EcoStruxure

Power Advisor

Alarm Health Report

ABC Industries
Analysis Period: 2021-02-01 to 2021-02-28

Created On
Wednesday, July 28, 2021

Site Information
ABC Industries
12825 144 St NW,
Edmonton, AB T5L 4N7

Contents

Report overview

Introduction

This report presents the Power Advisor analysis results for your power management alarm system.

The analysis focuses on specific performance indicators for alarm system health. Many of these indicators are based on the performance measures defined in the *ANSI/ISA-18.2-2009/IEC 62682 Management of Alarm Systems for the Process Industries (ISA-18.2/IEC 62682)* standard. The observed system performance is compared to targets defined by these standards.

The insights and findings provided by the Power Advisor analysis can help you create a more effective alarm system and maintain its performance.

The information in the report is for qualified personnel who configure and maintain your power management system. Use this information to correct any identified issues and improve the alarm system performance.

Introduction (continued)

The report contains the following sections:

Analysis insights

This section shows high-level summary information on the issues found, including an overall assessment of the alarm system health.

Issue summary

This section has summary information on each issue type, including a list of potential causes and recommended actions.

Analysis details

This section provides device and alarm level details related to the analysis results.

Reference

This section has information on the ISA-18.2/IEC 62682 alarm management standard. It also has general reference information related to the alarm life cycle and other relevant topics.

Note

The findings in this report are based on a Power Advisor analysis of your power management system data for the analysis period. The report was prepared by one of our power system experts as a part of your EcoStruxure™ Service Plan for Power Management featuring Power Advisor technology.

Analysis insights

Introduction

This section provides high level summary information on the results of the alarm system analysis. It includes an overview of the overall alarm system health and a list of issues found by Power Advisor.

This section contains the following topics:

Overall alarm system health

This topic shows an overall assessment of the alarm system health.

Alarm behavior summary

This topic shows a categorization of the alarms based on problematic behavior such as chattering, fleeting, or stale.

Most frequent alarms

This topic identifies the most frequent alarms during the analysis period.

Identified issues

This topic lists the alarm health issues found in the system.

Tests passed without issues

This topic shows the Power Advisor tests your alarm system has passed with no identified issues.

Analysis insights

Overall alarm system health

The primary function of an alarm system is to notify operators and other personnel of abnormal process conditions or equipment malfunctions and to support the response.

Alarm system health is a measure of the system's ability to perform this function effectively. This includes the hardware and software components of the system, and the associated operational processes.

Power Advisor analyzes the alarm data collected by your power management system and compares the results to the goals and targets set for the system.

The following provides high level summary information about the health of your alarm system.

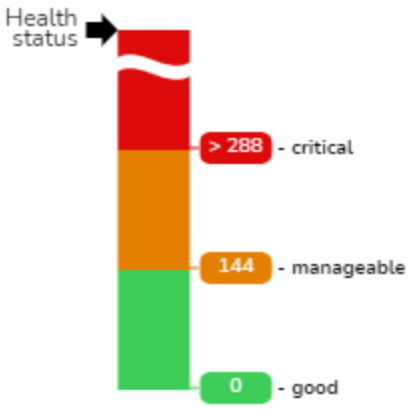
Overall alarm system health (continued)

Daily Alarm Rate

476

alarms / day

Health status: **critical**



Your rate compared to a previous month:

21 % higher

Previous month:

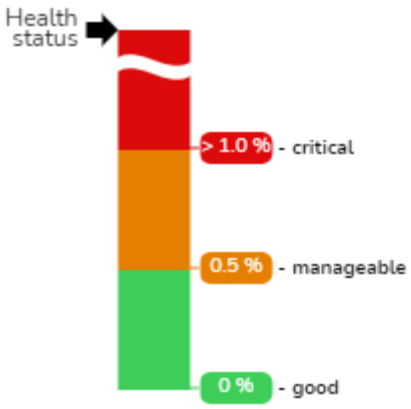
395 alarms / day

Alarm Flood Rate

10 %

of the time *

Health status: **critical**



Your rate compared to a previous month:

1 % higher

Previous month:

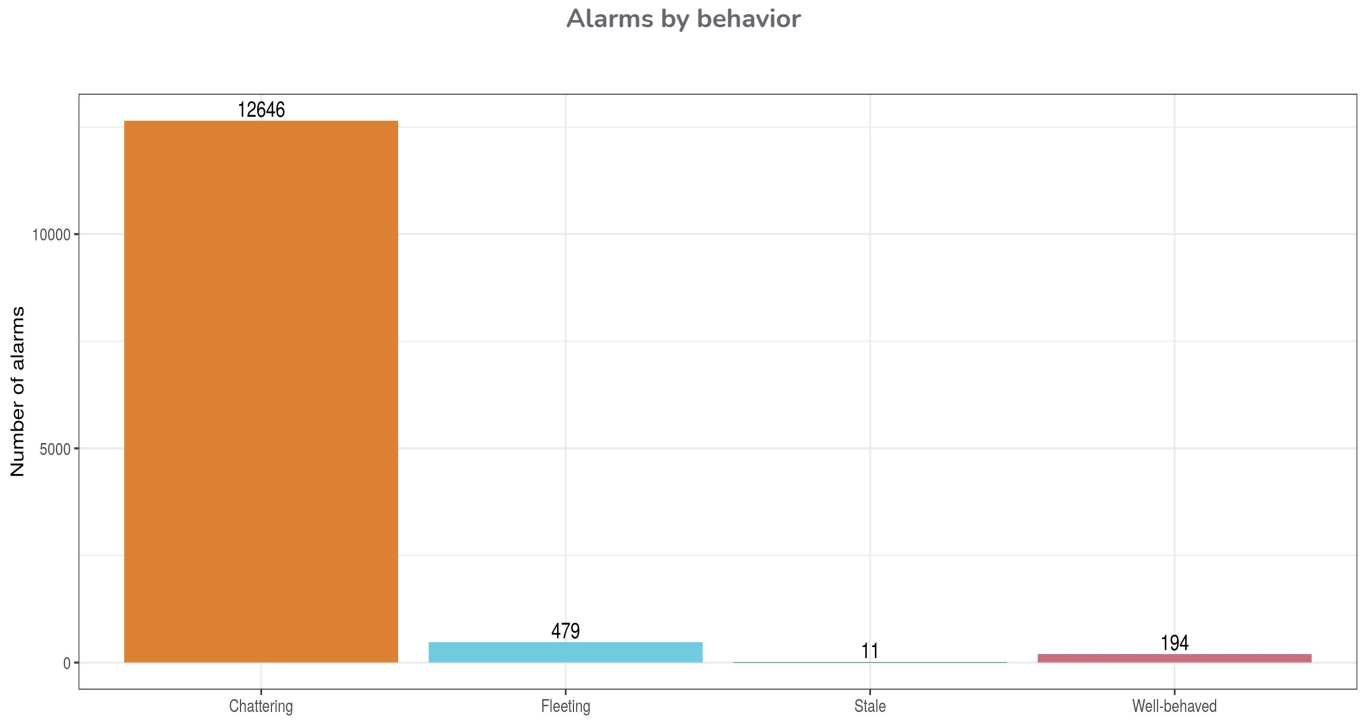
9 % of the time *

* percent of 10-minute intervals with > 10 alarms

Alarm behavior summary

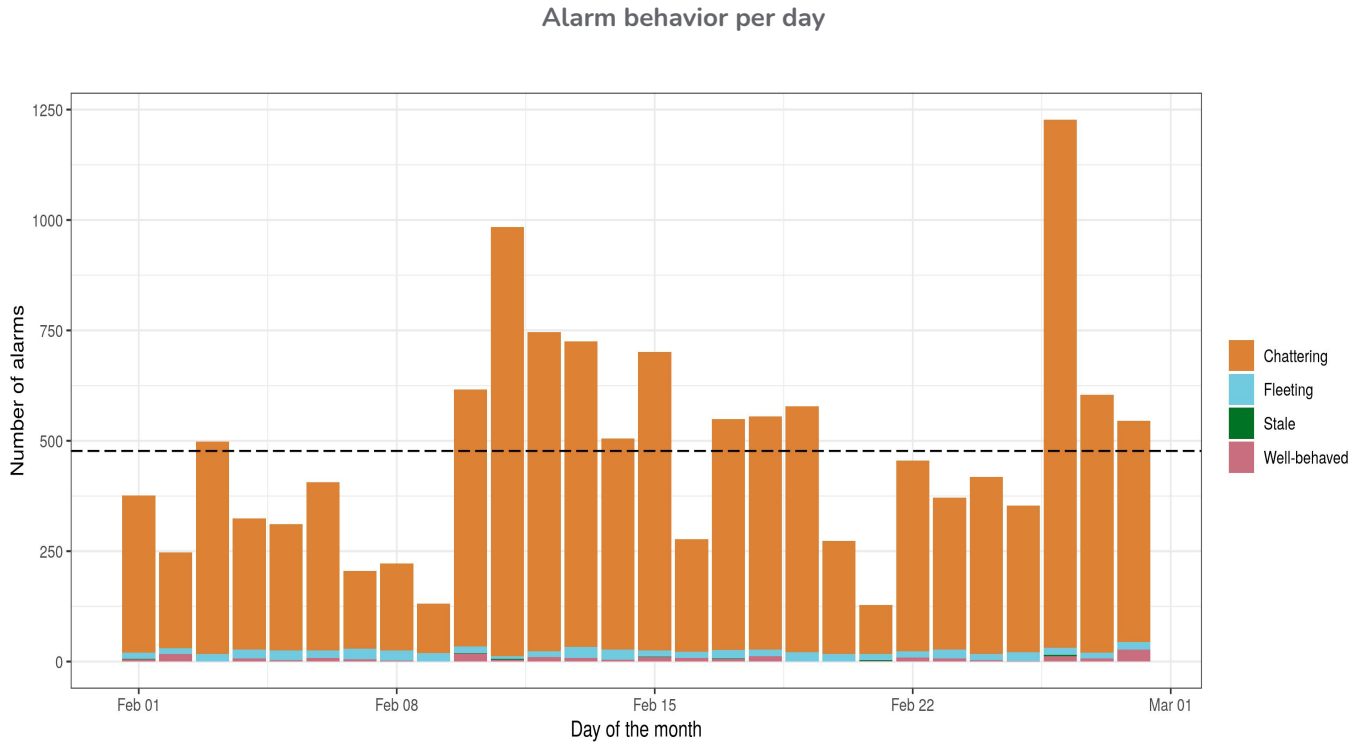
Incorrect alarm configuration can cause alarms to annunciate excessively, unnecessarily, or to not return to normal after the operator takes action. This type of alarm behavior is nuisance behavior. Examples of nuisance alarms include chattering, fleeting, and stale alarms.

The following chart categorizes the number of alarm occurrences in your system based on nuisance behavior.



Alarm behavior summary (continued)

The following chart shows a breakdown of the daily alarms by nuisance behavior. The dashed line shows the average number of alarms for the analysis period.



Analysis insights

Most frequent alarms

The following table lists the alarms in your system that happened most often during the analysis period. The alarms are ordered by the number of occurrences, with the alarms with the most occurrences at the top. Up to 10 alarms are shown.

Contribution of the most frequent alarms to the total alarm volume:
99.55 %

Rank	Alarm	Device	Alarm Volume
1	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	**35.45 %** (4726 alarms)
2	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	**34.88 %** (4650 alarms)
3	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	**28.93 %** (3857 alarms)
4	IB SWELL – Current B (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	**0.16 %** (21 alarms)
5	IA SWELL – Current A (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	**0.12 %** (16 alarms)

Analysis insights

Identified issues

To determine the alarm system health, Power Advisor runs several tests on the alarm history data. A failed test shows a possible alarm system issue.

The following table shows the issues identified for your system.

Tip: Click the issue title to get more information about that issue.

	Issue Description
!	Alarm Floods The system was in an alarm flood condition for a high percentage of the time. Alarm floods are periods of time when the alarm activity is higher than an operator can typically handle on a sustained basis. Observed: **10 % of the time in a flood condition** Target: < 1%
!	Chattering Alarms Alarms with a high volume of chattering behavior have been detected in the system. Chattering is a type of nuisance behavior when an alarm transitions between active and inactive state repeatedly within a short period of time. Observed: **12,646 chattering alarms** Target: 0
!	Fleeting Alarms Alarms with a high volume of fleeting behavior have been detected in the system. Fleeting is a type of nuisance behavior when an alarm transitions from active state to inactive state in a short period of time and typically without any intervention. Observed: **479 fleeting alarms** Target: 0
!	Stale Alarms There are a large number of stale alarms in the system. Stale alarms are alarms that remain in an active state continuously for an extended duration. Observed: **11 stale alarms** Target: <= 5

Analysis insights

Tests passed without issues

To determine the alarm system health, Power Advisor runs several tests on the alarm history data.

Your system has passed none of the tests.

Issue summary

Introduction

This section provides summary information on the identified issues, including a list of possible causes and recommended actions.

Issues:

⚠ WARNING

POTENTIAL COMPROMISE OF ALARM SYSTEM FUNCTIONALITY AND INTEGRITY

- Consider the effects of alarm settings changes on the alarm system operation.
- Consider required alarm response times for all modes of operation before changing alarm settings.
- Verify alarm settings changes before bringing them online.
- Monitor the alarm system behavior after settings changes and make adjustments if necessary.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

Important Note

Electrical equipment and power management software and devices should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and power management systems and has received safety training to recognize and avoid the hazards involved.

Alarm Floods

The system was in an alarm flood condition for a high percentage of the time. Alarm floods are periods of time when the alarm activity is higher than an operator can typically handle on a sustained basis.

Observed: **9.9 % of the time in a flood condition**
Target: < 1%

Possible Causes	Recommended Actions
Multiple alarms are triggering on the same conditions.	• Consider removing duplicate alarms that only trigger on the same conditions.
Nuisance alarms are triggered at the same time as other alarms.	• Eliminate nuisance alarms, like chattering and fleeting alarms, or frequently occurring alarms. • Review the alarms and remove any that do not meet your alarm criteria. • Review and adjust the alarm settings(limits, deadband, on - delay, off - delay) and verify that the alarms operate as intended. • Remove 'information only' alarms, for example instrument diagnostic alarms.
The high alarm volume is triggered by facility maintenance.	• Suppress alarms triggered by facility maintenance.
The high alarm volume is related to electrical system issues or facility issues, such as incorrect breaker coordination.	• Investigate and analyze underlying electrical system or facility issues. • Resolve the root causes of issues if possible • Improve the alarm system with advanced and enhanced alarming methods such as logic - based alarming or model - based alarming.

Possible Consequences
Alarm flood conditions can affect the operator's ability to manage alarms effectively and can increase the risk of missed alarms. Studies suggest that an operator requires approximately 1 minute per alarm, on average, during peak alarm conditions.

See details about this issue.
Go back to identified issues for information on all identified issues in this analysis.

Chattering Alarms

Alarms with a high volume of chattering behavior have been detected in the system. Chattering is a type of nuisance behavior when an alarm transitions between active and inactive state repeatedly within a short period of time.

Observed: **12,646 chattering alarms**
Target: 0

Possible Causes	Recommended Actions
Alarm settings (limits, deadband, on-delay, off-delay) have not been optimized or maintained. For example, the normal operating ranges are too close to the existing alarm limit settings.	• Review and adjust the alarm settings (limits, deadband, on-delay, off-delay). • Maintain alarm settings over time as your facility and operations change.
The chattering alarms trigger on normal operating states that happen frequently, such as undercurrent alarms on intermittently used equipment.	• Use dynamic alarm thresholds. • Use latching alarms instead of discrete alarms. • Replace absolute alarms with deviation alarms.
The chattering alarms are related to alarm system issues, such as faulty sensors or mis-configured devices.	• Check your alarm system, replace faulty sensors, and correct mis-configured devices.

Possible Consequences
Chattering alarms can distract operator attention and can hide the presence of other important alarms. This can result in reduced operator efficiency, the possibility of ignoring alarms, and an increased risk of missing important alarms.

See details about this issue.
Go back to identified issues for information on all identified issues in this analysis.

Issue summary

Fleeting Alarms

Alarms with a high volume of fleeting behavior have been detected in the system. Fleeting is a type of nuisance behavior when an alarm transitions from active state to inactive state in a short period of time and typically without any intervention.

Observed: **479 fleeting alarms**
Target: 0

Possible Causes	Recommended Actions
Alarm settings (limits, deadband, on-delay, off-delay) have not been optimized or maintained. For example, the normal operating ranges are too close to the existing alarm limit settings.	• Review and adjust the alarm settings (limits, deadband, on-delay, off-delay). • Maintain alarm settings over time as your facility and operations change.
The fleeting alarms trigger on normal operating states that happen frequently, such as undercurrent alarms on intermittently used equipment.	• Use dynamic alarm thresholds. • Use latching alarms instead of discrete alarms. • Replace absolute alarms with deviation alarms.
The fleeting alarms are related to alarm system issues, such as faulty sensors or mis-configured devices.	• Check your alarm system, replace faulty sensors, and correct mis-configured devices.

Possible Consequences
Fleeting alarms can distract operator attention and can hide the presence of other important alarms. This can result in reduced operator efficiency, the possibility of ignoring alarms, and an increased risk of missing important alarms.

See details about this issue.
Go back to identified issues for information on all identified issues in this analysis.

Issue summary

Stale Alarms

There are a large number of stale alarms in the system. Stale alarms are alarms that remain in an active state continuously for an extended duration.

Observed: **11 stale alarms**
Target: <= 5

Possible Causes	Recommended Actions
The data signals that represent a 'return to normal' state have not been set up correctly.	• Check that sensors, equipment, and alarm settings are set up correctly to detect the 'return to normal' state.
The alarm is set to trigger on a normal operating condition that does not require intervention, such as an undercurrent alarm on occasionally used equipment.	• Consider changing the alarm threshold to trigger only when action is required; if possible, configure a logic-based alarm that takes into account the operating mode of the equipment.
The alarm is a 'latching' alarm, and has not been acknowledged by an operator.	• Check that operators are acknowledging alarms according to standard operating procedures.

Possible Consequences
Stale data can distract operator attention without providing any valuable information.

See details about this issue.
Go back to identified issues for information on all identified issues in this analysis.

Analysis details

Introduction

This section provides device and alarm level details related to the analysis results.

⚠ WARNING

POTENTIAL COMPROMISE OF ALARM SYSTEM FUNCTIONALITY AND INTEGRITY

- Consider the effects of alarm settings changes on the alarm system operation.
- Consider required alarm response times for all modes of operation before changing alarm settings.
- Verify alarm settings changes before bringing them online.
- Monitor the alarm system behavior after settings changes and make adjustments if necessary.

Failure to follow these instructions can result in death, serious injury, and equipment damage.

Important Note

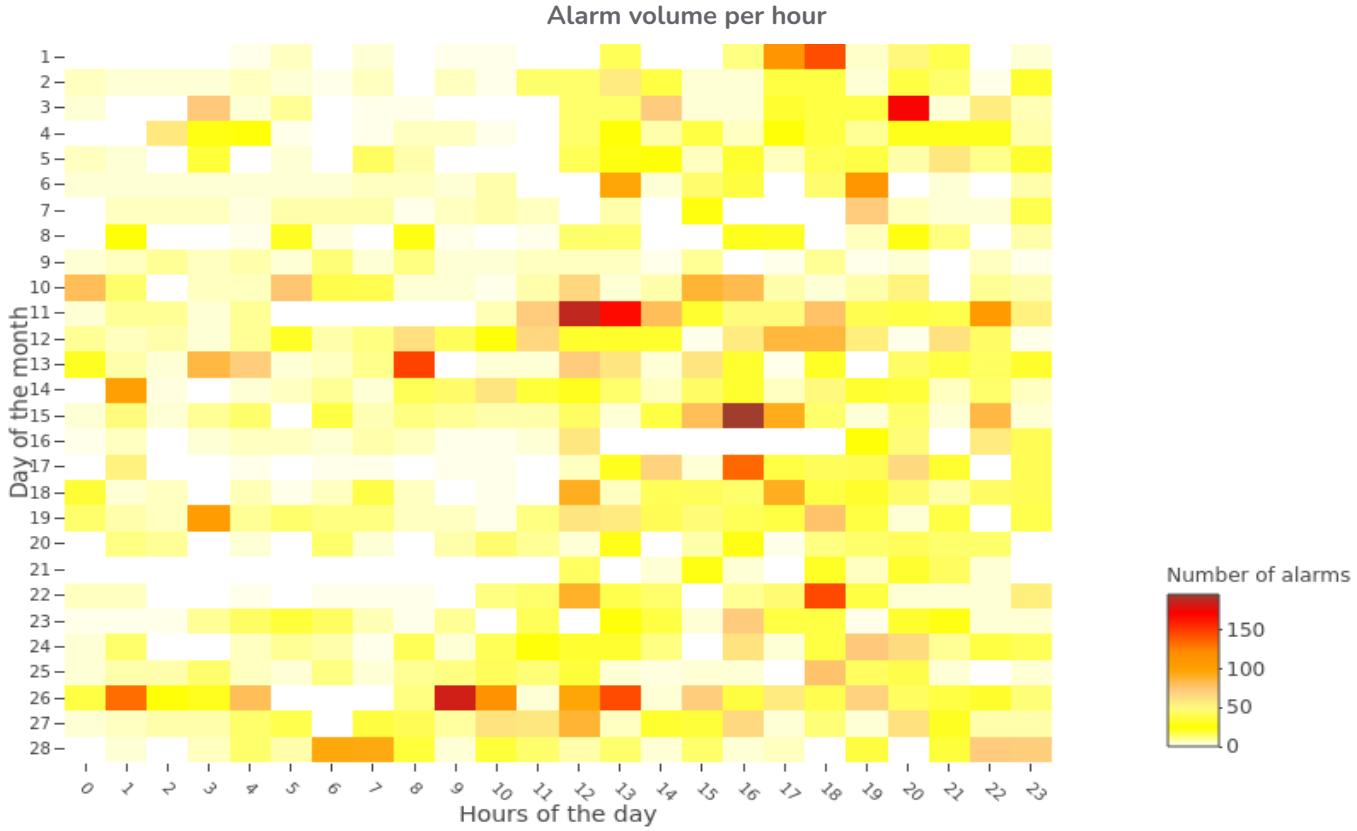
Electrical equipment and power management software and devices should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and power management systems and has received safety training to recognize and avoid the hazards involved.

Details by issue

Alarm Floods

Observed: **10 % of the time in a flood condition**
Target: **< 1%**

The following chart shows the alarm volume in your system per hour, for each day in the analysis period. The color variations show the differences in alarm volume. Lower alarm volumes are shown in lighter colors; higher alarm volumes are shown in darker colors.



Go back to Alarm Floods.
Go back to identified issues for information on all identified issues in this analysis.

Details by issue (continued)

Chattering Alarms

Total chattering alarm: **12,646**

The following details show the top chattering alarm in your system. The alarms are ordered by number of occurrences, with the alarm with the most occurrences at the top. Up to 10 alarms are shown.

Contribution of the most frequent chattering alarm to the total chattering alarm volume:
100 % (12,646 of 12,646 chattering alarm)

Rank	Alarm	Device	Details
1	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Occurrences: **4,511** Worst Measurements
2	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Occurrences: **4,471** Measurements
3	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Occurrences: **3,664** Measurements

Go back to Chattering Alarms.
Go back to identified issues for information on all identified issues in this analysis.

1 Swell (Current) on MDP2.MDP2-DP5-PM870 Worst

Occurrences: **4,511**
Chattering behavior: **95.5 % of the occurrences**
(4,511 of 4,726 occurrences)
Device type: **PM870**
Alarm priority: **Low**

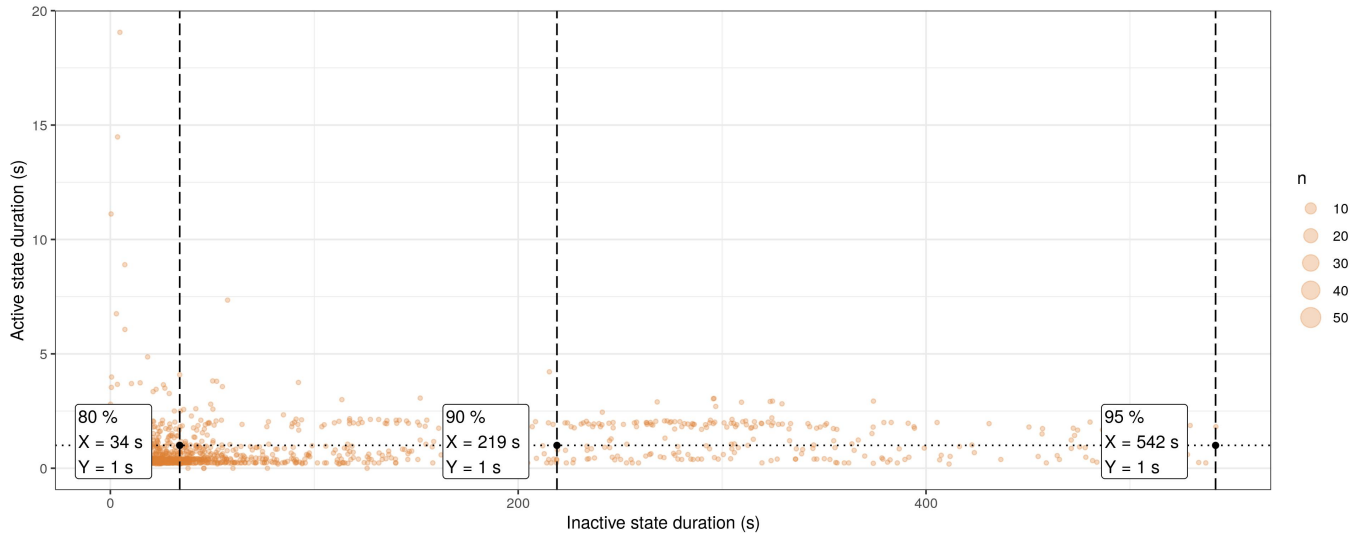
Details by issue (continued)

Chattering Alarms (continued)

1 **Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)** Worst

The following chart shows the occurrences of this alarm, based on the time spent in the active state and the inactive state. Occurrences with longer active state durations are shown more to the top of the chart. Occurrences with longer inactive state durations are shown more to the right side of the chart.

Alarm distribution based on active and inactive state duration



If applicable, consider increasing the on-delay setting for this alarm to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm on-delay increase	Potential alarm volume reduction
>= 1 s	80 %
>= 1 s	90 %
>= 1 s	95 %

Details by issue (continued)

Chattering Alarms (continued)

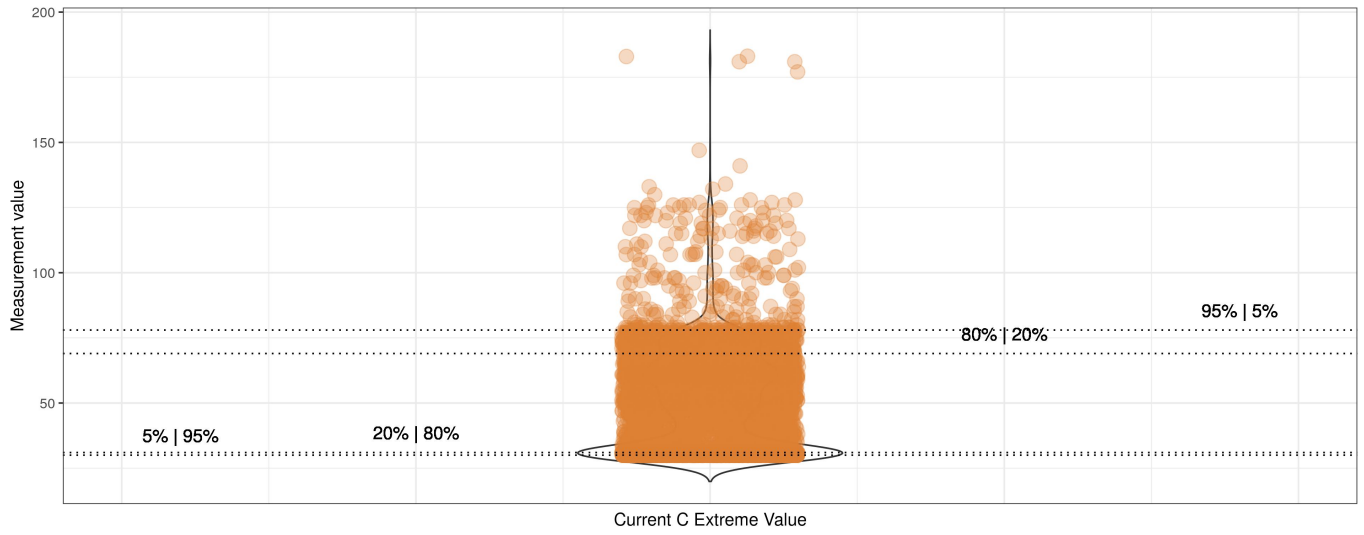
1 **Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)** Worst

If applicable, consider increasing the off-delay setting for this alarm to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm off-delay increase	Potential alarm volume reduction
>= 34 s	80 %
>= 219 s	90 %
>= 542 s	95 %

The following chart shows the occurrences of this alarm, based on the measurement values when the alarm was active.

Alarm distribution based on measurement values



Details by issue (continued)

Chattering Alarms (continued)

1 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued) Worst

Review whether the pickup setpoint is appropriate for this alarm, and consider adjusting it to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm pickup setpoint	Potential alarm volume reduction	
	Over alarm	Under alarm
30	5 %	95 %
31	20 %	80 %
69	80 %	20 %
78	95 %	5 %

Go back to Chattering Alarms (Details by issue).

2 Swell (Current) on MDP2.MDP2-DP5-PM870

Occurrences: **4,471**
Chattering behavior: **96.2 % of the occurrences**
(4,471 of 4,650 occurrences)
Device type: **PM870**
Alarm priority: **Low**

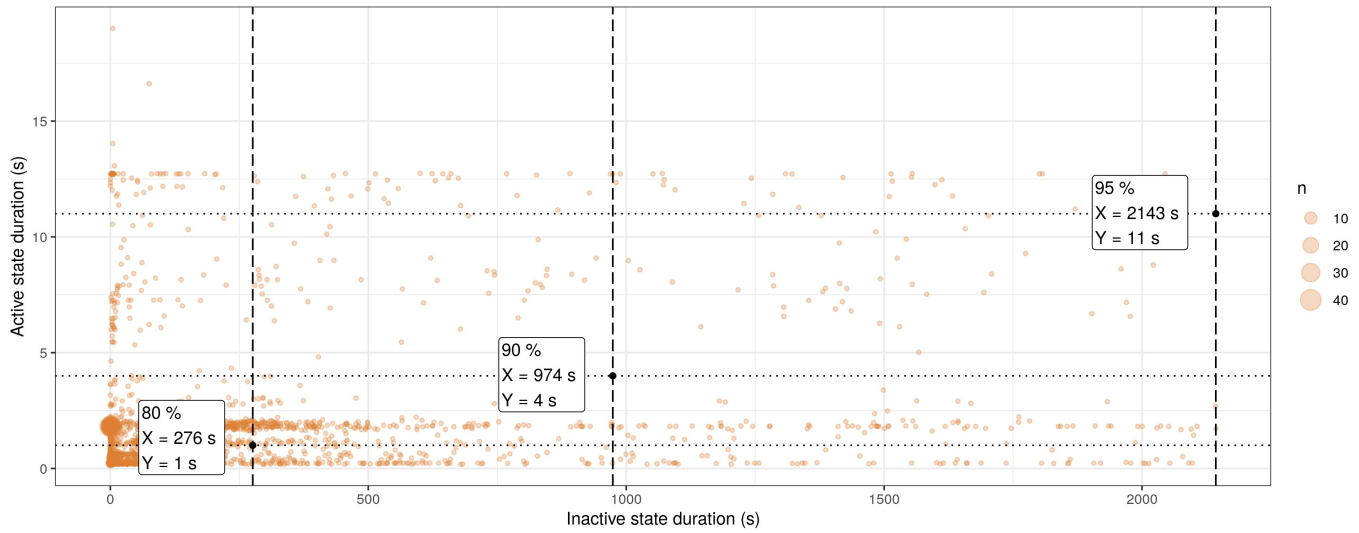
Details by issue (continued)

Chattering Alarms (continued)

2 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

The following chart shows the occurrences of this alarm, based on the time spent in the active state and the inactive state. Occurrences with longer active state durations are shown more to the top of the chart. Occurrences with longer inactive state durations are shown more to the right side of the chart.

Alarm distribution based on active and inactive state duration



If applicable, consider increasing the on-delay setting for this alarm to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm on-delay increase	Potential alarm volume reduction
>= 1 s	80 %
>= 4 s	90 %
>= 11 s	95 %

If applicable, consider increasing the off-delay setting for this alarm to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm off-delay increase	Potential alarm volume reduction
>= 276 s	80 %
>= 974 s	90 %

Details by issue (continued)

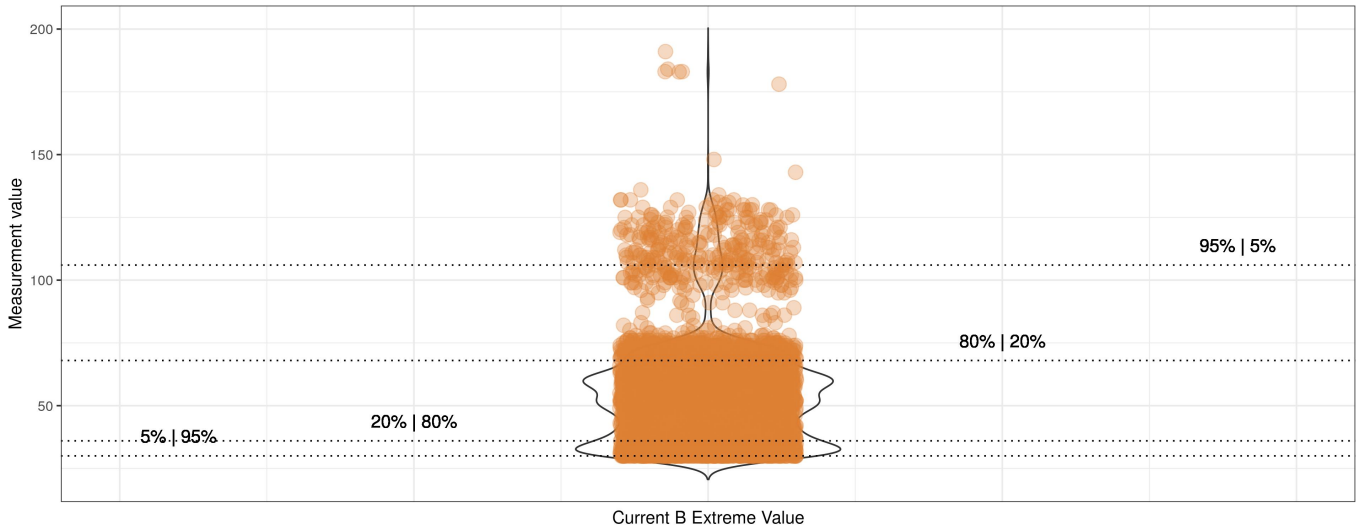
Chattering Alarms (continued)

2 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

Alarm off-delay increase	Potential alarm volume reduction
>= 2143 s	95 %

The following chart shows the occurrences of this alarm, based on the measurement values when the alarm was active.

Alarm distribution based on measurement values



Review whether the pickup setpoint is appropriate for this alarm, and consider adjusting it to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm pickup setpoint	Potential alarm volume reduction	
	Over alarm	Under alarm
30	5 %	95 %
36	20 %	80 %
68	80 %	20 %
106	95 %	5 %

Go back to Chattering Alarms (Details by issue).

Details by issue (continued)

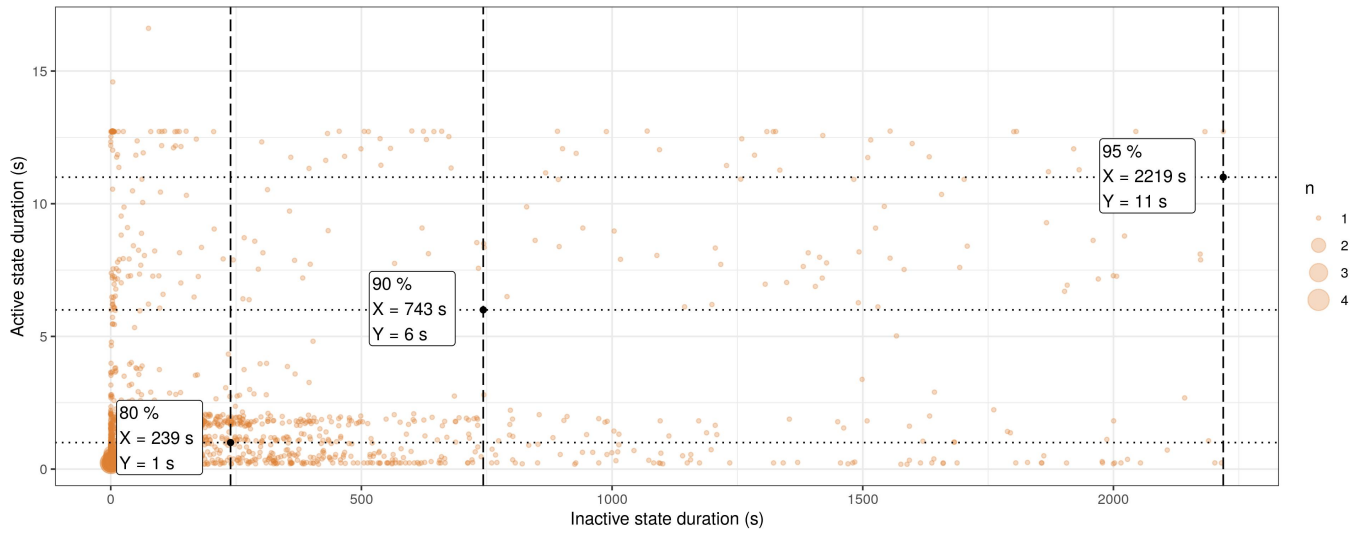
Chattering Alarms (continued)

3 Swell (Current) on MDP2.MDP2-DP5-PM870

Occurrences: **3,664**
Chattering behavior: **95 % of the occurrences**
(3,664 of 3,857 occurrences)
Device type: **PM870**
Alarm priority: **Low**

The following chart shows the occurrences of this alarm, based on the time spent in the active state and the inactive state. Occurrences with longer active state durations are shown more to the top of the chart. Occurrences with longer inactive state durations are shown more to the right side of the chart.

Alarm distribution based on active and inactive state duration



If applicable, consider increasing the on-delay setting for this alarm to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm on-delay increase	Potential alarm volume reduction
>= 1 s	80 %
>= 6 s	90 %
>= 11 s	95 %

Details by issue (continued)

Chattering Alarms (continued)

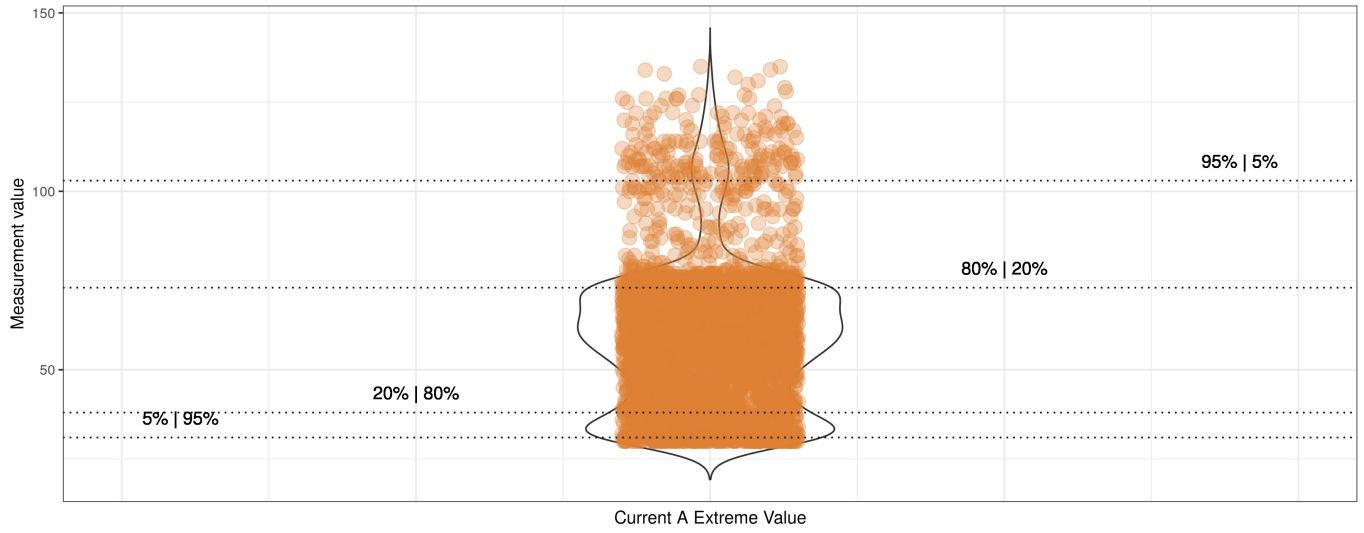
3 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

If applicable, consider increasing the off-delay setting for this alarm to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm off-delay increase	Potential alarm volume reduction
>= 239 s	80 %
>= 743 s	90 %
>= 2219 s	95 %

The following chart shows the occurrences of this alarm, based on the measurement values when the alarm was active.

Alarm distribution based on measurement values



Details by issue (continued)

Chattering Alarms (continued)

3 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

Review whether the pickup setpoint is appropriate for this alarm, and consider adjusting it to reduce the chattering behavior. The following table shows potential reductions for different settings.

Alarm pickup setpoint	Potential alarm volume reduction	
	Over alarm	Under alarm
31	5 %	95 %
38	20 %	80 %
73	80 %	20 %
103	95 %	5 %

Go back to Chattering Alarms (Details by issue).

Details by issue (continued)

Fleeting Alarms

Total fleeting alarm: **479**

The following details show the top fleeting alarm in your system. The alarms are ordered by number of occurrences, with the alarm with the most occurrences at the top. Up to 10 alarms are shown.

Contribution of the most frequent fleeting alarm to the total fleeting alarm volume:
100 % (479 of 479 fleeting alarm)

Rank	Alarm	Device	Details
1	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Occurrences: **213** Worst Measurements
2	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Occurrences: **141** Measurements
3	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Occurrences: **125** Measurements

Go back to Fleeting Alarms.
Go back to identified issues for information on all identified issues in this analysis.

1 Swell (Current) on MDP2.MDP2-DP5-PM870 Worst

Occurrences: **213**
Fleeting behavior: **4.5 % of the occurrences**
(213 of 4,726 occurrences)
Device type: **PM870**
Alarm priority: **Low**

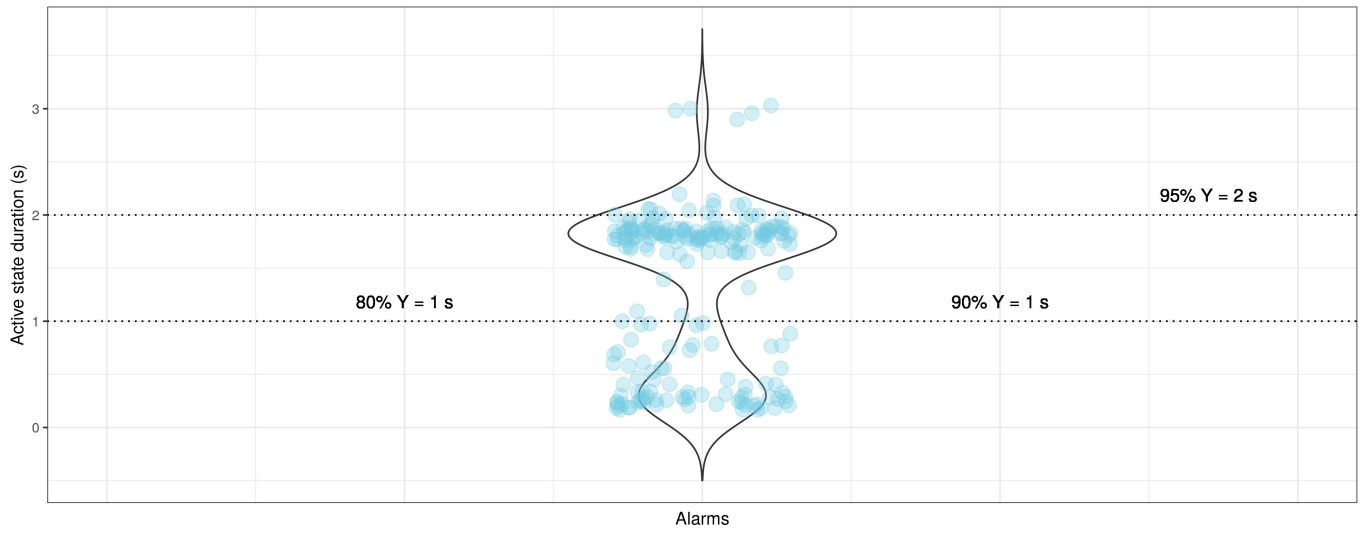
Details by issue (continued)

Fleeting Alarms (continued)

1 **Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)** Worst

The following chart shows the occurrences of this alarm, based on the time spent in the active state. Occurrences with longer active state durations are shown more to the top of the chart.

Alarm distribution based on active state duration



If applicable, consider increasing the on-delay setting for this alarm to reduce the fleeting behavior. The following table shows potential reductions for different settings.

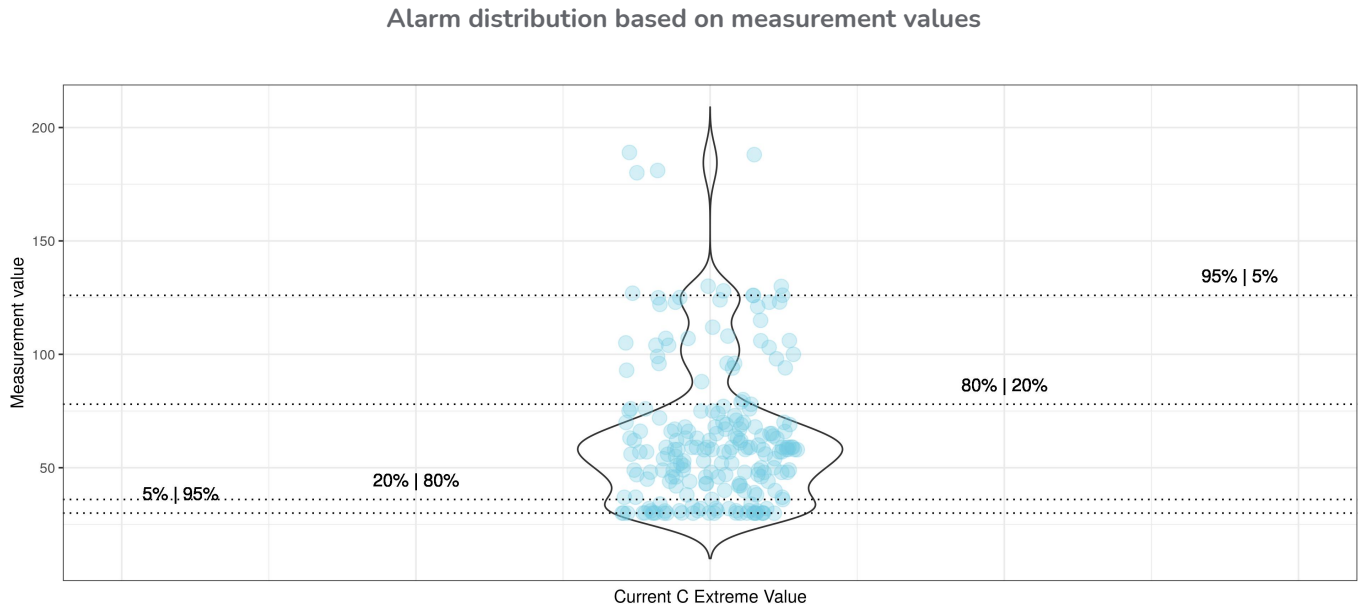
Alarm on-delay increase	Potential alarm volume reduction
>= 1 s	80 %
>= 1 s	90 %
>= 2 s	95 %

Details by issue (continued)

Fleeting Alarms (continued)

1 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued) Worst

The following chart shows the occurrences of this alarm, based on the measurement values when the alarm was active.



Consider adjusting the pickup setpoint for this alarm to reduce the fleeting behavior. The following table shows potential reductions for different settings.

Alarm pickup setpoint	Potential alarm volume reduction	
	Over alarm	Under alarm
30	5 %	95 %
36	20 %	80 %
78	80 %	20 %
126	95 %	5 %

Go back to Fleeting Alarms (Details by issue).

Details by issue (continued)

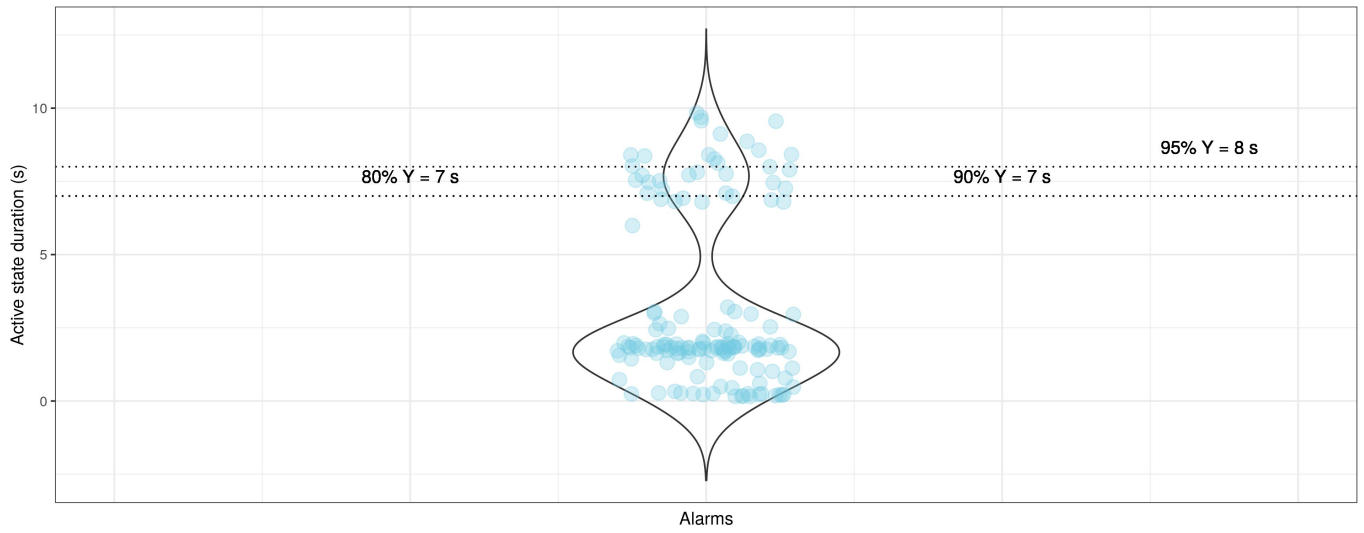
Fleeting Alarms (continued)

2 Swell (Current) on MDP2.MDP2-DP5-PM870

Occurrences: **141**
Fleeting behavior: **3 % of the occurrences**
(141 of 4,650 occurrences)
Device type: **PM870**
Alarm priority: **Low**

The following chart shows the occurrences of this alarm, based on the time spent in the active state. Occurrences with longer active state durations are shown more to the top of the chart.

Alarm distribution based on active state duration



If applicable, consider increasing the on-delay setting for this alarm to reduce the fleeting behavior. The following table shows potential reductions for different settings.

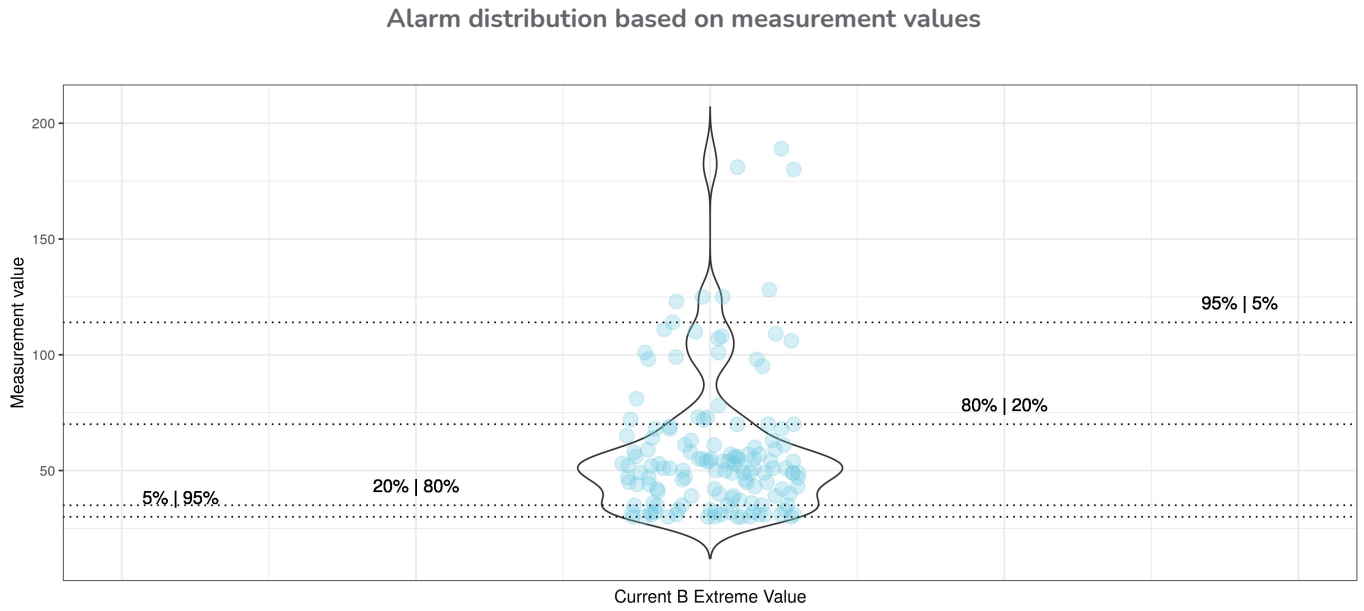
Alarm on-delay increase	Potential alarm volume reduction
>= 7 s	80 %
>= 7 s	90 %
>= 8 s	95 %

Details by issue (continued)

Fleeting Alarms (continued)

2 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

The following chart shows the occurrences of this alarm, based on the measurement values when the alarm was active.



Consider adjusting the pickup setpoint for this alarm to reduce the fleeting behavior. The following table shows potential reductions for different settings.

Alarm pickup setpoint	Potential alarm volume reduction	
	Over alarm	Under alarm
30	5 %	95 %
35	20 %	80 %
70	80 %	20 %
114	95 %	5 %

Go back to Fleeting Alarms (Details by issue).

Details by issue (continued)

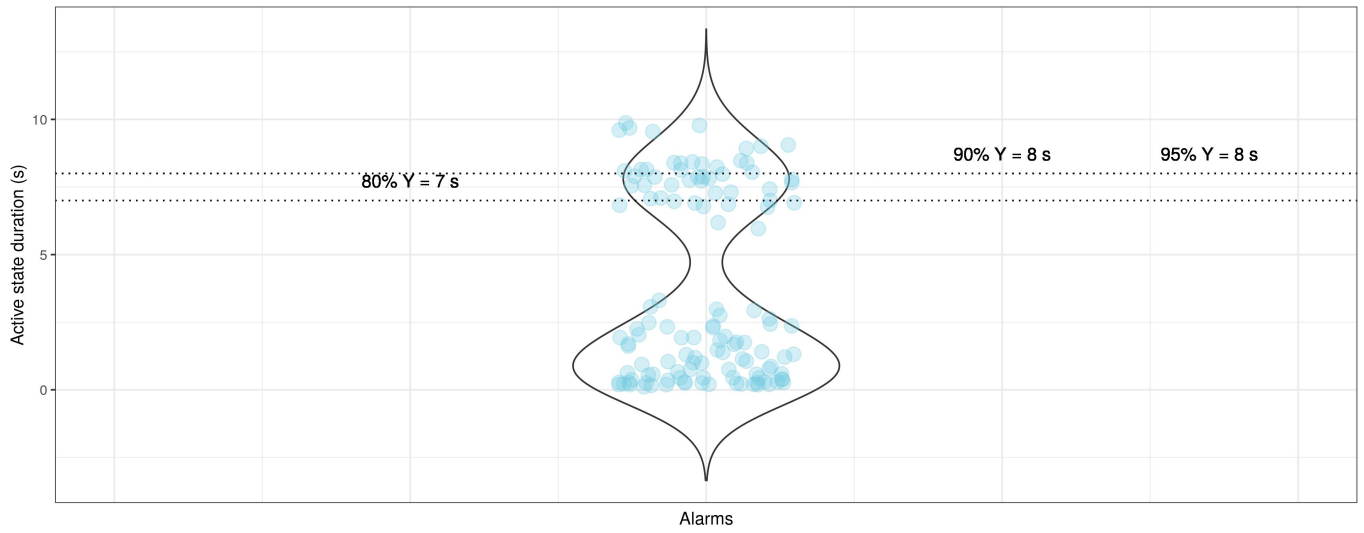
Fleeting Alarms (continued)

3 Swell (Current) on MDP2.MDP2-DP5-PM870

Occurrences: **125**
Fleeting behavior: **3.2 % of the occurrences**
(125 of 3,857 occurrences)
Device type: **PM870**
Alarm priority: **Low**

The following chart shows the occurrences of this alarm, based on the time spent in the active state. Occurrences with longer active state durations are shown more to the top of the chart.

Alarm distribution based on active state duration



If applicable, consider increasing the on-delay setting for this alarm to reduce the fleeting behavior. The following table shows potential reductions for different settings.

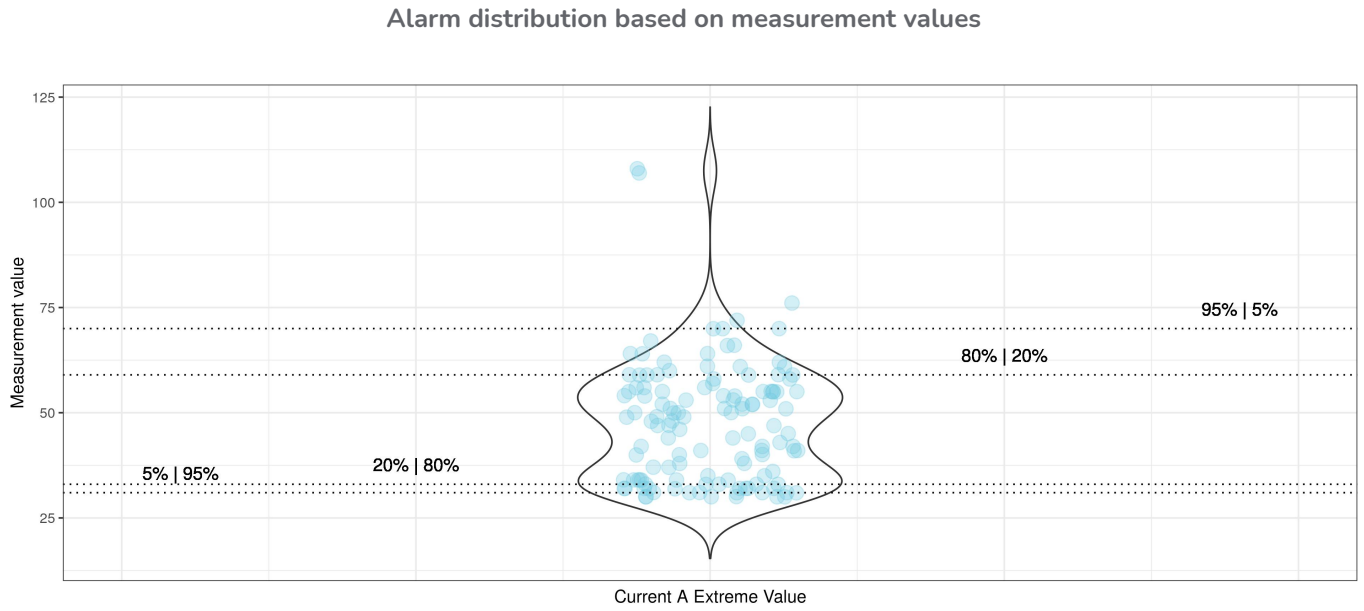
Alarm on-delay increase	Potential alarm volume reduction
>= 7 s	80 %
>= 8 s	90 %
>= 8 s	95 %

Details by issue (continued)

Fleeting Alarms (continued)

3 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

The following chart shows the occurrences of this alarm, based on the measurement values when the alarm was active.



Consider adjusting the pickup setpoint for this alarm to reduce the fleeting behavior. The following table shows potential reductions for different settings.

Alarm pickup setpoint	Potential alarm volume reduction	
	Over alarm	Under alarm
31	5 %	95 %
33	20 %	80 %
59	80 %	20 %
70	95 %	5 %

Go back to Fleeting Alarms (Details by issue).

Details by issue (continued)

Stale Alarms

Total stale alarm: **11**
Devices with stale alarm: **1**

The following details show the top stale alarm in your system. The alarms are ordered by alarm duration, with the alarm with the longest duration at the top. Up to 10 alarms are shown.

Contribution of the most frequent stale alarm to the total stale alarm volume:
100 % (11 of 11 stale alarm)

Rank	Alarm	Device	Details
1	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Longest duration:: **8.9 days** Worst Measurements
2	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Longest duration:: **6.2 days** Measurements
3	Swell (Current) (Alarm priority: Low)	MDP2.MDP2-DP5-PM870 (PM870)	Longest duration:: **2.9 days** Measurements

Go back to Stale Alarms.
Go back to identified issues for information on all identified issues in this analysis.

1 Swell (Current) on MDP2.MDP2-DP5-PM870 Worst

Occurrences: **2**
Longest duration: **8.9 days**
Average duration: **6.5 days**
Device type: **PM870**
Alarm priority: **Low**

Go back to Stale Alarms (Details by issue).

2 Swell (Current) on MDP2.MDP2-DP5-PM870

Occurrences: **6**
Longest duration: **6.2 days**
Average duration: **2.7 days**
Device type: **PM870**

Details by issue (continued)

Stale Alarms (continued)

2 Swell (Current) on MDP2.MDP2-DP5-PM870 (continued)

Go back to Stale Alarms (Details by issue).

3 Swell (Current) on MDP2.MDP2-DP5-PM870

Occurrences: **3**
Longest duration: **2.9 days**
Average duration: **1.8 days**
Device type: **PM870**
Alarm priority: **Low**

Go back to Stale Alarms (Details by issue).

Reference

Introduction

This section provides reference information related to alarm system health.

Reference

ISA-18.2/IEC 62682 Alarm management standard overview

The ANSI/ISA-18.2-2009/IEC 62682 Management of Alarm Systems for the Process Industries (ISA-18.2/IEC 62682) standard provides guidance for the design, implementation, and maintenance of alarm systems.

The standard defines terminology and best practices, based on an alarm management lifecycle model. The model includes distinct stages for the different alarm system tasks, from system specification to maintenance and change management. Each stage and its relationships within the model are described in the standard.

For more information on ISA-18.2/IEC 62682, see the standard documentation. Visit www.isa.org or www.iec.ch to get a copy of the ISA-18.2/IEC 62682 standard documentation.

Note

The performance indicators used in Power Advisor's alarm system health analysis are based on ISA-18.2/IEC 62682 metrics. These metrics are defined as part of the 'Monitoring and Assessment' stage of the lifecycle model

ISA-18.2/IEC 62682 Alarm management stages

The following gives a brief description of the alarm management lifecycle stages defined in the ISA18.2/IEC 62682 standard.

For more detailed information on the ISA-18.2/IEC 62682 lifecycle model, see the standard documentation. Visit www.isa.org or www.iec.ch to get a copy of the ISA-18.2/IEC 62682 standard documentation.

A - Alarm philosophy
The alarm philosophy documents the objectives, guidelines, and work processes for the alarm management system.

B - Identification
Identification includes determining operational conditions that should be considered for potential alarms.

C - Rationalization
Rationalization includes:

- reviewing and justifying alarms to ensure that they are consistent with the alarm philosophy
- defining alarm attributes such as limits, priority, classification, and type
- documenting the consequence, response time, and operator action
- ensuring that a single alarm condition generates only one alarm, and that all alarms are necessary

D - Detailed design
Detailed design includes designing how the alarms will be implemented in the control systems and the human-machine interface.

E - Implementation
Implementation includes installing and testing of the alarms and providing operator training.

F - Operation
During operation, the alarms are in service and operators respond to alarms. This stage also includes refresher training.

G - Maintenance
During Maintenance, the alarm system is not operational but is being tested or repaired.

H - Monitoring and assessment
Monitoring and assessment includes monitoring the alarm system performance, analyzing the alarm data, and comparing the analysis results to the goals stated in the alarm philosophy.

Note: A Power Advisor alarm system health analysis can be an important part of the monitoring and assessment lifecycle stage.

I - Management of change
Management of change includes reviewing and authorizing additions, modifications, and deletions of alarms.

J - Audit
Audits provide periodic reviews of the integrity of the alarm system and the work processes, and identify gaps in the implementation of all the other stages.

ISA-18.2/IEC 62682 Alarm management terminology

The following definitions are based on the ISA-18.2/IEC 62682 standard.

For more terms, definitions, and acronyms related to ISA-18.2/IEC 62682, see the standard documentation. Visit www.isa.org or www.iec.ch to find out how to get a copy of the ISA-18.2/IEC 62682 standard documentation.

active alarm
alarm state when the measurement value is above the pickup and dropout setpoint (for Over alarms) or below the pickup and dropout setpoint (for Under alarms) for longer than the on-delay

alarm
audible and/or visible means of indicating to the operator an equipment malfunction, process deviation, or abnormal condition requiring a timely response

alarm deadband
change in signal from the alarm setpoint necessary for the alarm to return to normal; in the configuration settings of an alarm, the alarm deadband may also be expressed as the difference in value between the pickup setpoint and the dropout setpoint

alarm flood
condition during which the alarm rate is greater than the operator can effectively manage, for example more than 10 alarms per 10 minutes

alarm management
collection of processes and practices for determining, documenting, designing, operating, monitoring, and maintaining alarm systems

alarm off-delay
alarm setting that determines the time a process measurement must remain below the dropout setpoint before the alarm can return to normal state

Note: Different alarm systems and device types can use different names for the off-delay setting. For example, in ION devices, the off-delay setting is called 'sustain until off' (SusUntlOFF).

alarm on-delay
alarm setting that determines the time a process measurement must remain above the pickup setpoint before the alarm moves to active state

Note: Different alarm systems and device types can use different names for the on-delay setting. For example, in ION devices, the on-delay setting is called 'sustain until on' (SusUntlON).

alarm philosophy
document that establishes the basic definitions, principles, and processes to design, implement, and maintain an alarm system

ISA-18.2/IEC 62682 Alarm management terminology (continued)

alarm rate
number of annunciated alarms in a specific time interval

alarm system
collection of hardware and software that detects an alarm state, communicates the indication of that state to the operator, and records changes in the alarm state

annunciation
function of the alarm system to call the attention of the operator to an alarm

audit
comprehensive assessment that includes the evaluation of alarm system performance and of the work practices used to administer the alarm system

chattering alarm
alarm that transitions between active state and normal (inactive) state repeatedly in a short time

clear
alarm transition from an active alarm state to a normal (inactive) alarm state

dropout setpoint
alarm setting that determines the measurement value that releases the alarm

fleeting alarm
alarm that transitions between an active alarm state and normal (inactive) alarm state in a very short time, typically without any intervention

inactive alarm
alarm state when the measurement value does not meet the criteria defined by the alarm setpoints and alarm delays

nuisance alarm
alarm that annunciates excessively or unnecessarily
examples: chattering alarm, fleeting alarm, stale alarm

out-of-service
state of an alarm during which the alarm indication is indefinitely suppressed, typically manually, for reasons such as maintenance

pickup setpoint
alarm setting that determines the measurement value that triggers the alarm

shelve
temporarily suppress an alarm, with engineering controls that will unsuppress it

stale alarm
alarm that remains annunciated for an extended period, for example 24 hours

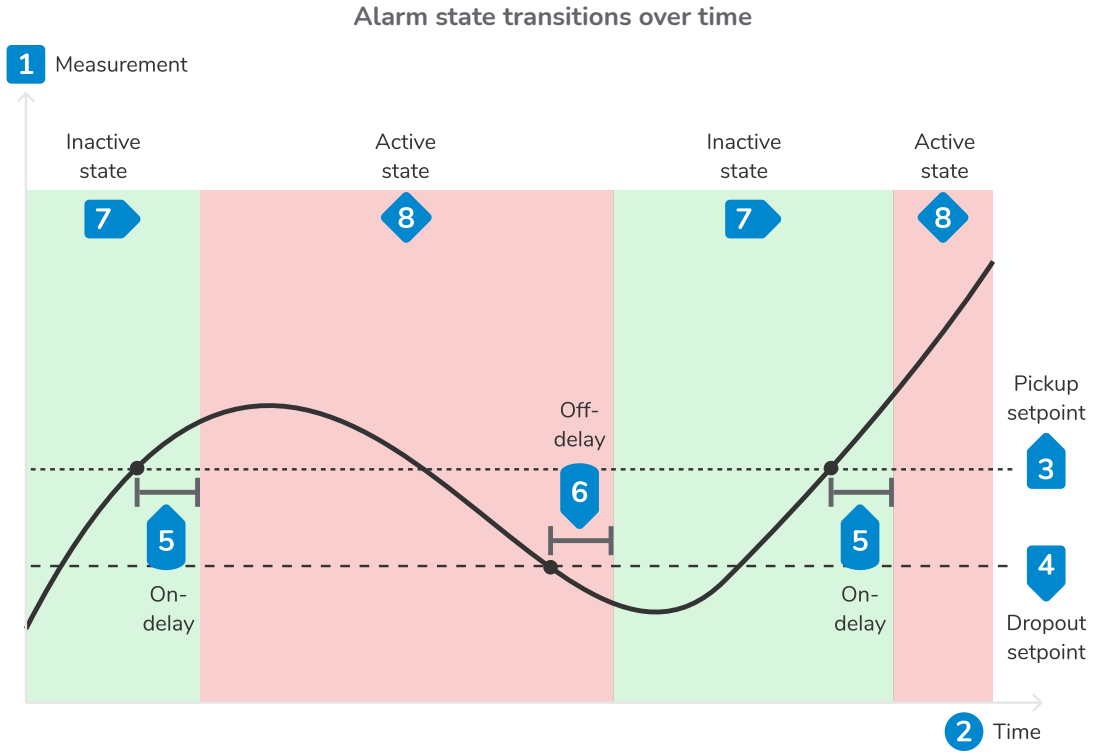
suppress
prevent the annunciation of the alarm to the operator when the alarm is active

Alarm lifecycle

The following diagram shows how alarm settings can impact the operational behavior of an alarm. As the measurement value changes, the alarm alternates between a Normal state and an Alarm state. The alarm state transitions are determined by the measurement value and the alarm attribute settings for pickup, dropout, on-delay, and off-delay.

Tip: In many systems, alarm attribute settings are configured based on theoretical design, before the actual operating ranges are known. Optimizing the pickup and dropout settings for an alarm can be very effective in reducing nuisance alarms.

See the parameter descriptions following the diagram for more details.



1 Measurement

The measurement is the monitored variable for which an alarm is triggered if it exceeds defined limits. This can be any measured quantity in the power management system, such as voltage, current, or temperature. The value of the measurement is determined by the process it belongs to and the sensor that is measuring it.

2 Time

The diagram shows the measurement and alarm state changes over time.

3 4 Alarm setpoints

(Also known as alarm limits or alarm trip points.)
The pickup setpoint (3) and dropout setpoint (4) determine the measurement values that trigger and release the alarm. These setpoints work together with the alarm delays (see 5/6) to determine the state of the alarm, so that ideally the alarm is not constantly triggered if the measurement oscillates near the pickup setpoint. After the

Alarm lifecycle (continued)

measurement value has crossed the pickup threshold, it must remain above this threshold for the duration of the on-delay (see 5) before the alarm goes active. After the measurement value has fallen below the dropout threshold, it must remain below this threshold for the duration of the off-delay (see 6) before the alarm goes inactive.

Note: The diagram shows an 'Over' alarm that is triggered when the measurement value exceeds an upper limit. Alarms can also be configured as 'Under' alarms. For 'Under' alarms, the measurement value must fall below the pickup setpoint for the alarm to go active and rise above the dropout setpoint to go inactive.

5 6 Alarm delays

The on-delay (5) and off-delay (6) determine the time for which the measurement value must exceed the alarm setpoints before an alarm goes active after being triggered or inactive after being released (see 3/4 for details).

Tip: Optimizing the on-delay and off-delay for an alarm can be very effective in reducing chattering alarms.

7 8 Alarm states

The alarm is in an inactive state (7) or in an active state (8).

Glossary

This section includes definitions of terms or concepts used in this report.

Worst instance of an issue

To determine the alarm system health, Power Advisor runs several tests on the power management system data. A failed test shows a possible alarm system issue. The most severe alarm instance of an issue is marked as Worst

For example, the longest stale alarm will be marked as worst for the Stale Alarms issue.

Disclaimer

The recommendations in this report are based on the information available to Power Advisor and may not consider other information that may be relevant to your situation. Please contact your Schneider Electric sales representative for a comprehensive evaluation.

Before you make any changes to the power monitoring system, make sure you have the proper training and follow all safety precautions.

This report is provided on an AS-IS basis and Schneider Electric makes no warranties or guarantees related to the accuracy, reliability or completeness of this report. Additionally, Schneider Electric makes no warranties or guarantees related to results obtained (or to be obtained) from the use of any information or recommendations contained in this report.

Your use or reliance on any information or recommendations contained in this report is solely at your own risk and this report is neither meant to be a substitute for consultation with a qualified professional nor a substitute for conducting an independent investigation. To the fullest extent permitted under applicable law, Schneider Electric expressly disclaims all warranties related to this report, either express or implied, including without limitation any warranties of fitness for a particular purpose or merchantability.

By accessing or using this report, you agree that Schneider Electric and its affiliates will have no liability to you or any other party for any actions taken or decisions made in reliance upon this report or for any direct, indirect, consequential, special or other damages even if advised of the possibility of such damages.

© 2021 Schneider Electric Industries, SAS

Make the most of your energy, Square D, PowerLogic, ION, and Modbus are registered trademarks of Schneider Electric, or its affiliates. Other marks used herein may be the properties of their respective owners.

www.se.com

Life Is On Schneider Electric