time. Due to the same reason, the delay may occur in the End Time.
- 4) When the time range of a schedule is changed by whatever method and the current time is inside the time range, the start action is performed.
- 5) When the same Start Times and End Times appear in multiple schedules, they are handled in order, starting from the smallest schedule number.
- 6) If the Start Action is completed and then a power outage occurs, the End Action will be performed at the End Time after the power is resumed.

