CHAPTER 11

ALARMS AND ALARM DISPLAYS

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In order to use alarm display for your application, you need to set up alarm processing first and then define an alarm block. This chapter describes how to set up the alarm processing and alarm block. It also describes how to configure the alarm display to show alarm history, alarm count, active alarm and alarm marquee.

11.1. Using Alarms

To use an alarm in your application, please follow the procedure as below:

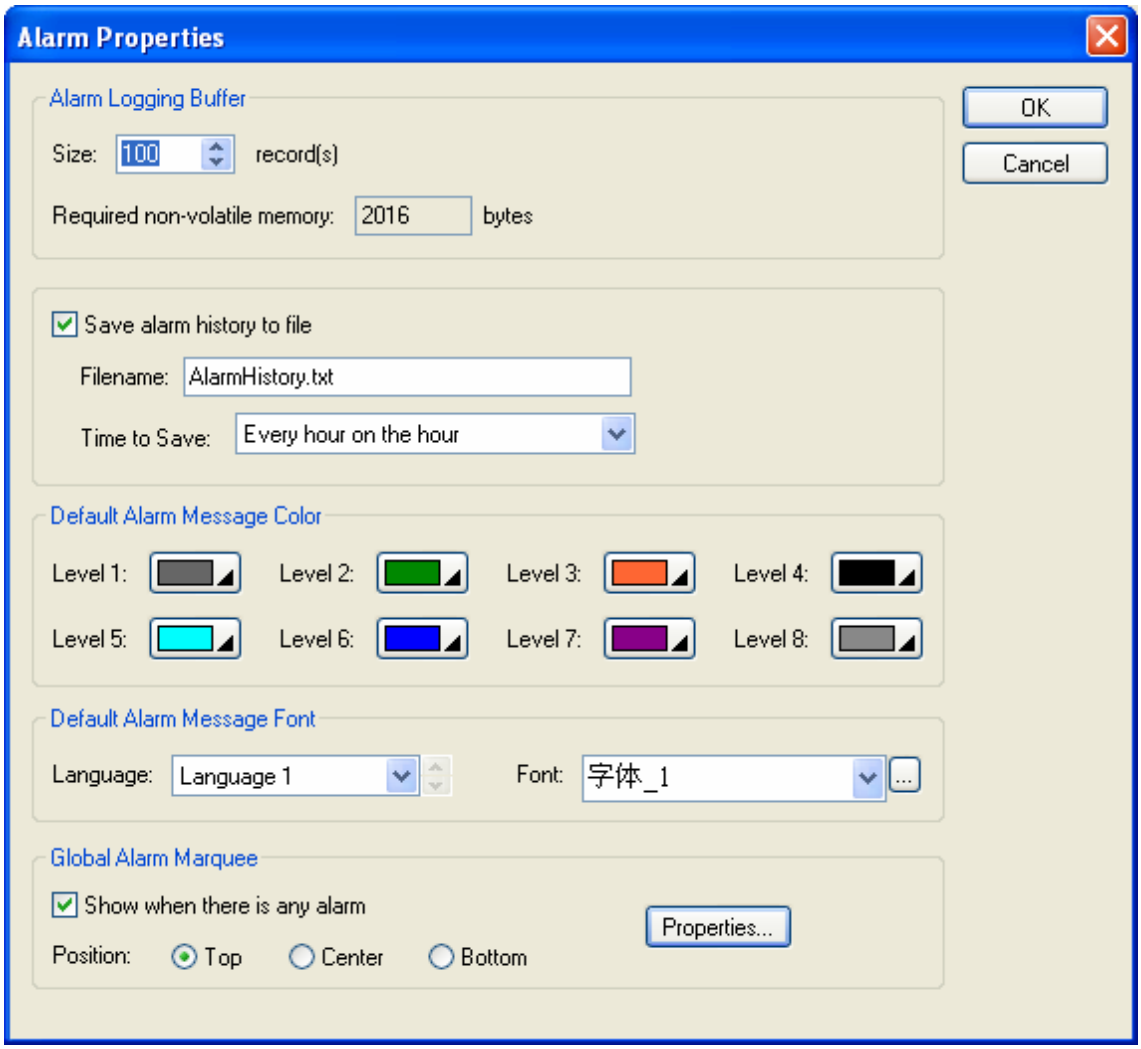
1. Setting up alarm processing
   Described in Section 11.2
2. Creating and configuring discrete alarm blocks or analog alarm blocks
   Described in Section 11.3 and Section 11.4
3. Creating and configuring alarm displays
   Described in Section 11.5

You can use command flag setting in command block or function button to request the panel to clear alarm history or clear alarm count.

To know how to set up the command flag in command block, please see Section 3.5.1 Command Block and Status Words.
To know how to define a function button, please see Section 5.4.1 Basic Operations of function buttons.

11.2. Setting Up Alarm Processing

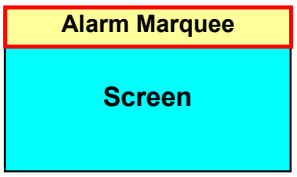
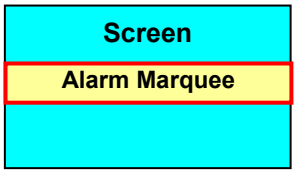
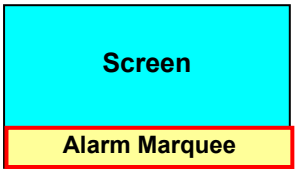
You can set up the alarm processing with the Alarm Properties dialog box. In this dialog, you can determine the required memory for alarm logging buffer, choose default color and font for the alarm message, specify how to save the alarm history records to a text file and configure the global alarm marquee if you want to show it on the screen. To open the dialog box of alarm processing, please double click the node named Alarms in the Project Manager tool window. The following is an example of the Alarm Properties dialog box.



The table below describes each property in the Alarm Properties dialog.

Property		Description
Alarm Logging Buffer	Size	The maximum number of records that the alarm logging buffer can hold. For example, 100 means when the 101st alarm happens, the 1st record will be overwritten.
	Required non-volatile memory	The size of the alarm logging buffer. The unit is byte. The formula to calculate the size is: Alarm Logging Buffer Size = Number of Records * 20 + 16

Continued

<table>
<tr><th colspan="2">Property</th><th>Description</th></tr>
<tr><td rowspan="3">Save alarm history to File</td><td>Save alarm history to file</td><td>Check this option so the newly alarm history record will be written to a specified file periodically. Each time when performing this operation, the panel writes only the record that are not saved to a file before.</td></tr>
<tr><td>File Name</td><td>The filename or the prefix of the filename of the file to save the alarm record. The alarm records are saved in text format and the file extension name must be “.txt”. You can use any text editor and Microsoft Excel to view the alarm records directly. This item is available when the option Save alarm history to file is checked.</td></tr>
<tr><td>Time to Save</td><td>Specifies the period to save the alarm history records. This item is available when the option Save alarm history to file is checked. There are nine kinds of period available: Every hour on the hour ; Every 8 hours (00:00, 08:00, 16:00) ; Every 12 hours (00:00, 12:00) Every day at 00:00; Every day at 08:00; Every day at 12:00; Every Sunday at 00:00; Every Monday at 00:00; Every month's first day at 00:00.</td></tr>
<tr><td>Default Alarm Message Color</td><td>Level 1, Level 2… Level 8</td><td>Select a default color for alarm level 1,2…8. The alarm display will show an alarm message with this color if that alarm is defined as a level 1,2…8 alarm.</td></tr>
<tr><td rowspan="2">Default Alarm Message Font</td><td>Language</td><td>Select a default language so you can view and edit the language dependent settings in the Text group for that language. The language dependent properties in the Text group include Font and Alarm Status Abbreviation.</td></tr>
<tr><td>Font</td><td>Select a default font for the text of the alarm message.</td></tr>
<tr><td rowspan="3">Global Alarm Marquee</td><td>Show when there is any alarm</td><td>Check this option if you want to show global alarm marquee on the current screen when there is any alarm.</td></tr>
<tr><td>Position</td><td>Select one of the following 3 positions for the global alarm marquee to show up.
<table>
<tr><th>Position</th><th>Description</th></tr>
<tr><td>Top</td><td>The global alarm marquee shows up on the top of the screen.
 
</td></tr>
<tr><td>Center</td><td>The global alarm marquee shows up in the center of the screen.
 
</td></tr>
<tr><td>Bottom</td><td>The global alarm marquee shows up at the bottom of the screen.
 
</td></tr>
</table></td></tr>
<tr><td>Properties</td><td>Click the button to bring up the Alarm Display dialog box to set up the properties of the global alarm marquee. Please see Section 11.4.4 for details.</td></tr>
</table>

11.3. Working with Alarm Blocks

11.3.1. Creating an alarm block

To create a discrete alarm block, you may do one of the followings:

1) In the Project Manager tool window, right-click the Alarms node of the concerned panel application and select Add Discrete Alarm Block.
2) In the menu bar, click Panel to bring up the Panel sub-menu. Click Discrete Alarm Block in the Panel sub-menu to bring up the pop-up menu. Select Add in the pop-up menu.

To create an analog alarm block, you may do one of the followings:

1) In the Project Manager tool window, right-click the Alarms node of the concerned panel application and select Add Analog Alarm Block.
2) In the menu bar, click Panel to bring up the Panel sub-menu. Click Analog Alarm Block in the Panel sub-menu to bring up the pop-up menu. Select Add in the pop-up menu.

11.3.2. Importing and exporting an alarm block

To import an alarm block, right-click the Alarms node and then select Import Alarm Block…in the Project Manager window. Select *.alm file in the Open file dialog and then click Open.

To export a discrete alarm block, right-click the node of the desired discrete alarm block and then select Export Alarm Block…. in the Project Manager window.

To export an analog alarm block, right-click the node of the desired analog alarm block and then select Export Alarm Block…. in the Project Manager window.

11.3.3. Deleting an alarm block

To delete a discrete alarm block, you may do one of the followings:

1) In the Project Manager window, right-click the node of the desired discrete alarm block and then select Delete.
2) In the menu bar, click Panel to bring up the Panel sub-menu. Click Discrete Alarm Block in the Panel sub-menu to bring up the Discrete Alarm Block pop-up menu. Select Delete in the pop-up menu to bring up the discrete alarm block list of the current panel application. Select the desired discrete alarm block in the list.

To delete an analog alarm block, you may do one of the followings:

1) In the Project Manager window, right-click the node of the desired analog alarm block and then select Delete.
2) In the menu bar, click Panel to bring up the Panel sub-menu. Click Analog Alarm Block in the Panel sub-menu to bring up the Analog Alarm Block pop-up menu. Select Delete in the pop-up menu to bring up the analog alarm block list of the current panel application. Select the desired analog alarm block in the list.

11.3.4. Embedding Variable in the Appended Text of Alarm Message

1. The appended text can have one embedded variable.

2. Use the following format to specify an embedded variable:
   @@ read_address<display_format>

   For example, the following embedded variable in the appended text will display the **32-bit floating point number** stored in **W300** with the format of **4 total digits** and **1 fractional digit**.

   (Current temperature: @@W300<F4.1> °C)

   If the value of W300 is 123.456 when the alarm occurs, the following text will be appended to its alarm message:

   (Current temperature: 123.4 °C)

3. The *read_address* can be any valid word address.

4. The *display_format* has the following format:
   Dt.f
   The *D* is a one-letter or two-letter code to specify the data type.
   The *t* is a number to specify the total number of digits to be displayed.
   The *f* is a number to specify the total number of fractional digits to be displayed.
   The following table shows the rule of specifying the *display_format*.

Data Type	*D* (Data Type)	*t* (Total Digits)	*f* (Fractional Digits)
16-bit Unsigned Integer	U	1~5	*t* >= *f* >= 0
16-bit Signed Integer	S	1~5	*t* >= *f* >= 0
16-bit BCD Integer	D	1~4	*t* >= *f* >= 0
32-bit Unsigned Integer	UD	1~10	*t* >= *f* >= 0
32-bit Signed Integer	SD	1~10	*t* >= *f* >= 0
32-bit BCD Integer	DD	1~8	*t* >= *f* >= 0
32-bit Floating Point Number	F	1~10	*t* >= *f* >= 0

5. Note that the embedded variable specified in the appended text of the first language will be used in the appended text of all other languages no matter what embedded variables are specified in those appended text.

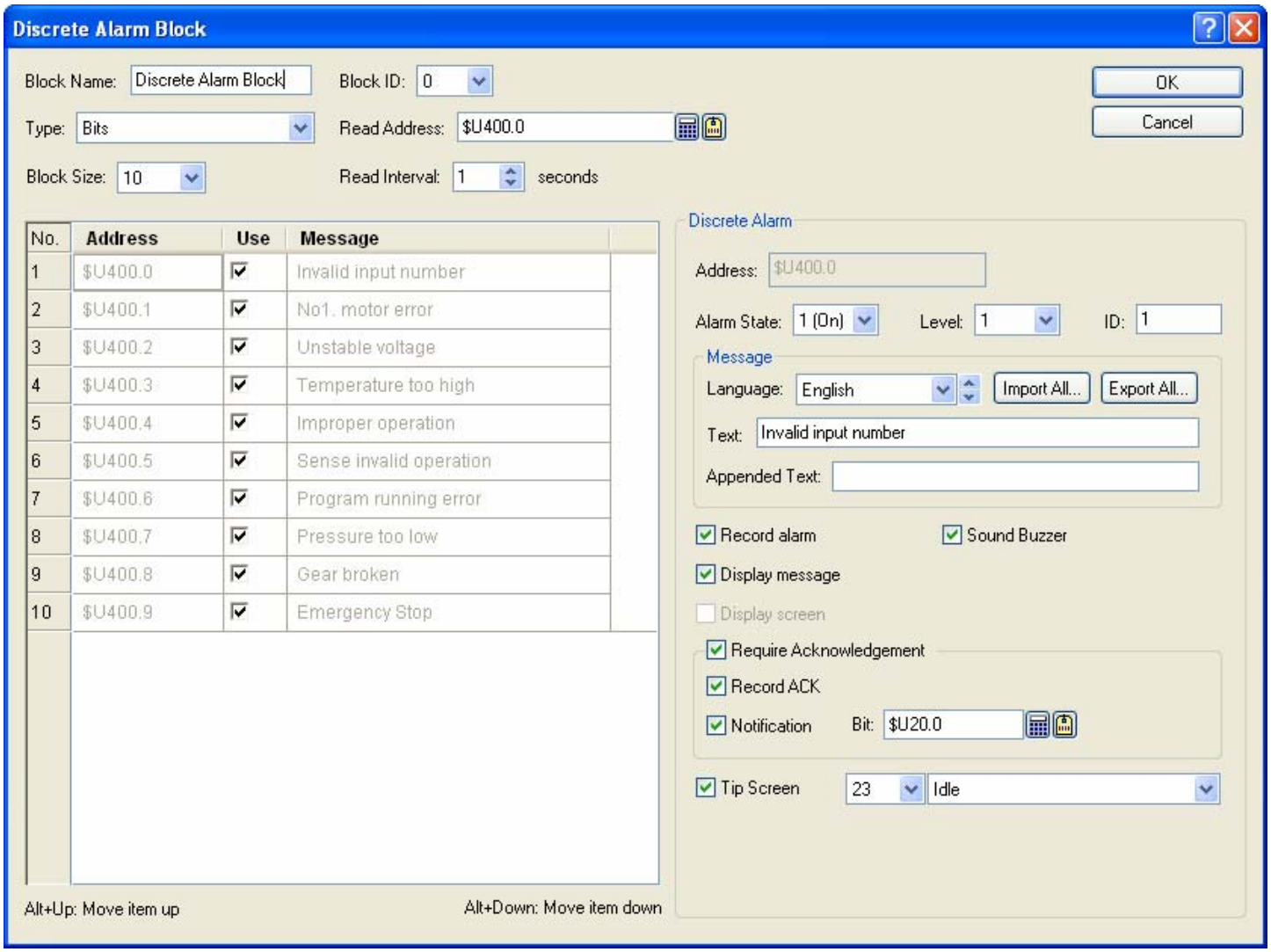
11.4. Discrete Alarm Blocks

You can set up a discrete alarm block with the Discrete Alarm Block dialog box. There are two ways to open the dialog box:

1) In the Project Manager window, move the mouse to the node of the desired discrete alarm block and double click the node or right-click the node and then select Properties.
2) In the menu bar, click Panel to bring up the Panel sub-menu. Click Discrete Alarm Block in the Panel sub-menu to bring up the Discrete Alarm Block pop-up menu. Select Properties in the pop-up menu to bring up the discrete alarm block list of the current panel application. Select the desired discrete alarm block in the list.

11.4.1. Settings

Use the dialog box to define all the settings for a discrete alarm block. The following is an example of the discrete alarm block dialog.



The table below describes some properties in the dialog.

<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Block Name</td><td>The discrete alarm block's name. The maximum length of the name is 20 characters.</td></tr>
<tr><td>Block ID</td><td>The discrete alarm block’s ID number. Select a number between 0 and 15. The number is unique among all discrete alarm blocks of the panel application.</td></tr>
<tr><td>Type</td><td>Specifies the memory type which is used to allocate the discrete alarm block. There are four types:
<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Bits</td><td>Select Bits to create a discrete alarm block starting from the bit device M with N continuous bits</td></tr>
<tr><td>Bits of Word Device</td><td>Select Bits of Word Device to create a discrete alarm block starting from the bit 0 of the word device M with N continuous bits of the word device.</td></tr>
<tr><td>Word Value</td><td>Select Word Value to create a discrete alarm block at word device M. An alarm will occur if the value of M is between 0 and N.</td></tr>
<tr><td>Random Bits</td><td>Select Random Bits to create a discrete alarm block with N specified random bits.</td></tr>
</table>
Legend: M: An address specified in Read Address field N: A size specified in Block Size/Maximum field.</td></tr>
<tr><td>Read Address</td><td>Specifies the starting address of an alarm block to monitor the status of alarms.
Click  to enter an address for this field. Click  to select a tag for this field.</td></tr>
<tr><td>Block Size / Maximum</td><td>Specifies the block size of an alarm block. The unit is bit. The maximum block size or maximum value you can specify depends on the type you select. The following table lists the limitation of each type:
<table>
<tr><th>Type</th><th>Maximum block size/value</th></tr>
<tr><td>Bits</td><td>256</td></tr>
<tr><td>Bits of Word Device</td><td>256</td></tr>
<tr><td>Word Value</td><td>0-511</td></tr>
<tr><td>Random Bits</td><td>64</td></tr>
</table></td></tr>
<tr><td>Read Interval</td><td>Specifies the period between 1 to 3600 seconds that the panel reads Alarm Block and checks the state of every bit in the block. The shorter the Read Interval is, the faster the alarm display object will be refreshed, but it will make other objects refresh slower.</td></tr>
</table>

To specify all discrete alarms, you need to do the setting on the discrete alarm list and discrete alarm properties field. The discrete alarm list located on the bottom-left part of the dialog shows all the discrete alarms in the alarm block. The discrete alarm properties field located on the right of the list shows all the properties of the selected discrete alarm.

The following table describes each column in the discrete alarm list.

Column	Description
No.	The number of the discrete alarm in the alarm block.
Address/Bit No./Value	If the type is Bits or Random Bits, the column shows the address of the discrete alarm; If the type is Bits of Word Device, the column shows the bit no of the discrete alarm. If the type is Word Value, the column shows the value of the discrete alarm.
Use	Check this option if you want to use discrete alarm #n.
Message	Displays specified alarm message in selected language.

You need to make selection before editing the discrete alarm. To select a discrete alarm, click the row of that alarm in the list. To select multiple rows, click the row on its header column and use Ctrl + Click to add a row to the selection.

If multiple rows are selected, any modification on the common properties such as Level, Record alarm, Sound Buzzer, Display message, Display screen, Required Acknowledgement, Record ACK, Notification, Tip Screen…will apply to all selected discrete alarms

The following table describes each property for the selected discrete alarm.

<table>
<tr><th colspan="2">Property</th><th>Description</th></tr>
<tr><td colspan="2">Address/Bit No./Value</td><td>Indicates the status of its corresponding alarm. The meaning of the field depends on the selected type.
<table>
<tr><th>Field Name</th><th>Type</th><th>Description</th></tr>
<tr><td>Address</td><td>Bits</td><td>Shows the address of the selected discrete alarm</td></tr>
<tr><td>Bit No.</td><td>Bits of Word Device</td><td>Shows the bit no of the selected discrete alarm</td></tr>
<tr><td>Value</td><td>Word Value</td><td>Shows the value of the selected discrete alarm</td></tr>
<tr><td>Address</td><td>Random Bits</td><td>Specifies the bit variable of the selected discrete alarm. Click  to enter an address. Click  to select a tag.</td></tr>
</table></td></tr>
<tr><td colspan="2">Alarm State</td><td>Specify the alarm state to indicate the corresponding alarm is active. If 1(On) is selected, a bit with high (on) state indicates the corresponding alarm is active. And a bit with low (off) state indicates the corresponding alarm is clear.</td></tr>
<tr><td colspan="2">Level</td><td>Select a level for the alarm between 1 and 8.</td></tr>
<tr><td colspan="2">ID</td><td>Specifies the alarm ID The maximum length of the ID is 6 characters.</td></tr>
<tr><td rowspan="4">Message</td><td>Language</td><td>Select an existing language that you are setting the message for.</td></tr>
<tr><td>Import All…</td><td>Click the button to import the texts of *.csv file and saves the texts as the alarm messages for the current language.</td></tr>
<tr><td>Export All…</td><td>Click the button to export all the messages for selected language to *.csv file.</td></tr>
<tr><td>Text</td><td>Specifies the text for the current language. The text will be shown when the alarm is active.</td></tr>
<tr><td></td><td>Appended Text</td><td>Specifies the appended text for the current language. For details, please see Section 11.3.4 Embedding Variable in the Appended Text of Alarm Message.</td></tr>
<tr><td colspan="2">Record alarm</td><td>Check this option if you want to record the alarm in the alarm display object.</td></tr>
<tr><td colspan="2">Sound Buzzer</td><td>Check this option if you want the panel to play sound buzzer when the alarm is active or clear.</td></tr>
<tr><td colspan="2">Display message</td><td>Check this option if you want the panel to display message automatically when the alarm is active or clear. This field can be checked only when the Display screen is unchecked.</td></tr>
<tr><td rowspan="2">Display screen</td><td><Check Box></td><td>Check this option if you want the panel to display a window screen automatically when the alarm is active or clear. This field can be checked only when the Display message is unchecked.</td></tr>
<tr><td></td><td>Select a window screen to display when the alarm is active or clear. The field is available when the Display Screen is selected. Note that only Window Screens will be available for selecting. Please see ?.? to create a window screen.</td></tr>
<tr><td rowspan="4">Required Acknowledge-ment</td><td><Check Box></td><td>Check this option if you want the operator to acknowledge an alarm. When an alarm become active, the panel display alarm message or screen with ACK button if Required Acknowledgement is selected. The operator should press the ACK button to acknowledge the alarm and have the panel start to refresh the current screen again. This field is available when either Display message or Display screen is selected.</td></tr>
<tr><td>Record ACK</td><td>Check this option if you want to record ACK in the alarm display object</td></tr>
<tr><td>Notification</td><td>Check this option if you want to notify the specified bit when the ACK button is clicked.</td></tr>
<tr><td>Bit</td><td>Specifies the bit that receives the notification.</td></tr>
<tr><td rowspan="2">Tip Screen</td><td><Check Box></td><td>Check this option if you want to display a screen when you select the corresponding alarm on the alarm display object.</td></tr>
<tr><td></td><td>Select a window screen as the tip screen</td></tr>
<tr><td colspan="2">Play multimedia</td><td>Check this option if you want the panel to play multimedia when the alarm is active or clear.</td></tr>
<tr><td colspan="2">File Name</td><td>Specifies the file name of the multimedia</td></tr>
</table>

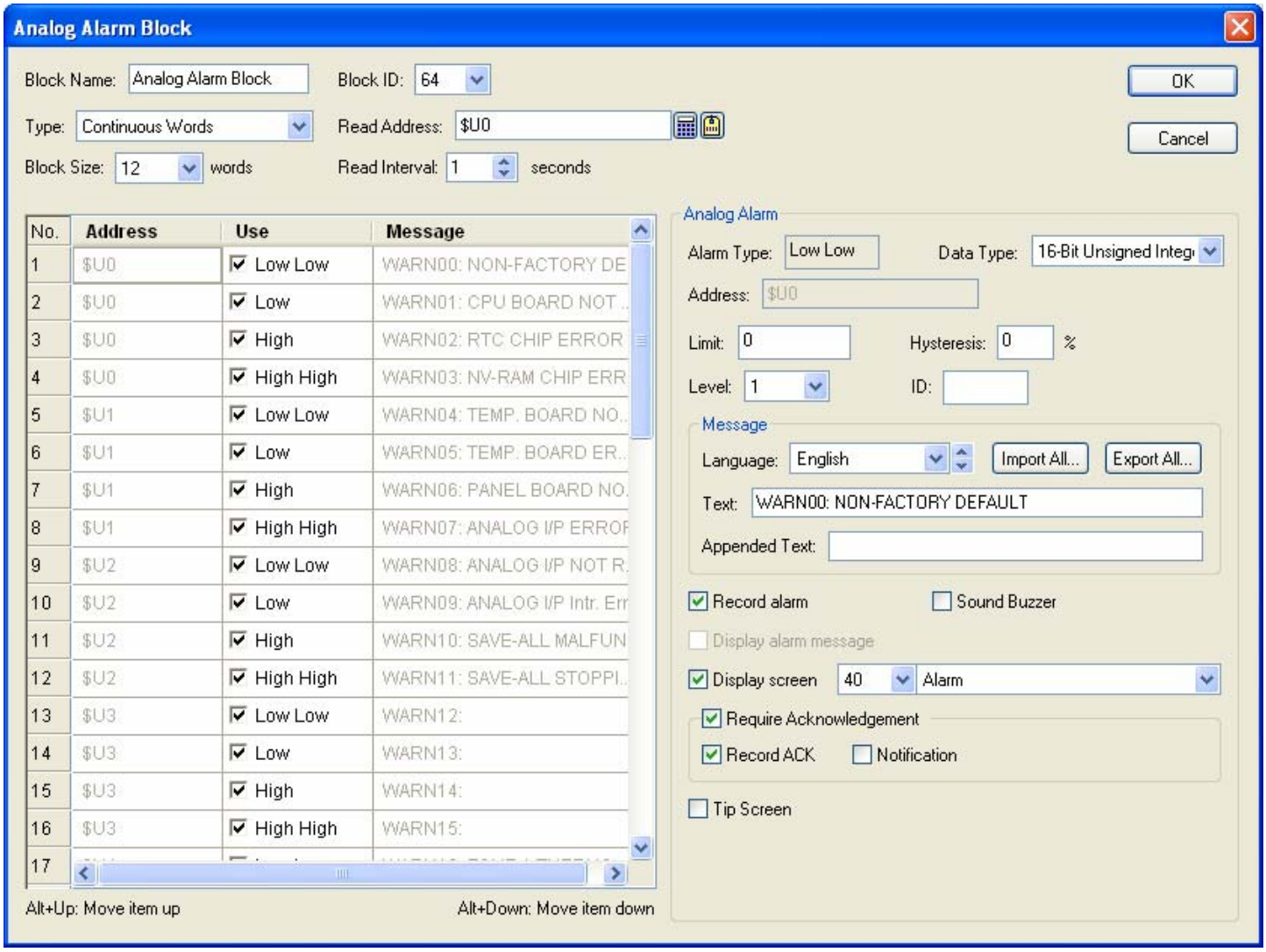
11.5. Analog Alarm Blocks

You can set up an analog alarm block with the Analog Alarm Block dialog box. There are two ways to open the dialog box:

1) In the Project Manager window, move the mouse to the node of the desired analog alarm block and double click the node or right-click the node and then select Properties.
2) In the menu bar, click Panel to bring up the Panel sub-menu. Click Analog Alarm Block in the Panel sub-menu to bring up the Analog Alarm Block pop-up menu. Select Properties in the pop-up menu to bring up the analog alarm block list of the current panel application. Select the desired analog alarm block in the list.

11.5.1. Settings

Use the dialog box to define all the settings for an analog alarm block. The following is an example of the analog alarm block dialog.



The table below describes each property in the dialog.

<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Block Name</td><td>The analog alarm block's name. The maximum length of the name is 20 characters.</td></tr>
<tr><td>Block ID</td><td>The analog alarm block’s ID number. Select a number between 64 and 79. The number is unique among all analog alarm blocks of the panel application.</td></tr>
<tr><td>Type</td><td>Specifies the type of the analog alarm block. There are two types:
<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Continuous Words</td><td>Select Continuous Words to create an analog alarm block starting from the word device M with N continuous words</td></tr>
<tr><td>Random Words</td><td>Select Random Words to create an analog alarm block with N specified random words.</td></tr>
</table>
Legend: M: An address specified in Read Address field N: A size specified in Block Size.</td></tr>
<tr><td>Read Address</td><td>Specifies the starting address of an alarm block to monitor the status of alarms.
Click  to enter an address for this field. Click  to select a tag for this field.</td></tr>
<tr><td>Block Size</td><td>Specifies the block size of an alarm block. The unit is word. The maximum block size you can specify depends on the type you select.
<table>
<tr><th>Type</th><th>Maximum block size</th></tr>
<tr><td>Continuous Words</td><td>16</td></tr>
<tr><td>Random Words</td><td>64</td></tr>
</table></td></tr>
<tr><td>Read Interval</td><td>Specifies the period between 1 to 3600 seconds that the panel reads Alarm Block and checks the state of every bit in the block. The shorter the Read Interval is, the faster the alarm display object will be refreshed, but it will make other objects refresh slower.</td></tr>
</table>

To specify all analog alarms, you need to do the setting on the analog alarm list and analog alarm properties field. The analog alarm list located on the bottom-left part of the dialog shows all the analog alarms in the alarm block. The analog alarm properties field located on the right of the list shows all the properties of the selected analog alarm.

The following table describes each column in the analog alarm list.

Column	Description
No.	The number of the analog alarm in the alarm block.
Address	Shows the address of the analog alarm.
Use	Check this option if you want to use analog alarm #n.
Message	Displays specified alarm message in selected language.

You need to make selection before editing the analog alarm. To select an analog alarm, click the row of that alarm in the list. To select multiple rows, click the row on its header column and use Ctrl + Click to add a row to the selection.

If multiple rows are selected, any modification on the common properties such as Level, Record alarm, Sound Buzzer, Display message, Display screen, Required Acknowledgement, Record ACK, Notification, Tip Screen…will apply to all selected analog alarms

The following table describes each column in the analog alarm list.

<table>
<tr><th colspan="2">Property</th><th>Description</th></tr>
<tr><td colspan="2">Alarm Type</td><td>There are four types of the analog alarm:
<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Low Low</td><td>An alarm will occur if the value of the destination variable is lower than or equal to the Low Low Limit.</td></tr>
<tr><td>Low</td><td>An alarm will occur if the value of the destination variable is equal to Low Limit or between Low Limit and Low Low Limit.</td></tr>
<tr><td>High</td><td>An alarm will occur if the value of the destination variable is equal to High Limit or between High Limit and High High Limit.</td></tr>
<tr><td>High High</td><td>An alarm will occur if the value of the destination variable is higher than or equal to the High High Limit.</td></tr>
</table></td></tr>
<tr><td colspan="2">Data Type</td><td>The data type of the destination variable. The supported data types include: 16-Bit Unsigned Integer, 32-Bit Unsigned Integer, 16-Bit Signed Integer, 32-Bit Signed Integer, 16-Bit BCD, 32-Bit BCD, 32-Bit Floating Point.</td></tr>
<tr><td colspan="2">Address</td><td>Indicates the status of its corresponding alarm.
<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Continuous Words</td><td>Shows the address of the selected analog alarm.</td></tr>
<tr><td>Random Words</td><td>Specifies the word variable of the selected analog alarm.
Click  to enter an address. Click  to select a tag.</td></tr>
</table></td></tr>
<tr><td colspan="2">Limit</td><td>Set a limit for the alarm. The value range of the limit depends on the specified data type.</td></tr>
<tr><td colspan="2">Hysteresis</td><td>Set the difference between the value where the alarm turns ON from turning OFF and the value where it turns OFF from turning ON.
If the alarm type is Low Low or Low, the range is between the Limit and Limit + Limit * Hysteresis/100. If the alarm type is High High or High, the range is between the Limit and Limit - Limit * Hysteresis/100.</td></tr>
<tr><td colspan="2">Level</td><td>Select a level for the alarm between 1 and 8.</td></tr>
<tr><td colspan="2">ID</td><td>Specifies the alarm ID The maximum length of the ID is 6 characters.</td></tr>
<tr><td rowspan="5">Message</td><td>Language</td><td>Select an existing language that you are setting the message for.</td></tr>
<tr><td>Import All…</td><td>Click the button to import the texts of *.csv file and saves the texts as the alarm messages for the current language.</td></tr>
<tr><td>Export All…</td><td>Click the button to export all the messages for selected language to *.csv file.</td></tr>
<tr><td>Text</td><td>Specifies the text for the current language. The text will be shown when the alarm is active.</td></tr>
<tr><td>Appended Text</td><td>Specifies the appended text for the current language. For details, please see Section 11.3.4 Embedding Variable in the Appended Text of Alarm Message.</td></tr>
<tr><td colspan="2">Record alarm</td><td>Check this option if you want to record the alarm in the alarm display object.</td></tr>
<tr><td colspan="2">Sound Buzzer</td><td>Check this option if you want the panel to play sound buzzer when the alarm is active or clear.</td></tr>
<tr><td colspan="2">Display alarm message</td><td>Check this option if you want the panel to display message automatically when the alarm is active or clear. This field can be checked only when the Display screen is unchecked.</td></tr>
<tr><td rowspan="2">Display screen</td><td><Check Box></td><td>Check this option if you want the panel to display a window screen automatically when the alarm is active or clear. This field can be checked only when the Display message is unchecked.</td></tr>
<tr><td></td><td>Select a window screen to display when the alarm is active or clear. The field is available when the Display Screen is selected. Note that only Window Screens will be available for selecting. Please see ?.? to create a window screen.</td></tr>
</table>

Continued

Property		Description
Required Acknowledge-ment	<Check Box>	Check this option if you want the operator to acknowledge an alarm. When an alarm become active, the panel display alarm message or screen with ACK button if Required Acknowledgement is selected. The operator should press the ACK button to acknowledge the alarm and have the panel start to refresh the current screen again. This field is available when either Display message or Display screen is selected.
	Record ACK	Check this option if you want to record ACK in the alarm display object
	Notification	Check this option if you want to notify the specified bit when the ACK button is clicked.
	Bit	Specifies the bit that receives the notification.
Tip Screen	<Check Box>	Check this option if you want to display a screen when you select the corresponding alarm on the alarm display object.
		Select a window screen as the tip screen
Play multimedia		Check this option if you want the panel to play multimedia when the alarm is active or clear.
File Name		Specifies the file name of the multimedia

11.6. Alarm Displays

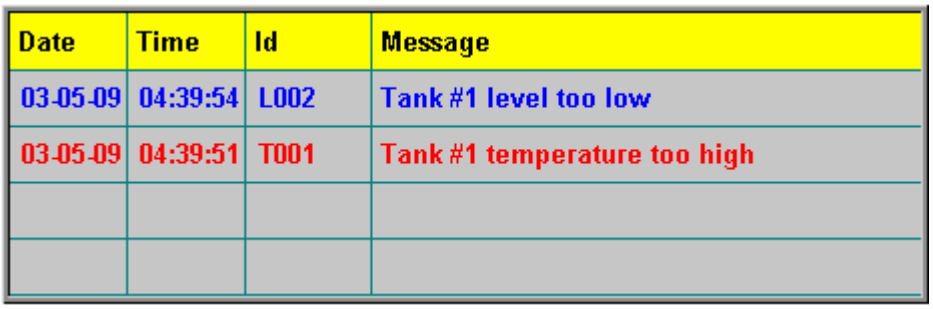
11.6.1. Basic Operations

There are four types of alarm displays.

<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Alarm History</td><td>
You can display a list of alarm records by using an alarm history display.
<table>
<tr><th>Date</th><th>Time</th><th>Blk Id</th><th>Level</th><th>Id</th><th>Status</th><th>Message</th></tr>
<tr><td>03-04-09</td><td>08:53:50</td><td>0</td><td>4</td><td>L002</td><td>C</td><td>Tank #1 level too high</td></tr>
<tr><td>03-04-09</td><td>08:53:44</td><td>0</td><td>4</td><td>L002</td><td>A</td><td>Tank #1 level too high</td></tr>
<tr><td>03-04-09</td><td>08:53:39</td><td>0</td><td>3</td><td>T001</td><td>C</td><td>Tank #1 temperature too high</td></tr>
<tr><td>03-04-09</td><td>08:53:35</td><td>0</td><td>3</td><td>T001</td><td>ACK</td><td>Tank #1 temperature too high</td></tr>
<tr><td>03-04-09</td><td>08:53:34</td><td>0</td><td>3</td><td>T001</td><td>A</td><td>Tank #1 temperature too high</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
The above is an example of the alarm history display. The first row is the title row. It displays the title of each column. The other rows display one alarm record per row. You can create scroll button groups or scroll bars to scroll the contents. An alarm history display can have seven columns. The following table describes the content of each column for an alarm record.
<table>
<tr><th>Column</th><th>Description</th></tr>
<tr><td>Date</td><td>The date when the record is created. This column is optional.</td></tr>
<tr><td>Time</td><td>The time when the record is created. This column is optional.</td></tr>
<tr><td>Alarm Block ID</td><td>The ID of the alarm block in which the associated alarm is defined. This column is optional.</td></tr>
<tr><td>Alarm Level</td><td>The level of the associated alarm. This column is optional.</td></tr>
<tr><td>Alarm ID</td><td>The ID of the associated alarm. This column is optional.</td></tr>
<tr><td>Alarm Status</td><td>The type of the alarm record. There are three types of alarm records.
<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Active</td><td>An Active record is created when an alarm is activated.</td></tr>
<tr><td>ACK</td><td>An ACK record is created when an alarm is acknowledged.</td></tr>
<tr><td>CLR</td><td>A CLR record is created when an alarm is cleared.</td></tr>
</table>
</td></tr>
<tr><td>Alarm Message</td><td>The message of the associated alarm. This column is optional.</td></tr>
</table>
The text color of a row is determined by the type of the alarm record.
</td></tr>
</table>

Continued

<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Alarm Count</td><td>
You can display a list of the number of occurrences for each alarm by using an alarm count display.


The above is an example of an alarm count display. The first row is the title row. It displays the title of each column. The other rows display one alarm per row. You can create scroll button groups or scroll bars to scroll the contents. An alarm count display can have five columns. The following table describes the content of each column for an alarm.
<table>
<tr><th>Column</th><th>Description</th></tr>
<tr><td>Alarm Block ID</td><td>The ID of the alarm block in which the alarm is defined. This column is optional.</td></tr>
<tr><td>Alarm Level</td><td>The level of the alarm. This column is optional.</td></tr>
<tr><td>Alarm ID</td><td>The ID of the alarm. This column is optional.</td></tr>
<tr><td>Alarm Count</td><td>The number of occurrences of the alarm.</td></tr>
<tr><td>Alarm Message</td><td>The message of the alarm. This column is optional.</td></tr>
</table>
The text color of a row is determined by the level of the alarm.
</td></tr>
<tr><td>Active Alarm</td><td>
You can display a list of active alarms by using an active alarm display.


The above is an example of an active alarm display. The first row is the title row. It displays the title of each column. The other rows display one active alarm per row. You can create scroll button groups or scroll bars to scroll the contents. An active alarm display can have six columns. The following table describes the content of each column for an active alarm.
<table>
<tr><th>Column</th><th>Description</th></tr>
<tr><td>Date</td><td>The date when the alarm is activated.</td></tr>
<tr><td>Time</td><td>The time when the alarm is activated.</td></tr>
<tr><td>Alarm Block ID</td><td>The ID of the alarm block in which the alarm is defined. This column is optional.</td></tr>
<tr><td>Alarm Level</td><td>The level of the alarm. This column is optional.</td></tr>
<tr><td>Alarm ID</td><td>The ID of the alarm. This column is optional.</td></tr>
<tr><td>Alarm Message</td><td>The message of the alarm. This column is optional.</td></tr>
</table>
The text color of a row is determined by the level of the alarm.
</td></tr>
</table>

Continued

<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Alarm Marquee</td><td>You can display and scroll the messages of the active alarms by using an alarm marquee.
 

The above is an example of an alarm marquee. You can place the following texts in front of the alarm messages.
<table>
<tr><th>Text</th><th>Description</th></tr>
<tr><td>Alarm Block ID</td><td>The ID of the alarm block in which the alarm is defined.</td></tr>
<tr><td>Alarm Level</td><td>The level of the alarm.</td></tr>
<tr><td>Alarm ID</td><td>The ID of the alarm.</td></tr>
</table>
The text color for an alarm is determined by the level of that alarm.</td></tr>
</table>

Note: You can sort the list of an alarm display at runtime by touching the title of the column that you want it to be the sort field. Touching the same title again changes the sort order from the ascending order to the descending order or vice versa. The columns that can be a sort field include: Date, Time, Alarm Block ID, Alarm Level, Alarm ID, Alarm Status, and Alarm Count.

11.6.2. Operation Options

The following operation option can be added to an alarm display. Select and set the option in the Alarm Display dialog box.

Options	Description
Visibility Control	You can show and hide an alarm display by a specified bit or the current user level. Select and set this option in the Visibility page.

11.6.3. Settings

You can complete all the settings of an alarm display in the Alarm Display dialog box. This dialog box contains the following two pages.

- **General**

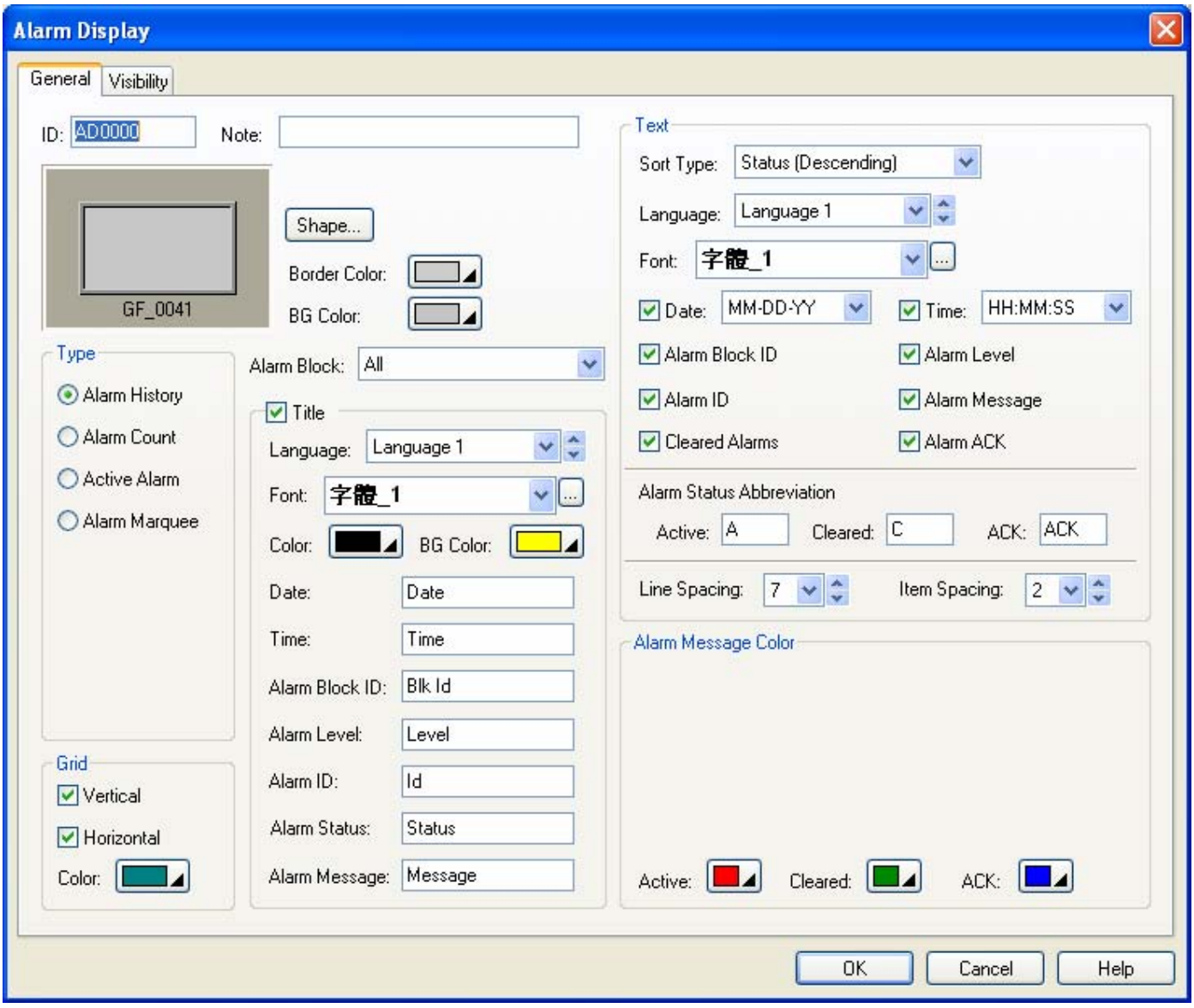
Described in Section 11.4.3.

- **Visibility**

Described in Section 4.4.6.

11.6.4. General Settings

This section describes how to define the general settings for an alarm display. The following is an example of the General page of the Alarm Display dialog box.



The following table describes each property in the General page.

Property	Description
ID	The object's identifier. It is generated when the object is created. The identifier is unique within the screen where the object is on and is unchangeable. The format of the ID's for the alarm displays is AD####.
Note	You can type a note for the object.
Shape settings	For details about the following properties, see Section 4.3.4 Setting up the Shape of an Object.. Shape..., Border Color, BG Color

Continued

<table>
<tr><th colspan="2">Property</th><th>Description</th></tr>
<tr><td colspan="2">Type</td><td>Specifies the type of the alarm display. There are four types:
<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td>Alarm History</td><td>The alarm history display lists the alarm records.</td></tr>
<tr><td>Alarm Count</td><td>The alarm count display lists the number of occurrences of each alarm.</td></tr>
<tr><td>Active Alarm</td><td>The active alarm display lists the active alarms.</td></tr>
<tr><td>Alarm Marquee</td><td>The alarm marquee scrolls the messages of the active alarms horizontally.</td></tr>
</table></td></tr>
<tr><td colspan="2">Scrolling Speed</td><td>Select a speed for the alarm display when the Type is Alarm Marquee.</td></tr>
<tr><td colspan="2">Direction</td><td>Select Leftward or Rightward for the alarm display when the Type is Alarm Marquee.</td></tr>
<tr><td rowspan="3">Grid</td><td>Vertical</td><td>Select this option if you want the alarm display to have vertical grids.</td></tr>
<tr><td>Horizontal</td><td>Select this option if you want the alarm display to have horizontal grids.</td></tr>
<tr><td>Color</td><td>Select a color for the grids.</td></tr>
<tr><td colspan="2">Alarm Block</td><td>Select an alarm block that the alarm display will show the alarms defined in that alarm block only. Select All if you want the alarm display to show all the alarms.</td></tr>
<tr><td rowspan="12">Title</td><td><Check Box></td><td>Select this option if you want the alarm display to have a title row to show the title for each column of the displayed list when the Type is Alarm History, Alarm Count, or Current Alarm.</td></tr>
<tr><td>Language</td><td>Select a language so you can view and edit the settings of the title row for that language.</td></tr>
<tr><td>Font</td><td>Select a font for the title text.</td></tr>
<tr><td>Color</td><td>Select a color for the text.</td></tr>
<tr><td>BG Color</td><td>Select a color for the title row.</td></tr>
<tr><td>Date</td><td>Specifies the title for the Date column. This field is available when the Type is Alarm History or Current Alarm.</td></tr>
<tr><td>Time</td><td>Specifies the title for the Time column. This field is available when the Type is Alarm History or Current Alarm.</td></tr>
<tr><td>Alarm Block ID</td><td>Specifies the title for the Alarm Block ID column.</td></tr>
<tr><td>Alarm Level</td><td>Specifies the title for the Alarm Level column.</td></tr>
<tr><td>Alarm ID</td><td>Specifies the title for the Alarm ID column.</td></tr>
<tr><td>Alarm Status</td><td>Specifies the title for the Alarm Status column. This field is available when the Type is Alarm History.</td></tr>
<tr><td>Alarm Count</td><td>Specifies the title for the Alarm Count column. This field is available when the Type is Alarm Count.</td></tr>
<tr><td>Alarm Message</td><td>Specifies the title for the Alarm Message column.</td></tr>
</table>

Continued

Property			Description
Text	Sort Type		Specifies how the alarm display sorts its list initially. This field is available when the Type is not Alarm Marquee. **Note**: When you want an alarm display to sort its list by the contents of a column at runtime, simply touch the title of that column and the alarm display will sort its list right away.
	Language		Select a language so you can view and edit the language dependent settings in the Text group for that language. The language dependent properties in the Text group include Font and Alarm Status Abbreviation.
	Font		Select a font for the text.
	Date	<Check Box>	Check this option if you want the alarm display to have the Date column. This field is available when the Type is Alarm History.
		<Drop-down List>	Select a format for displaying the date
	Time	<Check Box>	Check this option if you want the alarm display to have the Time column. This field is available when the Type is Alarm History.
		<Drop-down List>	Select a format for displaying the time
	Alarm Block ID		Check this option if you want the alarm display to have the Alarm Block ID column.
	Alarm Level		Check this option if you want the alarm display to have the Alarm Level column.
	Alarm ID		Check this option if you want the alarm display to have the Alarm ID column.
	Alarm Message		Check this option if you want the alarm display to have the Alarm Message column.
	Cleared Alarms		Check this option so the alarm display will show the records of cleared alarms. This field is available when the Type is Alarm History.
	Alarm ACK		Check this option so the alarm display will show the records of acknowledged alarms. This field is available when the Type is Alarm History.
	Alarm Status Abbreviation	Active	Enter up to 3 characters that will be shown in the Alarm Status column for the alarm records that record when an alarm occurs. This field is available when the Type is Alarm History.
		Cleared	Enter up to 3 characters that will be shown in the Alarm Status column for the alarm records that record when an alarm is cleared. This field is available when the Type is Alarm History.
		ACK	Enter up to 3 characters that will be shown in the Alarm Status column for the alarm records that record when an alarm is acknowledged. This field is available when the Type is Alarm History.
	Line Spacing		Specifies the extra space in pixels for two adjacent rows of the alarm display. This field is available when the Type is not Alarm Marquee.
	Item Spacing		Specifies the extra space for every column of the alarm display. This field is available when the Type is not Alarm Marquee.
Alarm Message Color	Set to default colors		Click the button to replace the selections of the L1 to L8 fields by the default alarm message colors defined in the Alarm Properties dialog box. . This button is available when the Type is not Alarm History.
	L1,L2 … L8		Select a color for alarm level 1,2…8. The alarm display will show an alarm message with this color if that alarm is defined as a level 1,2…8 alarm. This field is available when the Type is not Alarm History.
	Active		Select a color for displaying the alarm records that record when an alarm occurs. This field is available when the Type is Alarm History.
	Cleared		Select a color for displaying the alarm records that record when an alarm is cleared. This field is available when the Type is Alarm History.
	ACK		Select a color for displaying the alarm records that record when an alarm is acknowledged. This field is available when the Type is Alarm History.