

SkySpark's Data Visualization Features

Customizable Charts, Views,
Cards and Information Displays

SkyFoundry



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A Wide Range of Data Visualization Options and Tools – SkySpark® Chart Customization

Creating value from IoT device data requires four primary functional layers: *connecting to data sources, storing data, performing analytics, and presenting results to users.*

In 2018 SkyFoundry introduced **SWIVEL**, a revolutionary new tool for visualizing and analyzing analytic “sparks” and equipment data. Swivel enables simple, point-and-click customization of SkySpark’s data visualization Apps - with absolutely **no coding** required.

SkyFoundry further extended SkySpark’s data visualization by bringing **point-and-click customization** features to all data charting views across **all** of SkySpark’s Apps. The chart customization features allow users to quickly and easily adjust color, style and weight of chart lines, choose between line, area, scatter, bar, donut and other chart types, and drag-and-drop items to create multi-axis charts, and overlays.

Coupled with easy-to-use data importing tools, SkySpark dramatically enhances the data analysis features of SkySpark available to users with **NO CODING** required. By simplifying data importing and chart customization, SkySpark brings advanced data analysis tools to users of all skill levels. This white paper provides a detailed overview of SkySpark’s data visualization tools.

Point and Click Chart Customization

Overview of Chart Customization Features

So, what can you do with SkySpark's chart customization features?

- Adjust color, style and weight of chart lines
- Choose between line, area, bar, donut, pie, scatter and runtime chart types
- Drag-and-drop items to create multi-axis charts
- Overlay multiple chart types
- One click brings up the chart option

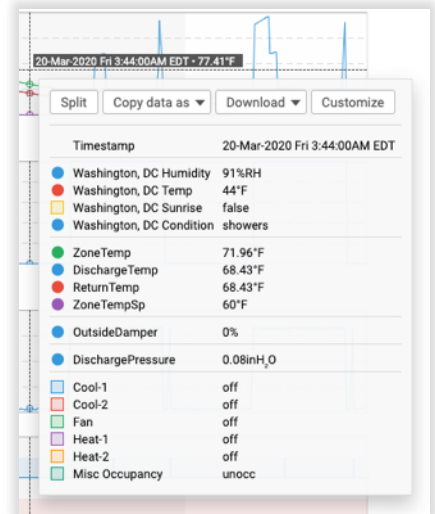
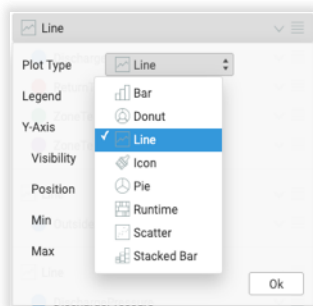
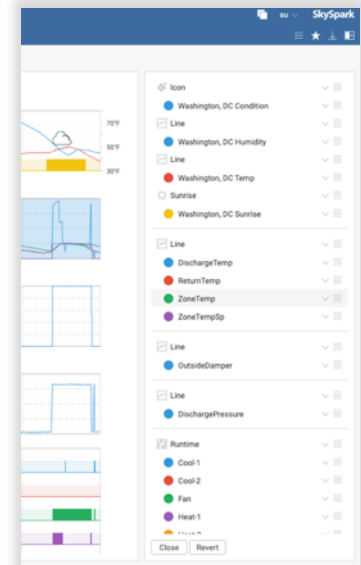


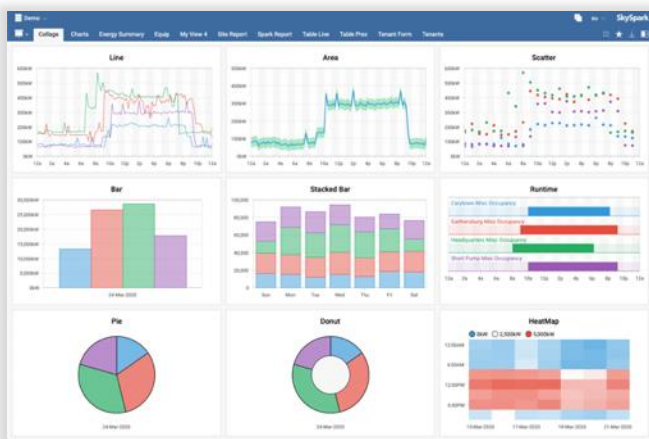
Chart option shown above in SkySpark Historian



The chart customization features work across **ALL** of SkySpark's Apps including, Energy, Historian and Equipment Views. (These examples are from the Historian App)



Select any available chart type – all with a simple click.

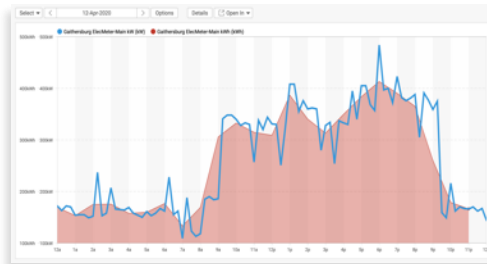
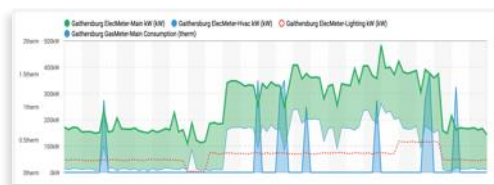


Click on 'Customize' to bring up the chart customization "sidebar"

Point and Click Chart Customization

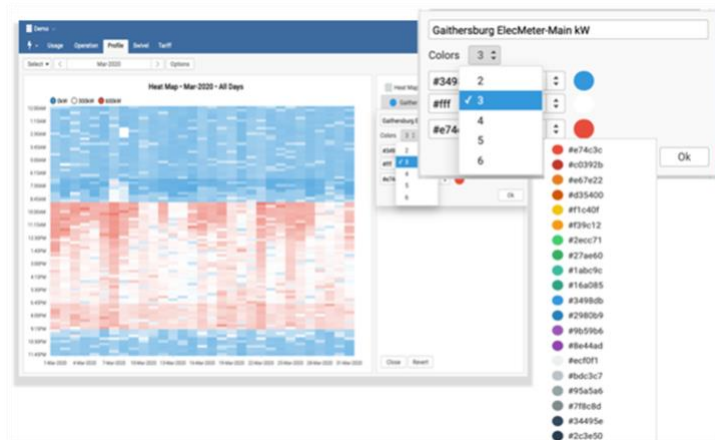
Here we will explore a few more examples of Chart Customization, including Area mode, Heat maps and options for line type, color and stroke width.

You can easily select **"Area Mode"** to clearly isolate items of interest and create confidence charts:



Overlay different items with different units onto a single chart, add bold dotted and dashed lines

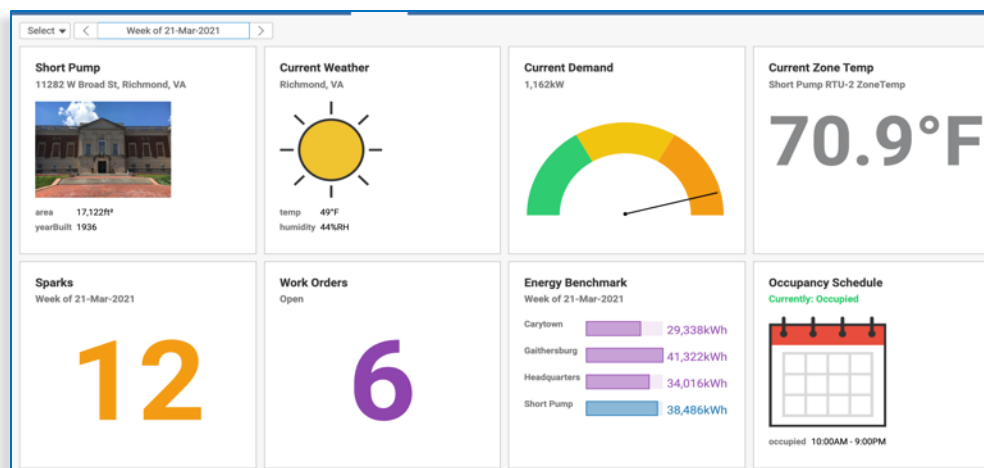
Choose number of **color** transitions and colors in Heat Maps



Creating Value from Sensor, Device and Equipment Data with SkySpark's "Cards" Presentation Option

A data visualization feature we call **Cards** makes it easy to create customized dashboards-style presentation of operational data and performance metrics.

Cards can combine data from any and all sources along with visual elements – photos, gauges, bar charts, text – to create a dashboard-style experience for users, like the one shown below.



Cards provide the flexibility to meet customer-specific data visualization needs.

Cards... Create Customized Dashboards of Operational Data and Performance Metrics

Cards allow you to create dashboards-style views that provide easy-to-understand summaries of key operational metrics **with both live** and static data and descriptive information.

Virtually any data in SkySpark can be formatted to display in the user-friendly “cards” format. As seen in the example above, you can include images, formatted text, icons, charts, gauges, and numerical data – *all of the visualization widgets available in SkySpark Apps can be used in cards.*

Once defined, cards can be assembled into “tiles” with SkySpark’s View Builder tools to create summary displays for users of all types. That’s how the example on page 1 was created.

AND make no mistake, **cards can display live**, streaming data from sensors and control systems. In the view on page 1, which is included in the latest SkySpark Demo project, the gauge and temperature values show live, updating values.

As seen below cards can be used to present text-based information

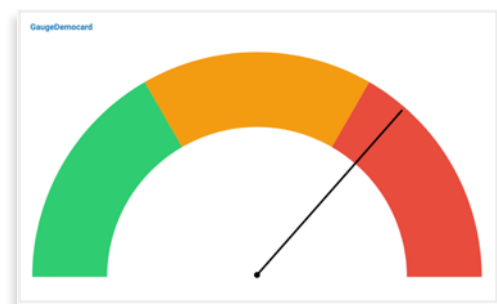
The screenshot shows a card with the following text-based information:

- target: Gaithersburg RTUs
- rule: AHU Group Cool and Heat
- date: 31-Mar-2021
- duration: 0.25h
- priority: med
- help: A group of AHUs have at least one unit in cooling mode at the same as another unit is in heating mode. These units may be “fighting” each other to maintain temperature setpoints.

Recommended Actions: Check control sequences. Priority: Medium

Gaithersburg RTU-1 Washington DC	
ahu	✓
directZone	✓
disMacro	SiteRef \$navName
dxCooling	✓
elecHeating	✓
elecRef	Gaithersburg ElecMeter-Hvac
equip	✓
equipRef	Gaithersburg RTUs
hvac	✓
navName	RTU-1
rtu	✓
singleDuct	✓
siteRef	Gaithersburg
variableAirVolume	✓
mod	22-Mar-2021 Mon 1:31:41PM UTC

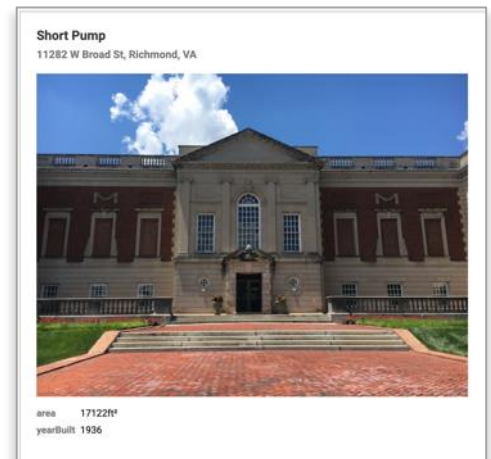
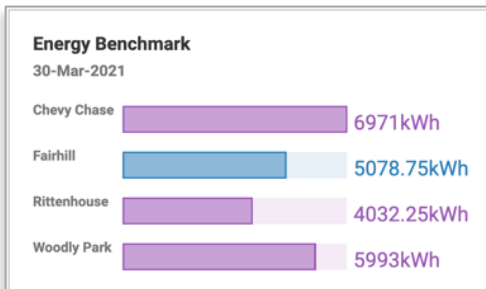
Cards can include graphical elements. Here is a simple card with one graphical element – a gauge which can show live updating data or static values



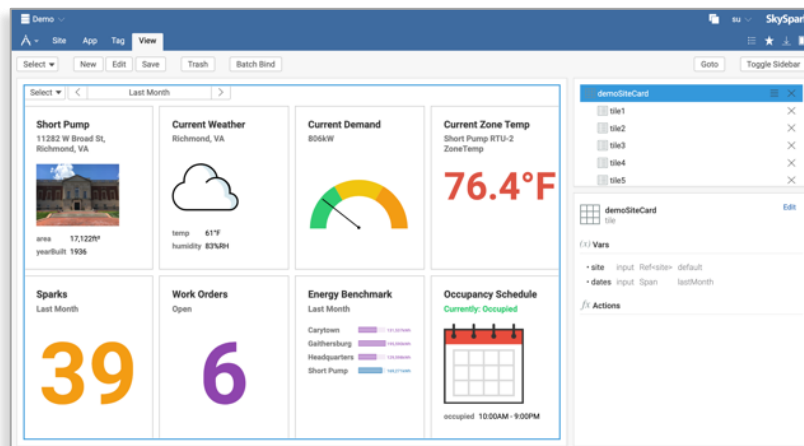
SkySpark® Provides a Wide Range of Possibilities for Data Presentation

Below we see an example of how graphic images can be used in cards

This sample card uses bar charts to compare consumption across a



When you use SkySpark's "View Builder" you can assemble cards into dashboard views that provide quick, easy-to-digest summaries of essential information including interactive controls to enable users to select items like date range shown below



Cards add a whole new range of possibilities to SkySpark. *It's just another way SkySpark advances data visualization and presentation.*

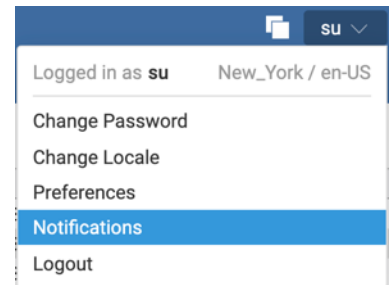
Notifications - Automated Delivery of Sparks, KPI's, Reports and Cards



Once we have important data, reports and views, we want to deliver them to different members of our organization. Another notable SkySpark capability are features that streamline the setup of **automated notifications** – *automatically emailing essential information to users based on their specific areas of interest or job responsibilities.*

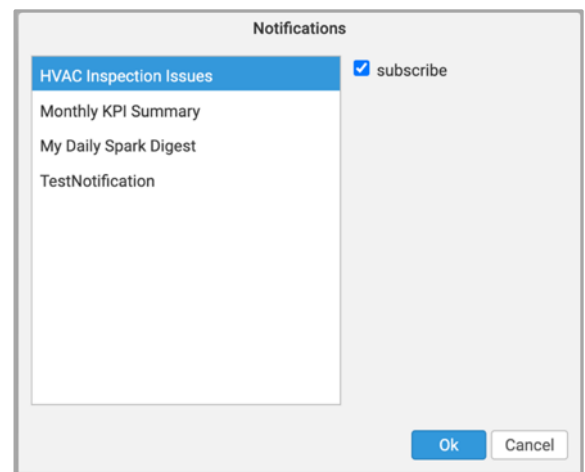
Notifications in SkySpark are based on the concept of “subscriptions to topics” – users subscribe to topics of interest with easy selection boxes.

Topics can include individual sparks, digests of sparks, KPI's, reports, creation or changes made to Arcs (workorders) – virtually anything that can be displayed in an HTML-style email. Plus, emails can include hyperlinks to SkySpark views and text-based **Cards** described earlier in this document.



Users access their notification options from the user menu

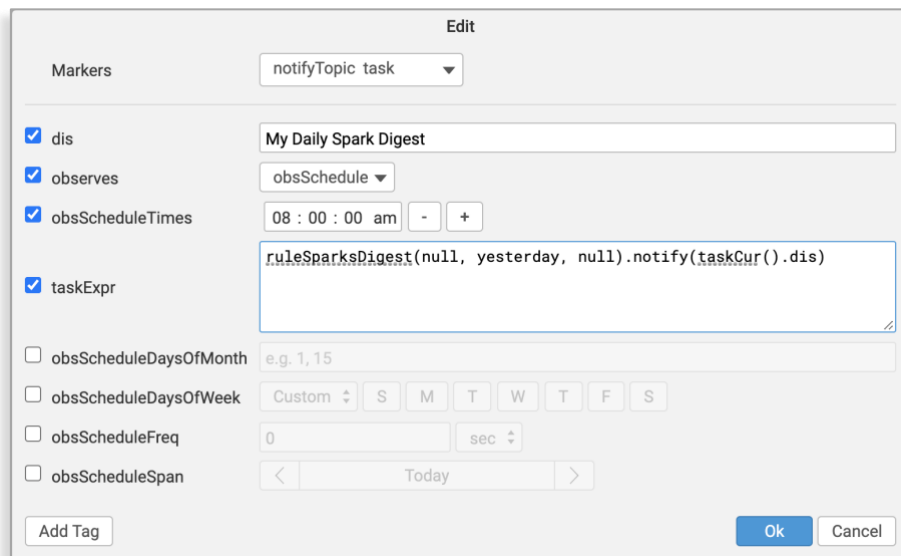
Notifications can be triggered (sent) based on pre-defined schedules, the occurrence of events, or initiated by user actions.



Notifications



Below a notification is configured to be sent based on a schedule. In this example a daily digest of Sparks will be sent every day at 8 am to all users that “subscribe” to the topic – *My Daily Spark Digest*.



The screenshot shows the 'Edit' dialog for a notification. The 'Markers' dropdown is set to 'notifyTopic task'. The 'dis' field contains 'My Daily Spark Digest'. The 'observes' dropdown is set to 'obsSchedule'. The 'obsScheduleTimes' field is set to '08 : 00 : 00 am'. The 'taskExpr' field contains the expression: `ruleSparksDigest(null, yesterday, null).notify(taskCur().dis)`. Other options like 'obsScheduleDaysOfMonth', 'obsScheduleDaysOfWeek', 'obsScheduleFreq', and 'obsScheduleSpan' are unchecked. The 'Add Tag' button is at the bottom left, and 'Ok' and 'Cancel' buttons are at the bottom right.

Notifications can be sent in a wide range of formats including HTML, formatted text, text-based “**Cards**” and links that take users directly to views in SkySpark. And multiple topics can be combined into “groups” to provide further simplification for users.

We’ve only scratched the surface here – as you can see SkySpark’s new notification features are highly flexible and configurable, and it’s easy for users to subscribe to topics of interest.

ABOUT SKYFOUNDRY

SkyFoundry's mission is to provide software solutions for the age of "the Internet of things". Areas of focus include:

- Building automation and facility management
- Energy management, utility data analytics
- Remote device and equipment monitoring
- Asset management

SkyFoundry products help customers derive value from their investments in smart systems. Contact us to learn more.

<https://skyfoundry.com/>

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