



Siemens Basic/Comfort Panel Alarm Messaging

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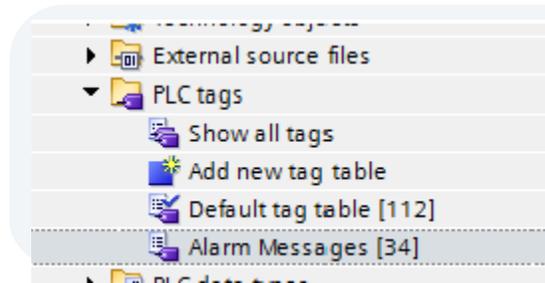
Siemens Basic/Comfort Panel Alarm Messaging

This document describes the basic setup of the alarm messaging function in the Siemens Basic and Comfort panel families of HMIs. Additional info on alarm messaging can be found in TIA Portal online help (expand Help menu and select Show Help) in the Content tab under Information System->Visualize Processes->Working with alarms.

Alarm messaging using M memory

Alarm messages are transferred to the HMI in word sized registers. For every 16 messages, create an alarm message word in M memory. Also, create tags in the table for the individual bits in the word. The individual bits in that alarm word will trigger the messages.

Create a new tag table by expanding the PLC Tags folder under the PLC and clicking on 'Add new tag table'. Rename the tag table to (for example) 'Alarm Messages'



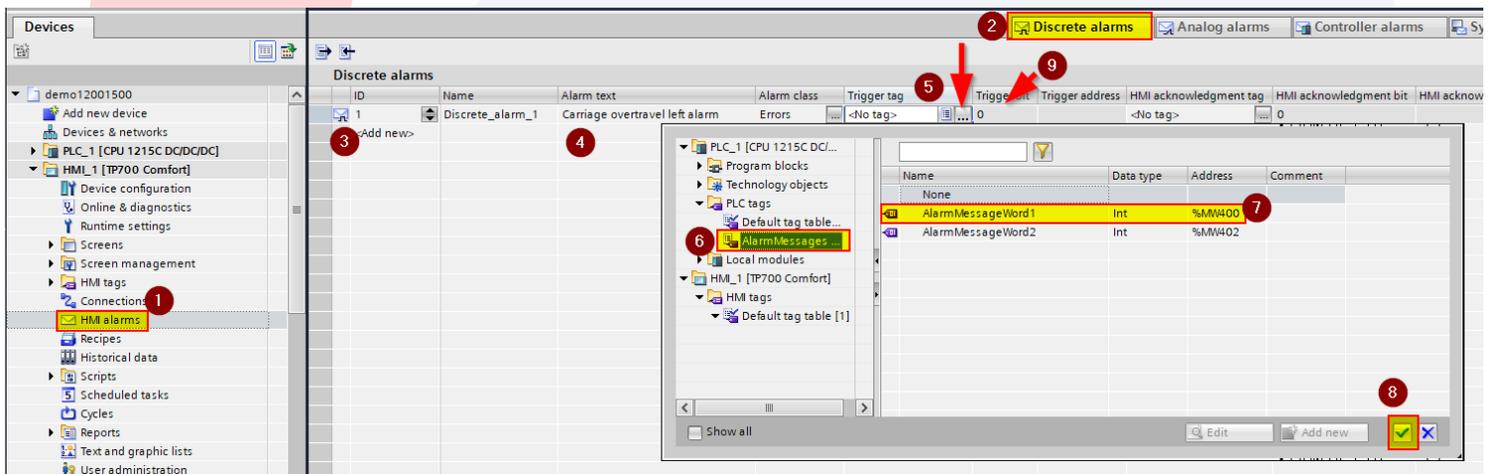
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Add the alarm message word and bit tags in the table. In this case, the alarm words are MW400 and MW402. Each individual bit within the word can be added and documented and will be used to trigger the messages. It is not required but it is suggested that contiguous M memory words be used for the alarm message words.

AlarmMessages							
	Name	Data type	Address	Retain	Acces...	Writa...	Visibl...
1	AlarmMessageWord1	Int	%MW400	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	AlmMsgW1TB0	Bool	%M401.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	AlmMsgW1TB1	Bool	%M401.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	AlmMsgW1TB2	Bool	%M401.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	AlmMsgW1TB3	Bool	%M401.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	AlmMsgW1TB4	Bool	%M401.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	AlmMsgW1TB5	Bool	%M401.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	AlmMsgW1TB6	Bool	%M401.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	AlmMsgW1TB7	Bool	%M401.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	AlmMsgW1TB8	Bool	%M400.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11	AlmMsgW1TB9	Bool	%M400.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12	AlmMsgW1TB10	Bool	%M400.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13	AlmMsgW1TB11	Bool	%M400.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14	AlmMsgW1TB12	Bool	%M400.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
15	AlmMsgW1TB13	Bool	%M400.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
16	AlmMsgW1TB14	Bool	%M400.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17	AlmMsgW1TB15	Bool	%M400.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
18	AlarmMessageWord2	Int	%MW402	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
19	AlmMsgW2TB0	Bool	%M403.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
20	AlmMsgW2TB1	Bool	%M403.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
21	AlmMsgW2TB2	Bool	%M403.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
22	AlmMsgW2TB3	Bool	%M403.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
23	AlmMsgW2TB4	Bool	%M403.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
24	AlmMsgW2TB5	Bool	%M403.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
25	AlmMsgW2TB6	Bool	%M403.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
26	AlmMsgW2TB7	Bool	%M403.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27	AlmMsgW2TB8	Bool	%M402.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
28	AlmMsgW2TB9	Bool	%M402.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
29	AlmMsgW2TB10	Bool	%M402.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
30	AlmMsgW2TB11	Bool	%M402.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
31	AlmMsgW2TB12	Bool	%M402.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
32	AlmMsgW2TB13	Bool	%M402.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
33	AlmMsgW2TB14	Bool	%M402.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
34	AlmMsgW2TB15	Bool	%M402.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
35	<Add new>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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1. Expand the HMI folder in the project tree and double click on 'HMI Alarms'.
2. Select the 'Discrete Alarms' tab.
3. Double click on the '<Add new>' in the first row ID column to add an alarm message.
4. Type in the message in the 'Alarm text' column.
5. Click on the browse button in the 'Trigger tag' column to select the tag. The trigger tag must be an INT or Word data type.
6. If the tag has not been created in 'HMI tags', expand the PLC folder then expand 'PLC tags' and select the tag table containing the alarm message words. If the tag is already in 'HMI tags' expand the HMI folder and 'HMI tags'.
7. Select the tag. The tag must be an Int or Word data type.
8. Click on the green check box in the lower right hand corner of the tag selection dialog when finished.
9. Select the bit in the alarm word tag (Trigger tag) being used to trigger the alarm message in the 'Trigger bit' column.



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In the HMI tags folder right click on an alarm message word tag and select 'Properties' to display the tags properties. In the Settings section of the Properties, make sure the tag's 'Acquisition mode' is set to 'Cyclic continuous'. Cyclic continuous setting means the tag is always being updated in the background at the rate specified.

The screenshot displays the Siemens SIMATIC Manager interface. On the left, the 'Devices' tree shows the project structure, with 'HMI tags' expanded to show 'Default tag table [2]'. The main area shows a table of alarm tags:

ID	Name	Data type	Connection	PLC name	PLC tag	Address
1	Discrete...			PLC_1	AlarmMessageWord1	
2	Discrete...			PLC_1	AlarmMessageWord1	

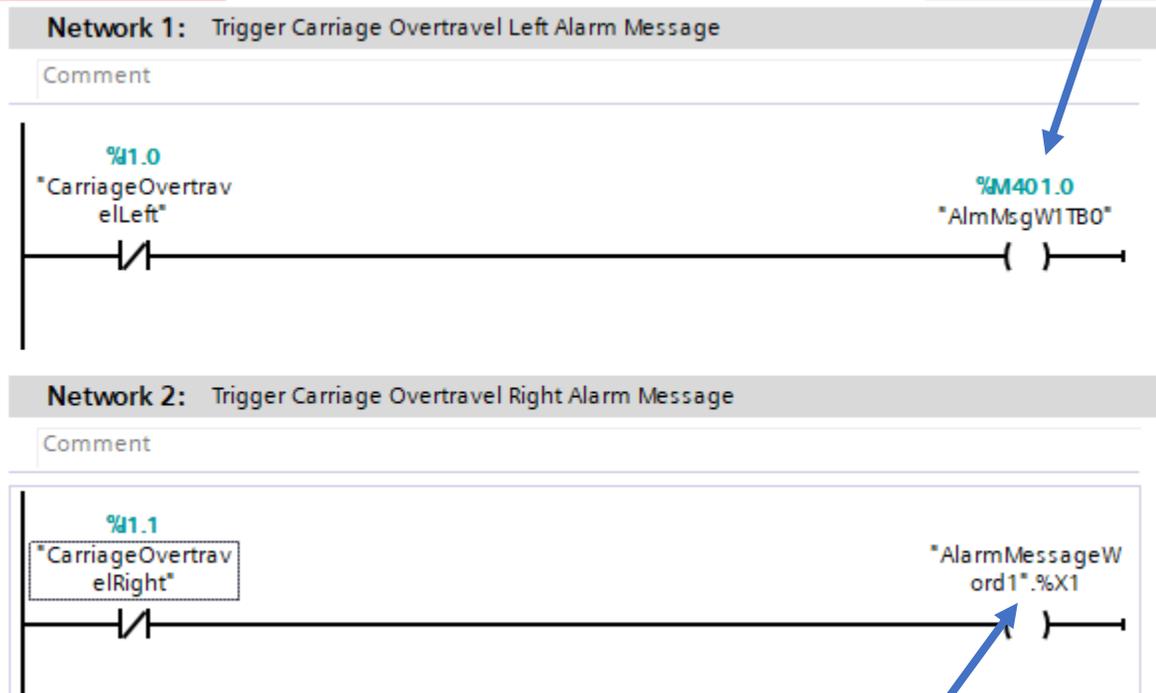
Below the table, the 'AlarmMessageWord1 [HMI_Tag]' properties dialog is open, showing the 'Settings' section where 'Acquisition mode' is set to 'Cyclic continuous'.

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In the PLC program trigger logic, use the bit in the alarm word indicated in the Trigger bit column. Siemens byte orientation puts the least significant byte address on the left and the most significant on the right (Big-Endian byte ordering). In this case, trigger bit 0 of AlarmMessageWord1 would be M401.0.

ID	Name	Alarm text	Alarm class	Trigger tag	Trigger bit	Trigger address	HMI acknowl...	HMI a...	HMI acknowl...	R...
1	Discrete_alarm_1	Carriage overtravel left alarm	Errors	AlarmMessageWord1	0	AlarmMessageWord1.x0	<No tag>		0	
2	Discrete_alarm_2	Carriage overtravel right alarm	Errors	AlarmMessageWord1	1	AlarmMessageWord1.x1	<No tag>		0	

MW400																	
MB400								MB401									
M400.7	M400.6	M400.5	M400.4	M400.3	M400.2	M400.1	M400.0	M401.7	M401.6	M401.5	M401.4	M401.3	M401.2	M401.1	M401.0		
Trigger Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Trigger Bit

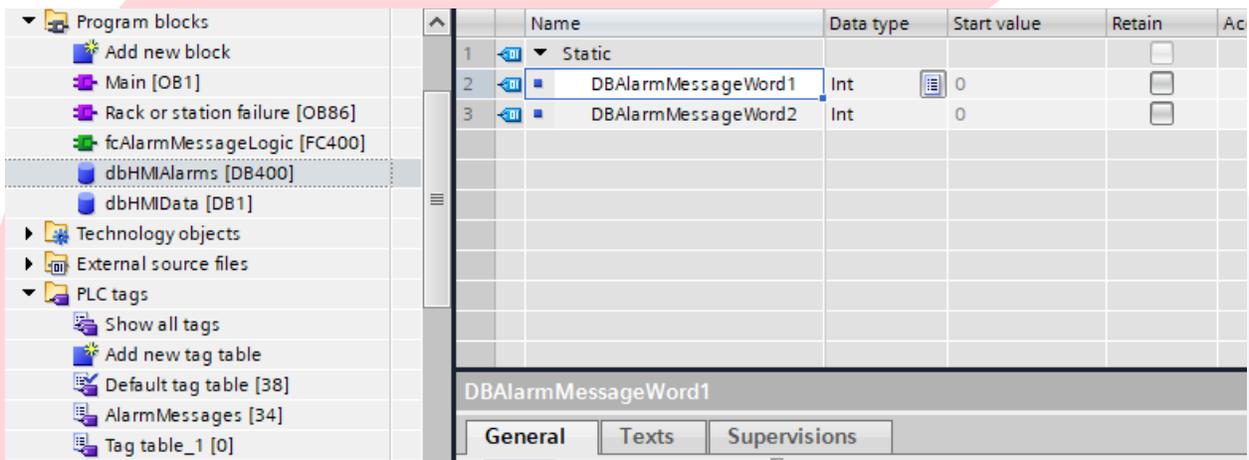


Slice addressing can also be used. In this case the alarm word tag is referenced followed by a .X then the bit. 'alarmwordtagname'.Xy where y is the bit address. The address can be copied directly from the Trigger Address column if needed

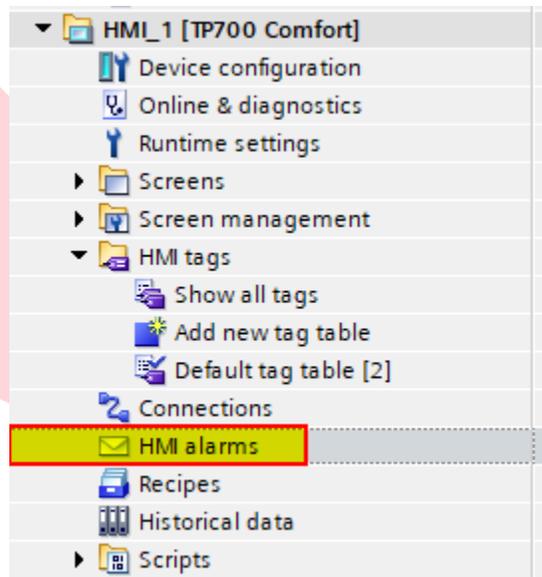
Alarm Messaging using Data Block (DB) memory

Alarm messaging using DB memory is similar to using M memory except with DB memory, you can't break the alarm message word into individual bits. You must use slice addressing to access the bit of the alarm word in logic.

Create a DB in the program blocks folder. Create a tag of the data type INT in the data block for the first alarm word. In the case below, DB400 was created and two alarm words were added (DBAlarmMessageWord1 and DBAlarmMessageWord2)



Expand the HMI folder in the project tree and double click on HMI Alarms.



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The screenshot shows the 'Discrete alarms' configuration window. At the top, the 'Discrete alarms' tab is selected. Below it is a table with columns: ID, Name, Alarm text, Alarm class, Trigger tag, Trigger address, HMI acknowledgment, and Report. Row 3 is selected, showing 'Discrete_alarm_3' with the text 'Lift overtravel up alarm'. Below the table is a 'Properties' panel for 'Discrete_alarm_3' with fields for 'Alarm text', 'ID', 'Alarm class', 'Alarm group', and 'Name'. A tag selection dialog is open, showing a tree view of PLC_1 [CPU 1215C DC/DC/DC] with 'dbHMAAlarms [DB400]' selected. The dialog also shows a list of tags with 'DBAlarmMessageWord1' and 'DBAlarmMessageWord2' selected. A green checkmark button is visible in the bottom right of the dialog.

1. Select the Discrete Alarms tab
2. Click on <Add New> in the ID column to add a new message.
3. Type in the message in the 'Alarm text' column.
4. Click on the browse button in the 'Trigger tag' column to select the tag. The trigger tag must be an INT or Word data type.
5. If the tag has not been created in 'HMI tags', expand the PLC folder then expand 'Program blocks' and
6. select the data block (DB) containing the alarm message words. If the tag is already in 'HMI tags' expand the HMI folder and 'HMI tags'.
7. Select the tag. The tag must be an Int or Word data type.
8. Click on the green check box in the lower right hand corner of the tag selection dialog when finished.
9. Select the bit in the alarm word tag (Trigger tag) being used to trigger the alarm message in the 'Trigger bit' column.

This screenshot shows the same 'Discrete alarms' configuration window, but with the 'Trigger bit' column highlighted in yellow. The 'Trigger bit' column contains the value '0' for the selected alarm. A red circle and arrow point to this value. The 'Trigger tag' column for the selected alarm is also highlighted in yellow.

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In the HMI tags folder, right click on an alarm message word tag and select 'Properties' to display the tags properties. In the Settings section of the Properties, make sure the tag's 'Acquisition mode' is set to 'Cyclic continuous'. Cyclic continuous setting means the tag is always being updated in the background at the rate specified.

The screenshot shows the Siemens SIMATIC Manager interface. The 'Project tree' on the left shows the 'HMI tags' folder expanded. A right-click context menu is open over a tag, with 'Properties' selected. The 'Properties' dialog box is open, showing the 'Settings' tab. The 'Acquisition mode' is set to 'Cyclic continuous'. The 'Update ID' field is empty.

Name	Tag table	Data type	Connection	PLC name	PLC tag
AlarmMessageWord1	Default tag table	Int	HMI_Connection_1	PLC_1	AlarmMessageWord1
dbHMIAlarms_DBAAlarmMessageWord1	Default tag table	Int	HMI_Connection_1	PLC_1	dbHMIAlarms.DBAAlarmMessageWord1

ID	Name	Discrete	Alarm class	Trigger tag	Trigge...	Trigger address	Acknowledg...	Ackn.
3	Discre		Errors	dbHMIAlarms...	0	dbHMIAlarms...	<No tag>	0
4	Discre		Errors	dbHMIAlarms...	1	dbHMIAlarms...	<No tag>	0

Properties dialog box - Settings tab

Settings

Acquisition mode: **Cyclic continuous**

Acquisition cycle: 1 s

Update ID:

Siemens Basic/Comfort Panel Alarm Messaging

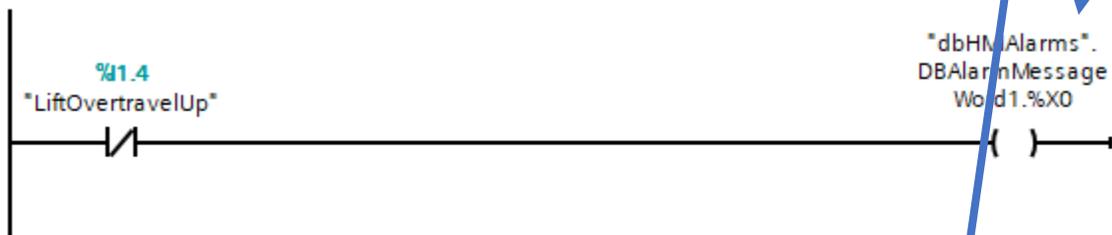
In the PLC program trigger logic, use the address specified in the Trigger Address column. When using DB registers for alarm trigger bits, slice addressing must be used. You can copy and paste from the Trigger Address field if needed.

ID	Name	Alarm text	Alarm class	Trigger tag	Trigge..	Trigger address	HM
1	Discrete_alarm_1	Carriage overtravel left alarm	Errors	AlarmMessageWord1	0	AlarmMessageWord1.x0	<-N
2	Discrete_alarm_2	Carriage overtravel right alarm	Errors	AlarmMessageWord1	1	AlarmMessageWord1.x1	<-N
3	Discrete_alarm_3	Lift overtravel up alarm	Errors	dbHMIAlarms_DBAlarmMessageWord1	0	dbHMIAlarms.DBAlarmMessageWord1.x0	<-N
4	Discrete_alarm_4	Lift overtravel down alarm	Errors	dbHMIAlarms_DBAlarmMessageWord1	1	dbHMIAlarms.DBAlarmMessageWord1.x1	<-N

Trigger bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Trigger bit
Tag (ex. dbHMIAlarms.DBAlarmMessageWord1)																	

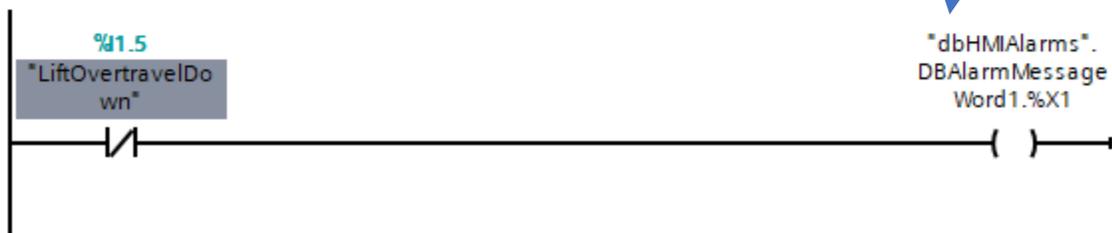
Network 3: Trigger Lift Overtravel Up Alarm Message

Comment



Network 4: Trigger Lift Overtravel Down Alarm Message

Comment



Slice addressing must be used. In this case the alarm word tag is referenced followed by a .X then the bit. 'alarmwordtagname'.Xy where y is the bit address.

Alarm Classes and Alarm Groups

Each alarm message can be assigned to an alarm class and an alarm group. An alarm class is used to indicate the importance or priority of an alarm message. An alarm group is used to organize the messages (for example, into sections of the machine or areas of a plant). The alarm class and group can be assigned in the properties of each message.

Alarm Classes

Alarm classes are defined in the Alarm classes tab in HMI Alarms section. Six default class are provided and the user can their own classes and modify background colors and parameters if needed

The screenshot displays the Siemens HMI Alarms configuration interface. The top window shows the 'Alarm classes' tab with a table of predefined classes. The 'System' class is selected, and its properties are shown in the 'Properties' dialog below.

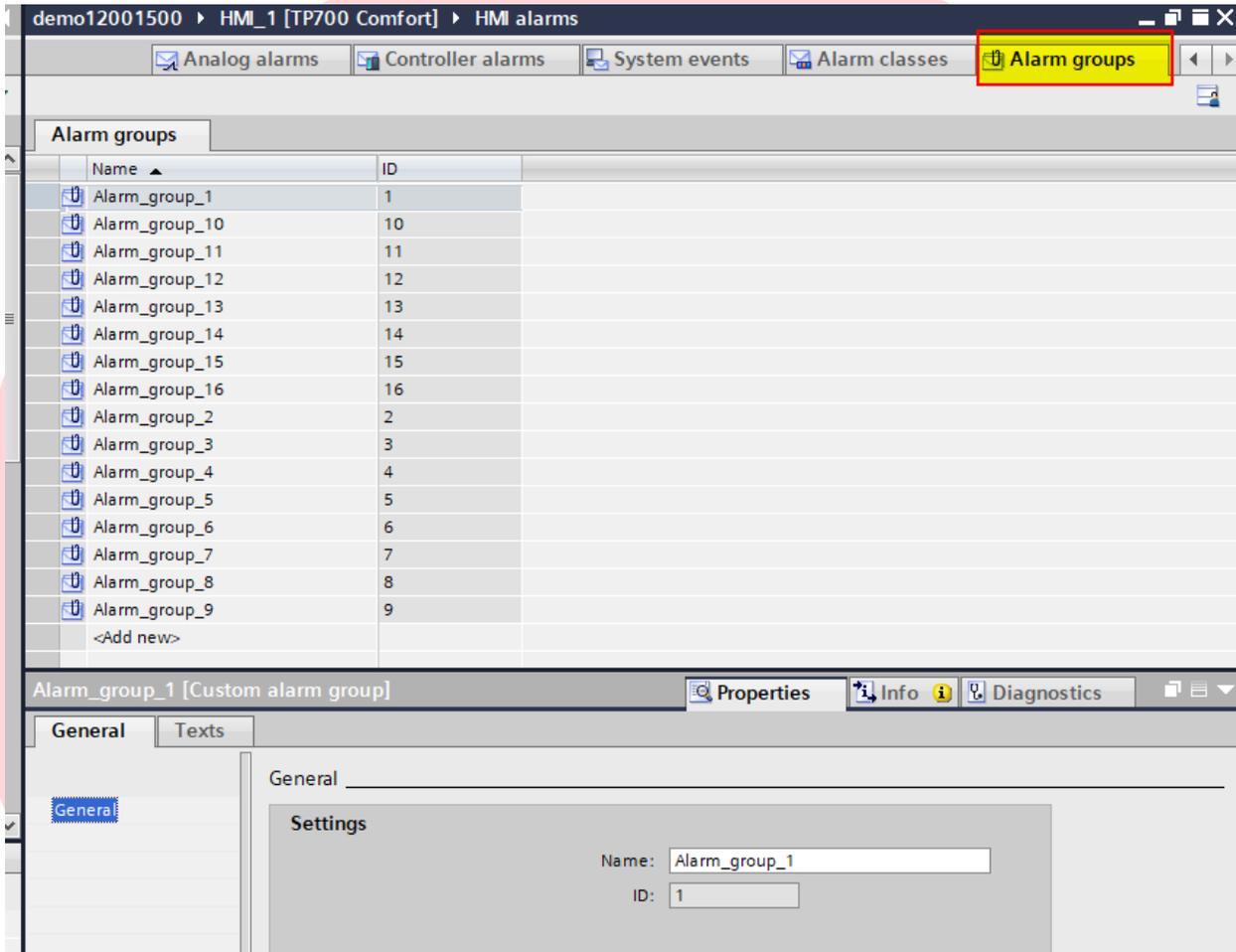
Display name	Name	State machine	Log	E-mail address	Background color *Incoming*	Background co...	Backgro...	Backgro...
!	Errors	Alarm with single-mode ...	<No log>		255, 0, 0	255, 0, 0	255...	255...
!	Warnings	Alarm without acknowle...	<No log>		255, 255, 255	255, 255, ...	255...	255...
\$	System	Alarm without acknowle...	<No log>		255, 255, 255	255, 255, ...	255...	255...
S7	Diagnosis events	Alarm without acknowle...	<No log>		255, 255, 255	255, 255, ...	255...	255...
A	Acknowledgement	Alarm with single-mode ...	<No log>		255, 0, 0	255, 0, 0	255...	255...
NA	No Acknowledgement	Alarm without acknowle...	<No log>		255, 0, 0	255, 0, 0	255...	255...
<Add new>								

The 'Properties' dialog for the 'System' class shows the following settings:

- Name: System
- Display name: \$
- ID: 3
- Common alarm class: <No alarm class>
- Log: <No log>
- E-mail address: (empty)

Alarm Groups

Alarm groups are defined in the Alarm groups tab in the HMI Alarms section. Sixteen alarm groups are set up by default and more can be added by the user. The user can change the name from the default 'Alarm_group_x' to a name of their choice.



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Specifying Alarm Class and Alarm Group in a message

For discrete alarms select the message and open its properties. In the General section, select the Alarm class and Alarm group (if needed).

The screenshot displays the Siemens Basic/Comfort Panel Alarm Messaging software interface. The top window shows a table of discrete alarms. The 'Alarm class' column for the first alarm is highlighted in yellow. Below this, the 'Properties' window for 'Discrete_alarm_1' is open, showing the 'General' section. The 'Settings' area includes fields for 'Alarm text', 'ID', 'Alarm class', 'Alarm group', and 'Name'. The 'Alarm class' and 'Alarm group' fields are highlighted in yellow.

ID	Name	Alarm text	Alarm class	Trigger tag	Trigger bit	Trigger address	HMI acknowl...	HMI a...	HMI ...
1	Discrete_alarm_1	Carriage overtravel left alarm	Errors	AlarmMessageWord1	0	AlarmMessageWord1.x0	<No tag>	0	
2	Discrete_alarm_2	Carriage overtravel right alarm	Errors	AlarmMessageWord1	1	AlarmMessageWord1.x1	<No tag>	0	

Discrete_alarm_1 [Discrete_alarm]

Properties | Events | Texts

General

Settings

Alarm text: Carriage overtravel left alarm

ID: 1

Alarm class: Errors

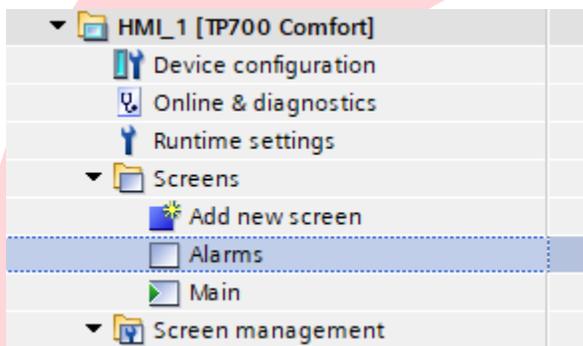
Alarm group: <No alarm group>

Name: Discrete_alarm_1

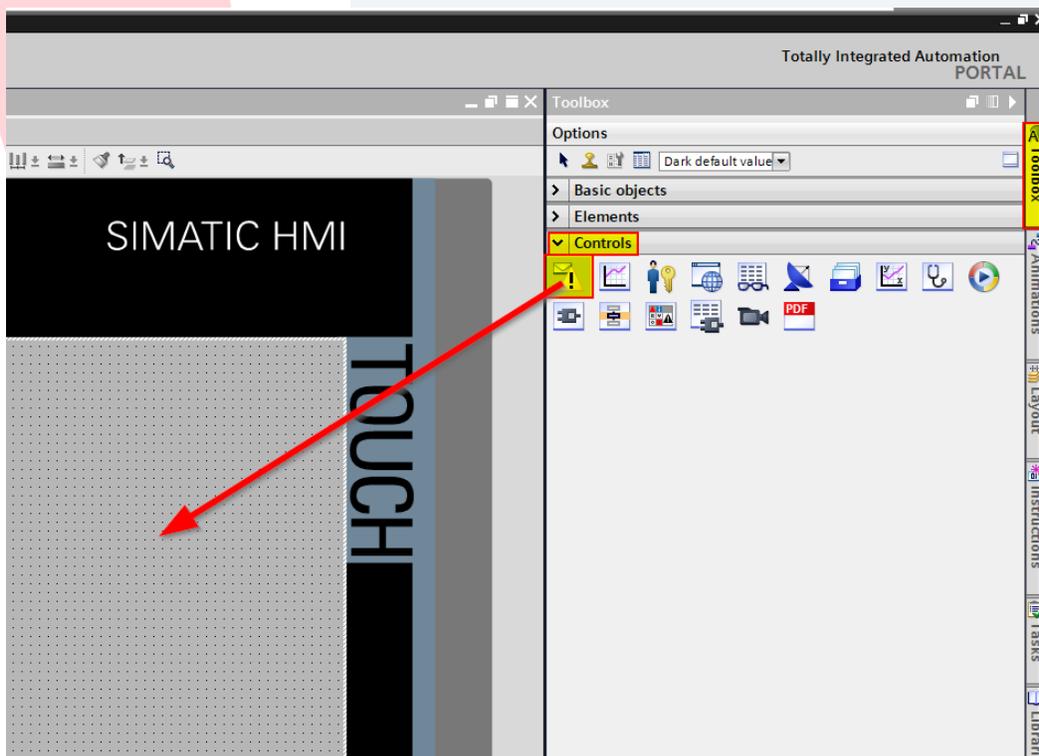
Adding the Alarm View object to a screen

The Alarm View object is located in the Toolbox->Controls section. Open the screen where the Alarm View object is to be located. On the right hand side click on the Toolbox tab to make the Toolbox appear. Expand the Controls section and left mouse click and hold on the Alarm View object. Drag it over to the screen. Adjust the size and location.

In the example below, a screen called Alarms was created.

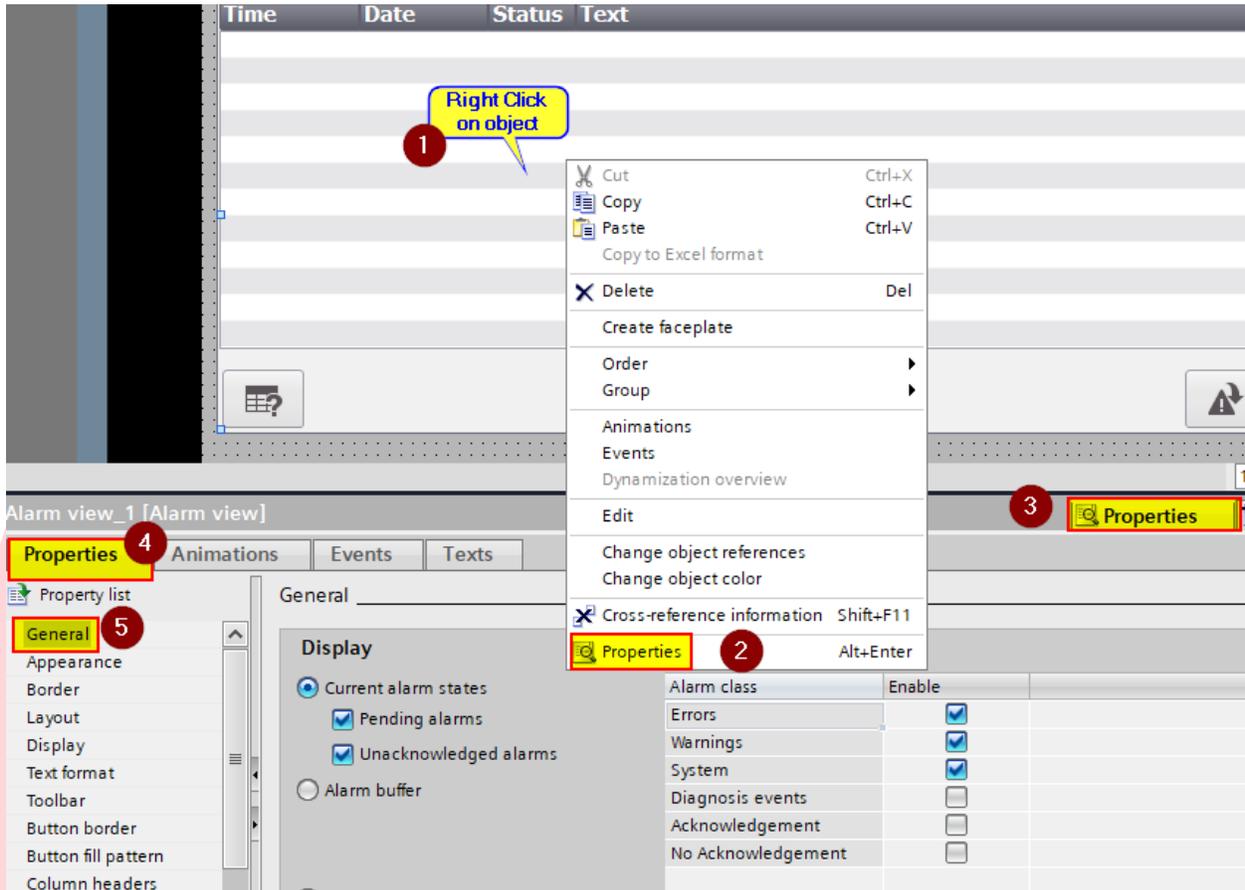


The Alarm View object was placed on the Alarms screen and resized



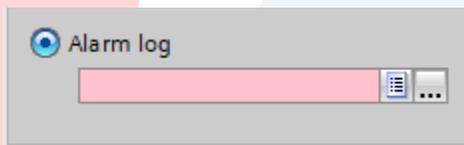
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Right click on the Alarm object and select Properties from the pop-up menu to view and parameterize the properties of the Alarm object.

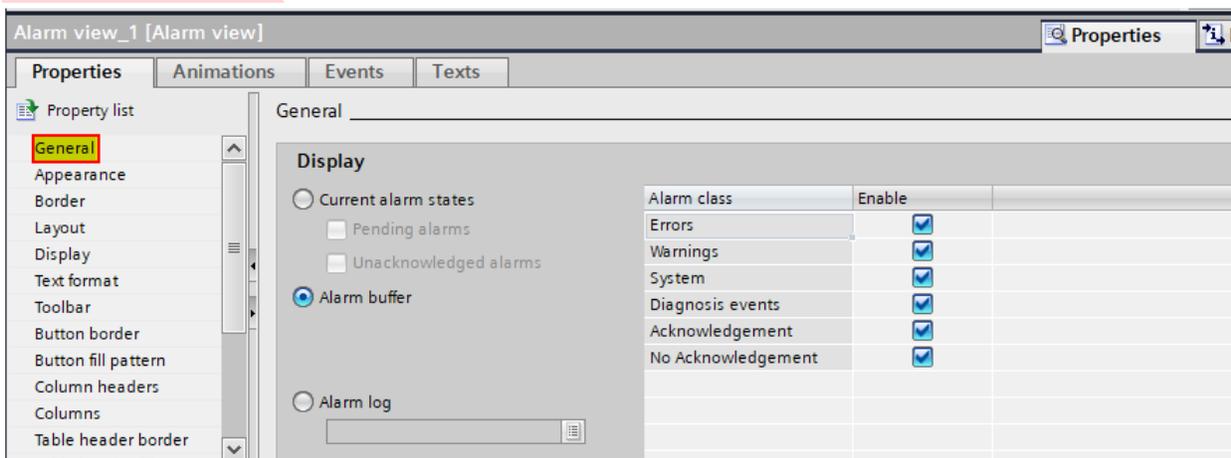


There are three ways to display the alarms

- Current Alarm States (active alarms) –
 - Pending/Unacknowledged checked – messages are displayed until outgoing and acknowledged
 - Only Pending checked – only incoming alarms will be displayed. No acknowledgement
 - Only Unacknowledged checked- message will be displayed until acknowledged
- Alarm buffer (alarm history) – all alarm states (incoming/outgoing/acknowledged) are displayed. The alarm buffer uses panel memory to store the messages. The number of messages stored depends on the panel.
- Alarm log – All alarm states are displayed from a log file. The log file is stored either on a SD memory card (max 2Gb) in the Data Card slot or on a USB drive (max 2GB). An alarm log must be created in Historical Data and selected in the field.



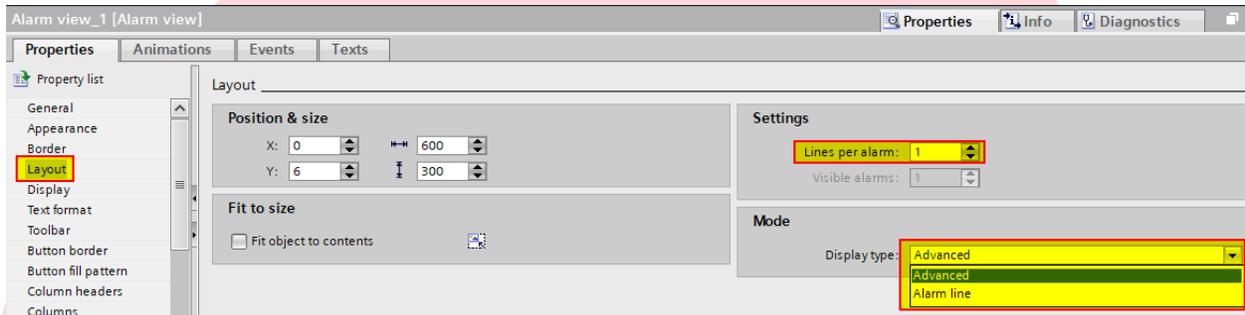
Some users have only one Alarm View set up to display alarm history ('Alarm buffer' selected). Some users create two separate alarm screens, one showing the current alarm states and the other showing alarm history.



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Below are some of the more common properties to be set in the Alarm view.

In the Layout property, you can adjust the number of lines to display in the Advanced mode or you can select Alarm Line mode for use as an alarm banner at the top of the screen. If you want the single line banner to be displayed on all of the screens, put it on a template screen.



In the Toolbar property, you can select which buttons to display. 'Info text' can be used to display additional information when the alarm is selected and the 'Info text' button is pressed. The 'Acknowledge' button acknowledges alarms. The 'Loop-in-Alarm' can be used to jump to a screen that displays information relevant to the alarm message selected.



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In the Columns property, the columns to displayed can be selected.

