



[ADMIN PANEL] USER GUIDE

Section 4

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Section 4

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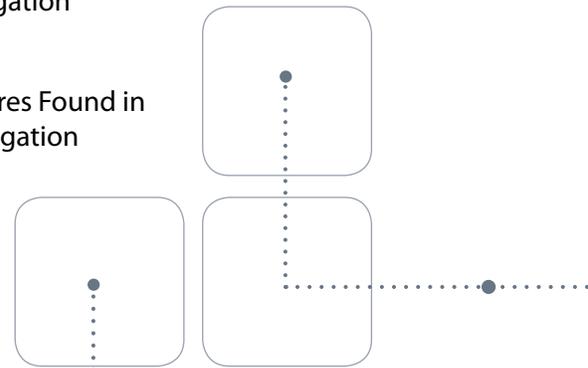
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DECK Alarms: Set Up Automated System Oversight

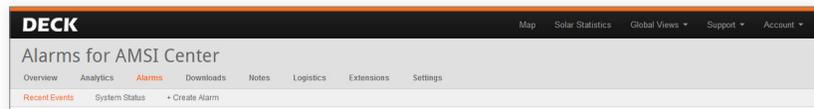
DECK

Alarms Page Views

DECK **Alarms** are a powerful tool to help you stay on top of your system performance, whether you are monitoring one system only, or a multitude of projects. The versatile DECK Alarms interface includes a wide range of alarm type options:

- Monthly Performance Alarm
- Irradiance to kWh Alarm
- Weather Alarm
- Device Reporting Alarm
- Inverter Fault Code Alarm
- Relative Performance Alarm
- String Performance Alarm

As with **Analytics**, you can choose between system-specific page views, or page views that encompass your entire system portfolio. **System Alarms** page views can be accessed from the System Navigation titles.



Global Alarms can be accessed from the Global Views drop-down menu, found in the top black stripe on each page (as seen in bottom example below).



In both Alarms page views, you will see the same 3 navigation titles to access Alarms tools: **“Recent Events,” “System Status,”** and **“+Create Alarm.”**

- **Recent Events** shows alarms that have been triggered over a user-defined historical period. If you access Recent Events from *System Navigation*, you will only see recent alarm events for that system; if you access Recent Events from *Global Navigation*, you will see recent alarm events for all monitored systems.
- **System Status** simply lists all active alarms (not to be confused with all triggered alarms). If you access System Status from *System Navigation*, you will only see active alarms for that system only; if you access System Status from *Global Navigation*, you will see *all* active alarms for *all* monitored systems.
- **+Create Alarms** gives you the opportunity to create new alarms. Alarms must be associated with individual systems, so accessing +Create Alarms from the Global Alarms page views will prompt a location drop-down menu that will allow you to choose one system from your full system portfolio.

Alarms: Recent Events

The Recent Events page view shows recently triggered alarm events, beginning with the most recent event. Note that alarms will be listed here even if the associated data point has returned to normal reporting (alarm is no longer triggered). Alarms that have never been triggered will not appear on this page view. In cases where an alarm has been raised more than once, you will only see one notification in this list... this feature avoids clutter from multiple notifications for the same alarm.

A complete history of each alarm's trigger events can be found by navigating to the alarm **Home Page**. Clicking on the alarm name under "Alarms" will take you to that alarm's Home Page (see p. 37).

The example below shows the Recent Events page view in Global Alarms.

The screenshot shows the DECK interface with the 'Alarms (All Systems)' section. It includes a navigation bar with 'Map', 'Solar Statistics', 'Global Views', 'Support', and 'Account'. Below the title, there are tabs for 'Recent Events', 'System Status', and '+ Create Alarm'. A filter dropdown is set to '10 days'. The main content is a table with the following data:

Status	Count	Raised At	Alarm	Device	Location	Notifications	Subscribe
▲	3	Jan 17, 2013 at 2:34pm (PST)	Irradiance to kw alarm for Katie SolarAnywhere Test Site	--	Katie SolarAnywhere Test Site	On Off	✉
▲	3	Jan 17, 2013 at 1:19pm (PST)	Device reporting alarm for AMSI Center	SMA Inverter (Array 4)	AMSI Center	On Off	✉
✓	8	Jan 12, 2013 at 9:00am (PST)	Irradiance to kw alarm for College of San Andreas	--	College of San Andreas	On Off	✉
▲	1	Jan 1, 2013 at 12:16am (MST)	Monthly performance alarm for Rocky Top Manufacturing	--	Rocky Top Manufacturing	On Off	✉

The Recent Events page view displays 8 pieces of information for each alarm event:

- **Status:** A red icon here indicates that the alarm is currently raised and not resolved. A green checkmark icon here indicates that the alarm has been resolved (i.e. data reporting has resumed, or reporting data has returned to your user-defined acceptable range, etc).
- **Count:** See the total number of times this alarm has been raised over the lifetime of the alarm.
- **Raised At:** See the most recent date and time when the listed alarm event was raised.
- **Alarms:** See the name of the alarm that has been raised in this alarm event. *Clicking on the alarm name here will navigate you to that alarm's Home Page.*
- **Device:** See the hardware device in your system associated with the listed alarm event (where applicable).
- **Location:** Link to the **System Overview** page for the system associated with the triggered alarm event (Global Alarms page view only).
- **Notifications:** This column provides a quick link to control all notification emails associated with the alarm that has been triggered. Note that the notifications control here will affect all email notifications associated with this alarm (in cases where there are more than one designated notification recipients).
- **Subscribe:** This column provides a quick link to control notification emails associated with the triggered alarm *for yourself only*. A highlighted envelope indicates that you will receive email notifications; a grayed-out envelope indicates that you will not receive notifications.

Alarms: System Status

Your **System Status** page view is an opportunity to see all active alarms listed. Note that all active alarms will appear on this page, regardless of their current (or historical) trigger status.

If you access the System Status page view using **System Navigation**, you will see a complete list of active alarms for that system only. If you access the System Status page view from **Global Navigation**, you will see a complete list of active alarms for all systems (*Global System Status page view shown below*).

The screenshot shows the 'Alarms (All Systems)' page in the DECK Admin Panel. The page is divided into sections for different systems. Each section contains a table of alarms with columns for Status, Count, Raised At, Alarm, Device, Notifications, and Subscribe.

Status	Count	Raised At	Alarm	Device	Notifications	Subscribe
✓	1	Jul 23, 2012 at 10:30pm (PDT)	Sma fault alarm for AMSI Center	Sma inverter	On Off	✉
✓	1	Jul 23, 2012 at 11:38am (PDT)	Irradiance to kWh alarm for AMSI Center	--	On Off	✉
✓	1	Mar 15, 2013 at 12:48pm (PDT)	Device reporting alarm for Birch Community College	Veniz H8036	On Off	✉
⚠	4	Mar 15, 2013 at 11:38am (PDT)	Relative performance alarm for Birch Community College	--	On Off	✉
⚠	7	Sept 1, 2013 at 12:09am (PDT)	Monthly performance alarm for Birch Community College	--	On Off	✉
✓	0		Custom alarm for Branch Farms Field Array	--	On Off	✉

The System Status page view displays 7 pieces of information for each alarm event:

- **Status:** A red icon here indicates that the alarm is currently raised and not resolved. A green checkmark icon here indicates that the alarm has been resolved (i.e. data reporting has resumed, or reporting data has returned to your user-defined acceptable range, etc).
- **Count:** See the total number of times this alarm has been raised over the lifetime of the alarm.
- **Raised At:** See the most recent date and time when the listed alarm was triggered (if applicable).
- **Alarms:** See the name of the alarm that has been raised in this alarm event. *Clicking on the alarm name here will navigate you to that alarm's Home Page.*
- **Device:** See the hardware device associated with the listed alarm (where applicable).
- **Notifications:** This column provides a quick link to control all notification emails associated with the alarm that has been triggered. Note that the notifications control here will affect all email notifications associated with this alarm (in cases where there are more than one designated notification recipients).
- **Subscribe:** This column provides a quick link to control notification emails associated with the triggered alarm *for yourself only*. A highlighted envelope indicates that you will receive email notifications; a grayed-out envelope indicates that you will not receive notifications.

Alarms: Alarm Home Pages

The **Home Page** for each alarm contains all the vital information and controls you will need to manage that alarm. The Alarm Home Page is where you must go when you want to change alarm trigger settings or change designated email notification recipients. An alarm home page also displays current alarm status and complete alarm event history.

You can access an alarm's Home Page by clicking on the alarm name either in a **Recent Events** page view, or in a **System Status** page view (both examples shown below).

Alarms (All Systems)

Recent Events System Status + Create Alarm

The following alarms are currently raised or have triggered within the last 10 days

Status	Count	Raised At	Alarm	Device	Location	Notifications	Subscribe
	3	Jan 17, 2013 at 2:34pm (PST)	Irradiance to kw alarm for Katie SolarAnywhere Test Site	--	Katie SolarAnywhere Test Site	On Off	
	3	Jan 17, 2013 at 1:19pm (PST)	Device reporting alarm for AMSI Center	SMA Inverter (Array 4)	AMSI Center	On Off	

Alarms (All Systems)

Recent Events System Status + Create Alarm

This page lists all of your systems with configured alarms, and for every system, it shows each alarm that has been configured, with a status icon to show if the alarm is currently triggered. Click on an alarm to see more information about it or to edit its settings.

PREV 1 2 3 4 5 6 7 NEXT

AMSI Center

Status	Count	Raised At	Alarm	Device	Notifications	Subscribe
	1	Jul 23, 2012 at 10:30pm (PDT)	Sma fault alarm for AMSI Center	Sma Inverter	On Off	
	1	Jul 23, 2012 at 11:38am (PDT)	Irradiance to kWh alarm for AMSI Center	--	On Off	

Key to information and settings on an Alarm Home Page:

- Alarm Status Information**
- Icon indicating current status (triggered or reporting correctly)
 - Link to associated System Overview page view
 - Alarm description
 - Control to delete alarm
 - Quick control for notifications
 - Details of current trigger event (if applicable)

- Complete Controls to Edit Alarm Settings**
- Alarm trigger mechanism
 - Alarm "active between" settings
 - Alarm time threshold
 - Email notification settings
 - List of designated notification recipients

- Complete History of Triggered Alarm Events**
- Date/time for trigger event
 - Date/time for event resolution
 - Details and data

The screenshot shows the 'Alarms for Test Site' page in the DECK Admin Panel. The page title is 'Irradiance To Kw Alarm for Test Site'. It includes a description of the alarm, current status information (Dec 12, 2012 at 12:45pm MST), and a detailed 'Alarm Settings' section. The settings include a 'Variance Trigger' of 10%, 'Active Between' times from 09:00 AM to 05:00 PM, and a 'Time Threshold' of 1 year. There are also sections for 'Company User Notifications' and 'External Email Notifications'. A 'History' section at the bottom lists several triggered events with their dates, times, and resolution details. The page has a top navigation bar with 'Map', 'Solar Statistics', 'Global Views', 'Support', and 'Account' options.

Alarms: +Create Alarm

+Create Alarm is the page view you will use to create new active alarms.

First choose from a list of available alarm types for your system. The DECK application will automatically determine all available alarm options based on reporting system hardware and/or data services.



Select Alarm Type

- Custom Alarm**
Raises when data values fall outside of a specified range. Examines a set of data for your chosen data type, starting with the most recently received point and looking back over a period of time specified by the time threshold. Raises if the aggregated value over the examined time window falls outside the user-specified tolerable range.
- Monthly Performance Alarm**
Lets you input a target value for each month, and alerts you if a month's actual generation significantly differs. Alarm is checked on the first day of each month, looks at how much generation happened for your location over the preceding month, and raises if that amount is above or below the expected generation for that month by more than the acceptable deviation range.
- Irradiance To Kw Alarm**
Uses irradiance data to judge if the amount of power recently generated is deviating from normal. Intended for use with solar panels plus weather data to alert you when leaves, snow, or panel damage may be lowering your power production. More specifically, this alarm compares the ratios of the average power and average irradiance values over two different time windows: a recent window and a historical window. It raises if the two ratios vary by more than the specified variance trigger. The recent time window ends at the latest point for which both irradiance and power data is available, and extends backwards in time for the length of the selected time threshold. The historical time window covers the 10 days preceding the recent time window.
- Weather Alarm**
Raises if weather data goes outside an expected range. A simpler version of the Custom Alarm that only applies to weather related data, and unlike the Custom Alarm, always only checks the most recent data point. This alarm will automatically be checked at all times of the day.
- String Performance Alarm**
Raises when any string is producing significantly more or less current than the others. Specifically, raises if any string's current (averaged over the user-specified time range) differs from the average of all strings on the location over the same period by more than the acceptable deviation percentage.
- Device Reporting Alarm**
Raises if a device stops reporting to DECK. Specifically, it examines the time of the most recent non-error data point received from the targeted device, and raises if that time is further in the past than the user-specified time threshold.
- Inverter Fault Alarm**
Examines encoded fault messages from supported Inverters, raises if any are concerning, and provides description of any issues.
- Relative Performance Alarm**
Examines ratios of contribution across selected devices and compares with either historic performance or manually chosen ratios. Raises if recent contribution ratios have varied significantly. It's an ideal tool to determine the relative performance of devices such as inverters, combiners, or strings on a particular site, and most importantly if the performance of any device changes. By its nature this alarm minimizes nuisance alarms and will not be affected by weather patterns. (Beta Feature)

You can create a new active alarm in 3 steps:

- Name your alarm.** Choose a name that is descriptive and site-specific, such as "Veris Meter Device Reporting Alarm for AMSI Center." If desired, add an alarm description. You can also choose whether or not to receive *alarm resolved* email notifications.
- Choose trigger settings.** Different types of alarms have different settings requirements. Note that the small question mark ("?") buttons will provide more information about required fields.
- Choose recipients for email notifications.** You may choose from a drop-down menu of registered users from your own company, or you can use **External Email Notifications** to input new email addresses.



Pvp Fault Alarm
Examines encoded fault messages from supported Inverters, raises if any are concerning, and provides English description of any issues.

Alarm Details
Alarm Name:
Description:

Send an alert when this alarm resolves. This will affect all notifieds of this alarm.

Trigger Settings
Time Filter
 Active Between and

Company User Notifications
Name: Peter Denato | Email: peter@deckmonitoring.com

External Email Notifications
Add email addresses of people who are not in your company. To add multiple email addresses at once, separate them with commas.

Device Reporting Alarm

This alarm raises if a device stops reporting to DECK. Specifically, it examines the time of the most recent non-error data point transmission from the targeted device, then raises if the elapsed time since a good transmission is longer than the user-specified time threshold.

To create a Device Reporting alarm, first select the desired device from a drop-down menu, then choose a time threshold for the alarm, along with active between time frame (avoids false alarms at night).

The screenshot shows the 'Trigger Settings' form for a Device Reporting Alarm. It includes a 'Trigger' section with a 'Device*' dropdown menu set to 'Veris H8036'. Below this is a 'Time Filter' section with a 'Time Threshold*' dropdown menu set to '2 hours'. At the bottom, there is a checkbox for 'Active Between' which is checked, with 'Start' and 'End' time pickers set to '10:00 AM' and '05:00 PM' respectively.

Custom Alarm

Custom Alarms are the most versatile alarms available. Here you can create an alarm from the ground up, delivering the information you need in the format most useful to you.

The settings here are flexible enough to configure most alarm types that are useful in the daily operation of a site. This alarm triggers when data values fall outside of your user-specified range of acceptable values.

Custom alarms examine a set of your chosen data type, starting with the most recently received point and looking back over a period of time specified by the time threshold. Custom alarms raise if the aggregated value over the examined time window falls outside the user-specified tolerable range.

To create a Custom Alarm complete the following fields:

- Data type
- Device
- Minimum Acceptable Reporting Value
- Maximum Acceptable Reporting Value
- Time Threshold
- "Active Between" Time Frame (avoids false alarms at night)

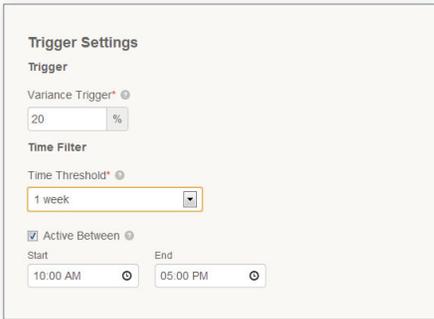
The screenshot shows the 'Trigger Settings' form for a Custom Alarm. It includes a 'Trigger' section with a 'Data Type*' dropdown menu set to 'generation (kWh)' and a 'Device' dropdown menu set to 'City House'. Below these are two input fields for 'Minimum Tolerable Value*' (set to 15) and 'Maximum Tolerable Value*' (set to 170). The 'Time Filter' section has a 'Time Threshold' dropdown menu set to '2 hours'. At the bottom, there is a checkbox for 'Active Between' which is checked, with 'Start' and 'End' time pickers set to '11:00 AM' and '05:00 PM' respectively. A link 'Click to Expand/Collapse Settings' is visible at the top right of the form.

Irradiance vs kWh Alarm

This alarm measures your kW production against the sun’s irradiance, as measured by an on-site irradiance sensor. This is a valuable performance indicator for your system because it accounts for varying sunlight conditions. This alarm can help you identify performance issues such as soiling, snow, leaves, shading, poor connections, storm damage, and panel failure.

This alarm uses the previous 10 day’s worth of data to establish a baseline number for the ratio of kW production to irradiance. The alarm sends email notifications if your production slips below the historically-determined performance ratio by a user-defined variance trigger percentage.

The **Active Between** setting allows you to specify a time when the alarm is active, which helps to avoid false alarms. *(In the early morning and late evening, the power and irradiance will be very low—small deviations in the numbers will cause large deviations in their ratio, resulting in false positives.)*

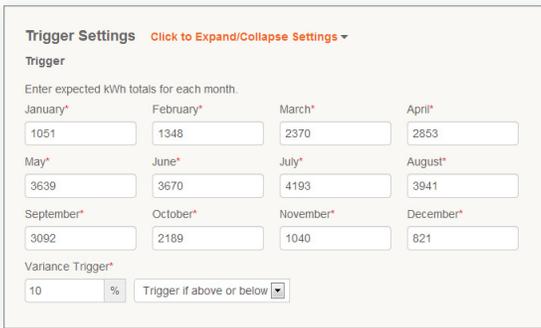


Monthly Performance Alarm

Monthly performance alarms trigger when the monthly production total deviates from a user-defined acceptable value by a user-defined variance percentage. If triggered, notifications for monthly performance alarms are sent by email on the first day of the following month.

Many users rely on historical system data to determine acceptable monthly generation values. This data can be taken directly from your DECK Dashboard or Admin Panel. If your site is less than a year old, you can go to: www.nrel.gov/rredc/pvwatts/grid.html. Use the available calculator here to create expected production values based on past meteorological data for your area.

This alarm can help you identify performance issues such as soiling, shading, poor connections, storm damage, and panel failure. This alarm can also be helpful to identify deteriorating hardware performance over time.



Relative Performance Alarm

Relative Performance Analytics (RPA) is ideal for larger PV systems with granular generation data. That includes systems with string inverters or multiple central inverters, as well as systems with sub-array or string level sensors on the DC side of the array. Relative Performance Analytics can be applied any time you have identical data types from two or more separate devices in one system.

RPA represents a shift in the traditional approach to solar power diagnostics that can help you identify under-performing devices in your PV system. This ‘smart software’ surveys historical system data to map the deltas among reporting values for separate data points (or relative performance). It actually learns the relative performance patterns of the entire system, so users can identify a change in performance of a single (or group of) components relative to the others. System managers will be able identify outlier data points and detect changing performance patterns with greater accuracy and fewer ‘nuisance’ alarms.

RPA Trigger Settings

The first choice here is **Data Type**. DECK software will automatically populate this drop-down menu with every type of reporting data in your system. If your system has an irradiance sensor, for example, “irradiance” will appear as a Data Type option.

Note that each Relative Performance alarm looks at just one data type across two or more devices. Although irradiance may appear in your drop-down menu, you can only create a Relative Performance alarm for that data type if you have two or more irradiance sensors in that installation.

Your next option lets you Select Devices to Include in the Group. DECK software will automatically look for all devices in your system that are providing your selected Data Type, then populate those devices into an **Available Devices** list. Select your desired devices from the list on the left, then click “Add” to include them in the **Currently Selected Devices** list on the right.

Trigger Settings

Select Data Type to Analyze

Data Type*
power (kW)

Select Devices to Include in the Group

Available Devices

- Inverters
- Sustainable Centennial: Meters: Net Demand: Veris H8
- Sustainable Centennial: Meters: Net Demand: WattNode
- Sustainable Centennial: Meters: Badger: SHW Meter
- Sustainable Centennial: Meters: Net Demand
- Inverters: Grouped Inverters: Solectria Inverter 1
- Inverters: Grouped Inverters: Solectria Inverter 2
- Inverters: Grouped Inverters: Solectria Inverter 3
- Sustainable Centennial: Meters: Net Demand: Shark 1C

Currently Selected Devices

- Inverters: Array 4
- Inverters: Array 5
- Inverters: Array 6
- Inverters: Array 2
- Inverters: Array 1
- Inverters: Array 3
- Inverters: Array 7

Add →

← Remove

Please note that you must select at least 2 devices to create a valid alarm.

After you have selected the devices to include in your Relative Performance Alarm, you will proceed to **Results and Settings**.

Results and Settings

Use Historic Weights
 Use Manual Weights

Raise only if a device's recent ratio of contribution is Standard Deviations outside expected.

Device Label	Manual Weight	Historic Ratio	Recent Ratio	Variation
Inverters: Array 2	<input type="text" value="1"/>	n/a	n/a	n/a
Inverters: Array 1	<input type="text" value="1"/>	n/a	n/a	n/a
Inverters: Array 3	<input type="text" value="1"/>	n/a	n/a	n/a

To update the above table, save and refresh.

Advanced Options

If no data is found for a device over the historic range, that device will not be considered in the alarm at all. If no data is found for a device during the recent range, it will be considered in the alarm as if it had reported zero for the entire recent period.

Days of historic data to consider:

Days of recent data to consider:

Your first choice here is to decide between using **Historic Weights** or **Manual Weights**.

Historic Weights allow you to compare a set of recently reported data points against older historical data sets from your system. When using historic weights, you will select a Standard Deviation option as the trigger mechanism for the alarm.

Manual Weights allow you to compare a set of recently reported data points against a fixed set of data points that you will manually enter into this software interface. When using Manual Weights, you will select a Deviation Percentage as the trigger mechanism for the alarm.

(Please see more on working with Historic Weights and Manual Weights in the following section.)

The next choice to make can be accessed by clicking the **Advanced Options** button. Here you will enter values to determine how many Days of **Historic Data** and Days of **Recent Data** the alarm should look at.

- Note that the default values here will be 60 days of Historic Data and 3 days of Recent Data.
- Note that if you are working with Manual Weights you will only have the option to enter a value for Days of Recent Data... Historic Data is not being considered when you are working with Manual Weights.

The last step before saving your Relative Performance Alarm is familiar to anyone who has worked with DECK alarms before: determine who will receive email notifications when an alarm is raised.

Registered Admin users from your company should appear in the drop-down menu under Company User Notifications. You may include additional individuals to receive email notifications by manually entering their email addresses into the Email Address field under External Email Notifications.

After you have completed these settings, click the "Save" button to finalize your new Relative Performance Alarm.

Historic Weights in Relative Performance Analytics

Any system with at least one or two months of historical monitored data will be able to immediately start using Historic Weights to create insightful Relative Performance Alarms. To understand what DECK software is looking for with these alarms, it will be helpful to understand the Standard Deviation trigger mechanism.

The Relative Performance Alarm maps reported data for multiple devices, then looks for the Standard Deviation among the device data sets (not within each data set). The key metric here is variance over time in relative performance, i.e. “inverter 1 historically produces 10% of the total AC production relative to the other inverters. Over the recent sample period, however, inverter 1 has only produced 8% of the total system generation.”

The Standard Deviation calculation begins by finding the mathematical mean among the designated data sets. The Standard Deviation calculation next determines the degree of variance from the mean across the data sets. A low Variation value indicates that the data points tend to be very close to the mean. High Variation indicates that the data points are spread out over a large range of values.

In other words, a low Variation value indicates that all surveyed devices are maintaining consistent performance relative to one another. A high Variation value indicates that the relative performance among the surveyed devices is shifting over time.

Note that this metric accounts for varying sunlight conditions, because that variable presumably impacts all device data sets equally.

Choosing Your Standard Deviation Option

The following example shows the different results you can generate by adjusting the number of Standard Deviations. The image below shows raised alarms when the Standard Deviation value is set very low, just 0.5 Standard Deviations. This sensitive trigger raises an alarm for 3 devices (shown highlighted in red and green).

Note that green highlighting indicates a device that is reporting data values that are higher than normal relative to other surveyed devices, and red highlighting indicates a device that is reporting data values that are lower than normal relative to other surveyed devices.

Results and Settings ⊙

Use Historic Weights Use Manual Weights

Raise only if a device's recent ratio of contribution is Standard Deviations outside expected. ⊙

Device Label	Manual Weight	Historic Ratio	Recent Ratio	Variation
Inverters: Array 5	<input type="text" value="1"/>	23.50%	23.15%	0.85 standard deviations below
Inverters: Array 6	<input type="text" value="1"/>	22.49%	22.24%	0.68 standard deviations below
Inverters: Array 3	<input type="text" value="1"/>	8.83%	8.79%	0.19 standard deviations below
Inverters: Array 7	<input type="text" value="1"/>	5.81%	5.82%	0.06 standard deviations above
Inverters: Array 1	<input type="text" value="1"/>	10.76%	10.80%	0.15 standard deviations above
Inverters: Array 2	<input type="text" value="1"/>	9.05%	9.09%	0.26 standard deviations above
Inverters: Array 4	<input type="text" value="1"/>	19.55%	20.11%	1.77 standard deviations above

To update the above table, save and refresh.

Advanced Options

The second image (below) shows the same data sets, but in this case the number of Standard Deviations has been set at 1. This metric still raises an alarm, but in this case only 1 device is out of range, rather than 3 devices in the previous example.

Device Label	Manual Weight	Historic Ratio	Recent Ratio	Variation
Inverters: Array 5	1	23.50%	23.15%	0.85 standard deviations below
Inverters: Array 6	1	22.49%	22.24%	0.68 standard deviations below
Inverters: Array 3	1	8.83%	8.79%	0.19 standard deviations below
Inverters: Array 7	1	5.81%	5.82%	0.06 standard deviations above
Inverters: Array 1	1	10.76%	10.80%	0.15 standard deviations above
Inverters: Array 2	1	9.05%	9.00%	0.26 standard deviations above
Inverters: Array 4	1	19.55%	20.11%	1.77 standard deviations above

Where should I set my Standard Deviation Option?

DECK recommends starting your Relative Performance alarms with a Standard Deviation value of 2. This number of Standard Deviations is reasonably sensitive in most applications, but will avoid “noisy” email notifications for “nuisance alarms.”

One of the great features of the Relative Performance alarm is the ability to see results immediately after you have finalized the alarm. This allows you to employ ‘trial and error’ methodology to find the right number of Standard Deviations for each alarm you create.

After the alarm has been created, click on the “System Status” tab (in Alarms section) to see the full list of alarms you have created for this system.

Find your new Relative Performance alarm in this list, and click on the alarm name to visit the “home page” for that Relative Performance alarm.

Look for the Trigger Settings section on this page, and click the prompt to Expand/Collapse Settings.

This will allow you to see the Historic Ratio and the Recent Ratio of relative performance for each surveyed device. You can also see the Variation for each device between the Historic Ratio and the Recent Ratio. As in the images above, raised alarms will be highlighted with either green or red.

You may begin by selecting 2 Standard Deviations, then immediately check results to gauge your desired level of sensitivity based on the number of raised alarms for each Standard Deviation option you try.

Manual Weights in Relative Performance Analytics

Manual Weights have been added to our Relative Performance Analytics to serve customers who do not yet have available historical data to create Historic Weights, or who have historical data that is not desirable for comparison purposes for one reason or another. If this applies to you, you can enter expected performance values as Manual Weights until you have enough good historical data to switch to Historic Weights.

Manual Weights can also reveal some performance metrics that are not available using Historic Weights:

For example, it can be useful to measure Relative Performance among inverters against the metric of DC Nameplate Ratings for each inverter. Enter the Nameplate Ratings for each device as a Manual Weight to quickly diagnose whether each inverter is producing its expected share of power relative to the other units.

You can achieve the same effect using percentages of total generation as Manual Weights; for example, a system that evenly splits production among 20 string inverters could enter "5" as a manual weight for each device, signifying 5% of total system output.

Of course, you can fine-tune your Relative Performance Analytics by adjusting these Manual Weight values to reflect your own understanding of relative performance expectations across your various devices.

Using Relative Performance Analytics in this way is different from traditional performance analytics. In this case you are not comparing actual production values against baseline production values; instead, you are comparing the relative deltas among various device performance values against baseline relative deltas. This calculation filters out the "noise" of fluctuating weather conditions because all device performance levels move up and down by equal measures as sunlight conditions change.

Note that any numeric values can be entered as manual weights... it is not the numeric value that matters, but rather the relation among the various values that are entered. So a system manager with ten 30 kW DC string inverters could either enter "30" as a manual weight for each inverter, or simply enter "1" in each Manual Weight field, since the relation among the values is identical in both cases.
