



ISA 18.2 and Dream Report from GE Digital



Introduction

In 2009, ANSI/ISA released a standard called ISA 18.2, covering the Management of Alarm Systems for the Process Industries. Alarm Management is critical to efficient operations and reducing risk. Without proper alarm management, issues can range from chattering alarms to alarm bursts that present too much information – all affecting operator performance.

Unlike other standards that define rigid guidelines, ISA 18.2 is a solution to identify and promote alarm management as a “Recognized and Generally Accepted Good Engineering Practice” (RAGAGEP). Regulatory bodies in various industries are adopting ISA 18.2.

ISA 18.2 presents guidelines for developing and managing an alarm solution. There are many aspects to the development of a proper alarm system:

- Alarm Philosophy – The documentation of the alarm system and the work processes to achieve that outcome
- Identification – Work processes to identify what alarms are necessary
- Rationalization – Evaluating that the alarm meets the requirements set forth in the alarm philosophy
- Detailed Design – The process of designing the alarms so that they meet the requirements listed under Rationalization and in the Alarm Philosophy
- Implementation – The alarm design, brought into operation
- Operation – Includes training
- Maintenance – Review and management of alarms
- Monitoring and Assessment – Alarm System monitoring to see that it meets the goals of the Alarm Philosophy
- Management of Change – The process and documentation of the change process
- Audit – The periodic review of the entire alarm solution to maintain and improve its operation and outcome

Dream Report and ISA 18-2 Capabilities

Dream Report is designed to perform alarm reporting and analysis functions. In fact, it is an easy-to-use and cost-effective solution for the Operation, Maintenance and Monitoring phases of your ISA 18.2 strategy.

With purpose-built drivers for alarm HMI/SCADA alarm repositories, Dream Report is designed to:

- Filter Alarms by various criteria such as Source, Operator, Priority, Status, and more
- Count Alarms – Generate alarm statistics such as counts based on filter criteria
- Document and Display Alarms – Generate Alarm Reports for archiving and distribution and provide an interactive interface to your alarms for real-time review and analysis. This functionality can be scheduled for automation, i.e. a monthly report of worst offender alarms, alarm response times, total number of alarms by site or piece of equipment, alarms by operator, etc. Documenting alarm Setpoints and Status – Active/Shelved/etc.
- Automatically Deliver Results – Email Reports, FTP Files, Automatically Populate a Browser based Portal.
- Perform Document Management – Delete old files, Delete after X files, Move Old Files, etc.

There are several specific features built into Dream Report for alarm management.

- Alarm Source Drivers – In general, alarm drivers access alarms from various repositories and enable filters of those sources. This enables the user to create many alarm channels to access the data they desire in a known context (All Alarms, High Priority Alarms, Alarms by Site/Equipment/Source, etc.)

Alarms/Events filters configuration

Filter name

Default_Alm

Site 1

Filter configuration

Filter name: Site 1

Property: Severity Condition: > Value: 500.0000000000

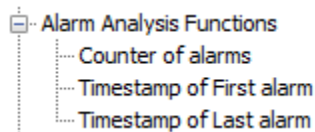
OR AND

Add Remove

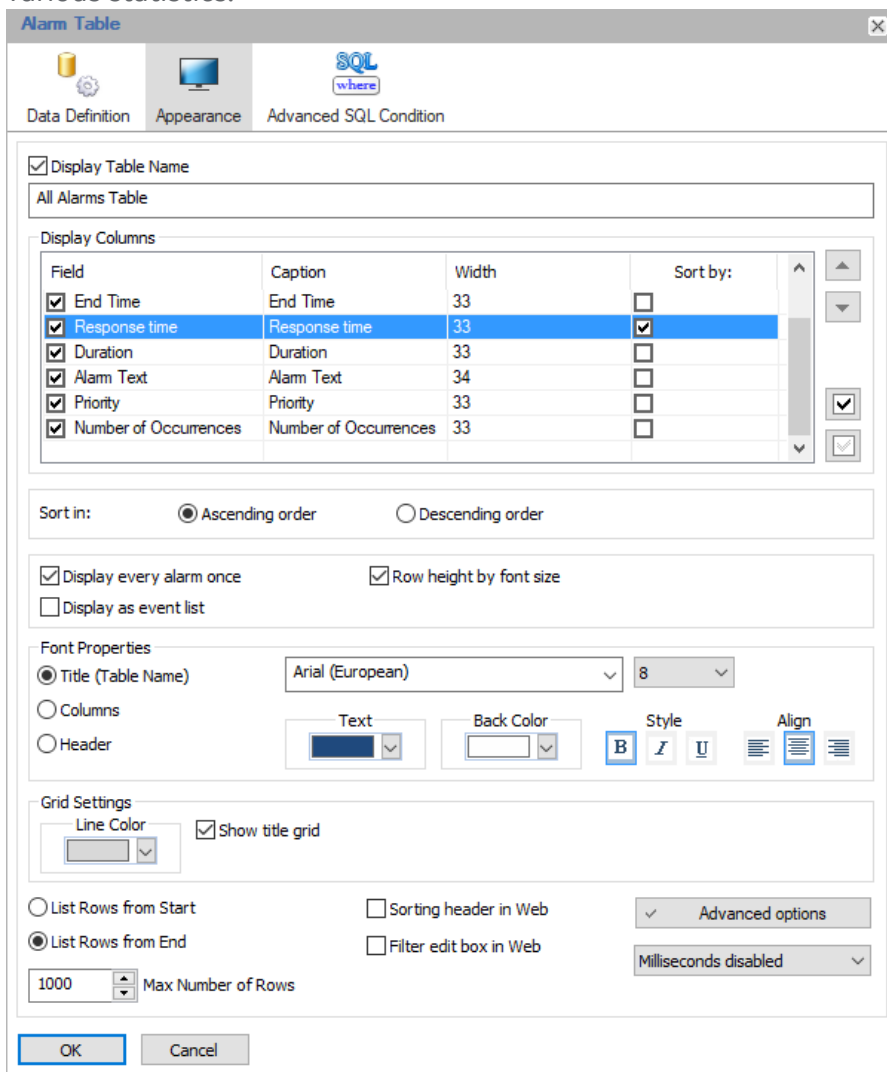
	Property	Condition	Value1	Value2
AND	Source	=	SITE 1	
AND	Actor	=	Frank	
AND	Severity	>	500.0000000000	

OK Cancel

- Alarm Statistics – Count of Alarms, Time of First, Time of Last. Count of Alarms generates the number of alarms over any specified Time Interval or Batch. An analysis of Alarms will often benefit from knowing other variables over that time and recalling Alarm Timestamps and performing Time math such as adding an hour or subtracting an hour would enable the generation of Charts to show other variables around the alarm. These statistics can be used in the Step Table for example, to break down alarm activity for example a monthly report of daily summaries, or an analysis of alarm counts in a specified period to identify alarm floods.



- Alarm Table Object – A Table that displays any range of alarms and organizes them as necessary for analysis. The Alarm Table is a very flexible object that can also perform alarm analysis such as alarm instance counts, duration and response time calculations. The table results can be organized as desired, sorting and filtering by various columns and color coding of various statistics.



Color Coding your results with Advanced Visualization:

Enable advanced visualization

Alarm property: **Duration** From: **5** To: **60**

Display Style

Font: **Arial (European)** Size: **8**

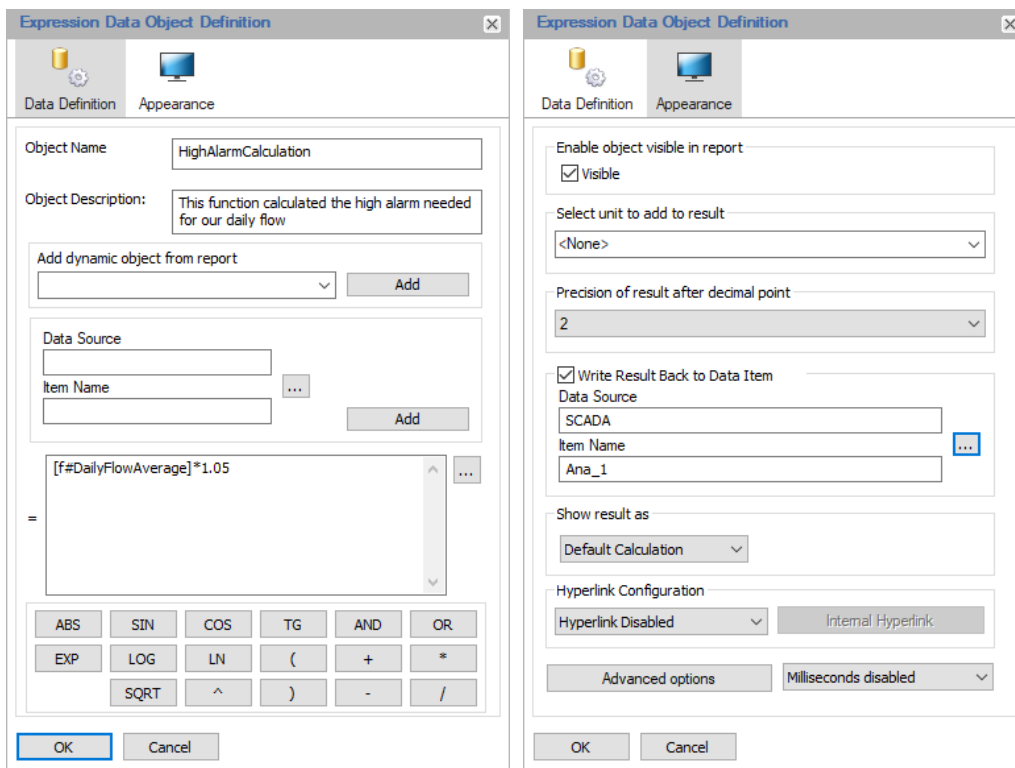
Font Color: **Black** Back Color: **Red**

Change font type Change text color
 Change font size Change background color
 Change font style

Alarm property	From	To
Priority	10	10
Duration	5	60
Number of alarm occur	20	200

Buttons: Add, Delete, Up, Down, OK, Cancel

- Some applications will benefit from Dynamic Alarm Setpoints, those that are calculated through a combination of other variables. Dream Report offers the unique ability to generate a report that accesses variables, performs statistics and can then Write Back to your automation system. Reports can be treated as a Recipe Download, retrieving alarms from a database and then downloading them to an HMI/SCADA/DCS, and Dream Report can perform statistics periodically, dynamically writing alarms as necessary. The core benefit of course, documenting your alarm management in the process.



All resulting documents should be available to users through an easy-to-use interface such as any approved Browser and Mobile Device on your network. Reports can automatically be emailed to recipients, and those documents can include links to the Browser-based portal to simplify next steps in analysis.

The screenshot displays the DR Web Portal Demo interface. The main content area shows an "Alarm Summary Report" generated on 06/28/2018 at 11:28:53. The report features a pie chart titled "Alarms by Priority" and a table of "All Alarms".

Alarms by Priority

Priority	This Week	Last Week	Target	Deviation
Critical	6 (13.0 %)	9 (19.6 %)	1 %	+0.3 %
High	5 (10.9 %)	12 (13.2 %)	5 %	-3.5 %
Medium	8 (17.4 %)	24 (26.4 %)	15 %	-1.0 %
Low	27 (58.7 %)	46 (50.5 %)	79 %	+2.5 %

All Alarms

Start Time	Ack Time	End Time	Resp. Time	Duration	Alarm Priority	Description	# of Occur.
24/06/2018 13:00:00	24/06/2018 13:30:00	24/06/2018 14:00:00	4:00:00	3:00:00	7	Valve Closed	6
24/06/2018 09:00:00	24/06/2018 09:30:00	24/06/2018 10:00:00	3:00:00	6:00:00	8	Production Starts	4
24/06/2018 12:00:00	24/06/2018 12:30:00	24/06/2018 13:00:00	2:00:00	4:00:00	8	Production In Progress	4
21/06/2018 17:00:00	21/06/2018 17:30:00	21/06/2018 18:00:00	2:00:00	4:00:00	5	Pumps Run	4
20/06/2018 14:00:00	20/06/2018 14:30:00	22/06/2018 12:00:00	2:00:00	4:00:00	7	Input Request	4
23/06/2018 07:00:00	23/06/2018 07:30:00	23/06/2018 08:00:00	2:00:00	4:00:00	8	Production Ends	4
21/06/2018 12:00:00	21/06/2018 13:30:00	21/06/2018 16:00:00	1:00:00	2:00:00	3	Tank High	2
22/06/2018 07:00:00	22/06/2018 07:30:00	22/06/2018 08:00:00	1:00:00	2:00:00	6	Temp Grow	2
21/06/2018 14:00:00	21/06/2018 14:30:00	21/06/2018 15:00:00	1:00:00	2:00:00	8	Ventilation Starts	2
23/06/2018 16:00:00	23/06/2018 16:30:00	23/06/2018 17:00:00	1:00:00	2:00:00	8	Enter Settings Value	2
20/06/2018 13:00:00	20/06/2018 13:30:00	23/06/2018 14:00:00	1:00:00	3:00:00	8	Input Request	2
22/06/2018 13:00:00	22/06/2018 13:30:00	22/06/2018 16:00:00	1:00:00	2:00:00	5	Motor Stopped	2
22/06/2018 08:00:00	22/06/2018 08:30:00	22/06/2018 09:00:00	1:00:00	2:00:00	8	Temp Fine	2
23/06/2018 11:00:00	23/06/2018 11:30:00	23/06/2018 12:00:00	1:00:00	2:00:00	8	Pumping Starts	2
24/06/2018 13:00:00	24/06/2018 13:30:00	24/06/2018 16:00:00	1:00:00	2:00:00	8	Confirm Settings	2
24/06/2018 11:00:00	24/06/2018 11:30:00	24/06/2018 12:00:00	1:00:00	2:00:00	5	Pumps 100%	2

The interface also includes a "Reports List" sidebar on the left and a "List of Report files" sidebar on the right. The "List of Report files" sidebar shows a selection of report files, including "Alarm Summary Report_28_06_2018".

Browser-based Reports can be fully interactive to let the user select Sites/Equipment, specify periods of interest, filter on column properties and export for analysis in other products like Excel.

The screenshot shows a web browser window displaying the 'Alarm Filter Report' interface. The browser address bar shows 'localhost:DRweb_Demo/webreport.aspx?Repld=Alarm+Filter+Report'. The page title is 'Alarm Filter Report'. The interface includes a navigation menu on the left with categories like 'All Demos', 'Batch reports', 'Drill-Down Examples', 'Energy Report examples', 'LUA Functions Examples', 'MES Reports', 'Multi Lang Example', 'OEE, Performance and Maintenance', 'Production and Manufacturing', 'Project Internal Reports', 'Reporting Objects Examples', 'Scipoint Analysis', 'SQC Reports', 'Water - Waste Water', and 'Web Reports'. The main report area has a title 'Alarm Filter Report' and a sub-header 'Select the Report Time Period'. It includes input fields for 'From:' (01/06/2018 11:15:53) and 'To:' (28/06/2018 11:30:53). There are also fields for 'Specify the Alarm Priority Range' (From: 0, To: 999) and 'Enter Alarm Search Text' (Pump). Buttons for 'Refresh Report' and 'Generate PDF' are present. Below the filters is a table with columns: Start Time, Ack Time, End Time, Response time, Duration, Alarm Text, and Priority. The table contains 30 rows of data, including entries like 'Pumps 100%', 'Pumping Starts', 'Pumps Stopped', and 'Pumps Runs'.

Start Time	Ack Time	End Time	Response time	Duration	Alarm Text	Priority
27/06/2018 18:00:00	27/06/2018 18:30:00	27/06/2018 19:00:00	0:30:00	1:00:00	Pumps 100%	5
26/06/2018 18:00:00	26/06/2018 18:30:00	26/06/2018 19:00:00	0:30:00	1:00:00	Pumping Starts	8
26/06/2018 09:00:00	26/06/2018 09:30:00	26/06/2018 10:00:00	0:30:00	1:00:00	Pumps Stopped	9
25/06/2018 13:00:00	25/06/2018 13:30:00	25/06/2018 14:00:00	0:30:00	1:00:00	Pumps Stopped	9
25/06/2018 12:00:00	25/06/2018 12:30:00	25/06/2018 13:00:00	0:30:00	1:00:00	Pumps Runs	5
25/06/2018 11:00:00	25/06/2018 11:30:00	25/06/2018 12:00:00	0:30:00	1:00:00	Pumps Runs	5
24/06/2018 11:00:00	24/06/2018 11:30:00	24/06/2018 12:00:00	0:30:00	1:00:00	Pumps 100%	5
23/06/2018 11:00:00	23/06/2018 11:30:00	23/06/2018 12:00:00	0:30:00	1:00:00	Pumping Starts	8
22/06/2018 14:00:00	22/06/2018 14:30:00	22/06/2018 15:00:00	0:30:00	1:00:00	Pumps Stopped	9
21/06/2018 18:00:00	21/06/2018 18:30:00	21/06/2018 19:00:00	0:30:00	1:00:00	Pumps Stopped	9
21/06/2018 17:00:00	21/06/2018 17:30:00	21/06/2018 18:00:00	0:30:00	1:00:00	Pumps Runs	5
21/06/2018 16:00:00	21/06/2018 16:30:00	21/06/2018 17:00:00	0:30:00	1:00:00	Pumps Runs	5
20/06/2018 16:00:00	20/06/2018 16:30:00	20/06/2018 17:00:00	0:30:00	1:00:00	Pumps 100%	5
19/06/2018 16:00:00	19/06/2018 16:30:00	19/06/2018 17:00:00	0:30:00	1:00:00	Pumping Starts	8
19/06/2018 07:00:00	19/06/2018 07:30:00	19/06/2018 08:00:00	0:30:00	1:00:00	Pumps Stopped	9
18/06/2018 11:00:00	18/06/2018 11:30:00	18/06/2018 12:00:00	0:30:00	1:00:00	Pumps Stopped	9
18/06/2018 10:00:00	18/06/2018 10:30:00	18/06/2018 11:00:00	0:30:00	1:00:00	Pumps Runs	5
18/06/2018 09:00:00	18/06/2018 09:30:00	18/06/2018 10:00:00	0:30:00	1:00:00	Pumps Runs	5
17/06/2018 09:00:00	17/06/2018 09:30:00	17/06/2018 10:00:00	0:30:00	1:00:00	Pumps 100%	5
16/06/2018 09:00:00	16/06/2018 09:30:00	16/06/2018 10:00:00	0:30:00	1:00:00	Pumping Starts	8
15/06/2018 12:00:00	15/06/2018 12:30:00	15/06/2018 13:00:00	0:30:00	1:00:00	Pumps Stopped	9
14/06/2018 16:00:00	14/06/2018 16:30:00	14/06/2018 17:00:00	0:30:00	1:00:00	Pumps Stopped	9
14/06/2018 15:00:00	14/06/2018 15:30:00	14/06/2018 16:00:00	0:30:00	1:00:00	Pumps Runs	5
14/06/2018 14:00:00	14/06/2018 14:30:00	14/06/2018 15:00:00	0:30:00	1:00:00	Pumps Runs	5
13/06/2018 14:00:00	13/06/2018 14:30:00	13/06/2018 15:00:00	0:30:00	1:00:00	Pumps 100%	5
12/06/2018 16:00:00	12/06/2018 16:30:00	12/06/2018 17:00:00	0:30:00	1:00:00	Pumping Starts	8
12/06/2018 07:00:00	12/06/2018 07:30:00	12/06/2018 08:00:00	0:30:00	1:00:00	Pumps Stopped	9
11/06/2018 15:00:00	11/06/2018 15:30:00	11/06/2018 16:00:00	0:30:00	1:00:00	Pumps Stopped	9
11/06/2018 14:00:00	11/06/2018 14:30:00	11/06/2018 15:00:00	0:30:00	1:00:00	Pumps Runs	5
11/06/2018 13:00:00	11/06/2018 13:30:00	11/06/2018 14:00:00	0:30:00	1:00:00	Pumps Runs	5
10/06/2018 17:00:00	10/06/2018 17:30:00	10/06/2018 18:00:00	0:30:00	1:00:00	Pumeline Starts	8

Conclusion

Alarm management features and benefits are just one area of excellence in Dream Report. In addition to your alarm management, Dream Report supports compliance reports, performance reports and dashboards for your entire organization. Justification of any solution comes from results, ease of use, flexibility, and cost. Dream Report excels in all these areas. If you are considering an ISA 18.2 solution, Dream Report provides an excellent addition for automating the Operating, Maintenance and Monitoring portion of the strategy.



About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

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