



KREO HMI TUTORIAL Allarms - Messagges

Tutorial dedicated to the programming of alarms and messages

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Ideas.
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solutions.



Introduction

Let's see how the management of alarms and messages in KREO HMI works including the various tables of ACTIVE, HISTORICAL, STATISTICAL ALARMS as well as PRIORITIES and REPORTS.

Please note that, in ESA terminology, the difference between ALARM (ISA) and simple MESSAGE consists in the manual acquisition of the alarm by the operator.

The MESSAGE its displayed only if the alarm bit (or tag value) is active.

How to do it

- 1) Suppose you create a tag-array [0.. 9] of INTEGER to handle 160 alarms + 2 individual INTEGER TAGS to handle 3 messages

The screenshot shows the configuration software interface for KREO HMI. The left sidebar displays a tree view with the following items: TESTMANUALE, EW107BA6SP, Configuration, Pages (5), Popups (1), Sequences (1), Tags (106), Alarms (0), and Datalogs (0). The main window displays a table with the following columns: Folder, Name, Description, Type, Address type, and Provider. The table contains the following data:

Folder	Name	Description	Type	Address type	Provider
104	TagALARMS		UInt16(10)	Internal	N/A
105	TagWARNING1		Int16	Internal	N/A
106	TagWARNING2		Int16	Internal	N/A
107					
108					
109					
110					



2) I now configure the ALARMS/MSG in different ways and associated with the created tags

Folder	Name	Message	Tag	Activation type	Activation value	Priority
	Alarm1	FIRE !!!! EVERYBODY OUT	TagALARMS[Element:0]	Bit	0	Error
	Alarm2	EMERGENCY ALARM!	TagALARMS[Element:1]	Bit	7	Error
	Alarm3	SECURITY REMOVED! HALT MACHINE	TagALARMS[Element:2]	Bit	15	Error
	Msg1	TANK ALMOST FULL	TagWARNING1	Greater Than	80	Warning
	Msg2	TANK FULL	TagWARNING1	Greater Than	100	Warning
	Msg3	TAG OUT OF RANGE	TagWARNING2	OutOfRange	100	Warning

Note that alarms have been configured associated with various bits of the tag-array while MESSAGES are activated only when WARNING1>80, >100, WARNING2 if OUT OF RANGE 0..100.

This is just an example of configuration of course. The alarms/messages activation mode is interchangeable.

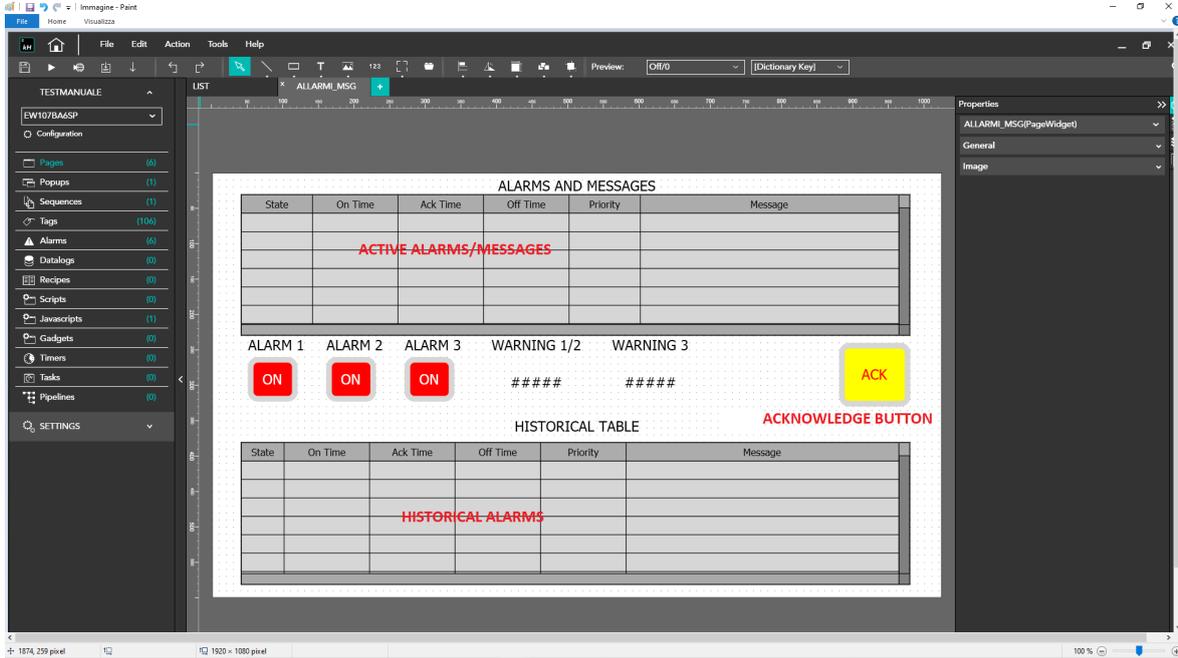
3) I now configure a display of colors ALARMS=RED and MESSAGES=BLUE

Name	Level	Color	Description
Error	0	Red	
Warning	1	#FF0000C0	

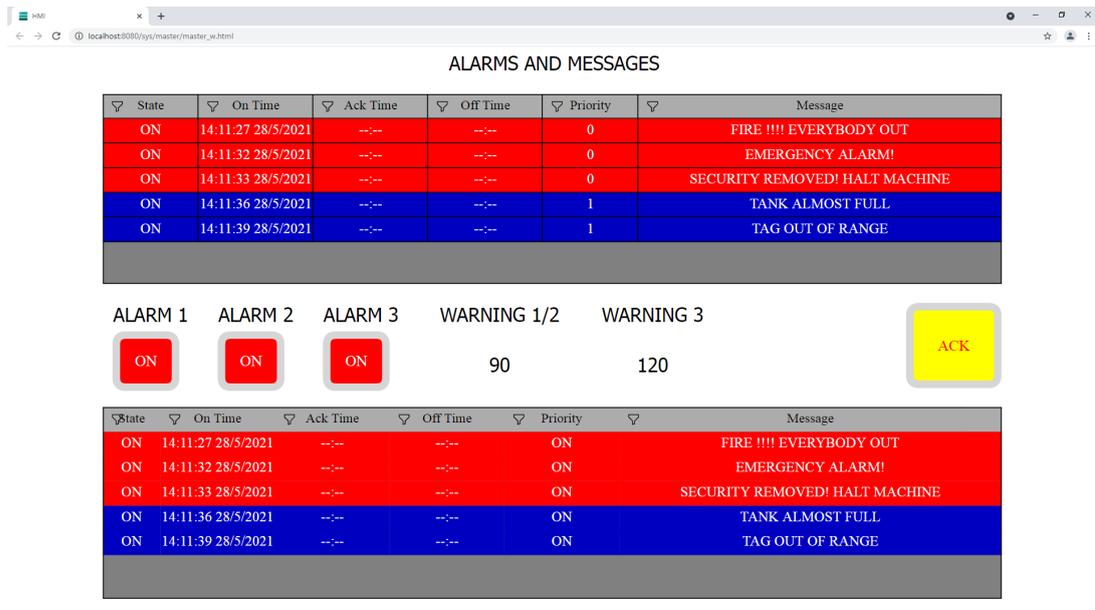
The PRIORITIES are configurable in NAME, LEVEL, COLOR.



4) On the project page I configure the alarms tables, HISTORICAL



5) By launching the project at RUNTIME and activating ALARMS/MESSAGES I get the following view:





Note the activation-ALARM time recorded in the ONTIME column. In this case the ALARMS have not yet been acquired (the MESSAGES do not require acquisition) and there are still 5 active in the machine.

6) Now we acquire the ALARMS with the ACK button (*function: AlarmAckGlobal*)

ALARMS AND MESSAGES

State	On Time	Ack Time	Off Time	Priority	Message
ON+ACK	14:11:27 28/5/2021	14:33:02 28/5/2021	--:--	0	FIRE !!!! EVERYBODY OUT
ON+ACK	14:11:32 28/5/2021	14:33:02 28/5/2021	--:--	0	EMERGENCY ALARM!
ON+ACK	14:11:33 28/5/2021	14:33:02 28/5/2021	--:--	0	SECURITY REMOVED! HALT MACHINE
ON	14:11:36 28/5/2021	--:--	--:--	1	TANK ALMOST FULL
ON	14:11:39 28/5/2021	--:--	--:--	1	TAG OUT OF RANGE

ALARM 1 ALARM 2 ALARM 3 WARNING 1/2 WARNING 3

ON ON ON 90 120 ACK

State	On Time	Ack Time	Off Time	Priority	Message
ON	14:11:32 28/5/2021	--:--	--:--	ON	EMERGENCY ALARM!
ON	14:11:33 28/5/2021	--:--	--:--	ON	SECURITY REMOVED! HALT MACHINE
ON	14:11:36 28/5/2021	--:--	--:--	ON	TANK ALMOST FULL
ON	14:11:39 28/5/2021	--:--	--:--	ON	TAG OUT OF RANGE
ACK	--:--	14:33:02 28/5/2021	--:--	ACK	SECURITY REMOVED! HALT MACHINE
ACK	--:--	14:33:02 28/5/2021	--:--	ACK	EMERGENCY ALARM!
ACK	--:--	14:33:02 28/5/2021	--:--	ACK	FIRE !!!! EVERYBODY OUT

The acquisition time was recorded in the appropriate column of the ACTIVES and HISTORICAL tables.

This procedure allows you to confirm to the system that the operator has become aware of the ALARMS in the machine.



7) Finally we reset the ALARMS / MESSAGES in the machine

The screenshot shows an HMI interface titled "ALARMS AND MESSAGES". At the top, there is a large grey rectangular area. Below it, there are five status indicators: "ALARM 1", "ALARM 2", "ALARM 3", "WARNING 1/2", and "WARNING 3". Each alarm indicator has a red "ON" button, while the warning indicators show "0". A yellow "ACK" button is located to the right of the warning indicators. Below these indicators is a table with the following columns: State, On Time, Ack Time, Off Time, Priority, and Message.

State	On Time	Ack Time	Off Time	Priority	Message
ACK	--:--	14:33:02 28/5/2021	--:--	ACK	EMERGENCY ALARM!
ACK	--:--	14:33:02 28/5/2021	--:--	ACK	FIRE !!!! EVERYBODY OUT
OFF	--:--	--:--	14:35:29 28/5/2021	OFF	FIRE !!!! EVERYBODY OUT
OFF	--:--	--:--	14:35:31 28/5/2021	OFF	EMERGENCY ALARM!
OFF	--:--	--:--	14:35:31 28/5/2021	OFF	SECURITY REMOVED! HALT MACHINE
OFF	--:--	--:--	14:35:34 28/5/2021	OFF	TANK ALMOST FULL
OFF	--:--	--:--	14:35:36 28/5/2021	OFF	TAG OUT OF RANGE

The ACTIVE table is empty and the HISTORY keeps the states recorded so far.



Information and additional alerts

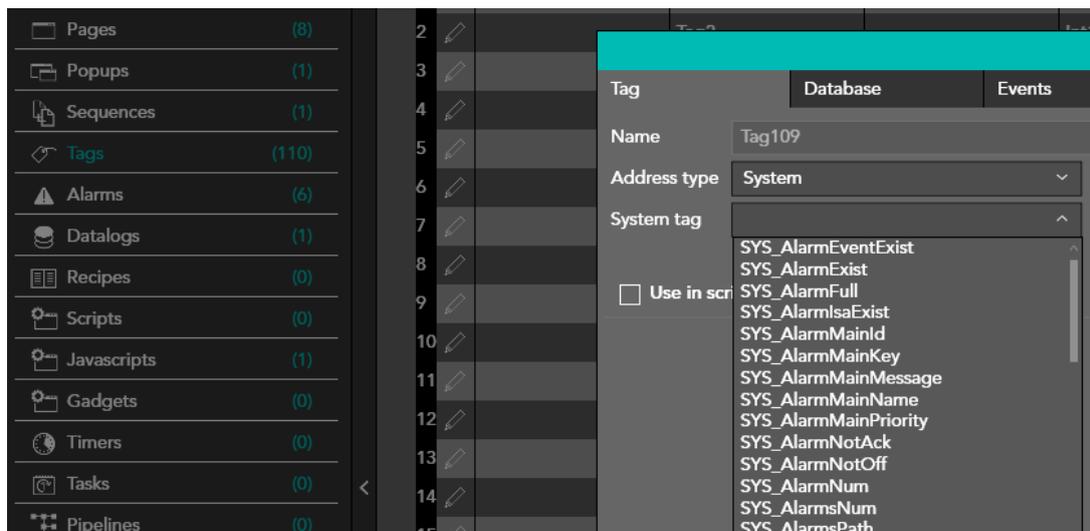
Other tables give additional alarms/messages informations.

Specific system tags (SYSTEM-TAGS) provide information on the status of the alarms (full history, acquired alarm, active, export path,... ..

Below example of statistics table

State	Duration	Priority	Number	Message
ON	0:00:30	0	3	FIRE !!!! EVERYBODY OUT
ON	0:00:26	0	2	EMERGENCY ALARM!
OFF	0:00:28	0	1	SECURITY REMOVED! HALT MACHINE
OFF	0:00:49	1	2	TANK ALMOST FULL
OFF	0:00:24	1	1	TANK FULL
ON	0:00:23	1	2	TAG OUT OF RANGE

In the figure below the alarm SYSTEM-TAGS



Other widgets integrate the alarm signals, such as ICONS and BANNERS of



ALARMS / MESSAGES.

It is also possible to configure HELP PAGES for each alarm / message configured, thus integrating the information related to each specific ALARM / MSG.

The screenshot shows an HMI interface with a table of active alarms and a help page for Alarm 1. The table has columns for State, On Time, and Message. The help page for Alarm 1 is displayed in the center, showing the same table data for that specific alarm.

State	On Time	Message
ON	15:43:36 28/5/2021	FIRE !!!! EVERYBODY OUT
ON	15:43:44 28/5/2021	TANK ALMOST FULL
ON	15:48:40 28/5/2021	EMERGENCY ALARM!
ON	15:48:42 28/5/2021	SECURITY REMOVED! HALT MACHINE

ALARM 1 ALARM 2 ALARM 3 WARNING 1/2 WARNING 3

OFF OFF OFF 90 0

HELP ALARM ACK

HELP PAGE OF ALARM1

State	On Time	Message
ON	15:43:36 28/5/2021	!!!! EVERYBODY OUT
ON	15:43:44 28/5/2021	TANK ALMOST FULL
ON	15:48:40 28/5/2021	EMERGENCY ALARM!
ON	15:48:42 28/5/2021	SECURITY REMOVED! HALT MACHINE

Note that the HELP pages for each ALARM/MSG are simple project pages (FULL PAGE or POPUP) associated with the various alarms.

A RUNTIME will just need a single HELP button to call them according to the ALARM / MSG selected in the ACTIVE table(*function: **GridAlarmShowPage***). It is also possible to set a double-click on the ADVANCED >> TABLE GRAPHIC PROPERTIES to perform the same function



Column display and sort filters

For a better reading of a table with many ALARMS /MSG you can take advantage of column sorting and display filters.

Pressing on the column-header sorts the ALARMS/MSG according to the alphabetical/time content of the sorted column.

Below example of sorting by text-message:

The screenshot shows a web browser window with a table of alarm messages. The table has columns for State, On Time, Ack Time, Off Time, Priority, and Message. The messages are sorted by their text content. The first three rows are red, the next three are blue, and the last three are grey.

State	On Time	Ack Time	Off Time	Priority	Message
ON	16:51:34 28/5/2021	--:--	--:--	ON	EMERGENCY ALARM!
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	EMERGENCY ALARM!
OFF	--:--	--:--	16:52:02 28/5/2021	OFF	EMERGENCY ALARM!
ON	16:51:33 28/5/2021	--:--	--:--	ON	FIRE !!!! EVERYBODY OUT
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	FIRE !!!! EVERYBODY OUT
OFF	--:--	--:--	16:52:01 28/5/2021	OFF	FIRE !!!! EVERYBODY OUT
ON	16:51:35 28/5/2021	--:--	--:--	ON	SECURITY REMOVED! HALT MACHINE
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	SECURITY REMOVED! HALT MACHINE
OFF	--:--	--:--	16:52:03 28/5/2021	OFF	SECURITY REMOVED! HALT MACHINE
ON	16:51:49 28/5/2021	--:--	--:--	ON	TAG OUT OF RANGE
OFF	--:--	--:--	16:52:08 28/5/2021	OFF	TAG OUT OF RANGE
ON	16:51:40 28/5/2021	--:--	--:--	ON	TANK ALMOST FULL
OFF	--:--	--:--	16:52:06 28/5/2021	OFF	TANK ALMOST FULL
ON	16:51:44 28/5/2021	--:--	--:--	ON	TANK FULL
OFF	--:--	--:--	16:52:06 28/5/2021	OFF	TANK FULL

To facilitate the reading of the table at RUNTIME you can apply filters to alarms / MSG that can be activated from the icons highlighted below:



State	On Time	Ack Time	Off Time	Priority
OFF	--:--	--:--	16:52:06 28/5/2021	OFF
ON	16:51:44 28/5/2021	--:--	--:--	ON
OFF	--:--	--:--	16:52:06 28/5/2021	OFF
ON	16:51:40 28/5/2021	--:--	--:--	ON
OFF	--:--	--:--	16:52:08 28/5/2021	OFF
ON	16:51:49 28/5/2021	--:--	--:--	ON
OFF	--:--	--:--	16:52:03 28/5/2021	OFF
ACK	--:--	16:51:58 28/5/2021	--:--	ACK

Depending on the selected column-filter, dedicated filters will be activated.

Status-column filter that contains text that begins with ACK

State	On Time	Ack Time	Off Time	Priority	Message
ACK	28/5/2021	--:--	ACK	FIRE !!!! EVERYBODY OUT	
ACK	28/5/2021	--:--	ACK	EMERGENCY ALARM!	
ACK	28/5/2021	--:--	ACK	SECURITY REMOVED! HALT MACHINE	



FILTER-COLUMN MESSAGE that contains the text FIRE + OUT (AND of 2 filters)

The screenshot shows an HMI interface with a table of messages. A dialog box is open, allowing the user to filter messages by column. The dialog has two input fields: the first contains 'FIRE' and the second contains 'OUT'. Below the fields are 'CANCEL' and 'OK' buttons. The background table has columns: State, On Time, Ack Time, Off Time, Priority, and Message. The messages are highlighted in red.

State	On Time	Ack Time	Off Time	Priority	Message
OFF	--:--	--:--	16:52:01 28/5/2021	OFF	ODY OUT
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	ODY OUT
ON	16:51:33 28/5/2021	--:--	--:--	ON	ODY OUT

FILTER-ON-TIME column that contains ALARMS/MSG between 2 dates/time

The screenshot shows the same HMI interface. The dialog box is now configured to filter by 'On Time'. The first input field contains '>=' and the second contains '16:14:12 28/5/2021'. The background table shows a list of messages with various states and times. The messages are highlighted in blue and red.

State	On Time	Ack Time	Off Time	Priority	Message
OFF	>=	16:14:12 28/5/2021	<=	17:14:12 28/5/2021	TANK FULL
ON					TANK FULL
OFF					TANK ALMOST FULL
ON					TANK ALMOST FULL
OFF					TAG OUT OF RANGE
ON					TAG OUT OF RANGE
OFF	--:--	--:--	16:52:03 28/5/2021	OFF	SECURITY REMOVED! HALT MACHINE
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	SECURITY REMOVED! HALT MACHINE
ON	16:51:35 28/5/2021	--:--	--:--	ON	SECURITY REMOVED! HALT MACHINE
OFF	--:--	--:--	16:52:01 28/5/2021	OFF	FIRE !!!! EVERYBODY OUT
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	FIRE !!!! EVERYBODY OUT
ON	16:51:33 28/5/2021	--:--	--:--	ON	FIRE !!!! EVERYBODY OUT
OFF	--:--	--:--	16:52:02 28/5/2021	OFF	EMERGENCY ALARM!
ACK	--:--	16:51:58 28/5/2021	--:--	ACK	EMERGENCY ALARM!
ON	16:51:34 28/5/2021	--:--	--:--	ON	EMERGENCY ALARM!



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