



Axonize IoT Platform - User's Guide

Planon Software Suite

Version: L132

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About this Document

Intended Audience

This document is intended for *Planon Software Suite* users.

Contacting us

If you have any comments or questions regarding this document, please send them to: support@planonsoftware.com.

Document Conventions

Bold

Names of menus, options, tabs, fields and buttons are displayed in bold type.

Italic text

Application names are displayed in italics.

CAPITALS

Names of keys are displayed in upper case.

Special symbols

	Text preceded by this symbol references additional information or a tip.
	Text preceded by this symbol is intended to alert users about consequences if they carry out a particular action in Planon.

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IoT Platform

IoT Platform is a full-scale IoT orchestration platform that automates application creation by enabling you to easily tie-in events, and business logic across applications, sensors and protocols in order to create new smart businesses and services within days, across any vertical and use case, and to visualize and optimize all the data in a single pane of glass:

- **Any Apps** - Interconnects all your apps so that you can build powerful solutions.
- **Anything** - Connects any system, device or protocol (both IoT and non-IoT).
- **Any Logic** - Lets you self-configure any business logic.
- **Any One** - Extremely configurable and flexible enabling you to do it on your own – no need for professional services.

IoT Platform enables IoT system integrators, service providers, digital enterprises and end customers to build multiple IoT applications within a few days utilizing minimal DevOps resources, and near zero engineering hours.

Building a powerful IoT app is simple, because absolutely everything in IoT Platform is configurable and extensible, meaning that no professional services or developers are needed for customization.

One of IoT Platform's most powerful features is that it enables you to reuse business logic and other platform customizations, in separate IoT apps, so that you are not starting from scratch each time.

Concepts and Terms

Here are some of the main concepts and terms of the IoT Platform system:

- [Application](#)
- [Product](#)
- [Device](#)
- [Event/Reading](#)
- [Alarm](#)
- [Dashboard](#)
- [Tenant](#)
- [Sub-tenant](#)
- [Master Application](#)

Application

An Application is a project managed on the IoT Platform platform. Each Application that you create can be used as a standalone portal for monitoring and controlling your IoT Devices.

You can create as many Applications as needed, which can also belong to multiple users. Each Device belongs to a specific Application. Each Application can have a separate login page and its own tailored settings, such as language, custom design and more.

For example, smart building, smart retail, smart warehouse, smart parking, smart lighting, air quality and so on.

IoT Platform provides a variety of default, ready-made Applications that you can use as a basis for creating your own Applications. In addition, IoT Platform provides a wide variety of configuration options for customizing this Application, and any other Application that you create.

Each user is uniquely identified by their email address. A user with the same email can belong to multiple Applications and is considered a different user for each, meaning that this user has his/her own password, Client ID/Client Secret, mobile phone number and so on. The information shown in the IoT Platform Portal relates to this user/email address as two different users.

Product

A Product is a type of Device, such as a type of elevator, car, lock, heat sensor and so on. In IoT Platform, a Product enables the grouping of Devices according to their type.

Each Product defines the properties that are assigned to each Device with the same Product type. For example, all the properties of the same type of heat sensor model.

Each Product belongs to a specific Tenant, Sub-tenant or Application.

Device

A Device is a connected external entity from which events are received. A Device is a specific instance of a Product, such as a specific elevator, car, lock, sensor with its own serial number, etc. It can even be a person.

Each Device belongs to a specific Tenant, Sub-tenant or Application.

The following types of Devices are supported:

- **Real Devices** – These are real-world entities that send events to the IoT Platform Server. There are two types of real devices.
- **Physical IoT Devices** – on which the Device SDK can be installed, such as an HVAC, lighting, proximity sensor, thermometer, pressure

gauge, lock and so on. Events are sent by these Devices to the IoT Platform Server using the Device SDK installed on the Device.

- **Other Devices-** represent every other kind of entity that might send events to the IoT Platform system, meaning each type of entity on which the Device SDK cannot be installed. For example, all non-IoT devices; a person, another computer system, a device without an Internet connection and so on. These entities can send the events to the IoT Platform Server in their own format. IoT Platform then converts them to the proprietary IoT Platform data format.
- **Virtual Devices** – These fake entities generate and periodically send predefined random events from inside the IoT Platform Server for application testing and/or demo purposes only.

Event/Reading

An Event/Reading is data received by the IoT Platform Server from a Device.

A reading consists of the reading name, reading type, reading value and reading timestamp. For example, a reading from a scale, the temperature from an air-conditioning system, the action of turning on a light, the periodic status of a light (open or closed) and so on.

Alarm

An 'AlarmInstance' is a notification that appears after a rule criterion has been met.

An 'AlarmInstance' is triggered by logical conditions applied to the events/readings of Devices. Alarms are characterized by their severity (major, minor, critical or warning) and timestamp.

Dashboard

A Dashboard is an at-a-glance customized view that you can create to enable the monitoring and operation of your Devices. You can create multiple Dashboards and select and configure the widgets that each contains.

Tenant

A Tenant is a representation of an organization. It is an instance of IoT Platform 's services, and infrastructure that an organization receives when the organization creates a relationship with IoT Platform .

Each Tenant has its own domain:

- A Tenant may create multiple Applications and multiple Sub-tenants.
- The Applications of a Tenant (and Sub-tenant) can share various settings (such as language, cultural settings, phone prefixes and so

on). Configuring a Tenant can affect all the Applications belonging to this Tenant, and all the Applications belonging to all of its Sub-tenants.

- Each Tenant has a single Master Application.
- A Tenant can create an Application. An Application can belong to one or more Users. The Users of a Tenant's Applications are assigned to the Tenant. Users are not assigned directly to Tenants.

Sub-tenant

A Sub-tenant is a single instance of the IoT Platform software that serves one customer account:

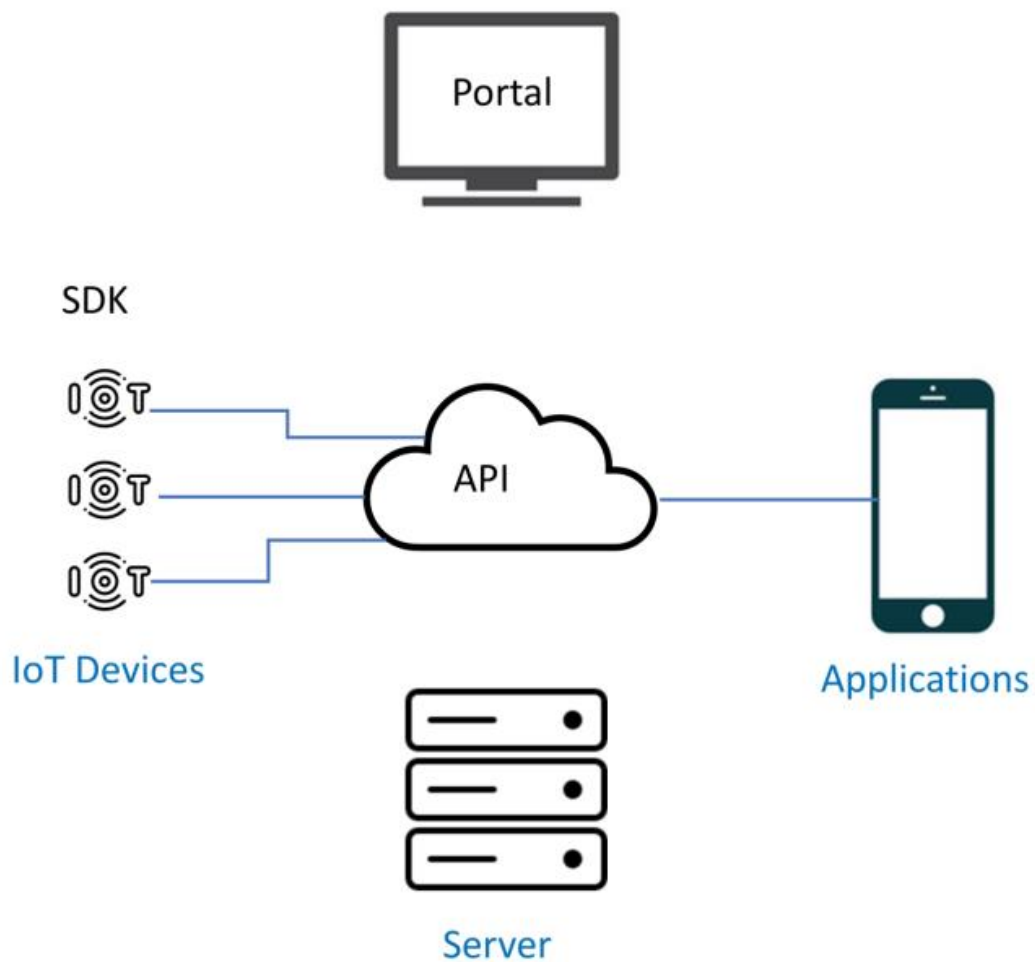
- A Sub-tenant belongs to a single Tenant.
- A Sub-tenant may create multiple Applications and multiple sub-tenants.
- Some settings may be applied to a Sub-tenant in order to affect all the Applications belonging to this Sub-tenant.

Master Application

A Master Application is the Application that enables the management of all/any of the Applications within a Tenant, and all of its Sub-tenants.

Each Tenant has a single Master Application. A Master Application does not have a parent Application.

How does the IoT Platform work?



The IoT Platform system comprises the following –

- [Portal](#)
- [REST API](#)
- [Device SDK](#)
- [Server](#)
- [Manifests](#)
- [Applications](#)

IoT Platform Portal

The IoT Platform Portal is a configurable easy-to-use user interface for monitoring and operating IoT Devices.

Note – Currently, the Portal's easy-to-use user interface provides most of the functionality that you need, as described in [Creating an Application](#). However, a few steps for setting up the system must still be performed by a developer.

The sequence of steps described in [Creating an Application](#) indicates when to use the IoT Platform Portal and when to use the [REST API](#) or [Device SDK](#). Soon, additional functionality will also be available in the IoT Platform Portal.

The IoT Platform Portal uses the [REST API](#).

REST API

The REST endpoints enable you to activate IoT Platform functionality. The REST API enables you to –

- **Activate IoT Platform Portal Functionality** - The REST API enables you to perform all the functions provided in the IoT Platform Portal and more, such as creating a Product, a Device or a Rule and getting reports.

See **REST API Reference** for a detailed description of these endpoints. For example, you can create Rules.

- **Send Endpoints to a Device from the IoT Platform Portal** - The IoT Platform Portal sits on top of the REST API in order to send endpoints to a Device in order to affect how the Device SDK operates and to get Device events. In addition, you can use the API to send endpoints as needed.

See **REST API Reference** for a detailed description of these endpoints. For example, you can create Devices.

- **Activate Operations on a Device** - The REST API enables you to send endpoints to a Real Device in order to activate operations on that Device, such as opening a light or closing a lock.

See the **sendCommand** endpoint for a detailed description.

See **REST API Reference** for more details.

Device SDK

The Device SDK is installed on each Real Device so that the Device can send events to the Portal and can listen for endpoints from the IoT Platform Portal and REST API.

IoT Platform supports the following runtime environments on the Device – Node.js, C, C#, Python and Java.

The Device SDK uses the AMQP (protocol) for connecting to the cloud. HTTPS and MQTT can also be used.

The Device SDK is a wrapper on top of the Azure IoT Hub SDK and can be used to send events to IoT Platform as long as the payload it is properly formatted.

Please contact Support in order to get the IoT Platform SDK.

See IoT Platform **Message Keywords**.

IoT Platform Server

The IoT Platform Server enables you to monitor and control your Devices from a single consolidated repository.

The IoT Platform Server collects all the Device events in one place so that you gain business insights from the events, in order to create new revenue streams and reduce operational costs.

The Device SDK can be installed on devices in order to send events to the IoT Platform Server. Alternatively, devices on which the Device SDK cannot be installed can send the events to the IoT Platform Server in their own format. IoT Platform then converts it to the proprietary IoT Platform data format. This conversion process is set up by Support.

The IoT Platform Server's architecture consists of three main layers:

- **IoT AnyApp Layer** – The IoT Platform pre-built layer is suited for all businesses and provides a rich variety of configuration and customization options. This layer enables you to get and monitor information from various IoT and non-IoT Applications and to control these Devices.
- **IoT Application Development** – IoT Platform provides its own proprietary IoT Application development framework, which is built from the ground up using breakthrough architecture to enable easy access and operation.
- **IoT Services** – This is the infrastructure that interacts with the hardware layer and collects events and handles storage, security and so on. This layer is based on leading IoT services and cloud providers, such as Microsoft IoT Services.

IoT Platform Manifests in detail

Manifests are customizable schemas that enable you to customize the properties, operations and/or events in the IoT Platform system. The following types of manifests must be defined:

- **Product Manifests** – A Product Manifest defines the metadata (both real and virtual) that is assigned to each Device which belongs to the same Product. For example, all the properties of the same type of heat sensor model.

See [Defining a Product](#) for more information.

- **Device Events Manifests** – A Device Event Manifest defines the types of events that a Device sends to the IoT Platform Server.

- For each Real Device, this manifest must be placed on the Device in the Device SDK.
- For each Virtual Device, this manifest must be placed on the IoT Platform Server.

See [Defining a Device Event Manifest](#) for more information.

- **Virtual Device Manifests** - Define the properties, operations and events of each Virtual Device.

See [Adding a Virtual Device](#) for more information.

- **Tenant Manifests** - A Tenant Manifest defines all the settings for a Tenant and its Sub-tenants. Tenant Manifests are templates that simplify the creation of Tenants. All the Tenants assigned to a given Tenant Manifest inherit the settings, default values and so on defined in that Tenant Manifest.

See [Defining a Device Event Manifest](#) for more information.

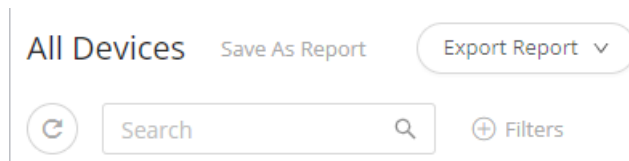
- **Application Manifests** - An Application Manifest defines all the settings and feature flags for an Application. Application Manifests are templates that simplify the creation of Applications. All the Applications assigned to a given Application Manifest inherit the settings, default values, and so on defined in that Application Manifest.

See [Adding an Application](#) for more information.

Using filters

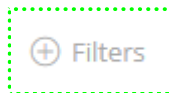
In any view you can apply a filter to focus your attention.

On the left of the view area, filtering options enable you to quickly find what you are looking for.



Procedure

1.



To specify a filter, click  Filters at the top of the view.

The **Add filter** dialog box appears.

2. Specify the filter criteria required to find the information you are looking for.

You can add multiple filters to fine-tune your filter criteria - these will operate as AND filters.

Alternatively, you use the **Search** box on top to find the information you are looking for.



If you've created the data you were looking for, there are various options to save the data:

- You can click **Export report**

This option enables you to export your report to PDF, XLSX, CSV.

- You can click **Save report as**

This option enables you to save your report for later use. It will be stored under Reports > My reports - here you can manage the report (amend or share it).

Overview

The IoT Platform is a configurable easy-to-use user interface for monitoring and operating IoT devices.

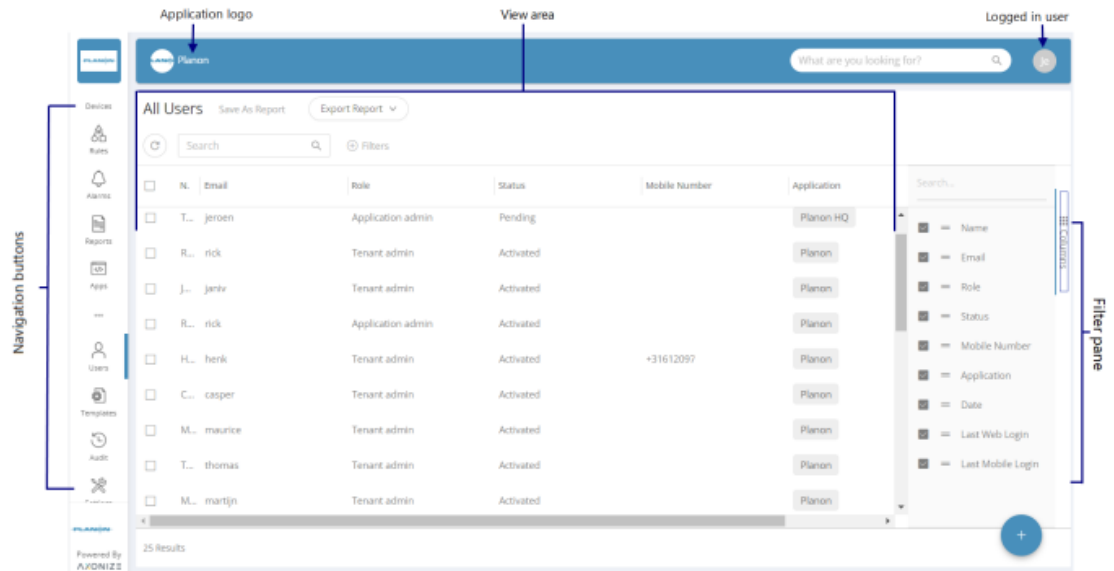
Login Window

When logging in using 'multi-factor authentication', you are prompted to enter the authentication code provided to you by SMS or email.

Enter the code in the text box and click the **Verify Code** button. Click the Get new code link if you need to obtain a new code.



Main Window



The left pane of the window contains a series of entity buttons. Click a button in this pane to access the relevant entity in the IoT Platform portal, as follows –



Boards



Things



Rules



Alarms



Reports



Apps



Users

Boards

Things

Rules

Alarms

Reports

Apps

Users



Templates



Products



Group templates



Audit



Settings

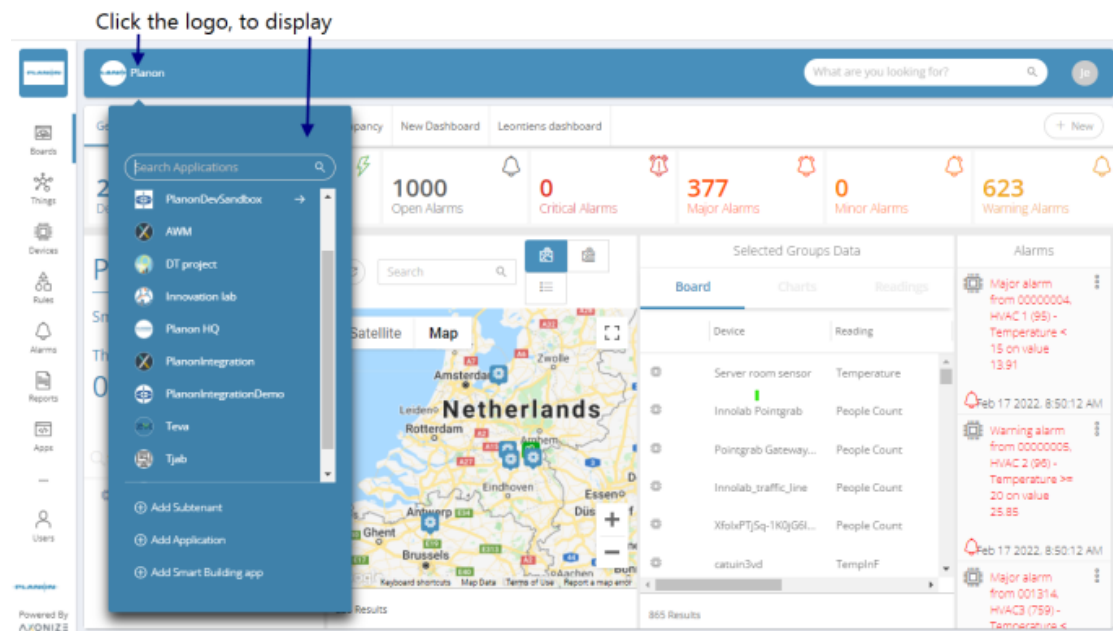
The pane on the right displays the view for entity selected in the left pane.

The Filters pane on the far right shows the filters currently applied in the selected view.

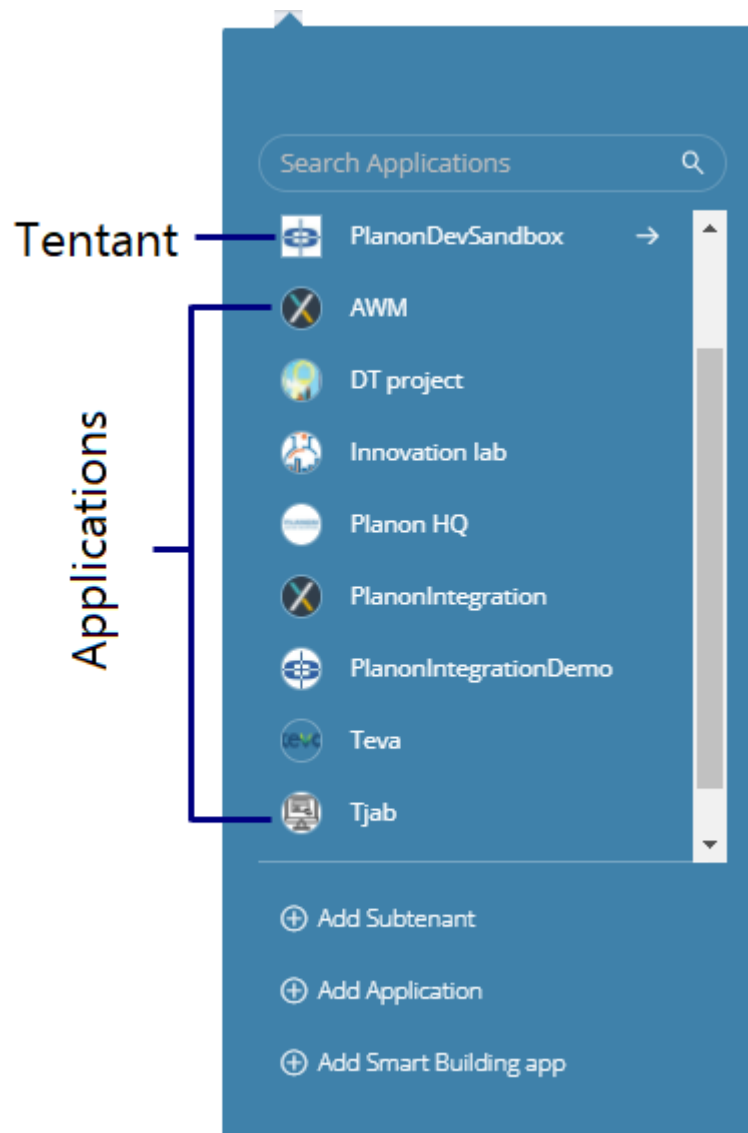
Application Logo

You can click the application logo at the top left of the window to open a pane beneath it containing a list of the Tenants and Applications in the IoT Platform platform.

You can click a Tenant to view its sub-Tenants or the Applications for that Tenant and sub-Tenants.



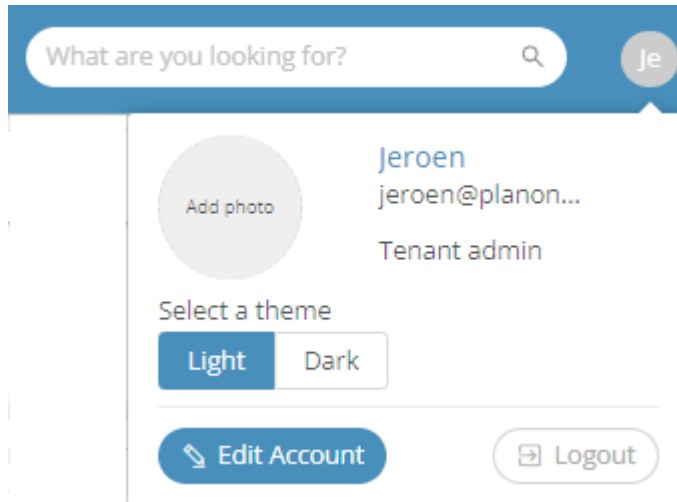
In the pane that displays, Tenants are indicated by an arrow  and Applications without an arrow.



You can add a sub-Tenant or Application using the respective options at the bottom of the pane.

Logged-in User Options

Several options are available by clicking the **Logged-in User** button at the top right of the window.

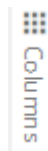


- Click **Logged-in User** to view details about the currently logged-in User.
- Click **Add Photo** to add a photo of the User.
- Select the theme used when displaying the IoT Platform Portal by clicking either the **Light** or **Dark** button.
- Click **Edit account** to edit your user account. This option opens the [Users](#) view, in which you can edit your User profile.
- Click **Logout** to exit the IoT Platform Portal.

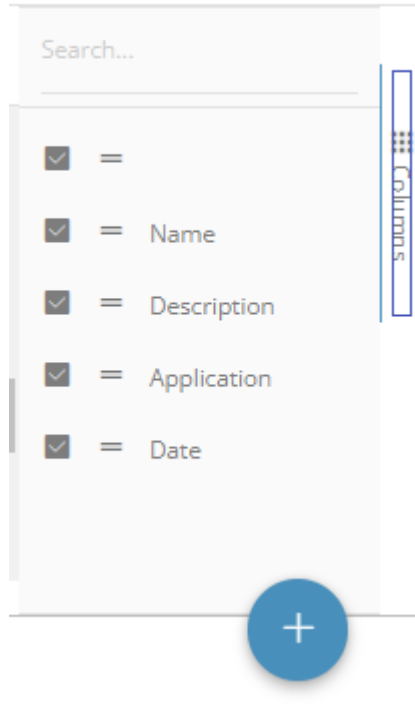
Filtering the view

You can filter the current view (Products, Rules, Alarms and so on) by one or more criteria.

Each criterion filter that you apply corresponds to a column in the view. The filters currently applied to the view are shown at the far right of the window when you click



, as shown here:



To filter the view –

1. In an entity view, click the **Filter**. A window such as the following displays. The options that display vary, depending on the current view (Products, Rules, Alarms and so on)

Add a filter

X

By Device Name

By Last Reading Time

By Readings >

By Product

By Group

By Manufacturer

By Custom ID

By Serial Number

By Connection Status

By Applications

Cancel

Add

2. Select the criterion by which to filter the view and then click **Add**. The view is filtered by the selected criterion.

 Various filters also have an AND logic available, to extend the filtering criteria.

How To – Quick Reference

Here is a quick reference to various tasks and options in the IoT Platform Portal –

Managing Entities	Alarm and Rules	Reports
Device • Adding a Device • Adding a	• Adding a Rule • Viewing Alarm Details	• Defining a Report • Managing Reports

- [Real Device](#)
- [Updating Firmware on a Device](#)
- [Dismissing an Alarm](#)
- [Pausing an Alarm](#)
- [Duplicating a Report](#)
- [Custom Reports](#)

Product

- [Adding a Product](#)
- [Defining a Product](#)
- [Deleting a Product](#)
- [Managing Device Firmware](#)

Application

- [Adding an Application](#)
- [Viewing Application Details](#)
- [Deleting an Application](#)
- [Changing the Application Country Code](#)
- [Changing the Application Language](#)

Dashboards

- [Creating a New](#)

Customized
Dashboard

- [Adding
Widgets](#)

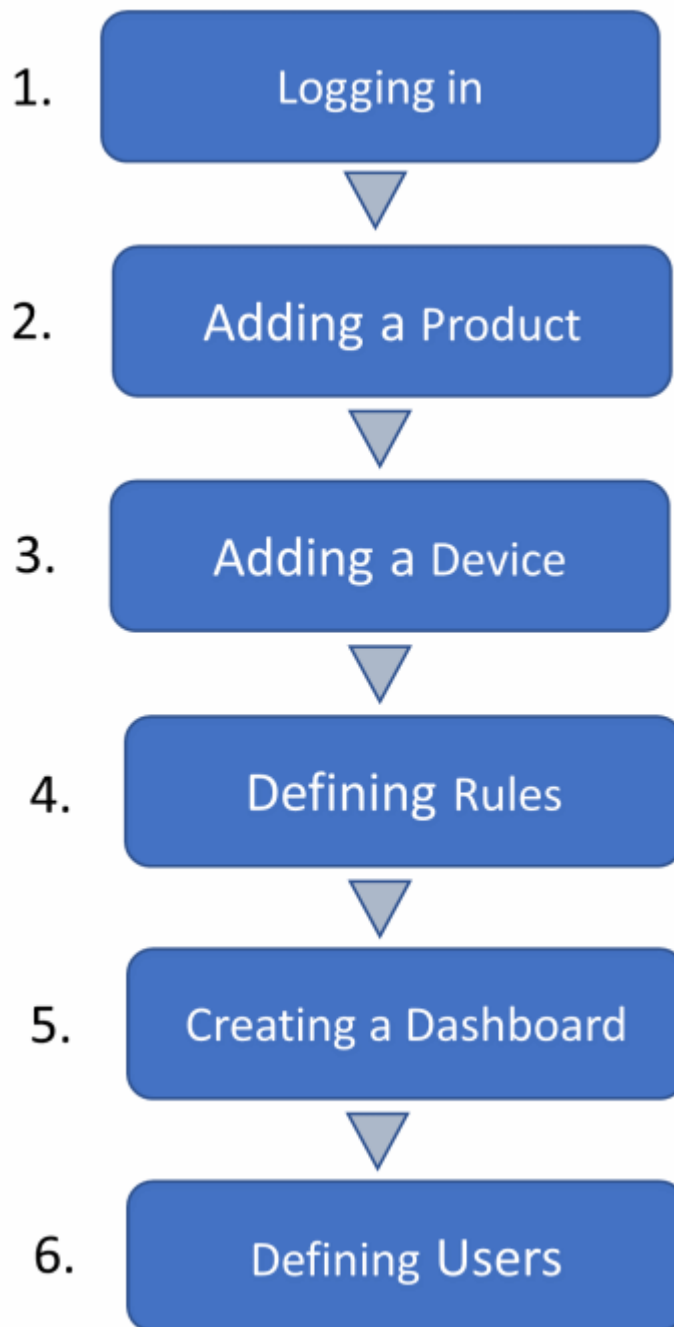
Portal/User Interface

- [IoT
Platform
Settings](#)
- **Log
Out
of
the
Portal,
see
[View
Logged-
in
User
Details](#)**
- **Set
the
Portal
Display
Theme,
see
[View
Logged-
in
User
Details](#)**
- [View
Logged-
in
User
Details](#)
- [Filter
the
View
in
the
Portal](#)

Users

- [Adding
a
User](#)
- [Viewing
User
Details](#)
- [Assigning
a
Role
to
Multiple
Users](#)
- [Logged-
in
User
Options](#)

Creating an Application



Note – Please see [Application Developer Workflow](#) for a description of the workflow for an application developer.

Logging in

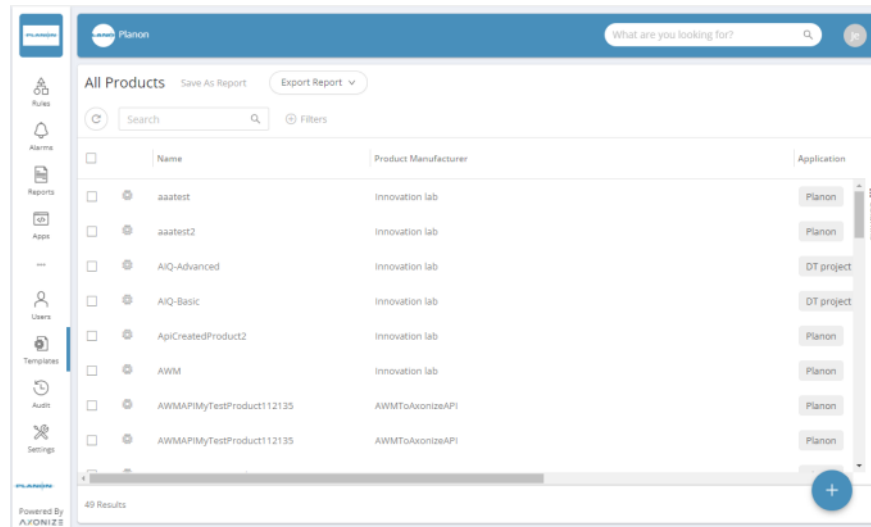
Contact Support/Sales staff of IoT Platform to set up an account for you. We will send you the URL of the IoT Platform Portal and the user name and password for logging in.

Adding a Product

A Product is a type of Device, and serves as a way of grouping Devices.

See [Product](#) for a description of what a Product is.

1. In the IoT Platform Portal, click **Templates > Products**. The **All Products** page displays:



2.



Click on the bottom-right to add a new product.

See [Defining a Product](#) for more details.

Adding a Device

A Device is an entity from which IoT Platform receives events.

A different procedure is required for each type of Device:

- Real Devices
- Virtual Devices

Real Devices

Real Devices are real-world entities that send events to the IoT Platform Server.

Real Devices can be added either using the IoT Platform Portal as described in [Adding a Device](#) or using the REST API (as described in [Adding a Device – Developer Workflow](#)).

In addition, for each type of Real Device, you must define an Events Manifest, which defines the type of events sent from the Device to the IoT Platform Server.

See [Defining a Device Event Manifest](#) for more information.

Virtual Devices

Virtual Devices generate and periodically send predefined random data events from inside the IoT Platform Server for application testing or demo purposes only.

Virtual Devices can be added using the IoT Platform Portal (as described below).



Creating and using virtual devices is governed by a *feature flag*, which is a paid feature.

Ingesting Events from a Virtual Device

Procedure

1. For instructions about how to define a Virtual Device Manifest, see [Adding a Virtual Device](#).
2. To place this Virtual Device Manifest on the IoT Platform Server, click the **Devices** button in the left pane to display a list of Devices.

3.



Click the **Add Device** button.

4.



Click the **New Virtual Device** button. The following displays:

New Device [X]

Product manufacturer
All [v]

* Product Type
Enter new product name / Pick product from the list [v]

* Device Name
[Text Input]

Serial Number
[Text Input]

Groups
Please select [v]

Parent Device
Please select [v]

* Events
[Large Text Area]

Cancel Done

1. Copy and then paste the manifest code into the **Events** field.
2. Click **Done**.

Defining Rules

Rules can be defined either using the IoT Platform Portal (as described below) or using REST API (as described in [Defining Rules – Developer Workflow](#)).

Create the rules that define the conditions and timing when specific actions are triggered. For example, a rule can define that an email is sent to specific person with a specific message when the temperature of a specific refrigerator goes over 20° F /-6,7 C.



To define a rule, click **Rules** () in the IoT Platform portal. Fill out the following fields:

Field	Description
General	Enter a Name and Description for the new rule. Here, you can also specify the severity of the alarm when it is triggered: • Warning • Minor • Major • Critical
Time	Here, you can specify a Timezone and time-related information for the rule. You can either select a Period, a Schedule or a time Relative to a meeting (start or end).
Conditions	Specify the conditions that trigger the rule. You can choose one of the available conditions: • Threshold • Threshold with duration • Entered geofence • Exited geofence • In geofence with duration • Out of geofence with duration

Field	Description
	- Instantaneous - Compare reading After selecting a condition, you can then further specify the condition details: - Condition name Specify a name for your condition. - Condition level Specify at which level you want to apply the condition. - Devices Specify the device(s) for which the condition applies. - Data Specify the event for which you want to create the rule - for example, a temperature threshold that drops below a specific value. - Operator Select an that applies to your situation. - Value Specify the value that constitutes the baseline for your condition. - Duration Specify the time in minutes.  When a rule is triggered, the notification will have a date/timestamp of the start of triggering the rule. - Radius

Field	Description
	Specify the radius for your condition by moving the slider (only for geofence conditions).
Actions	Specify the operations that are activated when the rule takes effect, such as: • Sending an SMS/email • Making a phone call • Sending a call to a web service • Sending information to an ERP/CRM • Activating an endpoint on the Device (such as opening a light or closing a lock). You can also specify that an Alarm instance is created when the rule is triggered. Various fields of information from the rule itself and/or from the event that triggered the rule can be included in an SMS/email.

Creating a Dashboard

Create a Dashboard and the widgets that it contains, in order to monitor and activate endpoints on your Devices. You can create multiple Dashboards.

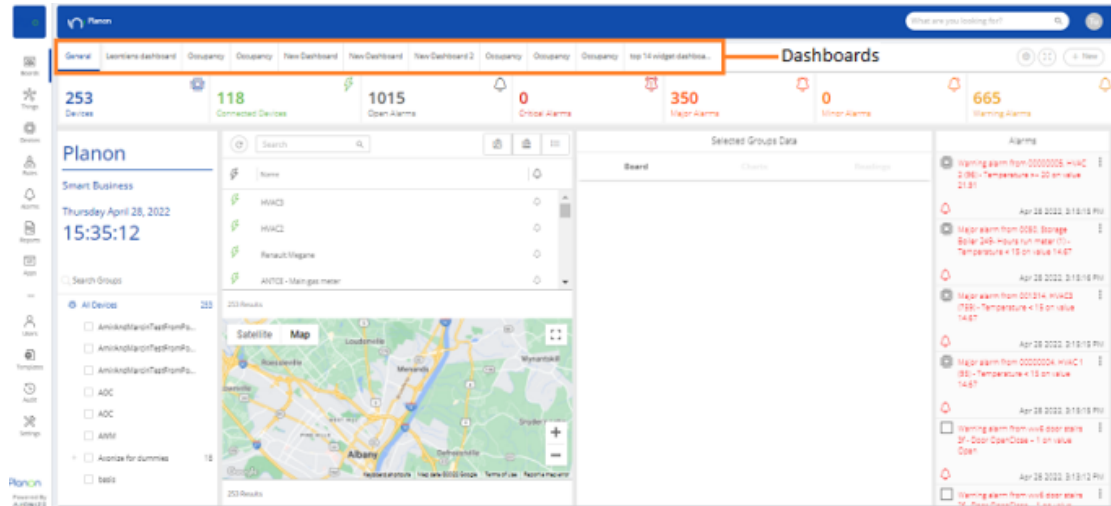
IoT Platform provides a variety of options for configuring the widgets that each contains.

The ability to create dashboards depends on the user's role and the corresponding privileges.

Dashboards

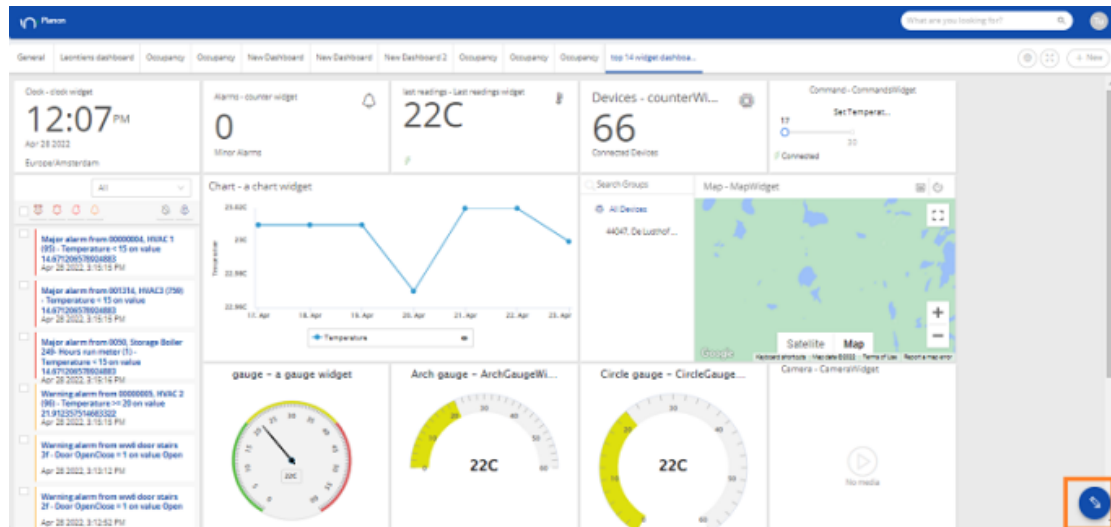
Dashboards provide an at-a-glance view that shows a snapshot of the status of an Application as well as Aggregations and History.

A Dashboard for an Application can contain one or more tabs, where each tab corresponds to a different Dashboard. Simply click a tab to view that Dashboard.



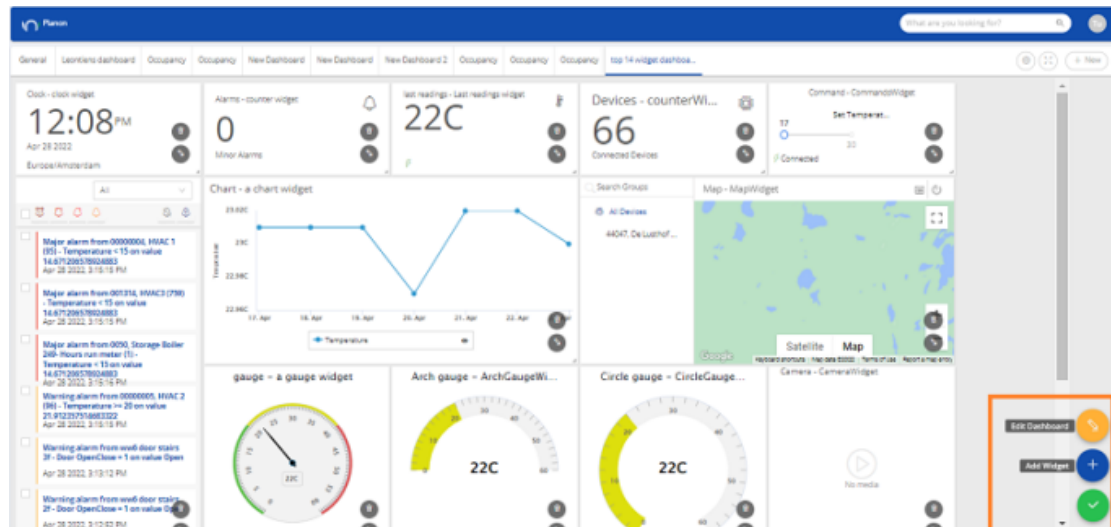
When working in a master Application, the Dashboard reflects all the Devices and Products under the Tenant, meaning those that belong to the master Application. The Dashboard tabs that display are those Dashboards created specifically for the master Application by a user of the master Application.

When working in a non-Master Application, the Dashboard shows the Devices, Products and Reports connected to that specific Application. Dashboards are Application-specific and can only be viewed by users of that Application.





You can click **Edit** () to display additional options for the Dashboard, as follows:



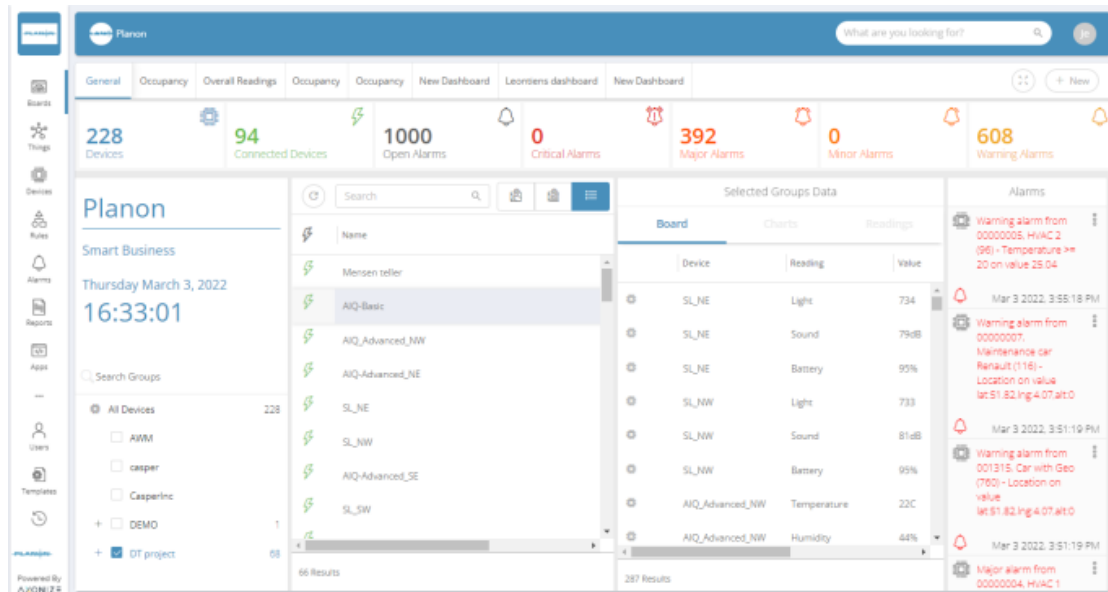
- 
 Click **Edit** to edit the Dashboard. Use this option to change the name of the Dashboard.
- 
 Click **Add** to [add a widget](#) to the Dashboard.
- 
 Click **Done** to exit the edit mode.



To change the dashboard to full screen mode, click **Enter full screen** button on the top-right corner of the screen. Press **ESC** to return to the regular mode.

Default Dashboard

Each application automatically has a default, General Dashboard. This Dashboard cannot be modified.



The default ready-made General Dashboard contains the following sections:

- **Devices Pane:** List of all connected Devices in a map or a combined view.
- **Detailed Pane:** Current readings, Charts tool and a last readings list for each Device.
- **Application Overview:** Device and Alarms counters on top, last events list on the right.

Device Pane

- **Group Hierarchy** - Filter the Devices by the groups with which they are associated. Clicking a required group shows only its Devices in the Devices' pane and their last readings in the detailed pane. In the tenant master Application, the Devices are grouped together under the Applications' names in the hierarchy selector.
- **View Options** - Display the Devices in a list, map or a combination of both. The default map focus is set according to the default country code set for the Application. The user can switch between Google's satellite map and Google's street view map.
- **Search Devices** - Find a Device using the search.

Detailed Pane

Click any of the Devices to access its pane and select between three quick options:

- Current readings
- Charts tool
- Last readings list

Application Overview

The top panel contains counters that present the number of Devices, Connected Devices and active Alarms (by severity).

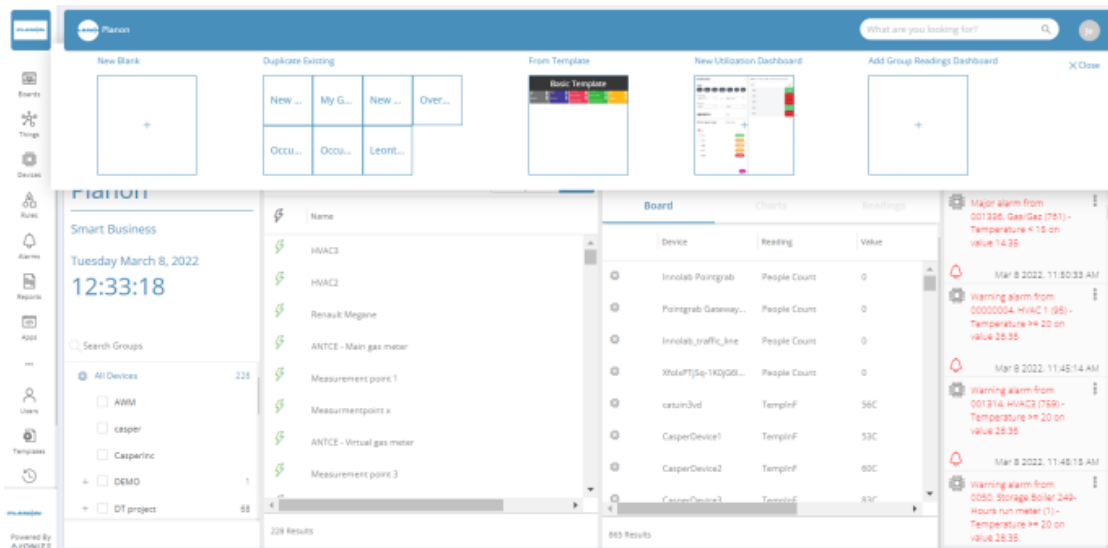
A chronological list of the last Alarms and Events appears on the right.

Creating a New Customized Dashboard



To create a new customized dashboard, click **+ New** in the top-right corner of the Boards view. This opens a panel providing a number of options for creating a new dashboard.

Either duplicate an existing Dashboard, use a template to create a new Dashboard, select a pre-defined dashboard or design one from scratch.



After you choose one of the options, a new Dashboard is created and a panel slides out on the right side of the screen, allowing you to define the Dashboard's name.

Rearranging dashboards

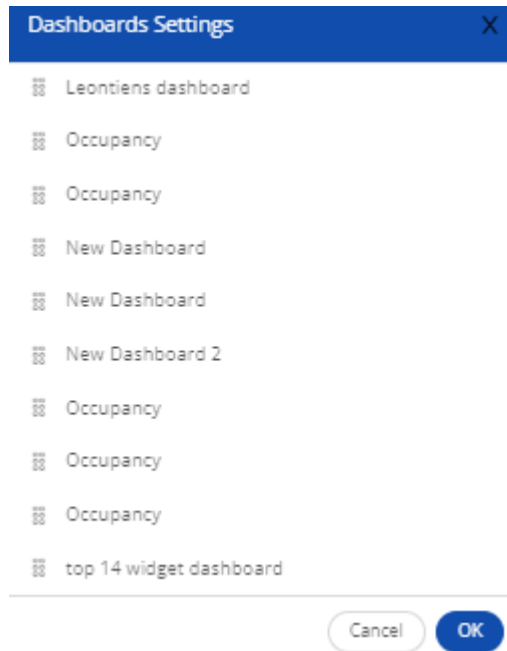
You can rearrange dashboards in IoT Platform by taking the following steps.

1.



Click **Dashboard settings** button at the top-right corner of the screen.

The **Dashboards Settings** window appears.



2. Simply drag the dashboard to the desired location.
3. Click OK.

Adding Widgets

IoT Platform provides various types of widgets that can be added to a Dashboard, including the following:

- [Devices](#) widget – Creates a Thing counter to present all Things or connected Things for specific Thing groups/all Things.
- [Last Readings](#) – Creates a counter to show the last reading value sent from the selected Thing for a specified reading type.
- [Real Time Readings](#) – Creates a line chart for a reading type sent from the selected Thing.
- [Aggregated Readings](#) – Creates a list of readings for specific Device groups/all Device.
- [Alarms](#) – Creates a major, minor, critical or warning AlarmInstance counter for specific Device groups/all Devices.
- [Alarms List](#) – Creates an editable list of all Application Alarms, filtered according to the Alarm severity and time.
- [Reports](#) – Presents a table showing matching report results, based on the specified report query. Only one report can be displayed per widget.
- [KPI](#) – Performs aggregation on a Thing's readings for a specific Thing.

- [Gauge](#) – The selected reading is shown in a classic gauge form. You can set the colors for the different zones on the gauge.
- [Arch Gauge](#) – The selected reading is shown in an arch gauge form. You can set the colors for the different zones on the gauge.
- [Circle Gauge](#) – The selected reading is shown in a circle gauge form. You can set the colors for the different zones on the gauge.
- [Command](#) – The widget supports sending a command to Devices that have a push-button type Command defined in the Product.
- [Map](#) – Creates a map showing Thing locations for specific Thing groups/all Things.
- [Heatmap](#) – Graphically represents readings data on a diagram, where the individual values are represented as colors. The heatmap provides a relative representation of the quantity of values of a certain reading.
- [Chart](#) – Creates a chart for one or more reading types sent from a selected Thing.
- [Camera Widget](#) – Displays the video input/video stream for a Thing that is a camera.
- [All Applications](#) – Counts the number of Applications under the Tenant of a master Application
- [Clock](#) – Displays a digital or analog clock by time zone.
- [Weather](#) – Displays daily weather, humidity and wind speed by location.
- [Properties and Settings](#) – Displays the properties and settings for a Thing.
- [Overall Readings](#) – Displays the number of Things of a specific Product type and its Events (readings).
- [Last Reading Chart widget](#)- Shows the latest value from multiple readings on a chart.
- [Space Utilization Widget](#) – Aggregates data from occupancy sensors and a booking system, returning the percent of time the sensor is in one of four states.
- [Floor Plan](#) - Shows Things on a selected Group with fields for selecting Groups and Products.

Each widget has the following buttons (available when you edit a dashboard):

- **Delete Widget** 
- **Edit Widget** 

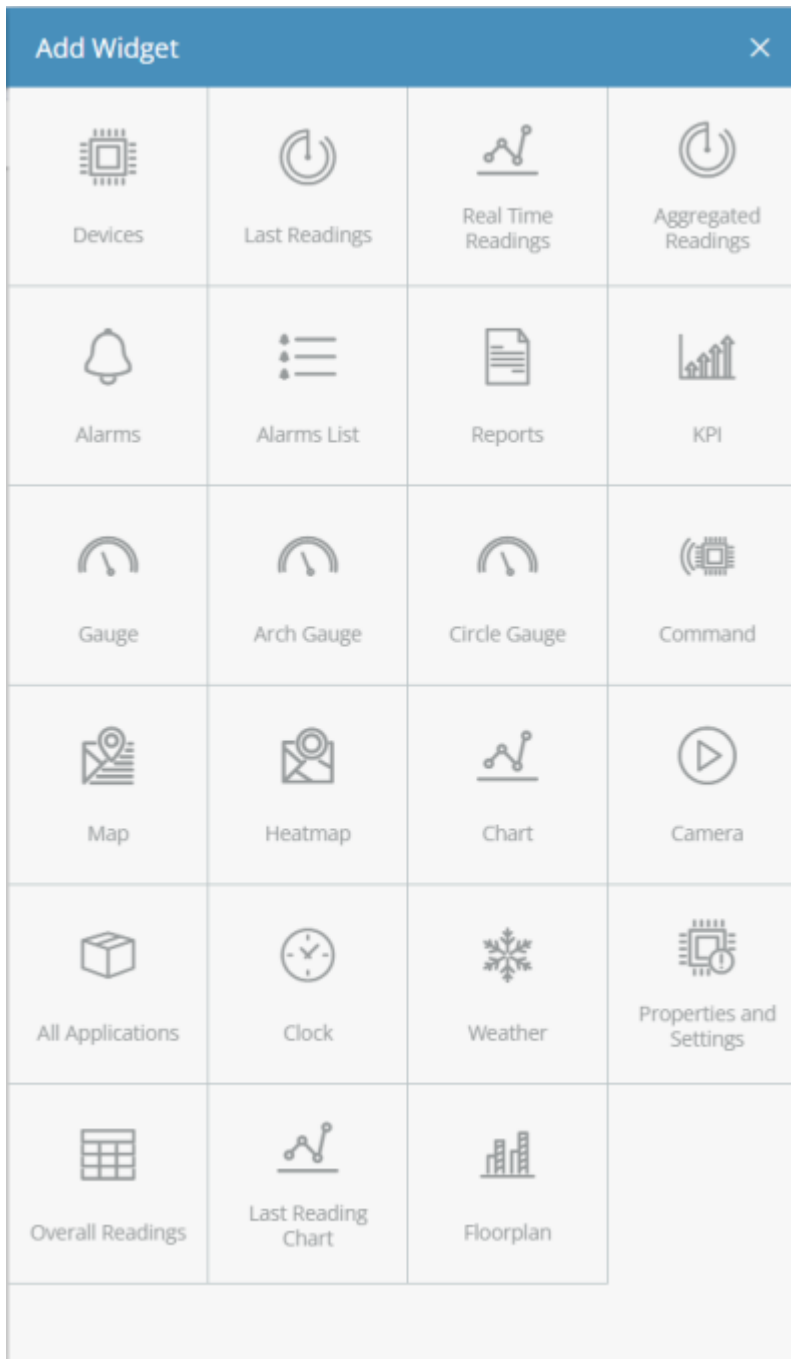
To add a Dashboard followed by widget:

Procedure

1. In the left pane, click **Boards**.
2. Click **New** in the top-right. Fill in the Dashboard name and its color scheme and click **Done**.

Alternatively, open an empty dashboard and click the **Edit** button in the top-right corner. Then click **Add widget**.

The **Add widget** side pane appears:



Each box in this window represents a type of widget that can be added to a Dashboard.

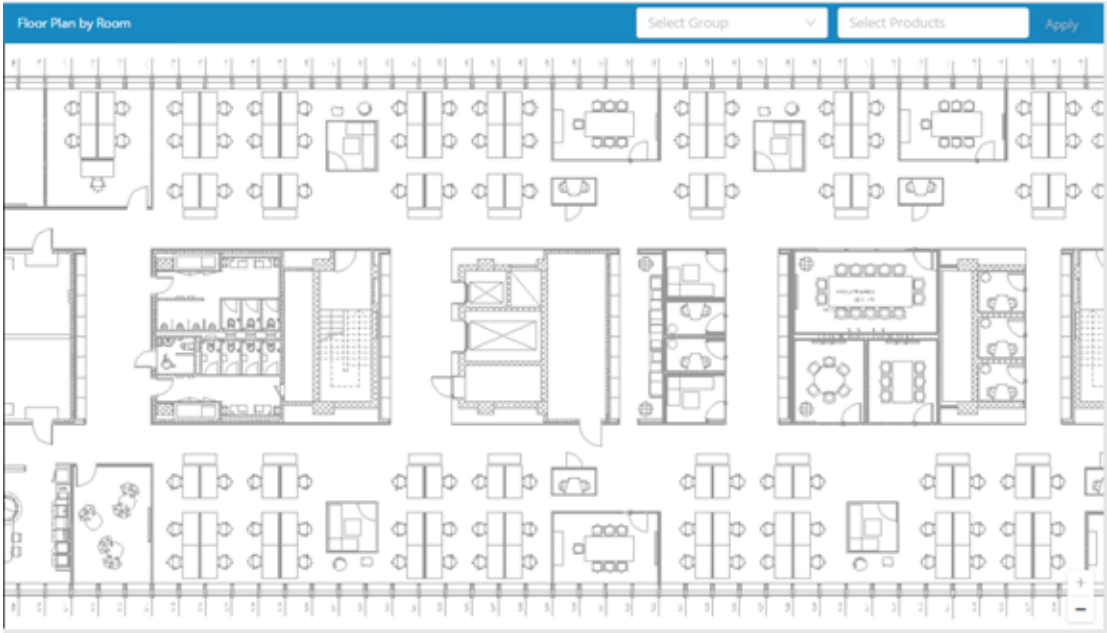
3. Click the box corresponding to the type of widget that you want to add.
4. Define the settings for the widget, and then click **Done** to save the settings. The settings that you specify vary, depending on the type of widget.



For more details about the settings for each widget type, see [Widget Settings](#)

Floor Plan

Displays the diagram of an area (zone, floor, room, etc.) and specific ‘things’ on top of it.



Field	Description
Select Group	Select the group's diagram (room, floor, area, etc.)
Select Products	Select the products that will be shown on the diagram

Configuration

Most widgets feature a number of configuration options such as shown here:

Configure Widget - Heatmap

Title

Widget title

Default View Mode

Application diagram

Group diagram

Groups / Devices

Please select

Clear all

Reading

Time Range

Today

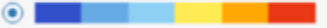
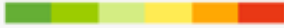
Aggregation Method

Average

Aggregation Times

Hours

Color Schema

☒  ☐ 

Background Color



Add Custom Colors



Text Color



Back

Done

Field

View Mode

Description

Application Diagram – Displays the diagram of the application

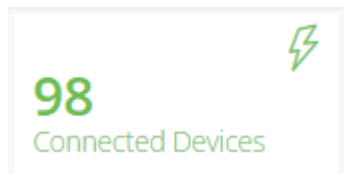
Group Diagram – Displays the diagram of a specific group

Field	Description
Reading	Specifies the Device reading to be included in the widget.
Time Range	Specifies the time range for the data to display in the widget.
Aggregation Method	Specifies the aggregation method to apply to the data (Average, Count, Min, Max).
Aggregation Times	Specifies the interval at which data is aggregated.

Widget Settings

This section describes the settings of various widgets and their configuration options.

Devices Widget



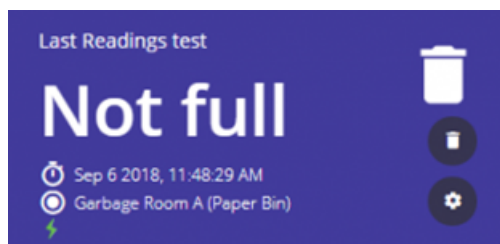
This widget presents all Devices (Things) or connected Devices (Things) for specific Device groups/all Devices.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Type	Specifies the type of Devices to include in the widget. Select either All , Connected Devices or Disconnected Devices .
Groups	Specifies the group(s) to be included in the widget.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme.

Field	Description
	
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Last Readings Widget



This widget shows the last reading value sent from the selected Device for a specified reading type. In addition, it shows the name of the Device, the Product icon (see page 102) and the timestamp sent by the Device in its payload for the reading.

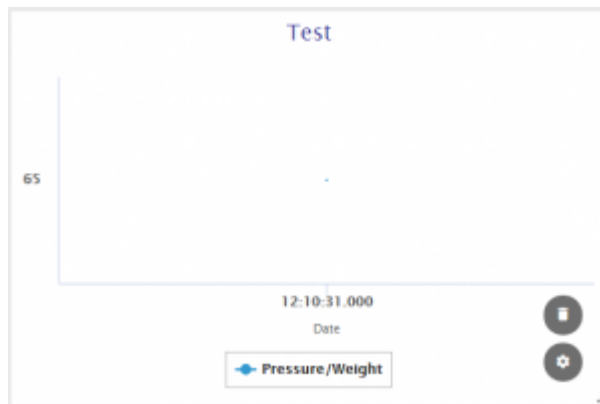
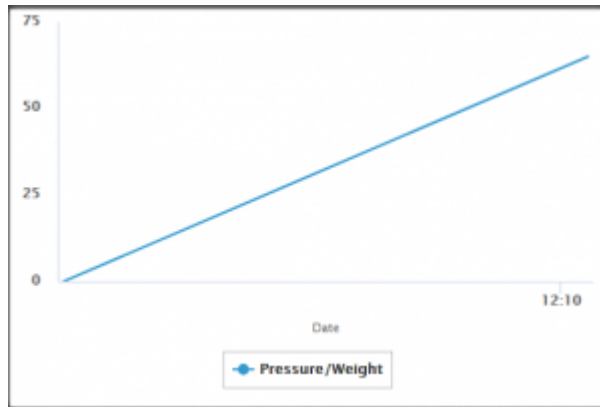
The  icon indicates that the Device is connected.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	The Device to be included in the widget.

Field	Description
Reading	Specifies the Device reading to be included in the widget.
Display connection status	Select this check box to display the device's connection status. Clear this check box if you do not want to display the device's connection status on the widget. You might, for example, turn off the status for a virtual device since by default its status is Disconnected.
Header font size	Specify the font size for headers.
Value font size	Specify the font size for values.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Real Time Readings Widget



This widget shows a line chart for a reading type sent from the selected Device. The chart displays information since the day it was created. The time periods on the X-axis are set automatically based on the frequency at which the Device's readings are sent.

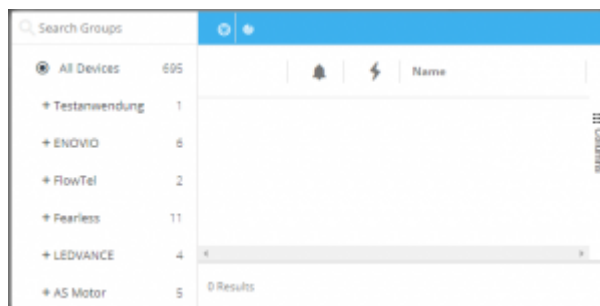
When multiple readings of different Device types are selected to show on a single Chart, additional axes are added with the relevant label and unit.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	The Device to be included in the widget.
Reading	Specifies the Device reading to be included in the widget. These are events that were defined in the Product or events that IoT Platform accepts, even if they were not defined in the Product (for example, color changing, labels, icons and so on. The Reading drop-down list shows all the events that were defined in the

Field	Description
	Product Events tab, plus any other events that were not defined, but that were received from the Device.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme. i Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Aggregated Readings Widget



This widget creates a list of readings for specific Device groups/all Devices. The widget contains both a list of last readings and all readings. All information in the widget is read-only (not editable).

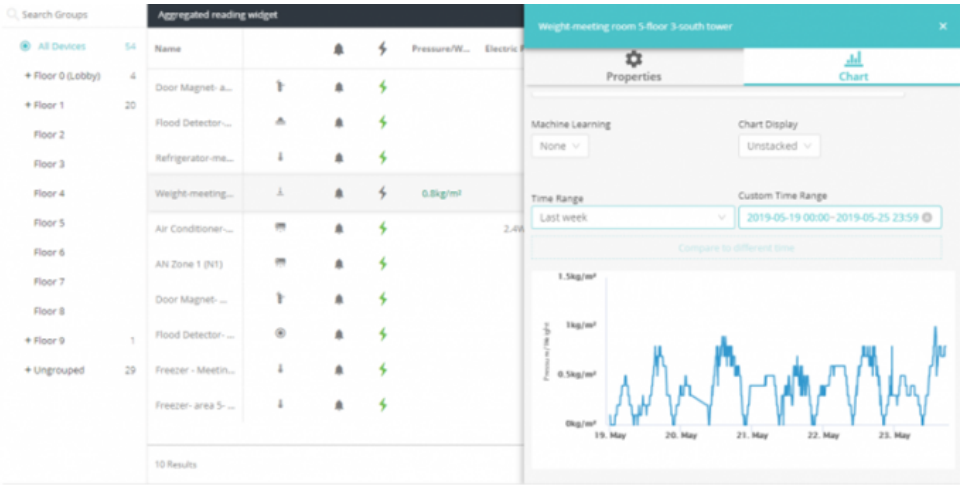
The widget shows the list of Devices in the left pane. The pane on the right presents two views. Click the relevant button to display the associated view –

- **Last Readings View**  – This view shows the last readings for each Device. Each row represents a different Device. For each Device, the reading value is according to the last reading sent by that Device.

Search Groups

All Devices		54		Aggregated reading widget	
Name				Pressure/W...	Electric
Door Magnet: a...					
Flood Detector...					
Refrigerator-me...					
Weight-meeting...				0.8kg/m²	
Air Conditioner...					2.48
AN Zone 1 (N1)					
Door Magnet: ...					
Flood Detector: ...					
Freezer - Meetin...					
Freezer-area 5- ...					
10 Results					

Click a Device row to view the properties and a chart for the associated reading.



- **Readings View**  – This view shows the readings received from Devices. Each row represents a different reading, and specifies the Device from which it was received. A Device may appear in more than one row. The most recent readings display at the top of the list.

Device	Name	Label	Value	Date
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:35:33 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:31:01 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:25:36 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:20:30 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:15:28 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:10:33 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:06:42 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 8:00:39 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 7:55:29 AM
Flood Detector-meetin	DISCONNECT	Status	Disconnected	May 26 2019, 7:50:40 AM

This view displays the following information for each Device reading:

Field	Description
Icon	The icon representing the type of reading sent by the Device.
Device	The name of the Device.
Name	The name of the Event (reading) sent by the Device.
Label	A user-defined name for the Event sent by the Device.
Value	The value of the reading sent by the Device.
Date	The date and time that the reading was sent by the Device.

You can filter the view using the filters at the top of the pane. Click the  button to define a filter.

You can also filter by selecting a group in the tree in the left pane. Only one such filter can be applied at a time.

By default, the time range is from midnight of the previous day until the present time.

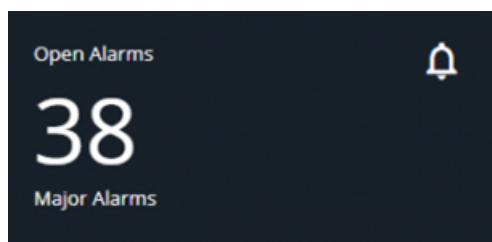
Click the  button to export to a PDF, Excel or CSV file.

Configure the following settings for the widget –

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Show Devices Hierarchy	Check this check box to display the Device hierarchy in the left pane of the widget.
View Groups	When checked, each row represents a different Group of Devices. The Group to which a Device belongs is defined when the Device is created.
Devices	The Devices to be included in the widget.
Readings	Specifies the Device readings to be included in the widget. These are events that were defined in the Product or events that IoT Platform accepts, even if they were not defined in the Product (for example, color changing, labels, icons and so on. The Readings drop-down list shows all the events that were defined in the Product Events tab, plus any other events that were not defined, but that were received from the Device.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic

Field	Description
	By selecting this option, you can specify a range based coloring scheme.
	 Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Alarms Widget



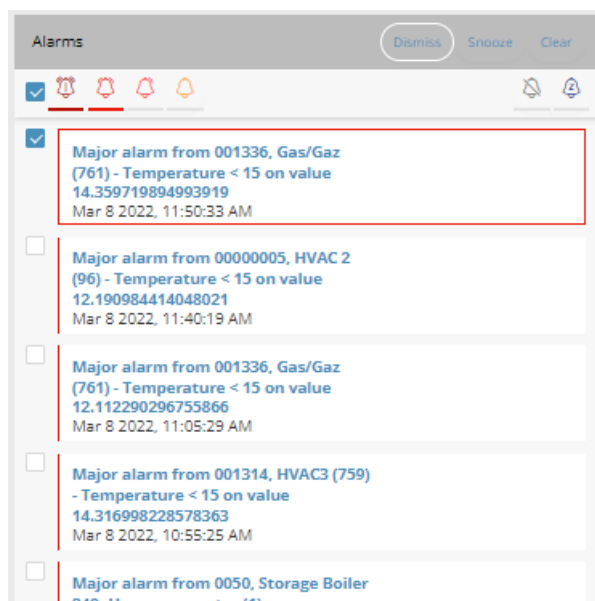
This widget shows a count of the number of Alarms of a given severity for specific Device groups/all Devices. You can also create a separate widget for all open Alarms.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Severity	Specifies the severity of the Alarm (major, minor, critical or warning).
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color.

Field	Description
	Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Alarms List Widget



This widget shows an editable list of all the Alarms triggered by the Devices in the selected Group(s), filtered by alarm severity and time. Alarms that appear in the Alarm list are linked to Events. Pressing an Alarm in the list accesses the Event section with the relevant Alarm selected and its details visible. An Alarm displays in the list each time it is triggered. For example, if an Alarm is triggered 10 times, it appears 10 times in the Alarm list.

The drop-down list at the top right of the widget enables you to specify the timeframe for the Alarms:

- Today
- Last 7 days
- last 30 days
- All
- Custom

The bell icons in the widget enable you filter the Alarm list to specify the severity of the Alarms to display in the widget. A bell with a line beneath it indicates that the alarm severity is selected, which means that it will display in the widget.

- Click the **Dismiss Alarm**  button to display only dismissed alarms.
- Click the **Snooze Alarm**  button to display only snoozed alarms.

 Alarms cannot be deleted in the Alarm list.

When you select the check box for an Alarm in the list, additional option buttons appear at the top right of the widget. These buttons enable you to dismiss an alarm, snooze an alarm or clear an alarm, respectively.

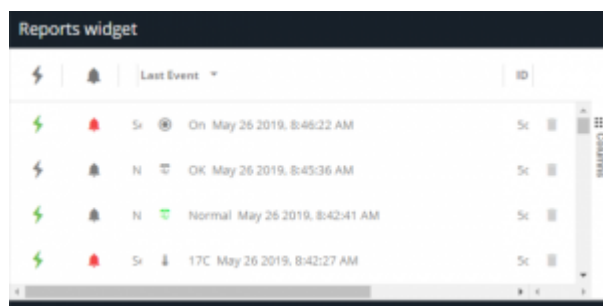
Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Groups	Group(s) of Products to display in the widget.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme.

 Make sure that the range values do not overlap.

Field	Description
Text Color	Select the color of the text to display in the widget (white or black).

Reports Widget



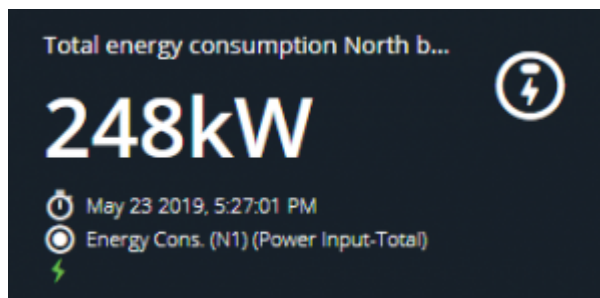
This widget presents a table showing matching report results, based on the specified report query. Only one report can be displayed per widget.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Entity	Specifies the entity to display in the widget, such as Devices, Products, Users and so on.
Reports	Specifies the report to include in the widget. The drop-down menu lists all of the defined reports for the type of entity specified in the Entity field.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring

Field	Description
	scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme.
	 Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

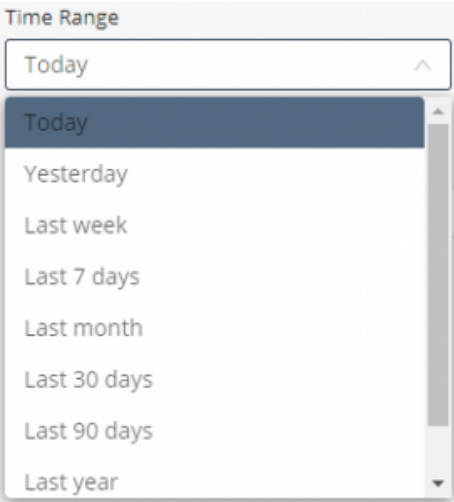
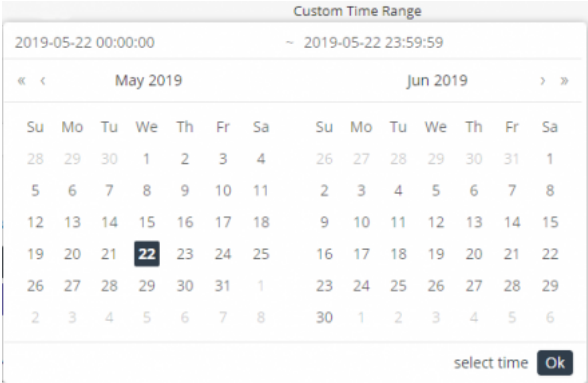
KPI Widget



This widget enables you to perform aggregation on a Device's readings for a specific Device.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	Specifies the Device to display in the widget.
Reading	Specifies the reading for the Device. The drop-down menu lists all of the readings for the Device specified in the Device field.
Display connection status	Select this check box to display the device's connection status. Clear this check box if you do not want to display the device's connection status on the widget.

Field	Description
	You might, for example, turn off the status for a virtual device since by default its status is Disconnected.
Time Range	Specifies the relative time range for the data to display in the widget. 
Custom Time Range	Enables you to define a custom time range for the data to display in the widget. 
Analytics Function	Specifies the function to apply to the data. For telemetric data, you can select from: • Sum • Average • Min • Max

Field	Description
	Count For status data, such as opening or closing a switch, you can only select Count.
Header font size	Specify the font size for headers.
Value font size	Specify the font size for values.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Gauge Widget

Temperature gauge



This widget shows a selected reading in a classic gauge form. You can set the colors for the different ranges of the gauge.

Configure the following settings for the widget - this widget has three tabs:

Field	Description
Readings Tab	
This tab defines the reading to the display in the widget. Define the following settings On this tab	
Device	Specifies the Device whose reading to display in the widget.
Reading	Select the reading to display in the widget.
Display connection status	Select this check box to display the device's connection status. Clear this check box if you do not want to display the device's connection status on the widget. You might, for example, turn off the status for a virtual device since by default its status is Disconnected.
Title	A free-text name for the widget, which displays at the top of the widget.
Gauge Colors	Sets the color for each value range. You can set a range for Red, Green and Yellow. After you set a color for

Field	Description
	a range, its box displays a border in that color, and is not color-filled (for example, ). For example, the example below shows that the 0–20 range will display in green on the gauge, the range of 20–40 will display in yellow and the range of 40–60 will display in red.

0

20

20

40

40

60

Temperature gauge

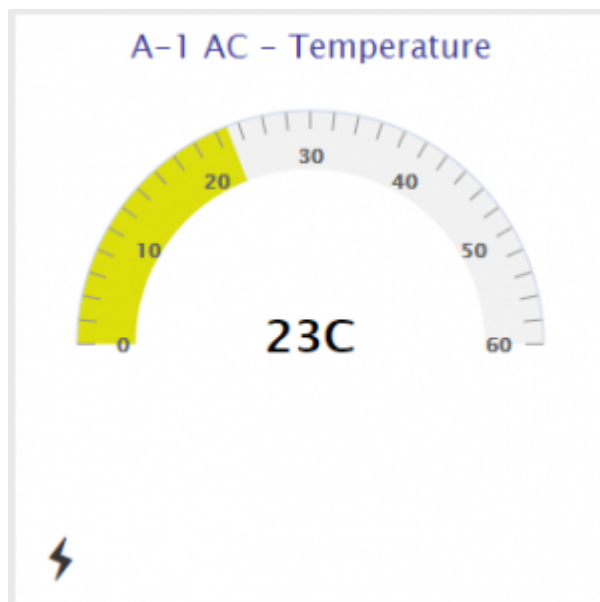


Select the background color to display for the widget. This is the color that will be displayed when you select the **Static** coloring scheme.

Field	Description
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).
Analytics Tab This tab specifies the functions to apply to the selected reading. The settings On this tab are the same as those in the Readings tab, with the following addition:	
Analytics Function	Specifies the function to apply to the reading data. For telemetric data, you can select from: • Sum • Average • Min • Max • Count For status data, such as opening or closing a switch, you can only select Count.
Duration Tab This tab indicates the amount of time that the Device was in the selected status (in hours, minutes or seconds), as specified by the last reading received. For example, how long a door was open or closed. The settings On this tab are the same as those in the Readings tab, with the following additions:	
State	Specifies the name of the value. For example, Disconnected , Connected and

Field	Description
	so on. The drop-down menu shows all possible values of the reading selected in the Reading
Time Format	Specifies whether to count the amount of time that the value was in the specified status in hours, minutes or seconds.

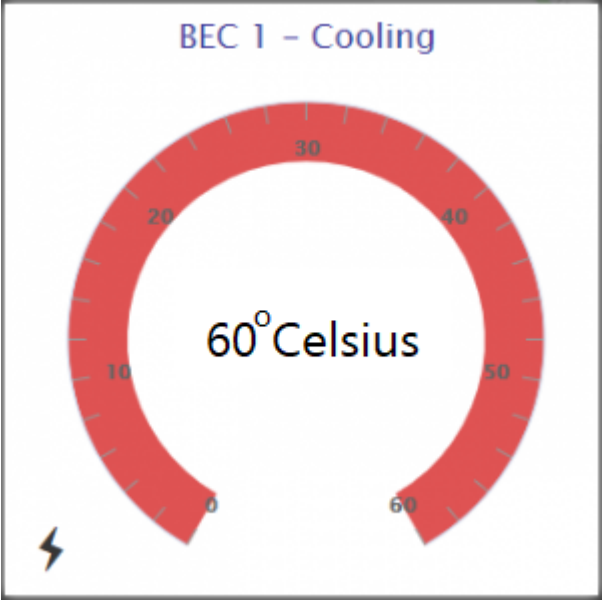
Arch Gauge Widget



This widget shows a selected reading in an arch gauge form. You can set the colors for the different ranges of the gauge.

The settings for this widget are the same as those for the [Gauge Widget](#).

Circle Gauge Widget



This widget shows a selected reading in a circular gauge form. You can set the colors for the different ranges of the gauge.

The settings for this widget are the same as those for the [Gauge Widget](#).

Command Widget



This widget enables you to toggle, use a slider or click a button to activate a command. For example, the sample Command widget above contains two buttons and one slider. A Command widget can contain up to three commands.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	Specifies the Device(s) to display in the widget. The drop-down menu only contains Devices for which one or more commands have been defined in the IoT Platform API.
Display connection status	Select this check box to display the device's connection status.

Field	Description
	Clear this check box if you do not want to display the device's connection status on the widget. You might, for example, turn off the status for a virtual device since by default its status is Disconnected.
Commands	Specifies the command(s) to include in the widget. The drop-down menu lists all of the commands for the Device specified in the Device field.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme. i Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Maps Widget

This widget creates a map showing Device locations for a specific device, device group or all devices.

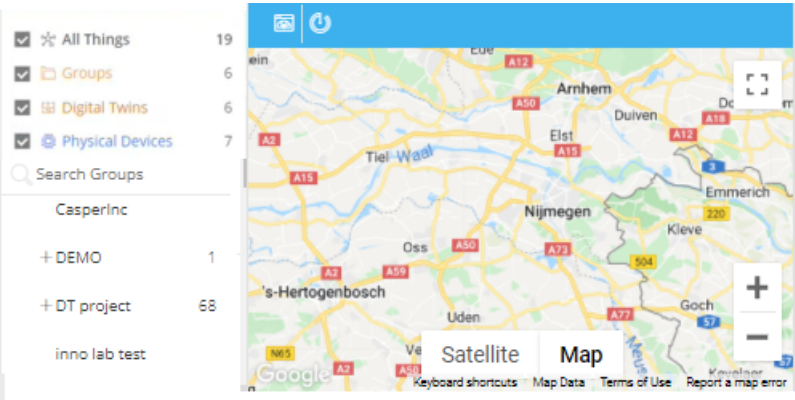
The map is searchable and can be filtered by Alarms, but also by type of device, either:

- All things

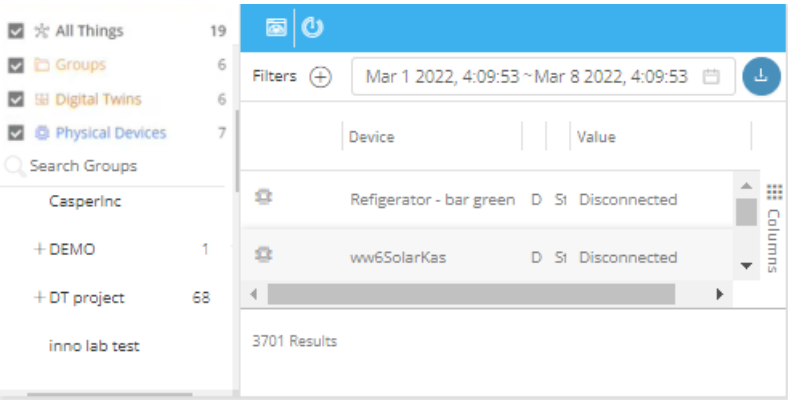
- Groups
- Digital twins
- Physical devices

You can toggle the map view to display either the **Last readings** () or all **Readings** ()

Click  to display the last readings of the selected Device(s), along with the map.



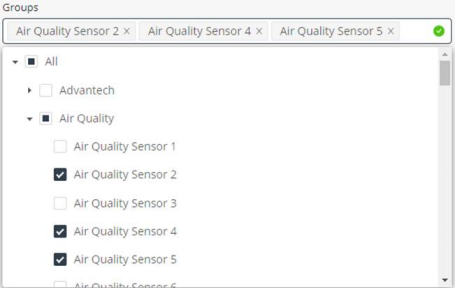
Click  to display all readings, without the map.



The default map focus is set according to the default country code set for the Application. You can switch between Google’s satellite map and Google’s street view map.

Configure the following settings for the widget –

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.

Field	Description
Show Devices Hierarchy	Select this check box to display the Device hierarchy in the left pane of the widget.
Groups	Specifies the Device groups to display on the map. When the Show Devices Hierarchy check box is selected (see above), the list displays Device groups. You can drill down within a group to select a specific Device(s). You can only select a single group or a single Device. 
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.

Field	Description
Text Color	Select the color of the text to display in the widget (white or black).

Heatmap Widget



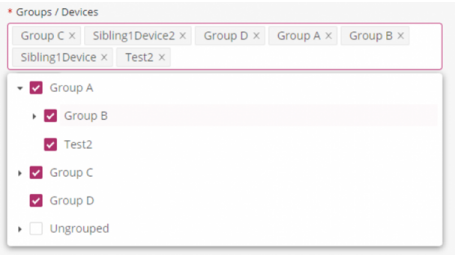
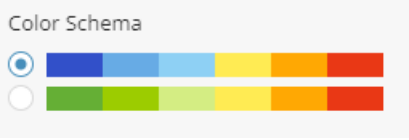
This widget graphically represents readings data on a diagram, where the individual values are represented as colors. The heatmap provides a relative representation of the quantity of values of a certain reading. The diagram to display in the heatmap can be defined per application or per Group. The diagram itself can be a blueprint of a floor, a building, an area and so on, or another image of your choice. This widget can present data for Groups (of Devices) or one or more selected Devices. Devices that do not have relevant data are not shown in the heatmap. The lowest reading values are shown in blue and green on the heatmap.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Default View Mode	Specifies the diagram to use for the heatmap. Click Application Diagram to display the diagram for the Application, or click Group Diagram to display the diagram for the Group.
Groups/Devices	Specifies the Groups or Devices(s) to display in the widget. It is possible to specify multiple devices or multiple groups. When using the “group diagram” option and multiple groups are selected, the diagram will be taken from the first group selected (In the attached screenshot, the diagram from Group C will be used).

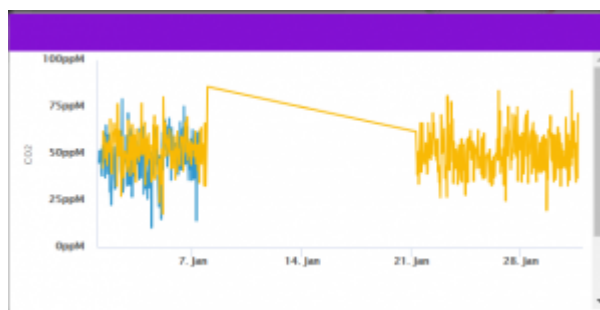


The Application diagram is defined in the [Settings](#).

Field	Description
	All further devices will then be set on that diagram. 
Reading	Specifies the reading for the Device(s). The drop-down menu lists all of the readings for the Device(s) specified in the Group/Devices field.
Time Range	Specifies the time range for the data in the widget: • Today • Yesterday • Last week • Last 7 days • Last month • Last 30 days
Aggregation Method	Specifies the aggregation method to apply to the data: • None • Average • Count • Min • Max
Aggregation Times	Specifies the interval at which data is aggregated.
Color Schema	Indicates whether cold temperatures are to be represented by blue or green. 

Field	Description
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme. i Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Chart Widget

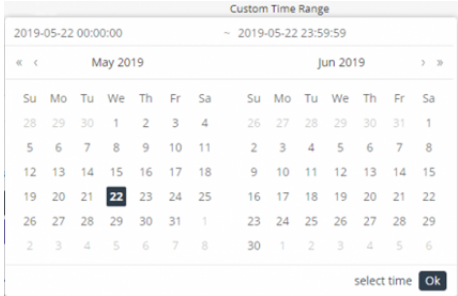


This widget creates a chart for one or more reading types sent from a selected Device. Choose the Chart type, value type (min, max, sum and so on) and the time gaps between periods on the X-axis. The Chart displays the information for the time period configured, which can be either a defined period (last week, last year) or specific dates.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	Specifies the Device(s) to display in the widget.
Chart Type	Specifies the type of chart to display in the widget: • Line chart • Smooth chart • Column chart • Area chart • Pie chart • Scatter chart • Heatmap
Aggregation Method	Specifies the aggregation method to apply to the data: • None • Sum • Average • Count • Min • Max • Duration
Aggregation Times	Specifies the interval at which data is aggregated.
Readings	Specifies the reading(s) for the Device. The drop-down menu lists all of the readings for the Device specified in the Device field. You can also add readings from different devices by using the Compare to option.
Machine Learning	Enables you to forecast or predict the readings in the next time period based on algorithmic calculations.

Field	Description
	Different algorithms are used for the Forecast Linear and Forecast Quadratic.
Define a Y-axis range by reading	Per available device readings, you can specify a minimum and maximum value for the respective Y-axis. This feature enables you to more easily compare different readings in the same chart. In the following example, both Y-axes show a custom range: - Min = 20 - Max = 60 
Chart Display	Specifies the type of Chart to display: - Unstacked - Stacked - Shared
Time Range	Specifies the time range for the data in the widget: - Today - Yesterday - Last week - Last 7 days - Last month - Last 30 days

Field	Description
Custom Time Range	Enables you to define a custom time range for the data to display in the chart. 
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Camera Widget

This widget displays the video input/video stream for a Device that is a camera.


To define a Device as a camera, see [How to connect Cameras to IoT Platform](#) .

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	Specifies the Device(s) to display in the widget. The drop-down menu only includes those Devices that are cameras.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

How to connect Cameras to IoT Platform

IoT Platform supports connect live stream of Cameras to the system, both as a widget and in the device media tab.

Adding a Camera can be done currently only by using the API.

Procedure

1. Create a product that is specific for your cameras.
2. Define the mediaSettings property, which has the following properties

Attribute	Value
mediaProtocol	The type of media streaming protocol, as follows: • 0 - None • 1 - RTMP • 2 - RTSP
mediaType	• 0 - Unknown • 1 - Video
aspectRatio	Not currently supported.

Example

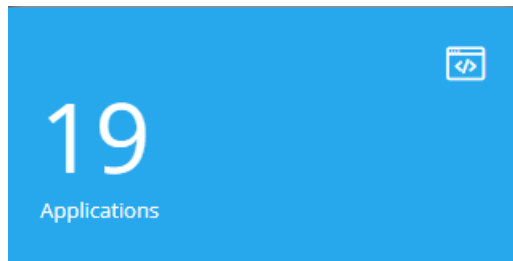
```
"mediaSettings": { "mediaProtocol": "RTMP", "mediaType": "Video", "aspectRatio": null }
```

3. Define the stream URL per device (Camera).

Each device has a streamUrl property that indicates from to take the live stream. For Example - "streamUrl": "rtmp://1234.com/live/1234".

Now you can go to the device and you will see a new media tab.

All Applications Widget



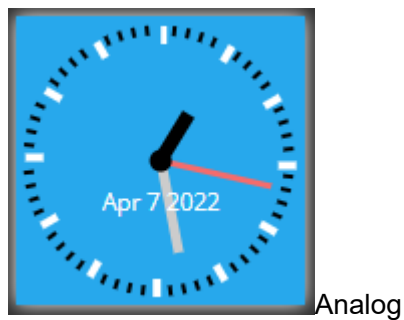
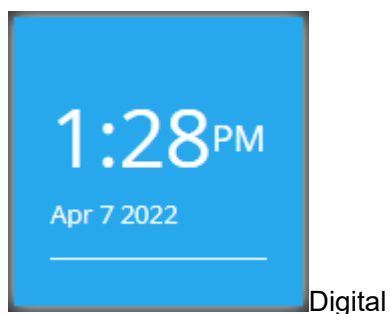
This widget displays the number of Applications under the Tenant of that master Application. This widget that is only available for master Applications.

Configure the following settings for the widget:

Field	Description
Text Color	Select the color of the text to display in the widget (white or black).
Background Color	Select the background color to display for the widget. This is the color that

Field	Description
	will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Clock Widget



This widget creates a digital or analog clock by time zone.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Type	Specifies the type of clock: - Analog - Digital
24	When this check box is selected, indicates that the clock is a 24-hour clock instead of a 12-hour clock. This setting only applies when you specify Digital in the Type field.
Timezone	Specifies the time zone for the widget.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Weather Widget



This widget displays the daily weather, humidity and wind speed by location.
Configure the following settings for the widget:

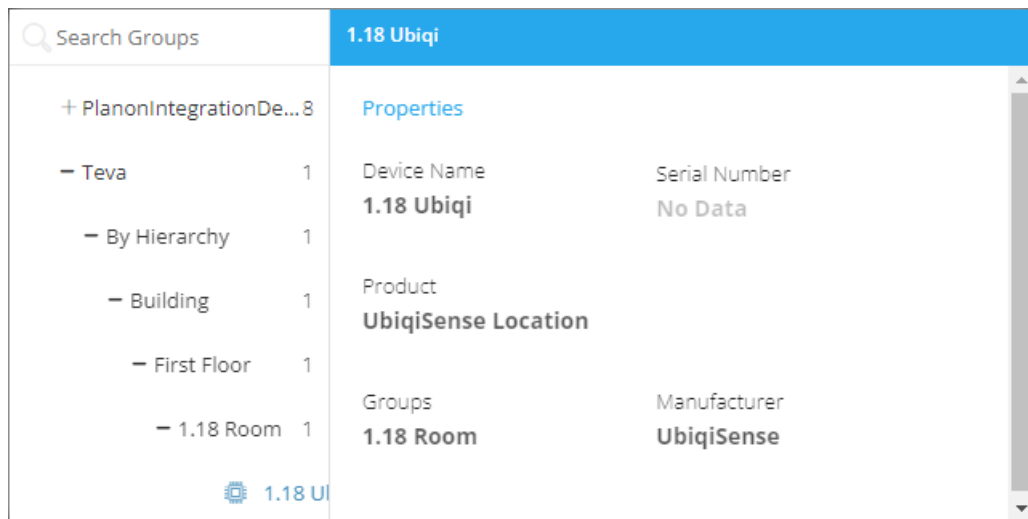
Field	Description
Location	Specifies the location for the widget. To select the proper value, start typing the name of your city and select it from the list once it appears.
Main Background	Select the background color (main pane) to display for the widget.
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.



Make sure that the range values do not overlap.

Field	Description
Second Tile	When this check box is selected , the widget displays two panes instead of one. You can define the background color for each pane separately.
Clock	Click this button for the widget to display the time.
Detailed Weather	Click this button for the widget to display detailed weather information (including humidity and wind speed).
Timezone	Specifies the time zone for the widget.
Second Tile Background Color	When the Second Tile check box is selected, specify the background color for the widget's second (right) pane.
Add Custom Colors	When the Second Tile check box is selected, specify the custom color to use for the widget's second (right) pane here.

Properties and Settings Widget



This widget displays the properties and settings for a Device. All data displayed in the widget is read-only. Properties are static values on a Device. Settings are synchronized between the digital device in IoT Platform and the physical device itself, and affect the device itself (like a command).

When specifying more than one Device, the widget displays a tree structure in the left pane. To view the properties and settings for a specific Device, simply select it in the tree in the left pane.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Devices	Specifies the Device(s) to display in the widget.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: • Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Overall Readings Widget

This widget displays the number of Devices of a specific Product type and its Events (readings).

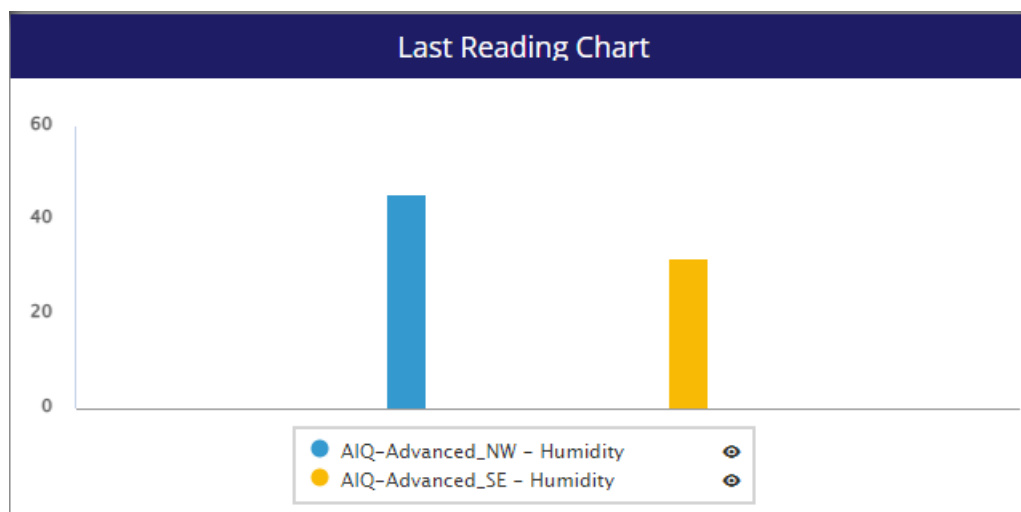
Overall Readings Widget							
10.1 regular Power	Overall display SOil	Overall display n/woroso	Overall display Power	Overall Widget2 someevent	Overall Widget2 Oxygen	Overall Widget2 test	Overall Widget test
No Data	No Data	No Data	No Data	1 Devices	1 Devices	1 Devices	2 Devices
No Data	No Data	No Data	No Data	1 Devices	1 Devices	1 Devices	2 Devices
No Data	No Data	2 Devices	No Data	No Data	No Data	No Data	No Data
No Data	No Data	2 Devices	No Data	No Data	No Data	No Data	1 Devices

Configure the following settings for the widget:

Field	Description
Group	Specify the Group of Products to display in the widget.
Product	Select the Product to include in the widget in the drop-down menu.
Readings	Specify the Event whose readings you want to display in the widget.
	An Event must already exist to be specified here.
Add Product (optional)	Click the Add Product button to add another Product to the widget. You must also specify the Event whose readings you want to report for this Product in the adjacent Readings . You can add an unlimited number of Products to the widget.
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme.
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring

Field	Description
	scheme selected as Background color. • Dynamic By selecting this option, you can specify a range based coloring scheme. i Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Last Reading Chart Widget



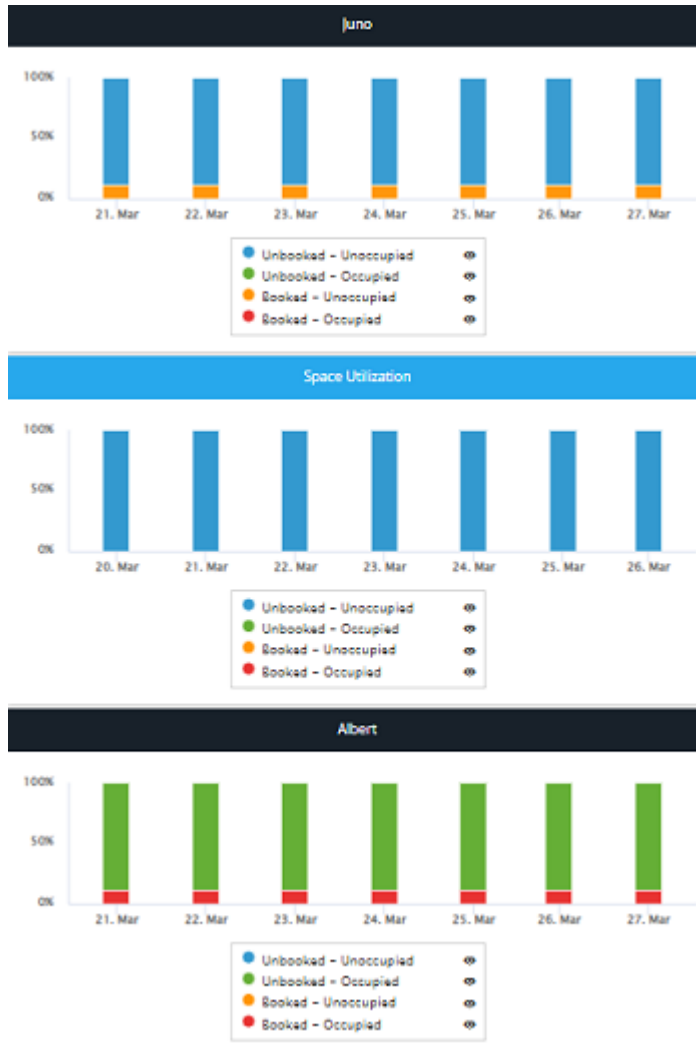
This widget shows the latest value from multiple readings on a chart.

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Device	Choose a device.
Reading	Choose a numeric reading from that device.
Add device	Add as many devices as you need.
Background Color	Select the background color to display for the widget. This is the color that

Field	Description
	will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.
Text Color	Select the color of the text to display in the widget (white or black).

Space Utilization Widget



This widget aggregates data from occupancy sensors and a booking system, returning the percent of time the sensor is in one of four statuses:

- Space is booked and occupied
- Space is booked and unoccupied
- Space is unbooked and unoccupied
- Space is unbooked and occupied

Configure the following settings for the widget:

Field	Description
Title	A free-text name for the widget, which displays at the top of the widget.
Space	Choose a space which has a calendar defined, this can be a device or a digital twin.

Field	Description
Time Range	Choose the time range to aggregate, options are preset but dynamic.
Aggregation Times	Choose the aggregation bucket to roll up to, these options change based on the time range selected.
Timezone	The time zone where the space is
Readings	Indicate which of the 4 statuses should be displayed
Work Days	Indicate which days of the weeks should be included in the aggregation. This is relevant as usually the utilization over weekend is just white noise.
Start Time/End Time	Indicate which hours of the day should be included in the aggregation. This is relevant as usually the utilization at night is not as relevant
Background Color	Select the background color to display for the widget. This is the color that will be displayed when you select the Static coloring scheme. 
Coloring	Here you can choose between: Static By selecting this option, you will apply the fixed coloring scheme selected as Background color. Dynamic By selecting this option, you can specify a range based coloring scheme.  Make sure that the range values do not overlap.

Field	Description
Text Color	Select the color of the text to display in the widget (white or black).

Viewing Widget Data

After a widget has been added to a Dashboard, the widget's Event readings are automatically reported and display in the widget.

The widget automatically displays the latest Event readings. All Event readings that meet the criteria defined for the widget are included, regardless of when received.

Each Product-Event combination is represented in a separate column in the widget.

	Overall Readings Widget					
Product Name Event Name	10.1 regular Temperature	10.1 regular eden	10.1 regular Power	ADI PRODUCT FIRE	ADI PRODUCT Rorman	eden product Temp
Event Reading	No Data	★1	1 1 0	0 2	0 0	0 0 1 0
Number of Devices		2 Devices	2 Devices	2 Devices	2 Devices	2 Devices

- The first row of the widget shows the Product name
- The second row shows the Event name
- The third row shows the actual Event reading.

The icons and labels in this row are based on the Event definition in the Product.

- The fourth row shows the number of Devices of the specified Product type that reported Event readings with the specified value or value range.

Events for which no data was ever received show 0, and are grayed out.



You can hover over an Event reading to see the value or value range for that reading.



Event readings in the widget display based on the Event definition in the Product. For example, the icons and colors of the reported Event readings are defined in the **Events** tab for the Product, as shown below.

These attributes can be defined for one or more value ranges.

The screenshot shows the 'Yanzi Comfort' configuration window with the 'Events' tab selected. The window has a dark blue header with a close button. Below the header are four tabs: 'General', 'Events' (selected), 'Properties', and 'Advanced'. A 'Back' button is located at the top right of the main content area. The main content area is divided into two sections. The first section contains a 'Precision' input field with the value '1' and an 'Accumulated' toggle switch that is currently turned off. The second section is titled 'Event Data' and contains two dropdown menus: 'Data Type' set to 'Double' and 'Logical Type' set to 'Range'. Below these are three rows of configuration for value ranges. Each row has four columns: '* Range Minimum', '* Range Maximum', 'Icon', and 'Color'. The first row has values 0.0, 25.0, a blue icon, and a blue circle. The second row has values 25.0, 29.0, a yellow icon, and a yellow circle. The third row has values 29.0, 60.0, a red icon, and a red circle. Each row also has a trash icon to its right. At the bottom left of the 'Event Data' section is an 'Add Value' button with a plus icon. At the bottom right of the window are 'Cancel Changes' and 'Done' buttons.

Utilization Dashboards

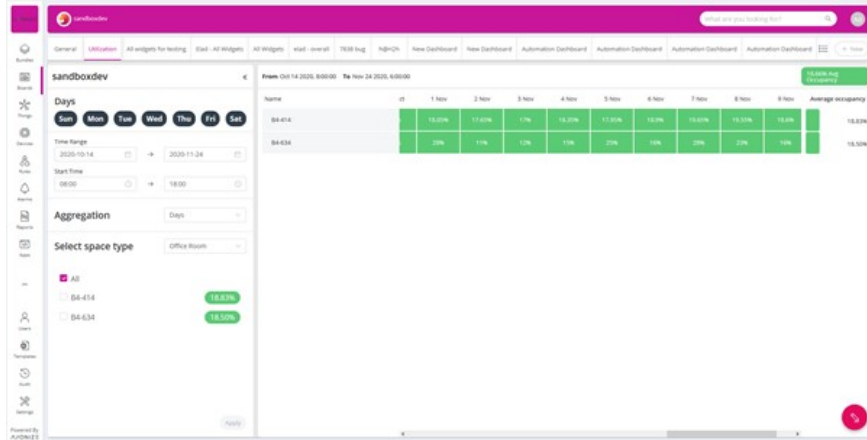
This section describes the Utilization functionality.

Utilization Widget

In order to create a utilization dashboard, proceed as follows:

Procedure

1. Go to the boards section and press the **+ New** button on the right side of the ribbon.
A dashboard panel in which you can make a selection slides in from the top.
2. Select **New utilization dashboard**.
This will automatically create and open a new dashboard



All the configurations are done on the left side of the screen. Once the **Apply** button is clicked, the configurations are saved and the dashboard is recalculated. The dashboard will aggregate readings with type code 44 – “Utilization”

The configuration options are as follows:

Field	Description
Days	Selecting which days of the week are relevant for the dashboard enables you to remove weekends or to look at specific days of the week.
Time Range	Select the dates from which to bring data.
Start Time	Select the work hours. Since utilization will usually be almost zero after the standard organization working hours, it is useful to filter out the hours in which when you expect the utilization to be zero.
Aggregation	Select between Hours, Days, Weeks, Months and Weekdays regarding how you would like to roll up the data. For each bucket, the utilization will be averaged.

Aggregation

Select space type

Days
Hours
Days
Weeks
Months
Weekdays

Field	Description
Select Space Type	The system will automatically detect all group templates which have a utilization event defined, and will let you select between the two, displaying all instances of that group template in the grid. If a group template has multiple events with type code 44 – “Utilization,” an additional drop-down will let you choose between them.

Once the options have been selected, and the **Apply** button clicked, the system will display all the things with a utilization average in each box.

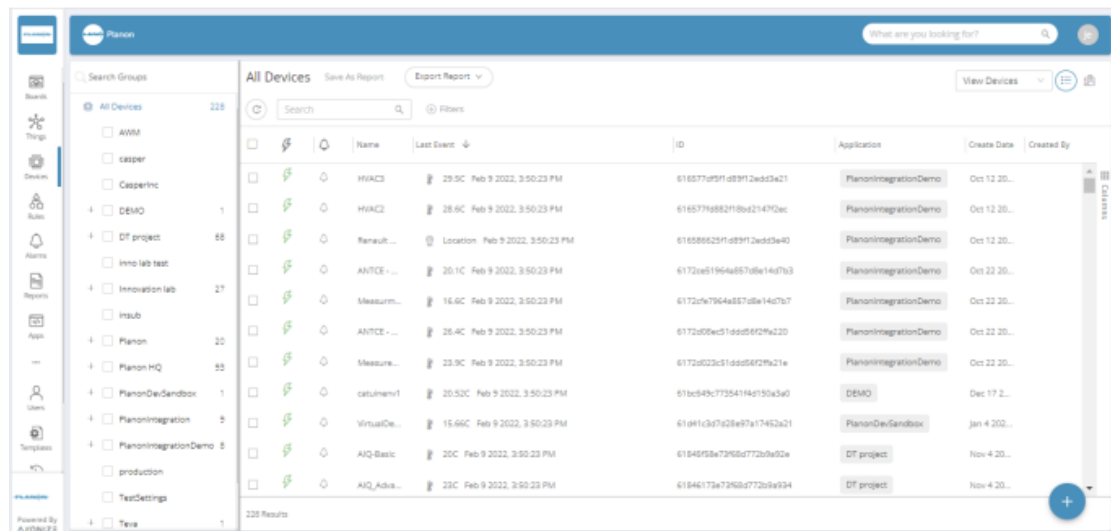
 You can sort the grid by Thing name (by clicking on **Name** in the grid,) or by utilization percent (by clicking on **Average occupancy** in the grid.)

Devices

A Device is a connected external entity from which IoT Platform receives events.

A Device is a specific instance of a [Product](#), such as a specific elevator, car, lock, sensor with its own serial number, etc. A Device can even be a person.

Different procedures are required for handling [Real Devices](#) and [Virtual Devices](#).



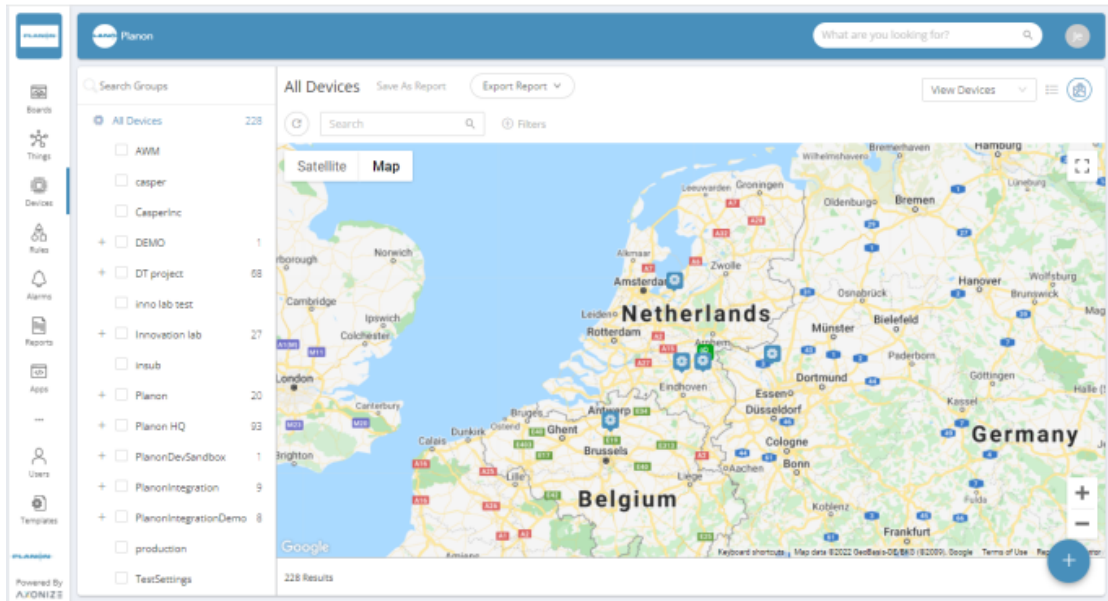
1.

Click the **List View**  button at the top right of the window to display the Device view in a standard list format, (as shown above).

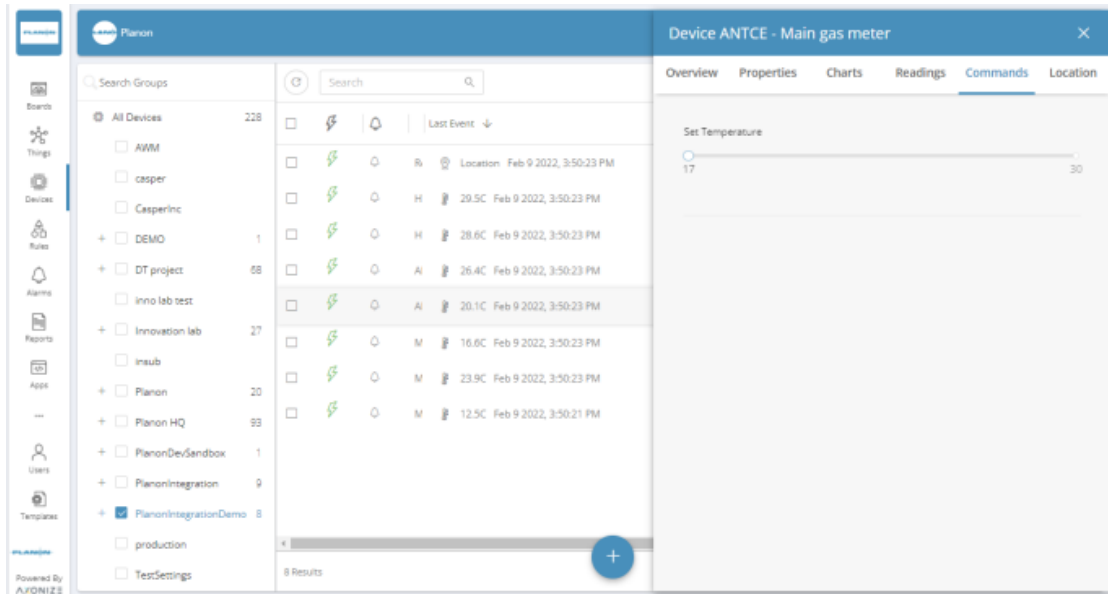
2.



Click the **Map View** button to display Devices based on their location on a map or diagram, as shown in the following image:



The **Device** tab is only available for Devices under a Product for which the Command property has been set.

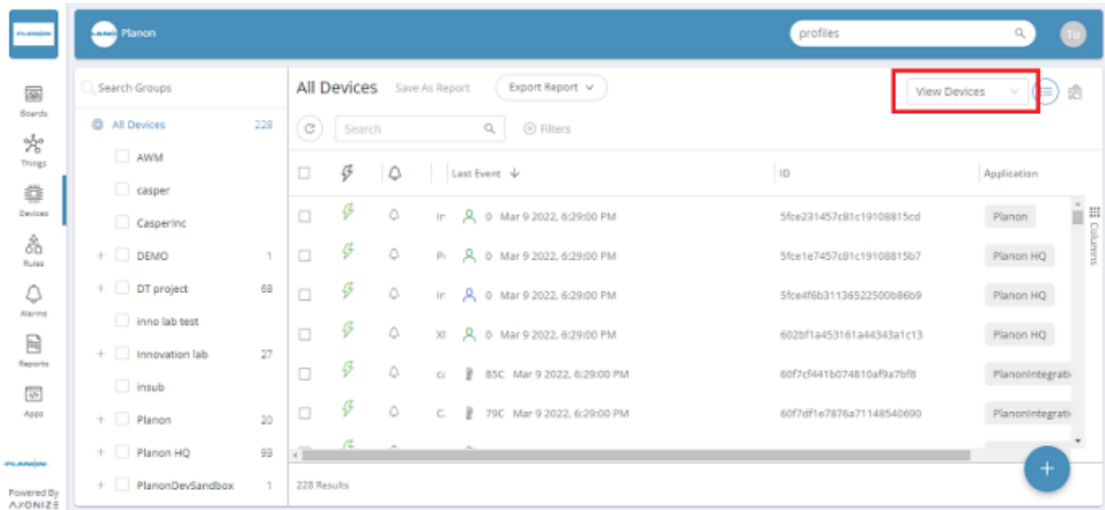


Viewing Device and Group Details

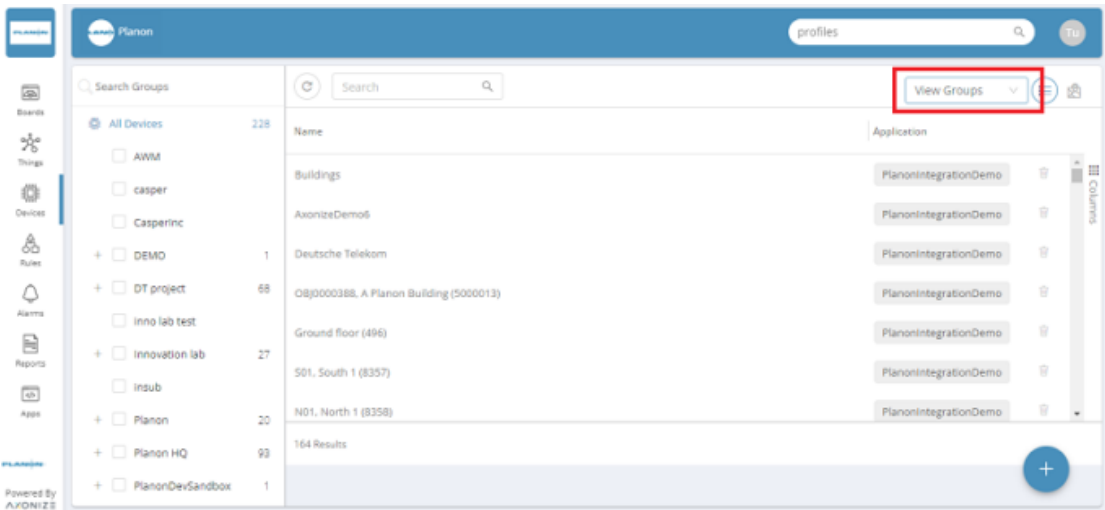
In the IoT Platform Portal, the Devices view enables you to manage the Devices in the system.

In the Devices view, you can choose to view either the Device list or the Device Group list by selecting the relevant option at the top right of the window.

When you select **View Devices**, each row in the device list represents a different Device.



When you select **View Groups**, each row represents a different Group of Devices. The Group to which a Device belongs is defined when the Device is created.



To view Device details –

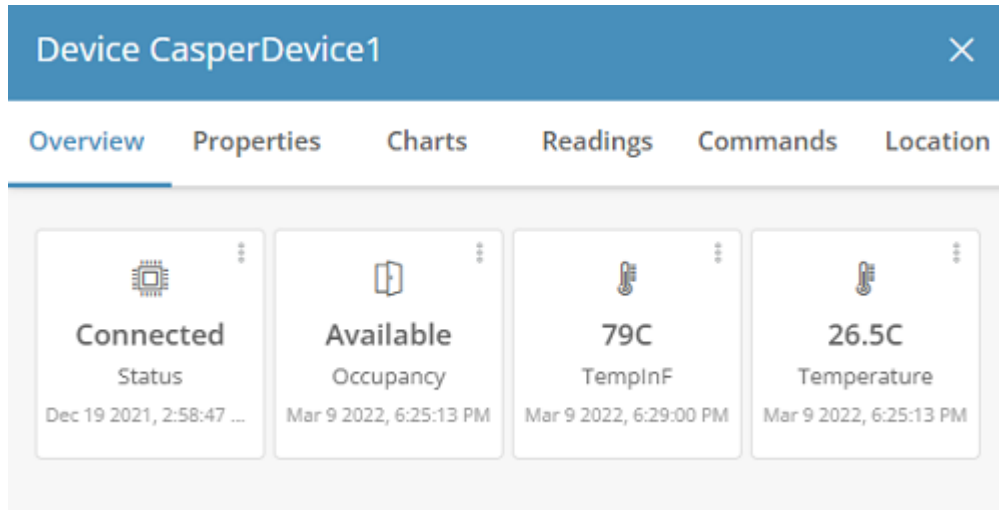
1.



In the left pane, click the  button to display the Device list.

2.

In the Device list, click anywhere in a Device row to view that Device's details. The following window displays, showing the details for the selected Device.



This window provides the following tabs:

- **Overview**
- **Properties**
- **Charts**
- **Readings**
- **Location**

 Devices that support commands will also have a Commands tab, devices used to connect to booking systems will also have a Calendar tab available, Command to which a Firmware can be updated will also have a Firmware tab available).

Overview Tab

The **Overview** tab (shown above) displays the name of the last reading, and its value, timestamp and icon (as defined in the [Product](#)).

Properties Tab

The **Properties** tab displays the following information for the Device.

Device Device1

Overview
Properties
Charts
Readings
Commands
Location

Device Info

Device Activation

☒

Device Name

Device1

Product manufacturer

Casper Inc

Product Type

Casper

Groups

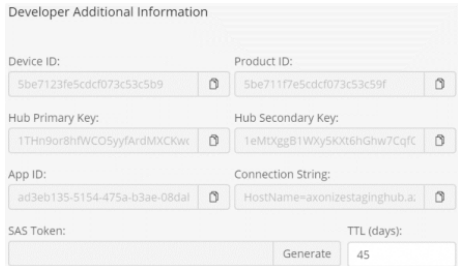
Floor1Room1 x

44047, De Lusthof Maastricht (b41189a3-eacb-450e-a152-7682e8fef2f7) x

Cancel Changes

Save

Field	Description
Device Activation	Toggles to activate/deactivate the Device. This slider is only relevant for Virtual Devices .
Device Name	The name of the Device.
Serial Number	The serial number assigned to the Device by the customer.
Product Manufacturer	The name of the manufacturer of the Product to which the Device belongs.
Product Type	The Product type assigned to the Device. All Devices with a given Product type have the same properties.
Groups	The name of the group(s) to which the Device belongs.
Additional properties	If defined in the Product.

Field	Description
Developer Additional Information	Displays additional developer details for the Device. Information only displays in this area if Developer mode is enabled on the Product. To enable Developer mode, see Defining a Product. 

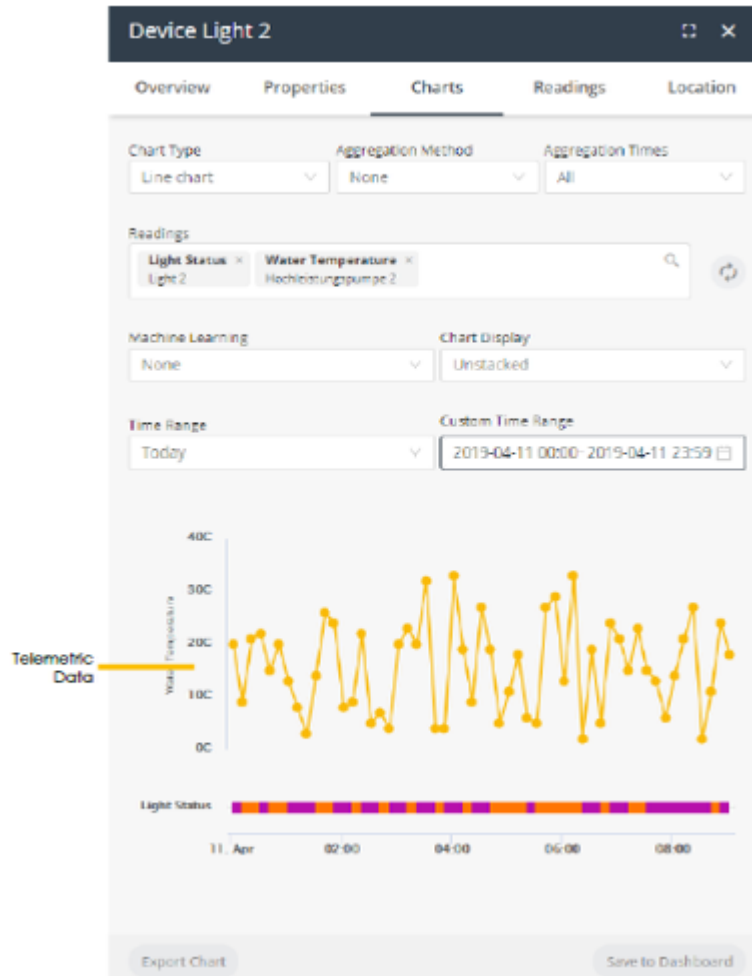
Charts Tab

The **Charts** tab enables you to visualize the data collected by IoT Platform for the Device.

You can display multiple readings in the same Chart (from the same device or different devices), in order to better understand the relationship between the data series.

For example, how humidity affects temperature or how power consumption affects a device's temperature or compare power consumption of 2 different devices.

You can create a Chart whenever you want to graphically present Device data and/or for further analysis.



A Chart presents telemetric readings data in a graph, as shown above. Telemetric data includes data whose logical type is **None**, **Range** or **Allowed Values** (State), as defined for the Product (see [Defining a Product](#)). For example, temperature readings.

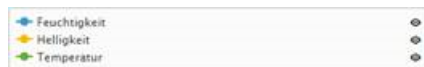
In addition, a Chart presents status data as a color-coded bar(s) beneath the chart. Chart data includes data whose logical type is **Allowed Values**, as defined for the Product (see [Defining a Product](#)). For example, a Device that is **Connected** or **Disconnected**.

Charts that include an instantaneous event show the data for that event below the graph. Instantaneous events do not have values. Each time that the instantaneous event occurred is represented by a colored diamond. For example, the chart below shows two instantaneous events – Help and Help2.



Chart Legend

A color-coded legend displays at the bottom of the window. Each series in the Chart displays in a different color.

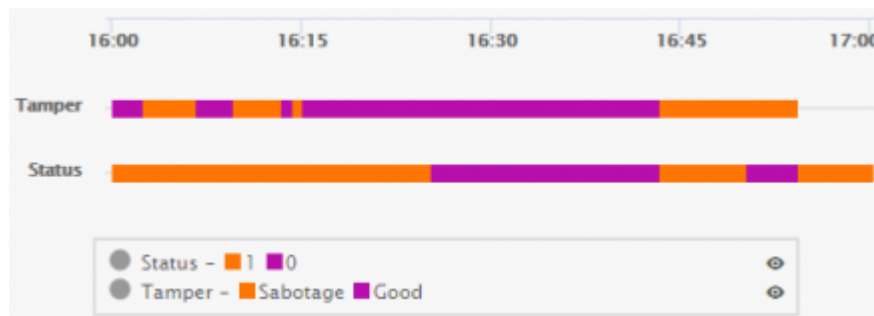


You can hover over a series in the legend to display only that series in the Chart.

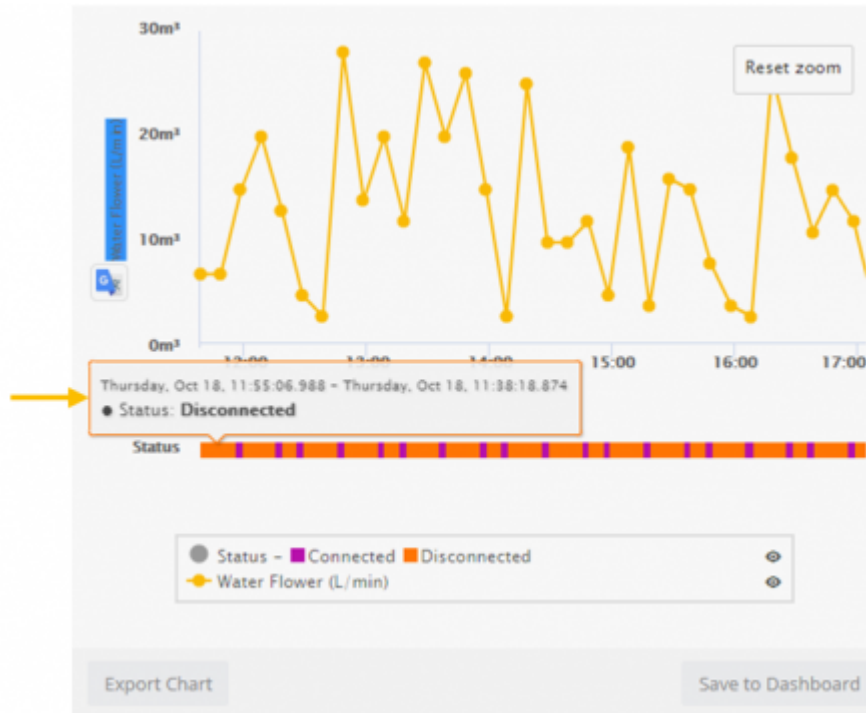
In the legend, you can click the  button in a series row to remove that series from the Chart.

For state-related data (see [Defining a Product](#)), each value in the color-coded bar for a reading is represented by a different color. The same scale applies for both telemetric data and the status data in the color-coded bar.

For example, the example below shows two types of status-related readings – one for Status and one for Tamper.



You can hover over a value in a color-coded bar to see more details about that value.



Charts can also be saved to a Dashboard (if one exists) or can be exported in various file formats.

To create a Chart, you specify the following information for it –

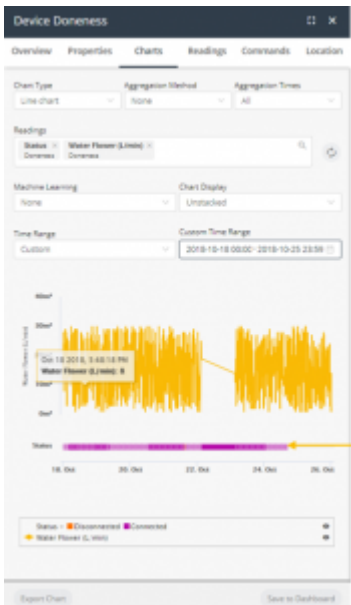
Note – Currently, Chart definitions cannot be saved for reuse.

Field	Description
Chart Type	Specifies the type of Chart to be created. The following chart types are available: • Line chart • Smooth chart • Column chart • Area chart • Pier chart • Scatter chart • Heatmap
Aggregation Method	Specifies the method used to aggregate data in a series. • None means that no method is applied to the data, so that

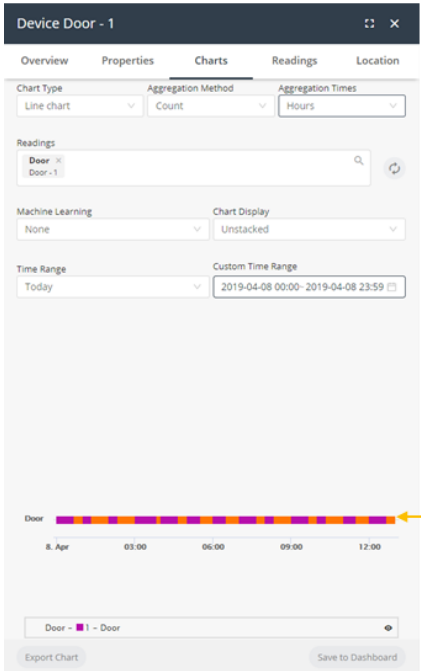
Field	Description
	only raw data is returned. Duration means that data is aggregated based on how long the device was in a specific state. The data represents the total time that a device or product was in each state. Data is then aggregated based on each state.
	Aggregation Method None None Sum Average Count Min Max Duration
	Note that aggregation methods typically do not apply to status data, as described below When the Aggregation Method is None, status data displays in a color-coded bar beneath the Chart instead of in the Chart itself.

Field

Description



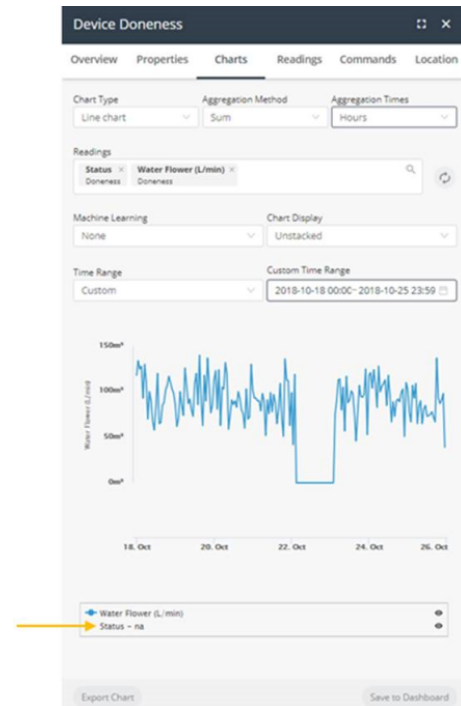
When the **Aggregation Method** is **Count**, then status data displays in a color coded bar beneath the Chart. This is the only case where results using an aggregation method display in the color-coded bar, instead of the Chart.



Field

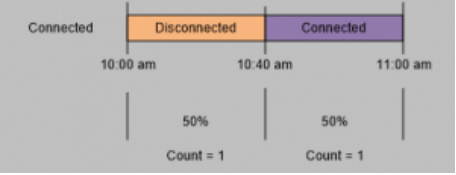
Description

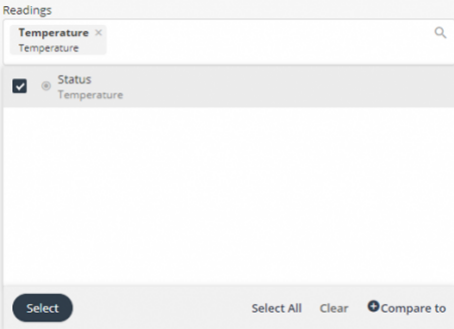
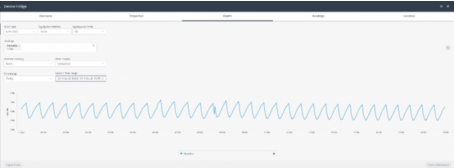
When the **Aggregation Method** is any value other than **None** or **Count**, such as **Sum**, **Average** and so on, then status data for the reading does not display in the color#coded bar beneath the chart, and instead shows **na** next to its reading in the legend.



Example

Let's look at an example in more detail. Assume that you have an assembly that can either be **Connected** or **Disconnected**. When the **Aggregation Method** is **Count**, then there is no real relationship regarding how long a given status (**Connected** vs **Disconnected**) existed. The Count aggregation only counts the number of times each value was received during a given timeframe. In this case, there is no relationship to how long the status lasted.

Field	Description
	 In contrast, when the Aggregation Method is None, then the amount of time that a given status existed is relevant. The following would show that the bar would show that it was Disconnected for two thirds of the time (meaning 40 minutes of the hour) and that it was Connected one third of the time (meaning 20 minutes of the hour). 
Aggregation Times	Specifies the interval at which data is aggregated. For example, if the Aggregation Method is Sum and the Aggregation Times value is Hours, then the data in the Chart represents the sum of the values during that hour. • All • Minutes • Hours • Days • Weeks • Months • Quarters • Semesters
Readings	Select the reading(s) to be included in the Chart. Each reading type in the Chart displays in a different color and series.

Field	Description
	
Machine Learning	This feature is part of the IoT Platform Analytics Package, which enables you to forecast or predict the readings in the next time period based on algorithmic calculations. Different algorithms are used for the Forecast Linear and Forecast Quadratic options. The following options are available: • None • Anomaly detection • Forecast linear • Forecast quadratic The Anomaly Detection option identifies single readings that deviate from the readings trend within the time period for the chart. 
Define a Y-axis range by reading	You can contact IoT Platform support for more for details about adding this feature to your system. Per available device readings, you can specify a minimum and maximum value for the respective Y-axis.

Field

Description

This feature enables you to more easily compare different readings in the same chart.

In the following example, both Y-axes show a custom range:

- Min = 20
- Max = 60

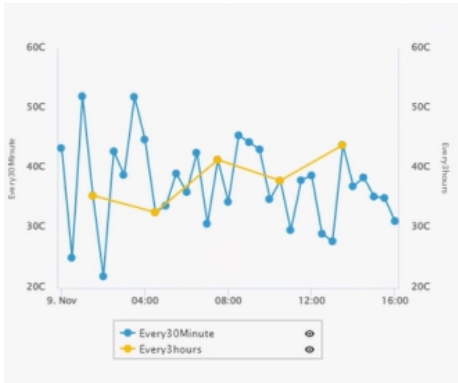
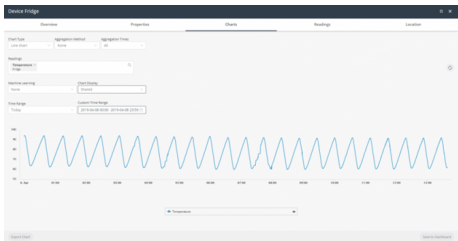


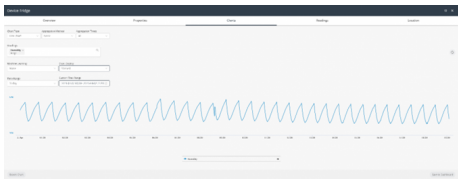
Chart Display

Specifies the type of Chart to display. The following options are available:

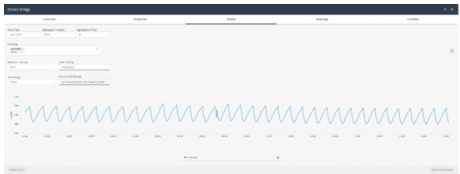
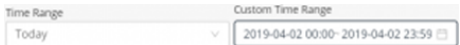
Shared – Shows all readings with a single Y axis.



Stacked – Shows all readings at one level, where each reading has its own Y axis and units.



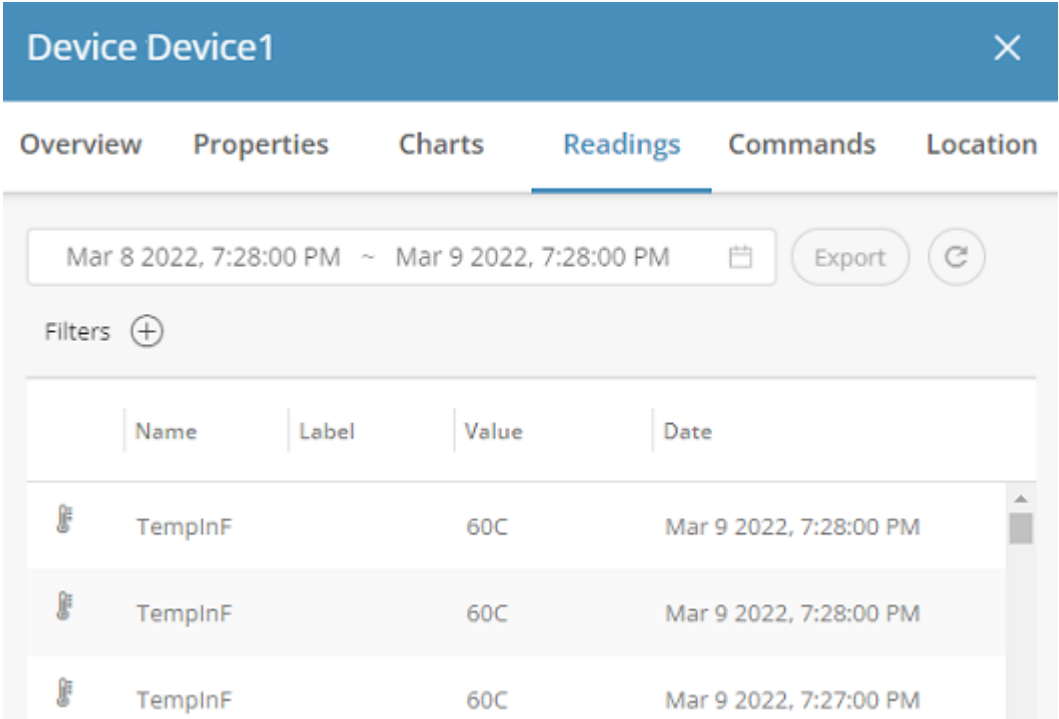
Unstacked – Shows all readings one on top of another. Each series does not necessarily use the same scale.

Field	Description
	
Time Range	Specifies the day(s) and time range of the Chart. 

Readings Tab

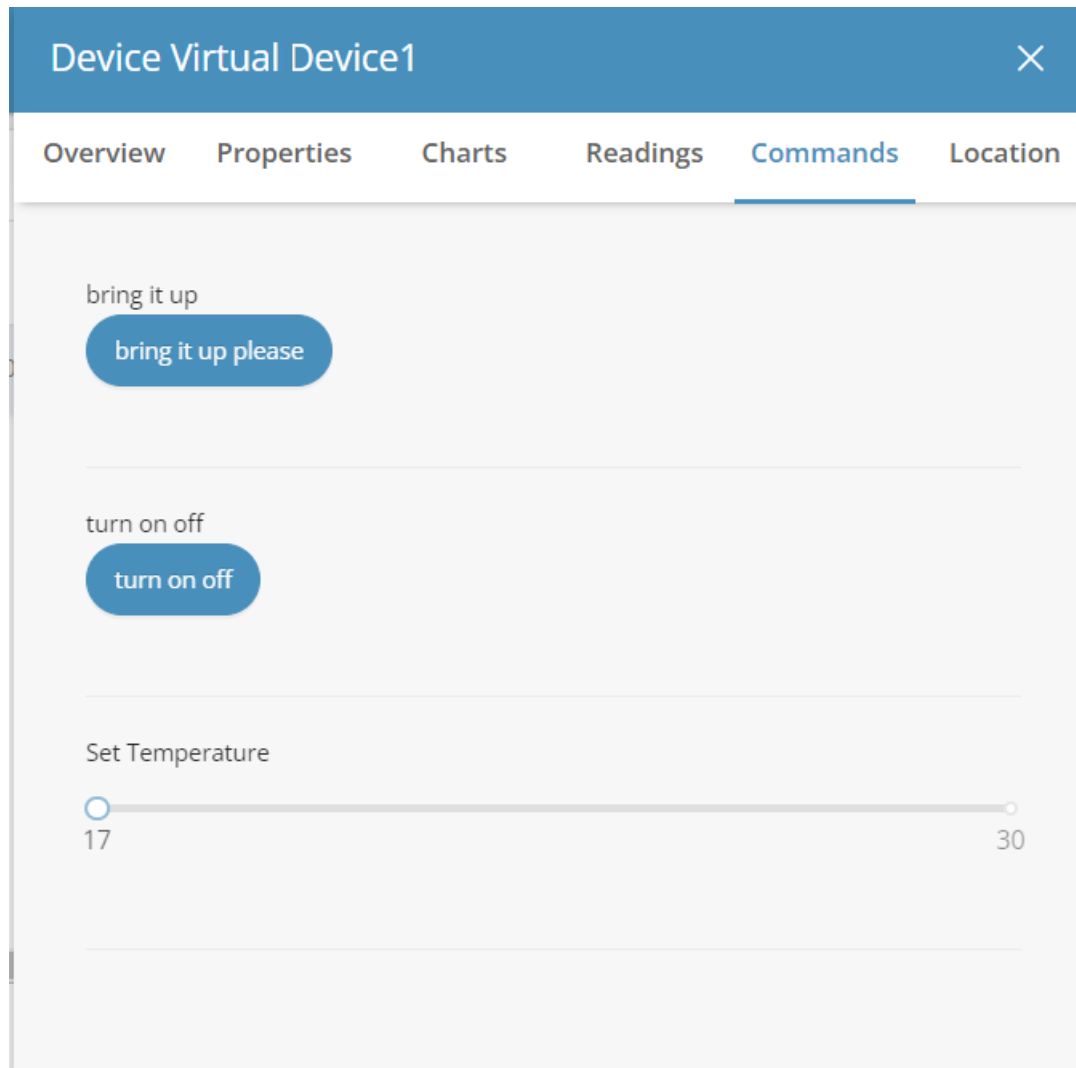
The **Readings** tab shows the last readings from the Device.

Readings are listed in chronological order, with the most recent reading at the top. You can set the time range to display, filter to display reading by Events or Labels as well as export the readings using the **Export** button.



Commands Tab

Commands are created under the [Product](#) and are available under the **Device Command** tab.



Location Tab

The **Location** tab displays the location of the Device on a map.

The **Location History/Current Location** button below the map toggles to show either the location history or the current location of the device on the map, respectively.

Click the **Current Location** button to display the current location of the device on the map, as shown below. This is the default.



When the **Location History** button is showing below the map, the map shows the current location.

Click the **Location History** button to display the location history of the device on the map. Each device icon on the map represents the current or a previous location of the device on the map.

Choose range to show

Feb 1 2022, 3:33:39 PM ~ Mar 2 2022, 3:33:39 PM

Distance

100m 500m 1km 5km

1.6

The **Distance** slider indicates the minimum distance of the displayed device icons on the map. The smaller the distance, the more device icons that display on the map, and vice versa.

Use the **Choose range to show** fields to specify the range of time to show on the map.

To relocate a device, double-click a location on the map to relocate the device to that location. Then, click the **Save** button to save the setting.

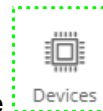
You can edit a location by double-clicking it in the map.

Use the zoom buttons to increase or decrease the size of the map.

Adding a Real Device

In order to add a Real Device:

1.



In the left pane of the IoT Platform Portal, click the **Devices** button.
The following window displays:

Search Groups	All Devices	Save As Report	Export Report	View Devices																												
☐ All Devices 228 ☐ AWM ☐ casper ☐ CasperInc ☐ DEMO 1 ☐ DT project 68 ☐ inno lab test ☐ Innovation lab 27 ☐ insub ☐ Planon 20 ☐ Planon HQ 93 ☐ PlanonDevSandbox 1	Search Filters <table border="1"> <thead> <tr> <th></th> <th>Last Event</th> <th>ID</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td>☐</td> <td>N 354ppm Feb 16 2022, 3:00:13 PM</td> <td>618a6f4fc51ddd562ffc797</td> <td>Innovi</td> </tr> <tr> <td>☐</td> <td>R -1C Feb 16 2022, 3:00:09 PM</td> <td>61ee72b443524af852bca61b</td> <td>Innovi</td> </tr> <tr> <td>☐</td> <td>w 1kW Feb 16 2022, 3:00:06 PM</td> <td>61670242882f18bd2147f4ff</td> <td>Innovi</td> </tr> <tr> <td>☐</td> <td>w 464ppm Feb 16 2022, 3:00:04 PM</td> <td>60f70399374568a75dd6e283</td> <td>Innovi</td> </tr> <tr> <td>☐</td> <td>Sr 19C Feb 16 2022, 2:55:07 PM</td> <td>61dd93772c7bdd62ad73e4ef</td> <td>Innovi</td> </tr> <tr> <td>☐</td> <td>W Open Feb 16 2022, 2:54:06 PM</td> <td>61f92fb343524af852bcb52a</td> <td>Innovi</td> </tr> </tbody> </table>		Last Event	ID	Application	☐	N 354ppm Feb 16 2022, 3:00:13 PM	618a6f4fc51ddd562ffc797	Innovi	☐	R -1C Feb 16 2022, 3:00:09 PM	61ee72b443524af852bca61b	Innovi	☐	w 1kW Feb 16 2022, 3:00:06 PM	61670242882f18bd2147f4ff	Innovi	☐	w 464ppm Feb 16 2022, 3:00:04 PM	60f70399374568a75dd6e283	Innovi	☐	Sr 19C Feb 16 2022, 2:55:07 PM	61dd93772c7bdd62ad73e4ef	Innovi	☐	W Open Feb 16 2022, 2:54:06 PM	61f92fb343524af852bcb52a	Innovi			
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☐	W Open Feb 16 2022, 2:54:06 PM	61f92fb343524af852bcb52a	Innovi																													

This window lists the Devices currently defined in the system.

2.



Click the button.

The New Device screen displays.

3. Fill in the following fields:



An asterisk (*) indicates a mandatory field.

Field	Description
Product Manufacturer	A free-text field specifying the name of the manufacturer.
*Product Type	The Product type assigned to the Device. All Devices with a given Product type have the same properties. For example, all the properties of the same type of heat sensor model.
*Device Name	A free-text field specifying the name of the Device.
Serial Number	The serial number assigned to the Device by the customer.
Group	The name of the Group to which the Device belongs.
Parent Device	This will place the device under the parent device in the hierarchy, this is usually used to describe a gateway/sensor relationship, when the parent device is the gateway.

4. Click **Done**.

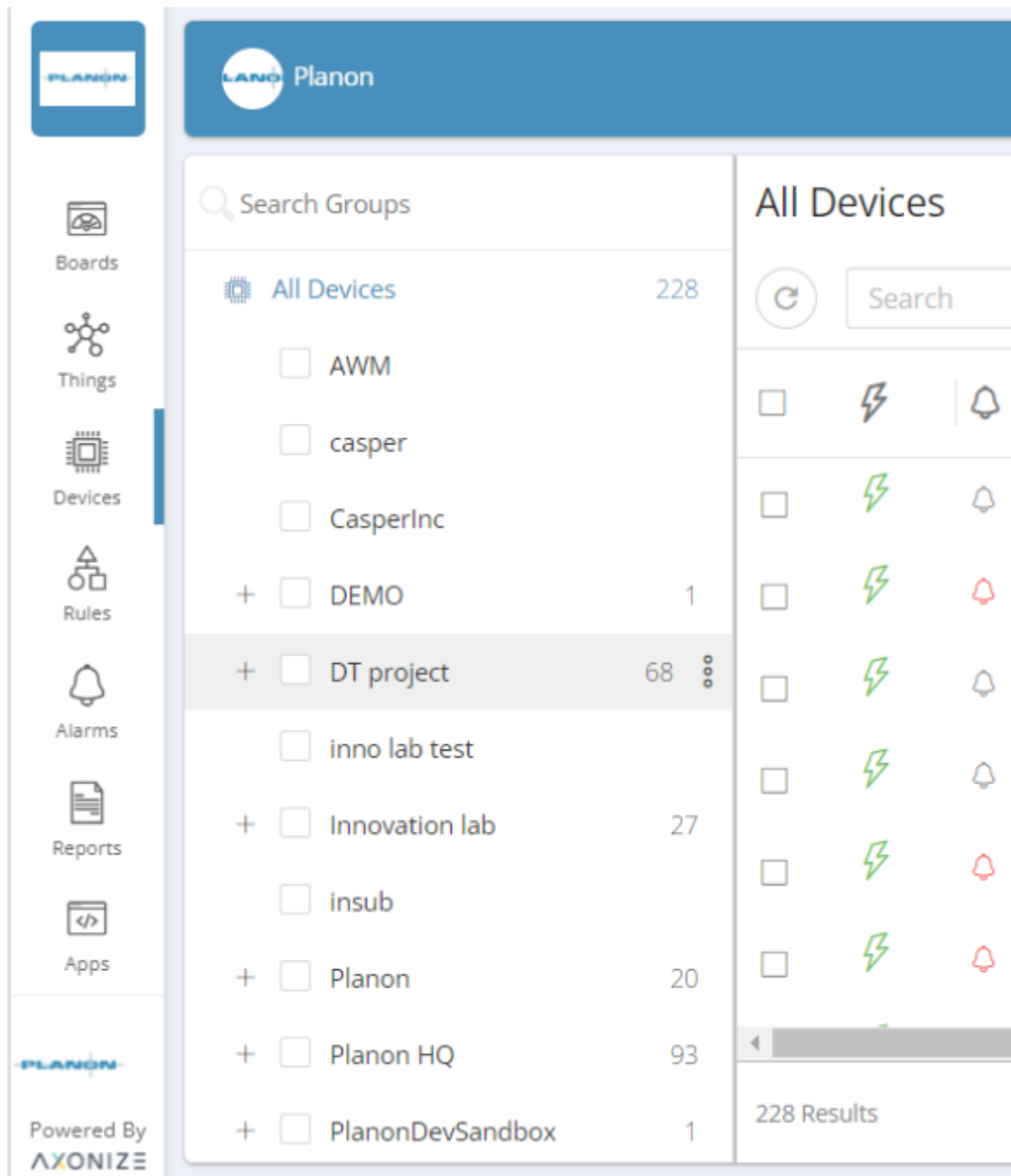
The Device is then added to the Device list.

Adding a Group

In order to add a group, do as follows:

There are 2 methods in which a Group can be added:

1. In the **Groups** pane on the left, hover over the location in which you want to place the group (hierarchy) and click the 3 vertical dots that appear. Click **Add Group** and specify the Group's name
2. Click the **Add** icon on the bottom right corner of the screen and select the Folder icon.
 - If Parent group is left blank, Group will be placed under the Application in alphabetical order.
 - If Group is specified, the new group will be placed under the selected parent group in alphabetical order.



Updating Firmware on a Device

IoT Platform enables you to manage the updating of firmware on your devices.

To do so, firmware files must first be uploaded to the IoT Platform server for a specific Product, as described in *Managing Device Firmware*. These firmware files are then available to be loaded onto the Devices belonging to that Product. You can only update Device firmware for one Device at a time.

In order to update a Device's firmware version, the IoT Platform SDK must be installed on that Device.

To update firmware on a Device –

1.



In the left pane, click the button  to display the Device list.

2. In the Device list, double-click anywhere in a Device row to view that Device's details.

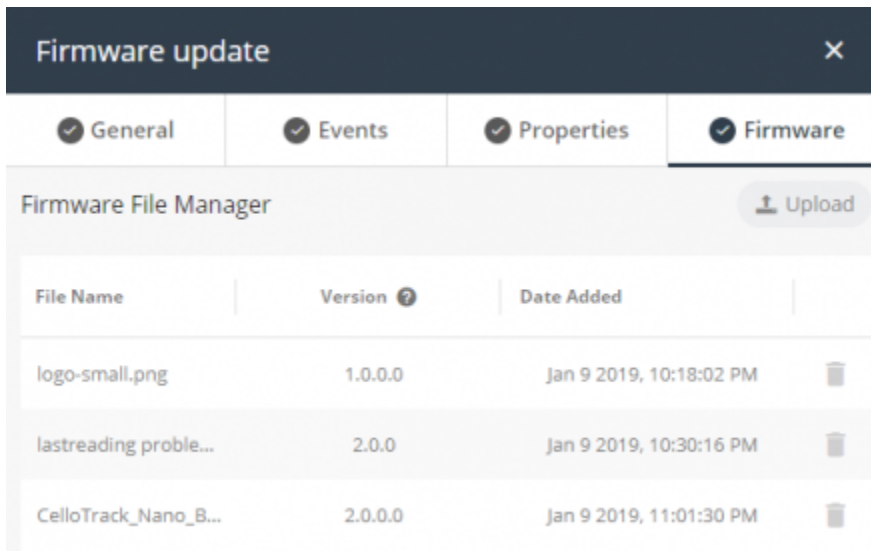
3. Select the **Properties** tab for the Device.

A screenshot of the IoT Platform web interface showing the 'Properties' tab for a device named 'Device1'. The interface has a blue header bar with the device name and a close button. Below the header is a tabbed menu with 'Overview', 'Properties' (selected), 'Charts', 'Readings', 'Commands', and 'Location'. The main content area is titled 'Device Info' and contains several sections: 'Device Activation' with a toggle switch turned on; 'Device Name' with a text input field containing 'Device1'; 'Product manufacturer' with a text input field containing 'Casper Inc'; 'Product Type' with a text input field containing 'Casper'; and 'Groups' with a list of two items: 'Floor1Room1' and '44047, De Lusthof Maastricht (b41189a3-eacb-450e-a152-7682e8fef2f7)'. At the bottom right of the form are two buttons: 'Cancel Changes' and 'Save'.

4. The **Firmware Version** field displays the current firmware version for the Device.

5. Click the **Update** button next to the **Firmware Version**.

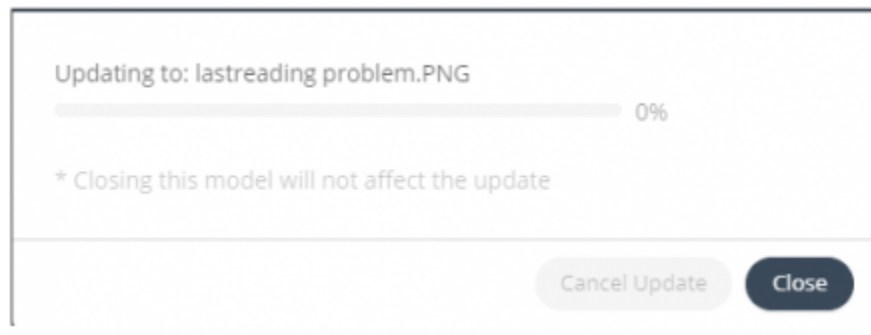
The following window displays, showing the list of firmware files installed on the Product to which the Device belongs:



In order for the **Firmware** tab to display for a Product, you must set the `enableSDKFeatures` property to **True**.

6. Click the radio button of the firmware version file to update on the Device and then click the **Update**.

A progress bar displays, showing the progress of the update process.



7. Click **Close** to close the window.

Closing this window does not affect the update process.

Things

In IoT Platform there are 4 entities in the Thing management world:

- **Group**

An entity in our hierarchy representation, a group can have one parent group allowing the customers to create hierarchy trees, and devices can be members in multiple groups. So you can have groups that delineate a spatial hierarchy, but also have a hierarchy based on devices types (All devices that are HVACS, and then sub groups based on manufacturers).

- **Digital Twin**

A representation in IoT Platform of a specific logical entity, for example this could be “Floor 1”, “North Beach Parking Lot”. A digital twin is an enhanced group, meaning that it has the capabilities of groups in terms of hierarchy, and in addition it has readings, properties and calendars. A group associated with a group template is considered to be a digital twin.

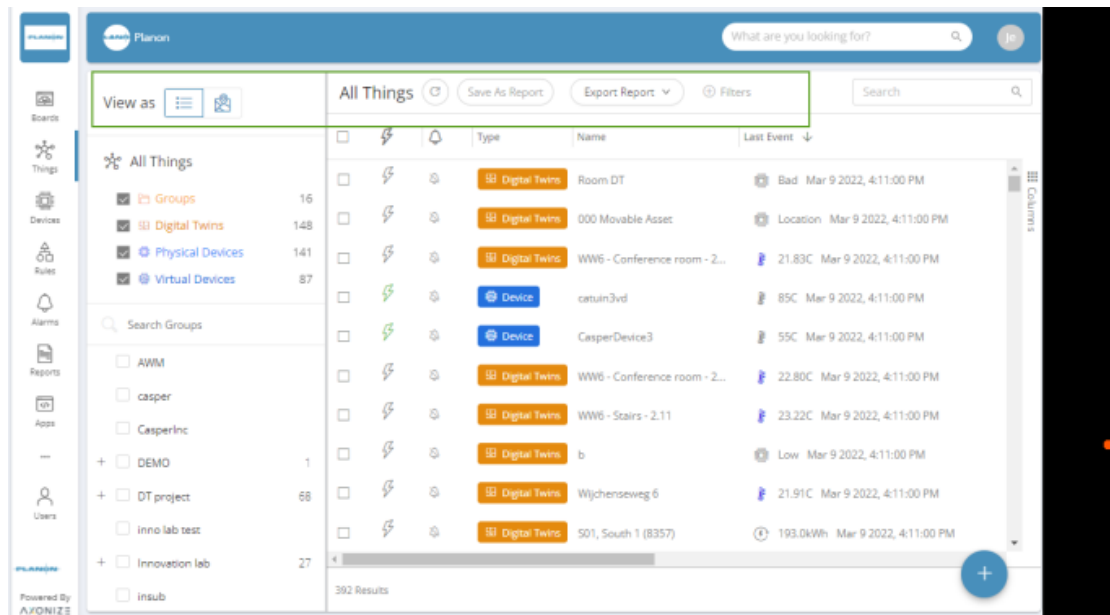
- **Device**

A representation in IoT Platform of a physical entity or sensor in the real world, for example this could be a specific temperature sensor or a field gateway. When viewing the device in IoT Platform you can see the readings it has sent, the values currently set, and other information about the device.

- **Virtual Device**

A Device in IoT Platform that can be configured (through the product) to have fake data sent periodically from within IoT Platform .

Views



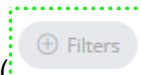
Beneath the ribbon:

- Click the **List View** () button at the top left of the window to display the Things view in a standard list form.

•

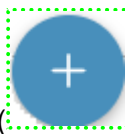


Click the **Map View** () button to display things based on their location on a map or diagram.



It is possible to filter the things grid by adding filters (), you can filter by name, reading values, property values, template, hierarchy and more.

Adding Things



Clicking on the **Add** button () in the lower right-hand side will open a menu allowing you to create one of the four thing entities:

- [Adding a Device](#)
- [Adding a Group](#)
- [Adding a Digital Twin](#)
- [Adding a Virtual Device](#)

Adding a Device

Field	Description
Product Manufacturer	A free-text field specifying the name of the manufacturer.
Product Type	The Product type assigned to the Device. All Devices with a given Product type have the same properties. For example, all the properties of the same type of heat sensor model.
Device Name	A free-text field specifying the name of the Device.
Serial Number	The serial number assigned to the Device by the customer.
Groups	The groups to which the Device belongs.
Parent Device	This will place the device under the parent device in the hierarchy, this is usually used to describe a gateway/

Field	Description
	sensor relationship, when the parent device is the gateway.

Adding a Group

Field	Description
Group Name	A free-text field specifying the name of the Group.
Parent Group	If this is a sub-group, we need to specify the parent group
Location	Set a location or a diagram for this group

Adding a Digital Twin

Field	Description
Group Template	The group template that defines this digital twin, for example Room or Floor.
Group Name	A free-text field specifying the name of the Group.
Parent Group	If this is a sub-group, we need to specify the parent group.
Location	Set a location or a diagram for this group.

Adding a Virtual Device

Field	Description
Product Manufacturer	A free-text field specifying the name of the manufacturer.
Product Type	The Product type assigned to the Device. All Devices with a given <u>Product</u> type have the same properties. For example, all the properties of the same type of heat sensor model.

Field	Description
Device Name	A free-text field specifying the name of the Device.
Serial Number	The serial number assigned to the Device by the customer.
Groups	The groups to which the Device belongs.
Parent Device	This will place the device under the parent device in the hierarchy, this is usually used to describe a gateway/sensor relationship, when the parent device is the gateway.
Events	This is where you input the xml manifest that defines the events the device will send.

The XML consists of a list of events. Each event has the following properties.

Field	Description
ID	The event type of the event, such as humidity or temperature. IoT Platform provides a predefined syntax (described below) and a list of the types of events that can be sent to the IoT Platform server, such as 7 for temperature, 8 for humidity, 9 for acceleration, 100 so on.
Name	The name of the event.
Event type	IoT Platform has two types of events – Allowed Values events and Number .

```

<?xml version="1.0" encoding="UTF-8"?>
<events>
  <event>
    <id>7</id>
    <name>Temperature</name>
    <description>Temperature sensor</description>
    <type>Temperature</type>
    <unit>Celsius</unit>
    <range>0-100</range>
  </event>
  <event>
    <id>8</id>
    <name>Humidity</name>
    <description>Humidity sensor</description>
    <type>Humidity</type>
    <unit>Percentage</unit>
    <range>0-100</range>
  </event>

```

Number events have the following properties –

- **minValue** – The minimum value that can be randomly generated.
- **maxValue** – The maximum value that can be randomly generated.
- **decimalPoints** – (Optional) The number of decimal points in the number that are randomly generated.

Allowed Values events contain a list of the allowed values in which you specify the possible values that can be randomly selected from a list. This type of event has no properties.

- Virtual device frequency is set by default to generating a reading in 5-minute intervals.
- **valueType** – The type of value, which can be one of the following –
- **gps** – If **valueType** is **gps**, then there are also the following properties –
 - latitude
 - longitude
 - altitude

The GPS coordinates are randomly generated in a radius of 3 kilometers around this coordinate.

- integer
- double
- decimal
- numeric
- **unit** – (Optional) A free-text field specifying the unit of the event.

Example

The following example shows an event tag that contains multiple event tags. Each of the event tags in the example has the properties described above. The example presents both a Number event and an Allowed Values event.

```
<Events>
  <Event>
    <Id>7</Id>
    <Name>Temperature</Name>
    <MinValue>-10</MinValue>
    <MaxValue>40</MaxValue>
```

```

    <SecondsInterval>300</SecondsInterval>

    <ValueType>Decimal</ValueType>

    <DecimalPoints>2</DecimalPoints>

  </Event>

  <Event>

    <Id>8</Id>

    <Name>Humidity</Name>

    <MinValue>0</MinValue>

    <MaxValue>100</MaxValue>

    <SecondsInterval>400</SecondsInterval>

    <ValueType>Decimal</ValueType>

    <DecimalPoints>2</DecimalPoints>

  </Event>

  <Event>

    <Id>1078</Id>

    <Name>Motion</Name>

    <AllowedValues>

      <Value>0</Value>

      <Value>1</Value>

    </AllowedValues>

    <SecondsInterval>60</SecondsInterval>

    <ValueType>Integer</ValueType>

  </Event>

</Events>

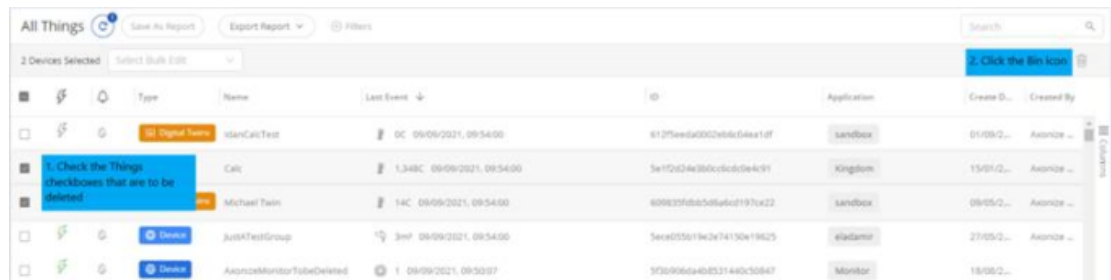
```

Deleting a Thing

Deleting a Thing removes it from the **Things** screen and the map. After deletion, Rules and widgets no longer accumulate readings from the Thing.

In order to delete a Thing, select the check box on the Thing's row, once checked a bulk edit bar will appear on the top with a bin icon on the top-right corner. Click the bin and confirm the 'are you sure' prompt.

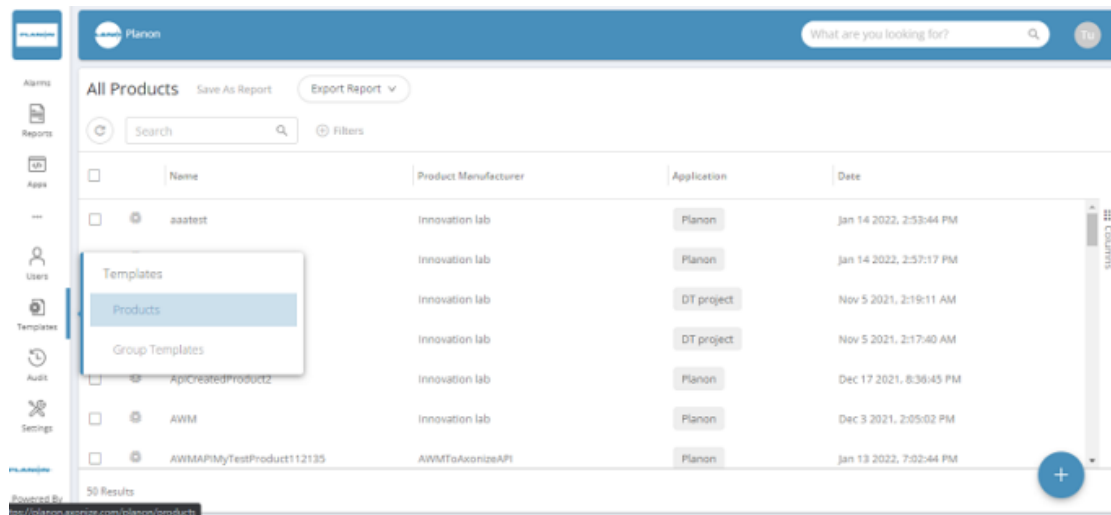
Note, you cannot delete a Thing that is a parent Thing of other Things, or when that Thing is specifically mentioned in a Rule(s). In the latter case, you must first delete or amend the Rule(s) before the Thing can be deleted. An error displays if you attempt to delete a parent Thing or a Thing that is bound to a Rule(s).



	Type	Name	Last Event	ID	Application	Create D...	Created By
☐	ST Digital Twin	IdanCalcTest	DC 09/09/2021, 09:54:00	612f5eada002ebdc5ea1d7	sandbox	01/09/2...	Axonize ...
☐		Calc	1.348C 09/09/2021, 09:54:00	5e12d34e3b0c9bdc5e4c91	Kingdom	15/07/2...	Axonize ...
☐		Michael Twin	14C 09/09/2021, 09:54:00	609625fbdcbcd5ebcd197xc22	sandbox	09/05/2...	Axonize ...
☐		JustATestGroup	3mF 09/09/2021, 09:54:00	5eac055b1f43e74130e19625	elastamor	27/05/2...	Axonize ...
☐		AxonizeMonitorTubeDeleted	1 09/09/2021, 09:50:07	5f3d906da4b853144dc50b47	Monitor	18/08/2...	

Templates

This pane combines the management of both products and group templates.



	Name	Product Manufacturer	Application	Date
☐	aaatest	Innovation lab	Planon	Jan 14 2022, 2:53:44 PM
☐		Innovation lab	Planon	Jan 14 2022, 2:57:17 PM
☐		Innovation lab	DT project	Nov 5 2021, 2:19:11 AM
☐		Innovation lab	DT project	Nov 5 2021, 2:17:40 AM
☐	ApiCreatedProduct2	Innovation lab	Planon	Dec 17 2021, 8:36:43 PM
☐	AWM	Innovation lab	Planon	Dec 3 2021, 2:05:02 PM
☐	AWMAPMyTestProduct112135	AWMToAxonizeAPI	Planon	Jan 13 2022, 7:02:44 PM

- **Product** – A product is the device manifest for a specific device type. In the product a user can define the events, commands, and properties the device has. In addition, the user can define a Self-Service Gateway mapping that applies to these devices. For example, a product can be for the ACME HVAC Unit 5000, which emits a temperature event, has On/Off commands, and has a property for “Target temperature”. All these things can be defined on the product.
- **Group template** – Similar to how the product defines devices, a group template defines the digital twins. A user can define which events

and properties the digital twin has. A group template will only have calculated events.

Defining a Product

Procedure

1.



In the left pane of the IoT Platform Portal, click **Templates > Products**.

The following window displays:

Name	Product Manufacturer	Application	Date
Disruptive	DT	Planon	Jun 19 2020, 11:29:52 AM
Porograb Sensor	Porograb	Planon	Dec 7 2020, 1:21:29 PM
Porograb Area	Porograb	Planon	Dec 7 2020, 1:24:21 PM
UbopSense Location	UbopSense	Planon	Dec 7 2020, 1:49:58 PM
Temperature	Disruptive Technologies	Planon	Dec 8 2020, 1:44:25 PM
Magnet	Disruptive Technologies	Planon	Dec 8 2020, 1:48:14 PM
Touch Button	Disruptive Technologies	Planon	Dec 8 2020, 1:50:49 PM
Edge Device	Edge	Planon	Dec 8 2020, 9:29:57 PM
BMS IAG	Accorize	Planon	Dec 14 2020, 9:35:57 PM
BMS Occupancy	Accorize	Planon	Dec 15 2020, 7:59:48 AM
MWAC	Price	Planon	Dec 15 2020, 8:07:10 AM
Hark	Hark	Planon	Mar 23 2021, 1:58:57 PM
Casper	Casper Inc	PlanonIntegration	Jul 16 2021, 11:20:22 AM
Solar Power Sensor	Planon	Innovation lab	Jul 20 2021, 4:20:10 PM

 This window lists the Products currently defined in the system.

2.



Click the button. The following window displays:

New Product [X]

1 General 2 Events 3 Properties

Product Info

* Name * Manufacturer

Icon Description

[+]

Readings Display Configuration ⓘ

Main Event Reading Property/Event for Tooltip Property/Event for Tooltip

Select Main Event Select Info to Display Select Info to Display

The reading display configuration will be enabled after setting the events

Additional Properties

Display Custom ID Enforce Custom ID

☒ ☒

Custom ID Read Only

☐ X

Display Serial Number Enforce Serial Number

☒ ☐

Cancel Changes Next

This window contains three tabs **General**, **Events** and **Properties**.

3. Fill in the following fields in the **General** tab, which specify general characteristics of the Product.

i An asterisk (*) indicates a mandatory field.

Field	Description
Name	A free-text field specifying the name of the Product.
Manufacturer	A free-text field specifying the name of the manufacturer.
Icon	Indicates the icon to represent the Product on maps and diagrams in the IoT Platform Portal. Click  the Icon button to display the following window in which you select the icon to be used. After selecting an icon in this window, the selected icon displays in the Icon field. 
Description	A free-text field that describes the Product.
Readings Display Configuration	In this area, you define the information that is shown in a tooltip when you hover over the Device icon in an IoT Platform map or diagram. You can select up to three different events. The tooltip displays the last reading of each selected event.  Items can be defined only after Events are added.

Field	Description
-------	-------------

Readings Display Configuration ⓘ

Main Event Reading	Property/Event for Tooltip	Property/Event for Tooltip
Select Main Event	Select Info to Display	Select Info to Display

The reading display configuration will be enabled after setting the events

The following shows an example of a tooltip displayed on a map that has three events defined for the Product.



Additional Properties

In this area, you can enable/disable various properties for the Product.

Additional Properties

Display Custom ID	Enforce Custom ID
☒	☒
Custom ID Read Only	
☒	
Display Serial Number	Enforce Serial Number
☒	☐
Enable Developer Mode	
☒	
Enable Calendar	
☒	

Cancel Changes Next

Display Custom ID

When enabled, the Custom ID of the Device is available in the IoT Platform Portal for all Devices under this Product. The Custom ID of a Device is the Device’s unique identifier under this Product in an external system. It enables the correlation of the IoT Platform Device ID with the external system’s Device ID.

Custom ID Read Only

When enabled, the Custom ID of the Device is available in the Read Only mode only.

Field	Description
Display Serial Number	When enabled, the serial number of the Device is available in the IoT Platform Portal for all Devices under this Product.
Enable Developer Mode	When enabled, displays additional developer details for the Device in the Device's Properties . This information is for third#party developer use when integrating with the IoT Platform gateway.
Enforce Custom ID	When this check box is selected, the custom ID is mandatory when defining a Device under this Product.
Enforce Serial Number	When this check box is selected, the serial number is mandatory when defining a Device under this Product.

- Click the **Next** button to move to the **Events** tab in the window or simply click the **Events** tab –

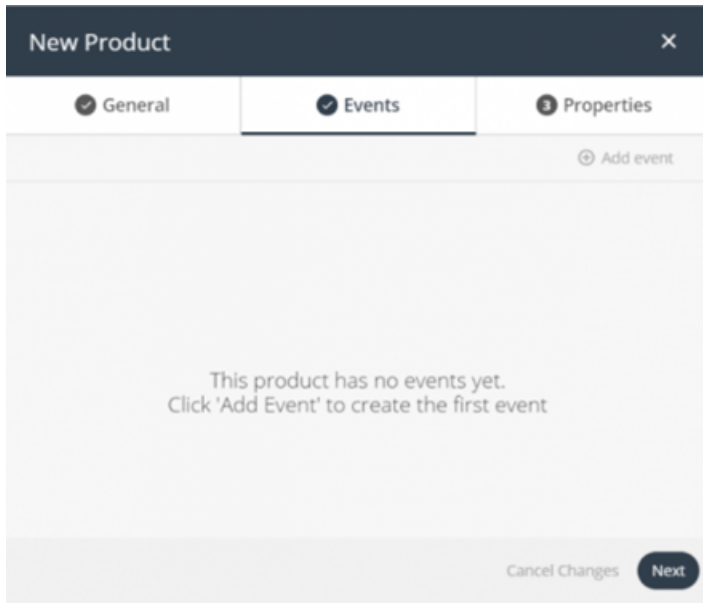


Devices for a certain Product will display Readings/Event which are sent by the actual sensor/ system and mapped, the Events do not have to be added to the Product.

IoT Platform uses an Events Manifest which specifies for each Event the Icon, Units, Type code, Data type,...

Specifying an Event in the Product is required when:

- Changing the manifest default settings for Events (for example the Units displayed, Adding a label, Icon..)
- Enabling the selection of the Main Reading and Tooltip
- Changing look and feel (icon and color for data ranges/Boolean/ allowed values..)
- Enabling the display of Things Readings in some Widgets requiring Groups and ranges (such as the 'Overall Reading' widget)



In the **Events** tab, you can add events to the Product definition (not mandatory). An Event is data received by the IoT Platform Server from a Device.

A reading consists of the reading name, reading type, reading value and reading timestamp. For example, a reading from a scale, the temperature from an air-conditioning system, the action of turning on a light, the periodic status of a light (open or closed) and so on.

These Events then appear in the IoT Platform Portal for each Device that belongs to this Product. These Events are also available to be selected when defining the tooltip that appears on the map showing Devices that belong to this Product.

You can define as many Events as you like. There are no dependencies between Events.

5. Click the  Add event button. The following displays –

New Product

General

Events

Properties

Back

Event Info

Event Label

Description

Name

Type Code

Default Rollup

Unit To Display

Precision

Accumulated

Event Data

Data Type

Logical Type

Icon

Color

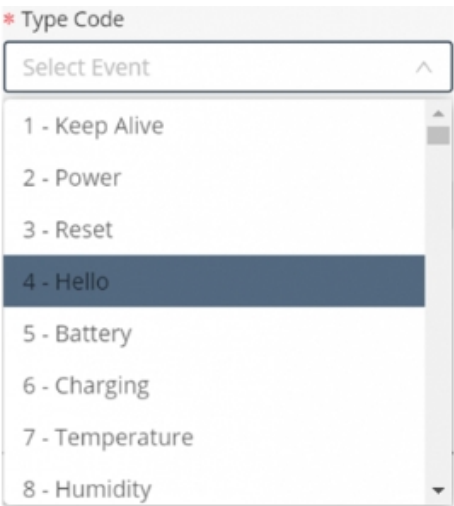
Cancel Changes

Done

- Fill in the following fields in the **Events** tab, which specify details for the Event –

 An asterisk (*) indicates a mandatory field.

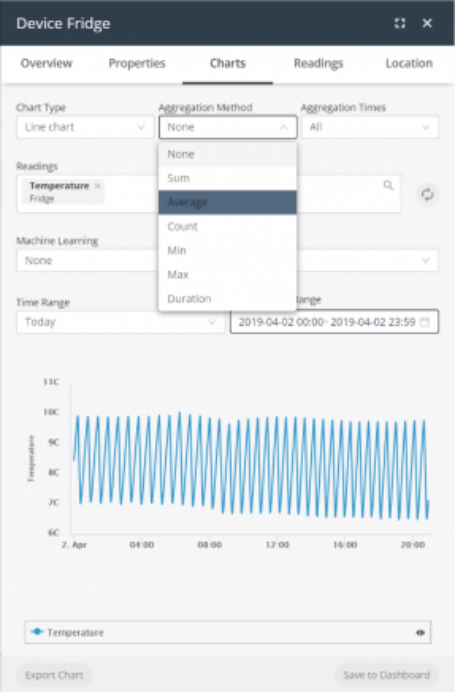
Field	Description
Name	A free-text field specifying the name of the Event sent by the Device. The name that you specify here must be exactly the same as the name sent by the Device in order to be identified by the IoT Platform system.
Type Code	Lists the types of events supported by IoT Platform . Each event type has its own logical data type, such as Boolean, integer, double and so on. Select the applicable event type in the list.

Field	Description
	 Status 30 When specifying the type of reading, keep in mind that Type Code 30 - Status is a reserved system status to denote whether a device is either: • 0 - Connected • 1 - Disconnected Because it is reserved as a system status, when choosing this type, the settings are predefined and greyed out indicating that it is read-only.
Description	A free-text field that describes the Event.
Default Rollup	Specifies the default aggregation type used by the IoT Platform platform when displaying charts for the Devices under this Product.

Field	Description
	Default Rollup Select Default Rollup ^ Sum Average Min Max Count

Note – Device-related settings are defined when you define a Device. Device settings such as the **Aggregation Method** are fixed and cannot be changed.

This means that whenever you select a Device under this Product, then the Device uses the aggregation method defined here by default. If you prefer a different aggregation method when viewing a chart for that Device, then you can change it in the Device's **Charts** tab, as shown below. Making such a change locally for a Device does not affect or change the **Default Rollup** setting for the Product.

Field	Description
	
Unit to Display	A free-text field that specifies the unit used for the Y axis in all charts displayed for Devices under this Product.
Precision	Specifies the number of decimal places that display in charts/things for Devices under this Product.
Accumulated	When enabled, indicates that the event contains an accumulated value. For example, an electrical meter. When this setting is enabled for an electrical meter Device, IoT Platform reads the value differences between each Event and calculates the delta from the previous reading.
Data Type	A read-only field that displays the data type of the Type Code (see above) that you selected previously.
Logical Type	Specifies the default logical type of the reading for the Event. Even if no Logical Type is specified, the Event is not dropped and is displayed as it was sent from the Device. Options are:

Field	Description
	• Boolean – Two possible values are permitted, such as Yes/No, 0/1, Open/Close and so on. • Allowed Values – Specifies a defined set of values that can be set by the Device. • None – This option only indicates that the event occurred, but does not display any additional information about it in charts or maps. • Range - to be used as readings' filter. You can also specify a range as a logical series (each with a Range minimum and a Range maximum, an icon and a color). This will provide a clear and instantaneous insights in key indicators. For example, a battery status with the following ranges:

Field	Description		
	Range	Color	Icon
	0%-50%	Red	
	50%-75%	Orange	
	75%-100%	Green	

Result

The data, received from the IoT Platform, will subsequently be displayed in the Planon application - See [Viewing device data](#).

Filter

This option dynamically appears when selecting **Range** as **Logical Type**. A check box appears that adds filtering functionality to the defined range. Any value not within the defined range is filtered out when the check box is selected. (This allows you to exclude reading anomalies).

Value, Label, Icon and Color

In these fields, you can configure how each value appears in charts or maps by specifying a label, icon and icon color for a value, as shown below. For

Field

Description

example, let's say that this Event is for a door, which can be either open or closed.

As shown in the example below, the Device for this Event sends either 0 or 1 to indicate when the door is open or closed, respectively, making this an Integer Data Type with Boolean values.

When the door is open, the Open label displays on maps and in charts in dark red , and when the door is closed, the Closed label displays in dark purple . If the device has more than a single event, the main event defined in the Product display configuration determines the Device's color on the map.

Event Data

Data Type		Logical Type	
Integer		Boolean	
Value	Label	Icon	Color
0	Open		
1	Closed		

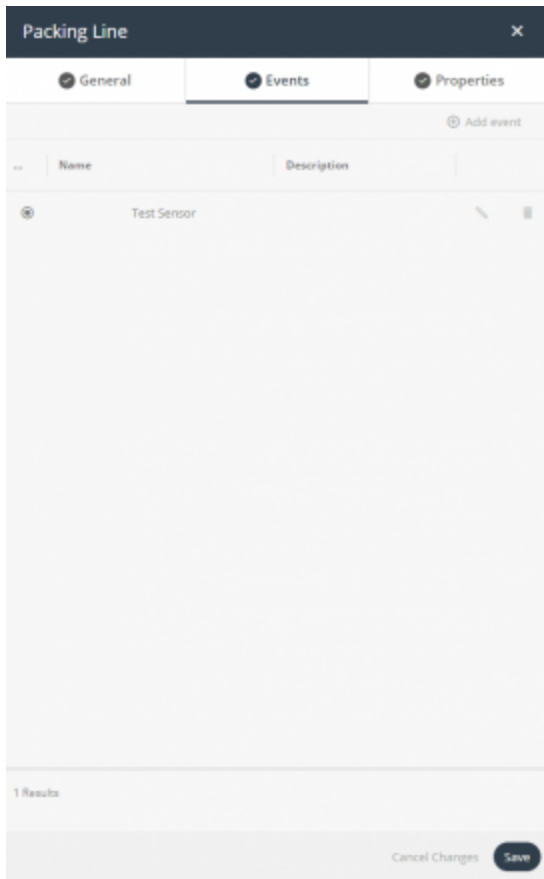
Add Value

- Value** – You must be familiar with the data sent by the Device in order to specify the proper value in this field. The value that you specify must be identical to that sent by the Device.
- Label** – This is a free-text field that represents the label that displays for the specified value in charts or maps.

Field	Description
	Icon – Indicates the icon that represents the value on maps and diagrams. Click  the Icon button to display a window in which you select the icon to be used. After selecting an icon, the selected icon displays in the Icon field. Color – Indicates the icon color that displays on maps and diagrams for the value. Click the Color button to display a window in which you set the color for the icon.
	

7. After defining all properties of the Event, click **Done**.

The Event displays in the list of Events in the **Events** tab.



Simplifying creating Events

In order to simplify creating Events that correlate to the ones used by devices, under a specific Product there is a functionality in the device readings which allows adding Events to the Product:

1. Go to Things/Devices.
2. Select a device.
3. Select the **Overview** tab.
4. Whichever Readings requiring an Event added in the Product – hover over the 3 vertical dots in the upper-right corner of the reading and click.
5. A dialog box appears with the options to either **Delete** the reading or to **Add Reading to Product**:
 - Delete: Will delete the reading from the device UI (will still be available in the DB and Readings tab).



If a new reading is sent, this will again be populated.

- **Add Reading to Product:** This option will add an Event to the device's Product populating the Type and Name of the Event (which together are the unique identifiers). This new Event can be used to further manipulate the look and feel of the reading.

8. Click **Next** to move to the **Properties** tab or simply click the **Properties** tab –

The screenshot shows the 'Fridge' product configuration window with the 'Properties' tab selected. The 'Property Info' section contains a 'Field Label' field with the value 'Test' and a 'Name' field which is empty. There is also a 'Make Required Field' toggle switch currently set to 'No'. The 'Property Data' section includes a 'Logical Type' dropdown menu set to 'Integer', a 'Field Input' dropdown menu set to 'Number', and several other empty input fields for 'Unit', 'Default Value', 'Minimum', 'Maximum', and 'Step'. At the bottom of the form are 'Cancel Changes' and 'Done' buttons.

In the **Properties** tab, you can add additional properties to the Product definition (not mandatory).

These additional properties then appear in the IoT Platform Portal for each Device that belongs to this Product. You can define as many additional properties as you like.

9. Fill in the following fields in the **Properties** tab, which specify details for the additional property –

 An asterisk (*) indicates a mandatory field.

Field	Description
Field Label	The name to appear in the IoT Platform Portal for this additional property.
Help Text	A free-text description of the additional property.
Name	The internal logical name to be used for this additional property. This name must match the additional property's name on the Device itself.
Make Required Field	A true/false field indicating whether this additional property is mandatory.
Logical Type	The data type of the additional property. The Logical Type indicates how the data for the property is to be displayed on the Device. Options are: Text – The value for the additional property is text. When selecting this option, you must also specify the Field Input, which can be either Text Field or Text Area along with the applicable Default Value for the additional property. A Text Field displays a single field for the data entry when displayed on the Device. For example, the color additional property, shown below, shows a single field in the Device's properties when you select Text Field as the Field Input value for the property –

Field

Description

Device eden device An

Overview Properties Settings Charts Readings Location

eden device An

Product manufacturer Product Type

Groups

Parent Device

Additional Properties

color available

aaa

SaleDate price

Select date 30.5

location Custom ID

(lat:30.1km40) 123

Cancel Changes Save

A **Text Area** displays a multi-line entry for the data entry when displayed on the Device. For example, the **color** additional property shows a multi-line field in the Device's properties when you select **Text Area** as the **Field Input** value for the property –

Additional Properties

color

aaa

- **Decimal** – The value for the additional property is a decimal number.

Logical Type Field Input

Decimal Number

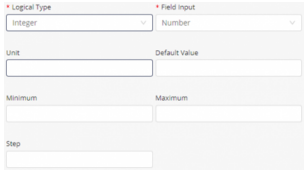
Unit Default value

Minimum Maximum

Step

When selecting this option, you must also specify values for the following fields –

- **Field Input**
– Select **Number**, which

Field	Description
	indicates that the data is numeric. ◦ Unit – The unit for the additional property. ◦ Default Value – The default value of the additional property. ◦ Minimum – The minimum value for the additional property. ◦ Maximum – The maximum value for the additional property. ◦ Step – Indicates the step used to increment the values for the additional property. For example, if the Minimum is 10, the Maximum is 20 and the Step is 2, then the following values can be entered – 10, 12, 14, 16, 18, 20. • Integer – The value for the additional property is a whole number.
	

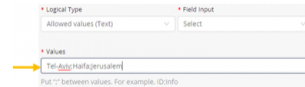
When selecting this option, you must also specify values for the following fields –

- **Field Input** – Select Number, which indicates that the data is numeric.
- **Unit** – The unit for the additional property.

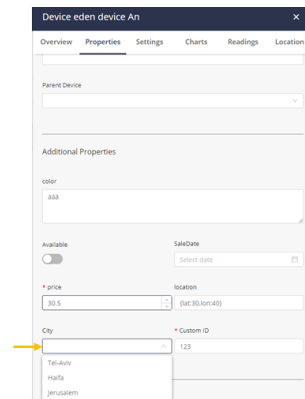
Field	Description
	◦ Default Value – The default value of the additional property. ◦ Minimum – The minimum value for the additional property. ◦ Maximum – The maximum value for the additional property. ◦ Step – Indicates the step used to increment the value for the additional property. For example, if the Minimum is 10, the Maximum is 20 and the Step is 2, then the following values can be entered – 10, 12, 14, 16, 18, 20. • Allowed Values (Text) – The value for the additional property can be selected from a list of text values. When selecting this option, you must also specify the Field Input, which can be either Select or Radio Button along with the applicable Values for the additional property. Separate values in the Values field with a semicolon (;).

Field

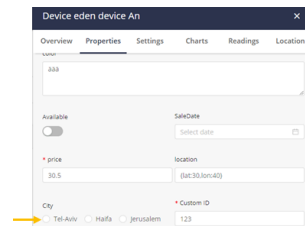
Description



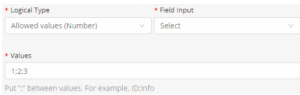
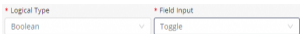
When you select **Select** in the **Field Input** drop-down menu, the Device properties display the additional property using a drop-down menu, as shown below –



When you select **Radio Button** in the **Field Input** drop-down menu, the Device properties display the additional property using radio buttons, as shown below –



- **Allowed Values (Number –** The value for the additional property can be selected from a

Field	Description
	list of numeric values.  This option is similar to the Allowed Values (Text) option, except that the values you specify are numeric instead of text. When selecting this option, you must also specify the Field Input, which can be either Select or Radio Button along with the applicable Values for the additional property. Separate values in the Values field with a semicolon (;). • Boolean – The value for the additional property is Boolean (yes/no, true/false and so on).  When selecting this option, you must also select Toggle in the Field Input field.

10. Click **Save** to save the Product definition.

Deleting a Product

Products can be deleted using the IoT Platform Portal.

To delete a Product:

1. Select the check box to the left of the Product.

 A Bin is made available at the top-right above the Products grid.

2. Click the Bin and click **Yes** for the 'Are you sure?' pop-up.

 You can delete multiple products via a mass action by checking the relevant check boxes.

Managing Device Firmware

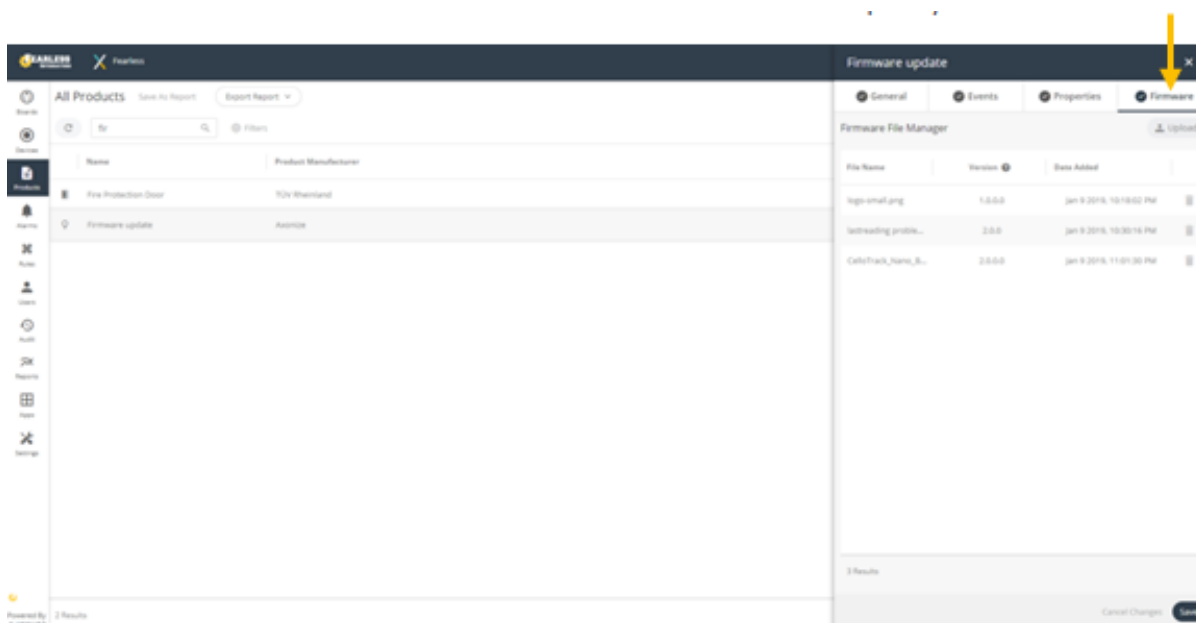
The IoT Platform platform can be used to host firmware files and enables you to manage firmware versions for Devices on which the IoT Platform SDK is installed.

This feature enables you to upload a firmware file version for the Devices of a specific Product. You can then load the firmware version of your choice to specific Devices that belong to that Product.

Procedure

To upload firmware to the IoT Platform server for a Product –

1. In the left pane of the IoT Platform Portal, click the  button.
2. Click a Device row in the left pane to display its properties in the right pane.
3. Click the **Firmware** tab. Note that the Device must have the IoT Platform SDK installed on it for the **Firmware** tab to display.



The **Firmware** tab displays all the current firmware files that have been uploaded to IoT Platform for this Product. In order for this tab to display, you must set the enableSDKFeatures property to True.

4. Click the **Upload** button at the top right of the **Firmware**.

A file selection window opens.

5. Select the firmware file to upload and then click **Open**.

The following displays –

The screenshot shows the 'Firmware File Manager' interface. At the top, there are four tabs: 'General', 'Events', 'Properties', and 'Firmware'. The 'Firmware' tab is selected. Below the tabs, there is a title 'Firmware File Manager' and an 'Upload' button. A table lists three files:

File Name	Version ?	Date Added	
logo-small.png	1.0.0.0	Jan 9 2019, 10:18:02 PM	🗑️
lastreading proble...	2.0.0	Jan 9 2019, 10:30:16 PM	🗑️
CelloTrack_Nano_B...	2.0.0.0	Jan 9 2019, 11:01:30 PM	🗑️

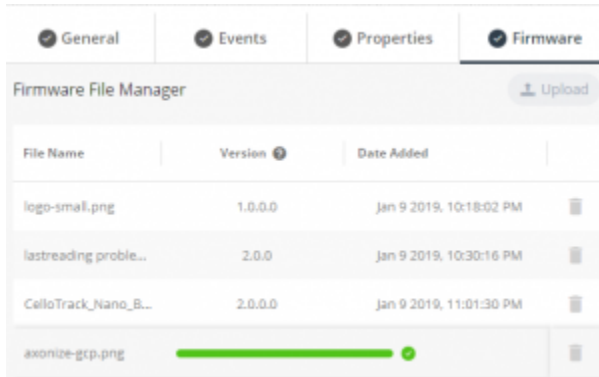
At the bottom of the table, it says '3 Results'. At the bottom right of the interface, there are two buttons: 'Cancel Changes' and 'Save'.

6. In the row of the firmware file you selected, in the **Version** field, enter the firmware version. The version format must be compatible with the Sematic Versioning Specification (SemVer) format.

This is a close-up of the 'Version' field for the selected file 'Axonize firmware t...'. The field is labeled 'Set firmware version' and has a 'Save' button next to it. There is also a trash icon to the right of the field.

7. Click the **Save** button in the firmware file row.

A progress bar displays, showing the progress of the upload process.



8. After the upload process completes, click the **Save** button at the bottom of the **Firmware** tab.



After the firmware file has been uploaded, the firmware version can be updated on [Devices Belonging to the Product](#).

IoT Platform CloudGateway™

The IoT Platform CloudGateway™ Self Service Gateway (SSG) feature enables end-users to send their own customized payload from their systems/devices and to let the IoT Platform system translate this data to the IoT Platform protocol.

How the IoT Platform CloudGateway™ works

1. Go to the product page in which you want to define the SSG feature, and choose the **Advanced** tab. If you are unable to see this tab, contact IoT Platform support so they can enable this feature for you.

The screenshot shows the 'Elevator' product configuration page with the 'General' tab selected. The page has a blue header with the title 'Elevator' and a close button. Below the header are four tabs: 'General' (selected), 'Events', 'Properties', and 'Advanced'. The main content area is titled 'Product Info' and contains two rows of input fields. The first row has a field for 'Name' with the value 'Elevator' and a field for 'Manufacturer' with the value 'Innovation lab'. The second row has an 'Icon' field with a plus sign icon and a 'Description' field with the value 'Kwh + vibrations + # people'.

2. On the **Advanced** tab you can upload a JSON file. The JSON file should include a payload sample from your device in a valid JSON format.

The screenshot shows the 'Elevator' product configuration page with the 'Advanced' tab selected. The page has a blue header with the title 'Elevator' and a close button. Below the header are four tabs: 'General', 'Events', 'Properties', and 'Advanced' (selected). The main content area is titled 'Gateway' and contains a button labeled 'Upload JSON file'.

For example:

```
{
  "serialNum": "12345",
  "temp": 14,
  "humid": 23,
  "t": "12314234234"
}
```

Properties of the JSON structure are taken to build the following form:

i Please note that the property values are not important when building the schema parser, but rather, only the properties themselves.

The screenshot shows a web interface titled "Gateway" with a "Test" button in the top right. Below the title is a table with two columns: "File Name" and "Date Added". The table contains one row with the values "ssgexample.json" and "Sep 10 2020, 12:46:08 PM". Below the table is a section for "Protocol" with a dropdown menu set to "IoT Hub". Further down is a section for "System Field", "Your Field", and "Function". This section contains two rows: one for "Device Id" and one for "Timestamp". Each row has a dropdown menu for "Your Field" set to "Select from list" and a button for "Add Function". Below this is a section for "Event" with a dropdown menu set to "Value". This section contains two rows: one for "Name" and one for "Type Code". Each row has a dropdown menu for "Your Field" set to "Select from list" and a button for "Add Function". At the bottom of the form is a button labeled "Add event".

3. Selecting the Communications Protocol.

First you need to select the Protocol that you would like to use to send events to IoT Platform , currently there are two options in the SSG; HTTP and IoT Hub.

Selecting 'HTTP' will create a new HTTP listener with a DNS, Port and authorization header in the IoT Platform platform, that will be provided after you click **Save**.

Choosing 'IoT Hub' will give you the IoT Hub connection string that you can use to send your data.

4. Building the Schema Parser

The Schema Parser handles the translation between the incoming JSON payload to the IoT Platform Event structure. The IoT Platform event structure consists of the device identifier, the unique identifier of the device that is sending the payload, the time stamp of the message, (not mandatory, but if not defined the time stamp of the event will be the time that it reached the IoT Hub) and the event definition, consisting of 4 parameters; name, value, type code and unit.

The name is the event name that will be displayed in the IoT Platform UI, the value is the event value, the type code is the logical classification of the event and unit is the unit value. Note that unit is not mandatory, and if not provided it will be taken from the default unit that is defined in the type code list.

Once the JSON file is uploaded, it's properties can be selected in the "your field" column and can then be matched to the system fields described above. Multiple events may be added for the same payload by clicking the '+ Add Event' button.

5. Adding Predefined functions.

Selecting a predefined function will activate logic on the incoming data. Currently there are five predefined functions:

- Multiply – To multiply the incoming data.
- HexToDec/DecToHex – Convert from hexadecimal to decimal and vice versa.
- Substring – Take only a subset of the incoming value.
- EpochToDateTime, (relevant only for time stamp property) – Convert date time from its epoch presentation to its ISO8601 presentation.

6. Testing your work.

After the schema is defined, it can be tested and you can see whether its parsed correctly by clicking the 'Test' button in the top right corner. If it works correctly, you will get the IoT Platform JSON payload in the response.

See the 'Parsed test event' as an example:

```
{
  {
    "app_id": "5ce5178ee3b0cc1678dd1234",
    "product_id": "4a8da32c-715b-4ada-a93a-f3c5c04b1234",
    "device_id": "testDevice",
    "dateTime": "1970-05-23T12:37:14.234Z",
    "type": 7,
    "name": "Temperature",
    "value": 14
  }
}
```

If there is something wrong with the schema you will get an error message, or one of the properties in the above JSON will be empty or missing.

7. Saving your work.

Once you click 'save' it will take a few seconds to create the new HTTP gateway or the new IoT hub connection string. When ready, you will get in the SSG for the IoT Hub Connection String or the HTTP gateway details, (DNS,Port, Authorization key).

 There are many SSG features that are not exposed in the UI but can be used using the API, for example, adding your own custom function on the incoming data, support in JSON arrays, decode functions on your JSON, (useful for Lorawan) and more.

Group Templates

Similar to how the product defines devices, a group template defines the digital twins.

A user can define which events and properties the digital twin has. Usually, a group template will only have calculated events.

See [Defining a Product](#) for Product creation on how to create group templates.

 Group templates DO NOT support commands, firmware management and the CloudGateway, because there is no physical device on the other end, but they support calculated events.

Custom Events

The IoT Platform calculation engine allows you to create new dynamic data streams based on data streams that come in from devices.

This can be done either at a device level or by leveraging the group hierarchy to aggregate streams from throughout the hierarchy.

To work with the calculation engine you create custom events on the product/group template. Once a custom event is created, a new data point will be created in the defined frequency for every device/thing that is defined by said template.

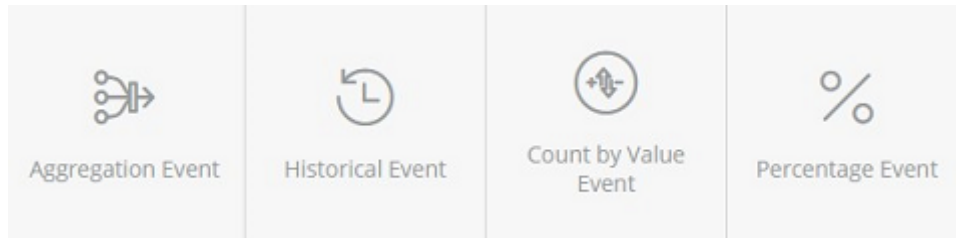
All custom events will output a single data point. In addition, custom events are nestable, so you can create a custom event on a custom event.

Custom Events Overview

The IoT Platform supports two types of generic custom events and four types of preset custom events.

Preset custom events

The preset custom events use the generic custom events internally and are meant to simplify creation for the most useful event types.



Aggregation event

- This event is used to aggregate the **current** status of multiple data streams, for example, I want the max temperature from all the fridges in my store.
- This must be a numeric data stream

Historical event

- This event is used to aggregate historical data of multiple data streams, so for example you could use this to create a new data stream which is the total energy consumption for the last 24 hours.
- This must be a numeric data stream.

Count by value event

- This event is used to count how many different streams currently have the value of X from a list of allowed values. For example, how many of my desks are currently occupied.
- This must be an Allowed Values data stream (Open/Close, Occupied/Free/NA, etc).

Percentage event

- This event will calculate the percentage between events or between an event and a property that is defined on the device/group. For example, you can set an occupancy limit per room as a property, and then use an event for current occupancy and then create a percentage event to track utilization.
- The numerator has to be a numeric event, and the denominator can be either a numeric event or property

Generic events



Event with Function Formula

- This event will let you define variables and then create an open formula with these variables. For example, you can define A to be the current number of people in a room, B the energy consumption and C the price of electricity and then create the formula $(A/B)*C$ to create a KPI for energy cost per person.
- All variables must be numeric values

Event with Condition Formula

- This lets you create the same variables but then use them in series of Boolean expressions to transform them to a list of discrete options. So for example, with the same A B C you could say If $A/C > 10$ -> Green , if $B = 200$ -> Yellow otherwise Red.
- All variables must be numeric values but the output event should be an allowed values.

Order of processing custom events

Custom events (defined in **Products** and **Templates**) are run by the order they appear on the **Events** tab.

Motion Sensors Group

General

Events

Properties

Add Custom Event
Add event

Icon	Name	Description	Active		
	People Count (Alt)				
	People Count				
	Average Presence Time				
	Average in Minutes				
	Movement Count				
	Occupancy	Occupancy			

In this example, the order of running events is:

1. People Count
2. Average Presence Time
3. ...

i

Note that *People Count (Alt)* will not run as it is de-activated.

Event Field descriptions

The first four fields are shared by all events.

* Event Name

* Type Code

Please select

Description

Aggregation Level

Device

Logical Type

Execution Interval

None

Range

Every Minute

Precision

Unit to Display

Icon

Color

+

+

Field	Description
Event Name	This is the name of the event that will be created from this custom event. This value can be whatever you want.
Type Code	This is the type code of the event that will be created from this custom event. This can be whichever type code you want, however the list is filtered by type. For all events except the Condition Formula, the typecode must be numeric because it outputs numeric values. The Condition Formula can be either numeric or string. If the type code you want is not provided, you can use either 998 or 997 which are the generic type codes.
Description	Enter a meaningful description.

Field	Description
Aggregation Level	Note that there will be additional filtering of the data streams based on product/event. Device level While this option is called device level, it is more accurately device/thing level. This will only take data from data streams that are directly on the device/thing itself. So, this type is good for transposing data on the device directly (Dividing a data stream by 1000), or in a thing it is useful to layer custom events on other custom event (for example create a hierarchy custom event for Occupied Desks, another hierarchy event for Unoccupied desks, and then create a thing level event to sum those data streams. Note that order of the events is relevant as they are calculated in order)
Groups	Groups - Same Level Only This can only be created on group templates, this will aggregate the data streams of all the Devices directly in the group, so for example if I have multiple energy meter devices in a room, I can use this to combine them into the total room energy consumption. Groups - One Level Down This can only be created on group templates. This will add all the data streams from exactly one level down the hierarchy, but not include devices in the group itself. This is useful in hierarchy situations where you want to aggregate things from one level down. For example if you want to create a floor energy consumption which consolidates the data from the room level energy consumption readings. Groups – All Levels Down

Field	Description
	This can only be created on group templates. This will add all the data streams from all the devices/things that are underneath this group in the hierarchy regardless of depth.
Logical type	Setting a range will affect coloring for the readings in widgets/diagrams, etc. (This is the same as for a regular event).
Precision	How many digits should be displayed after the decimal point to show for this event. (This is the same as for a regular event).
Unit to display	The unit of the reading. (This is the same as for a regular event).
Icon	Sets the Icon for the reading. (This is the same as for a regular event).
Color	Sets the color for the reading. (This is the same as for a regular event).

Aggregation Event

Aggregation Event

Event Name

Type Code

Please select

Description

Aggregation Level

Groups - Same Level Only

Data to Aggregate

Aggregation Method

Average

Logical Type

None

Range

Execution Interval

Every Minute

Precision

Unit to Display

Icon

Color

Aggregation Event:

- Is used to aggregate the **current** status of multiple data streams, for example, I want the max temperature from all the fridges in my store.
- Must be a numeric data stream.

Field	Description
Data to aggregate	This tells the calculation engine what event we are working on (this is then crossed with the aggregation level to choose the data stream we will be aggregating. To help you find the event it is broken down by product. The options are: Cross Product Events: This allows you to choose an event that is cross product, based on the type code and the event name. So for example you can have multiple

Field	Description
Aggregation Method	electric meters from different manufacturers and use this to aggregate them together. • Single Product Events: This lets you find any product/group template and choose any event from them. • Current Product Events: This lets you choose any event that is on the product/group template you are working on now. You can also find this product in the Single Product Events, this is just a shortcut to product/group template you are working on now. Note that if you choose an Aggregation Level of Device you can only choose Current Product Events. This is because the aggregation level will filter out anything that isn't the current device.
	This sets what aggregation method to do on all the data streams that were found on device/things based on the aggregation level and the event filtering, the options are: • Sum • Average • Min • Max

Historical Event

Historical Event

* Event Name

* Type Code

Please select

Description

Aggregation Level

Device

* Event

* Aggregation Times

Last month

☒ Single Aggregation

☐ Bucket Aggregation

* Aggregation Method

Average

Logical Type

None

Range

Execution Interval

Every Minute

Precision

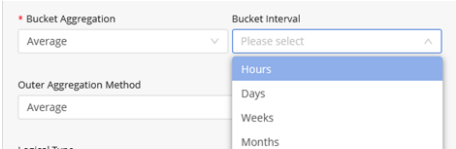
Unit to Display

- Is used to aggregate historical data of multiple data streams, so for example you could use this to create a new data stream which is the total energy consumption for the last 24 hours.
- Must be a numeric data stream.

Field	Description
Event	This tells the calculation engine what event we are working on (this is then crossed with the aggregation level to choose the data stream we will be aggregating. To help you find the event it is broken down by product. The options are: • Cross Product Events: This allows you to choose an event that is cross

Field	Description
	product, based on the type code and the event name. So for example you can have multiple electric meters from different manufacturers and use this to aggregate them together. • Single Product Events: This lets you find any product/group template and choose any event from them • Current Product Events: This lets you choose any event that is on the product/group template you are working on now. You can also find this product in the Single Product Events, this is just a shortcut to product/group template you are working on now. Note that if you choose an Aggregation Level of Device you can only choose Current Product Events. This is because the aggregation level will filter out anything that isn't the current device.
Aggregation Times	This is what historical period we want to include in our aggregation: • Last hour – 60 minutes going back from the time the

Field	Description
	calculation is executed, so this window will change at every execution • Last full hour – this will include everything from the last hour that is already done, so for execution times of 2:20pm, it will include the period of 1-2, and will do so until the time is 3:00pm, at which point it will include the period of 2-3 • Yesterday – this will include all the datapoints from the previous day, and will change at midnight • Last 24 hours, this will include all the data points from the last 24 hours and will change every execution • Last week – this will include the last full week that finished • Last 7 days – this will include 7 days ending on the last midnight. If run on the 13th at 13:00 of a month, it will include data

Field	Description
	from the start of day on the 6th until end of the day of the 12th • Last month – this will include the last full month that finished and will change at the 1st of every month • Last 30 days – if run on October 31st at 14:30 it looks back from October 1st 00:00:00 to October 30th 23:59:59
Single aggregation/ Bucket aggregation	The calculation engine will allow you to support either a single aggregation for the entire historical data or a two-step process where you aggregate the data twice. If you chose single aggregation you choose between the various aggregation methods available, if you chose bucket aggregation you will be able to do two separate roll ups:  The calculation engine will first roll up the data into the bucket interval selected, with the bucket aggregation method, and then roll up the rolled-up data points into one data point, with the outer aggregation method selected. This allows you to create scenarios like, create the sum of the energy consumption per day, and then

Field	Description
	create an average of the daily energy consumption per month.

Count by Value Event

Count by Value Event

Event Name

Type Code

Please select

Description

Aggregation Level

Device

Event to Aggregate

Value

Within Last

Please select

Logical Type

None Range

Execution Interval

Every Minute

Precision

Unit to Display

Icon

Color

Count by Value Event:

- Is used to count how many different streams **currently** have the value of X from a list of allowed values. For example, how many of my desks are currently occupied.
- Must be an Allowed Values data stream (Open/Close, Occupied/Free/NA, etc)

Field	Description
Event to aggregate	This tells the calculation engine what event we are working on (this is then crossed with the aggregation level to choose the data stream we will be aggregating. To help you find the

Field	Description
Within Last	event it is broken down by product. For count by value, you cannot choose a cross product event Here, you can define the range for checking the specified event. Note - if you select a range, and the range's time frame has passed and no event change has occurred, the event will reset to its default value. This could be an incorrect value. To ensure that you always receive the latest actual value, you can enable the switch Ignore within last. When enabled, the digital twin only takes into account the actual sensor value.
Single Product Events	This lets you find any product/group template and choose any event from them: • Value – The value you want to count, dynamically on the event chosen, so if the event for Door can be either Open or Closed, you will see both these options. • Within Last – since this is supposed to aggregate the current value, you must decide how far back is considered “current”, this could be different based on the business logic you are trying to implement: The options are:

Field	Description
	Cross Product Events: This allows you to choose an event that is cross product, based on the type code and the event name. So for example you can have multiple electric meters from different manufacturers and use this to aggregate them together. Single Product Events: This lets you find any product/group template and choose any event from them Current Product Events: This lets you choose any event that is on the product/group template you are working on now. You can also find this product in the Single Product Events, this is just a shortcut to product/group template you are working on now. Note that if you choose an Aggregation Level of Device you can only choose Current Product Events.

Field	Description
	This is because the aggregation level will filter out anything that isn't the current device. Anything that is not in the time frame will be ignored, so if you chose the door event, on value open and within last 24 hours, if the current reading of a specific door is open, but that reading was sent 3 days ago, it will not be counted.

Percentage Event

Percentage Event

* Event Name

* Type Code

Please select

Description

Aggregation Level

Device

* Event

* Denominator

Please select

Logical Type

None Range

Execution Interval

Every Minute

Precision

Unit to Display

Icon

Color

+

+

Percentage Event

- Will calculate the percentage between events or between an event and a property that is defined on the device/group. For example, you can set an occupancy limit per room as a property, and then use an event for current occupancy and then create a percentage event to track utilization.

Field	Description
Numerator	The numerator has to be a numeric event.
Denominator	Can be either a numeric event or property.

Event with Function Formula

Event with Function Formula:

- Will let you define variables and then create an open formula with these variables. For example, you can define A to be the current number of people in a room, B the energy consumption and C the price of electricity and then create the formula $(A/B)*C$ to create a KPI for energy cost per person.
- All variables must be numeric values.

Event with Function Formula

Event Name

Type Code

Please select

Description

Aggregation Level

Device

Variables

Variable A

^

Variable Type

Variable Description

Aggregation

Event to Aggregate

Aggregation Method

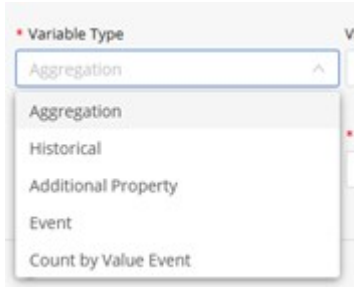
Please select

Add Variable

Formula

Formula

Cancel Changes
Done

Field	Description
Variables	Variables have five types:  • Aggregation – has the same options as aggregation event (see documentation above) • Historical – has the same options as historical event (see documentation above) • Additional property – choose which additional property you want to include as a variable, it can only be numeric properties that are defined on the product/ group template you are working on, as it does not aggregate the additional property but takes it as is. • Event – this takes the value from the last

Field	Description
	event that matches the event filter across the hierarchy level selected. So, if you have 4 devices that have this reading it will take the latest one. Count by Value Event- has the same options as count by value event (see documentation event) You can create as many variables as you want and then use them in a formula.
Formula	This is an open text field where you can input an expression using the variables you created, in addition you can use +,-,*,/,() and numbers. Remember that every variable will create just one number so the expression will be a simple expression after the variables are resolved. Example formulas can be: - A+B - A * 2 (A+B)*(C+D) - A/B Note that when introducing a division into your formula you must make sure that you do not divide by zero, as that will cause the event to not be calculated.

Condition Formula Event

Condition Formula Event:

- Lets you create the same variables but then use them in series of Boolean expressions to transform them to a list of discrete options. So, for example, with the same A B C you could say If A/C > 10 -> Green , if B = 200 -> Yellow otherwise Red.

Variable configuration is the same as Function Formula, see documentation above.

As for the conditions themselves:

Formula

* Conditions

Condition	Label	Icon	Color
If A + B > 100	1	Good	Green
If A > 34 AND C = 200	2	OK	Orange
If C = 2	3	Neutr.	Purple
else	Bad	Label	Red

Each condition must resolve to true or false, so <, >, =, <>, >=, <=, AND, OR

Conditions are evaluated top down with the first one that matches causing the evaluation to return, if none of the expressions return true, then the default value is return, for that reason a default value must be set.

You can either set a value or a value/label combination. Unless you have a specific use case just set the value, in addition you can set icon/color per value.

Rules

Rules define the conditions that trigger actions in IoT Platform .

For example, a Rule can define that an email is sent to a specific person with a specific message when the temperature of a specific refrigerator goes over 20° and the water sprinkling system can be automatically turned on.

The definition of a rule comprises the following:

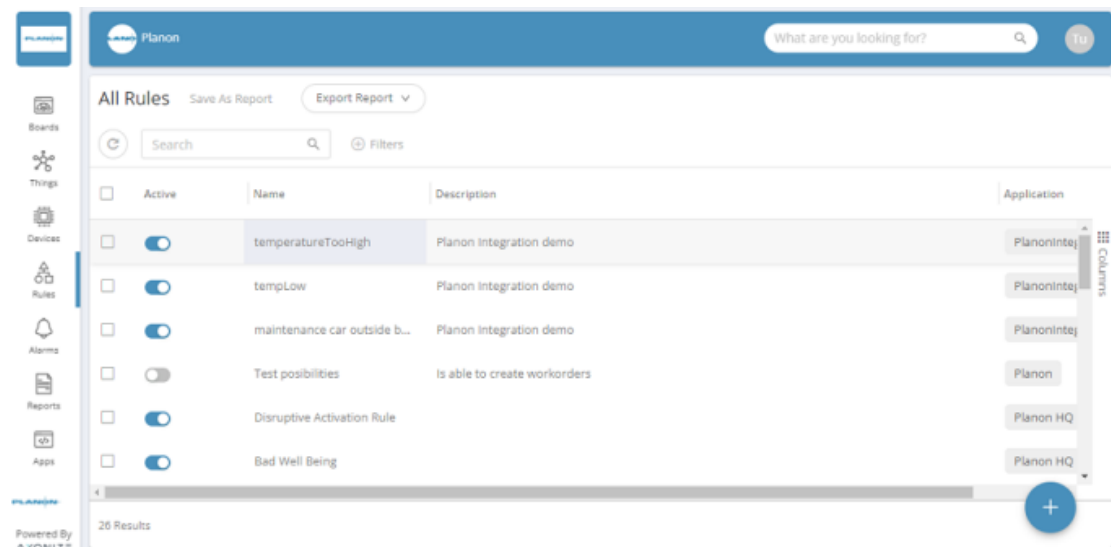
- **Entities** – Specify the Application(s), Product(s) or Device(s), Digital Twin(s), Group Template(s) to which the Rule applies.
- **Schedule** – Specify the schedule during which the Rule conditions are active.
- **Conditions** – Specify the conditions that trigger the Rule, such as when a Device reading is within a specific value range, over a specific threshold, entering/exiting a geo-fence and so on.
 - **Scheduled (CRON) Rules** – Rules can also be triggered according to a CRON-defined schedule, that is to report the status of a Device every half-hour. When a CRON schedule is defined for a Rule, no other conditions in this Rule are relevant.

- **AND/OR Logic – Inside a Rule** – To define that multiple **Conditions** must be met at the same time in order to trigger the Rule select the 'AND' option. If your condition is enough to trigger the rule action, select the 'OR' option.

Important – A condition can be defined as an **Instantaneous** condition. Setting a condition as an instantaneous condition means that the condition is set on an instantaneous event. Rules containing an instantaneous condition behave somewhat differently than standard rules, as described in **Instantaneous Rules, Conditions and Events**.

- **OR Logic – Between Rules** – Rules run at the same time. Therefore, you can define multiple Rules, each with their own **Condition**. If the **Condition** of two Rules exists for a specific Device, then both Rules are triggered when their conditions are matched.
- **Actions** – Specify the operations that are activated when the conditions of the Rule are matched, such as sending an SMS/email, making a call, sending information to an ERP/CRM or activating a command on the Device (such as opening a light or closing a lock). You can also specify that an Alarm is created when the Rule is triggered. Various fields of information from the Rule itself and/or from the Event that triggered the Rule can be used by the Action that is triggered by this Rule.

In the IoT Platform Portal, the Rules window shows all the Rules currently defined for an Application. Each row represents a different Rule.



The Rule view displays the following columns of information:

Field

Selection Checkbox

Active

Description

When selected, indicates that the Rule is selected to view its details.

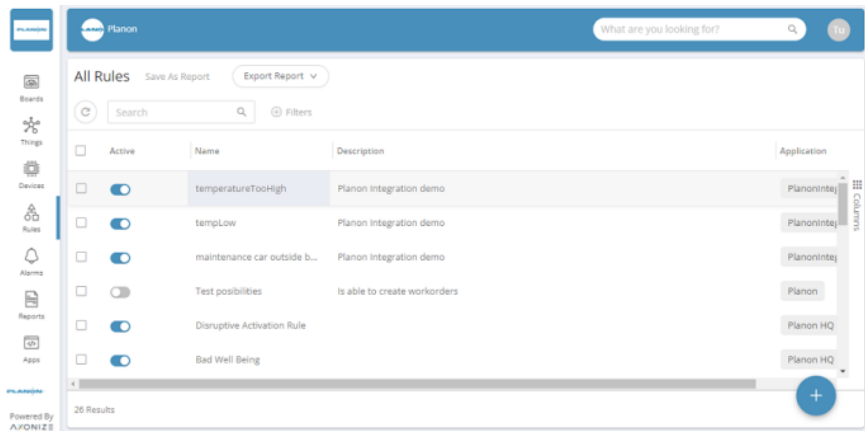
Toggles to activate/deactivate the Rule.

Field	Description
Name	Shows the name of the Rule.
Description	Shows a description of the Rule.
Application	Shows the name of the Application to which the Rule is assigned. This column only displays when the logged-in user is an Administrator.

Adding a Rule

Procedure

1.  In the left pane of the IoT Platform Portal, click the **Rules** button.
A window displaying the list of rules currently defined in the system opens.



2.  Scroll down to the bottom of the rule list and click the **+** button.

The following window displays:

The 'New Rule' window has a blue header bar with the title 'New Rule' and a close button (X). Below the header is a tabbed interface with four tabs: '1 General' (selected), '2 Time', '3 Conditions', and '4 Actions'. The 'General' tab contains the following fields: a mandatory 'Name' field (indicated by a red asterisk) with an empty text box, a 'Description' field with a larger empty text box, and a 'Rule generates an alarm of severity' dropdown menu currently set to 'Warning'. At the bottom right of the tab content are two buttons: 'Cancel Changes' and 'Next'.

This window contains four tabs **General**, **Time**, **Conditions** and **Actions**.

3. In the General tab fill the fields, which specifies general characteristics of the Rule.

This screenshot shows the 'New Rule' window with the 'General' tab selected. The 'Name' field now contains the text 'Test'. The 'Description' field remains empty. The 'Rule generates an alarm of severity' dropdown is still set to 'Warning'. The 'Next' button is now highlighted in blue, indicating it is the next step in the process.

 An asterisk (*) indicates a mandatory field.

Field	Description
Name	A free-text field specifying the name of the Rule.
Description	A free-text field providing a description of the Rule.
Rule generates an alarm of severity	Select the check box for the Rule to generate an Alarm of a particular severity. In the adjacent drop-down list, select the applicable Alarm severity: • Warning • Minor • Major • Critical • Information See also: Rules & Alarms.

4. Click the Next button to move to the **Time** tab in the window or click the **Time** tab.

New Rule

General

Time

3 Conditions

4 Actions

Timezone

(GMT+05:30) India Standard Time

Rule Activation Type

Period

Schedule

Relative

Frequency

S

Start Time

End Time

Duration: All Day

M

Start Time

End Time

Duration: All Day

T

Start Time

End Time

Duration: All Day

W

Start Time

End Time

Duration: All Day

Cancel Changes

Next

- In the Time tab, you can specify when the Rule is to be activated, and whether it is activated for a specific time period or based on a defined schedule. By default, a Rule is activated all day, every day.
- Specify the following fields to define when the Rule is to be active:

Field	Description
Timezone	Specify the time zone that applies to the Rule.
Rule Activation Type	This field determines whether the Rule is activated for a specific time period or based on a schedule, as follows: Period - Specifies the time period when the Rule is active. The condition(s) of a Periodic Rule are only checked during

Field	Description
	the particular days and times that you specify. If they are met, then the action defined for the Rule is triggered. For this type of Rule, each time an event arrives within the defined time period that crosses the threshold specified in the Rule's condition, the Rule is activated.

New Rule

General

Time

Conditions

Actions

Timezone

(GMT+05:30) India Standard Time

Rule Activation Type

Period

Schedule

Relative

Frequency

S

Start Time

End Time

Duration: All Day

M

Start Time

End Time

Duration: All Day

T

Start Time

End Time

Duration: All Day

W

Start Time

End Time

Duration: All Day

T

Start Time

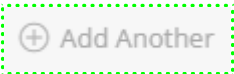
End Time

Duration: All Day

Cancel Changes

Next

- Schedule** – For a Scheduled Rule, you specify the frequency, day(s) and exact time when the Rule's condition(s) are checked. If the conditions are met at this exact time, then the Rule action is triggered. If no

Field	Description
	condition(s) are defined the Rule action will be triggered at the scheduled Set Hour. Setting this rule to be active Daily, Weekly or Monthly means that the condition(s) is checked Daily, Weekly or Monthly. You can add additional times when the Rule is meant to be active by clicking the  button, and then specifying the time in the new Set Hour.

Daily

In the following example, the condition(s) are checked once a day at 10:00.

Rule Activation Type

Period

Schedule

Relative

Frequency

Daily

Weekly

Monthly

Set Hour

10:00

Add Another

Weekly

In the example below, the condition(s) are checked on Sundays and Tuesdays at 10:00 and 11:00.

Field

Description

Rule Activation Type

Period

Schedule

Relative

Frequency

Daily

Weekly

Monthly

Set Days

S

M

T

W

T

F

S

☐ Select All

Set Hour

10:00

Set Hour

11:00

Cancel Changes

Next

Monthly

In the example below, the condition(s) are checked on the first of the month for January, March and May at 10:00 and 11:00.

Rule Activation Type

Period

Schedule

Relative

Frequency

Daily

Weekly

Monthly

Set Months

Jan

Feb

Mar

Apr

May

June

July

Aug

Sept

Oct

Nov

Dec

☐ Select All

Set Days

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

☐ Select All

Set Hour

10:00

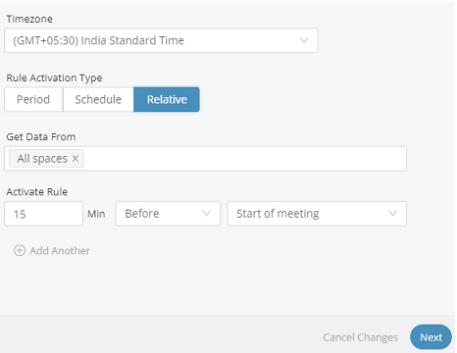
Set Hour

11:00

Cancel Changes

Next

- **Relative** - For a Relative Rule, select the device(s) which contain

Field	Description
	the booking information in the Get Data From field (devices with the Calendar tab) and specify the time relative to the booking in which the action is to be triggered. Example: Fifteen minutes before start of meeting.  Get Data From – Specify the calendar device, and the rule apply to (All the meetings will be taken from the device calendar). Activate Rule – Specify when to run the rule. You can trigger the rule X minutes before or after meeting (Apply for all the meetings).

- Click the Next button to move to the Conditions tab in the window or click the Conditions tab.

New Rule

General

Time

Conditions

4 Actions

Add Condition

This rule has no conditions yet.

Click 'Add Condition' to create the first condition

Cancel Changes

Next

8.

Add Condition

 Click the button.

The following window displays:

New Rule

General

Time

Conditions

4 Actions

Back

Threshold	Threshold with duration	Entered geofence	Exited geofence
In geofence with duration	Out of geofence with duration	Instantaneous	Compare Readings

Cancel Changes

Done

This window contains several boxes. Each box represents a different type of condition that can be defined for a Rule. The following condition types can be defined:

- **Threshold** – The Device reading is different than a specific reading.

Adding a Rule

175

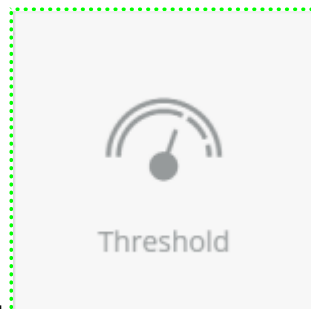
- **Threshold with Duration** – The Device reading is different than a specific value for a defined amount of time.
- **Entered Geofence** – The Device entered a predefined geolocation.
- **Exited Geofence** – The Device exited a predefined geolocation.
- **In Geofence with Duration** – The Device entered a predefined geolocation for a defined amount of time.
- **Out of Geofence with Duration** - The Device exited a predefined geolocation for a defined amount of time.
- **Instantaneous** – An event type reading, (or instantaneous) reading occurred.
- **Compare Readings** – Compare two different readings values from the same or two different devices.

Some conditions are standalone conditions and cannot be used with additional conditions, these include:

- Conditions that target multiple things (app/product/group template/multiple devices/multiple digital twins) cannot be combined with other conditions.
- Cannot have multiple duration conditions (can have one duration and one non duration condition)
- Compare readings condition cannot be combined with other conditions.

All condition types are defined in a similar manner.

9. Click a box in the window to define that type of condition. For example, the following describes how to define a Threshold condition type.



Threshold – For this type of condition, set the following properties:

New Rule

General

Time

Conditions

4 Actions

Back

Threshold

Condition Name

Condition Level

App

Data

Select from list

Operator

Select operator

Value

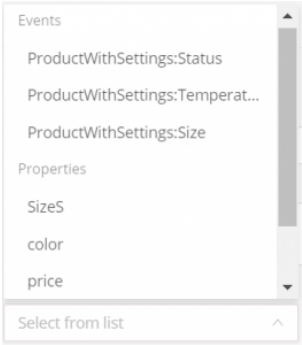
Enter a value

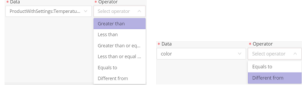
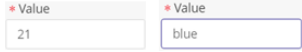
Cancel Changes

Done

 An asterisk (*) indicates a mandatory field.

Field	Description
Condition Name	Specifies a name for the condition.
Condition Level	Specifies the type of entity on which the Rule's action is to be performed such as; an Application, Device or Product. Note that some condition types only apply to the specific entities. For more details. The Condition Level for the Threshold with Duration, In Geofence with Duration and Out of Geofence with Duration condition types can be set for the: • Application • Device • Product • Digital Twin • Group template The Condition Level for the Threshold with Duration, In Geofence with Duration and Out of Geofence with Duration condition types can also be set for multiple devices simultaneously.

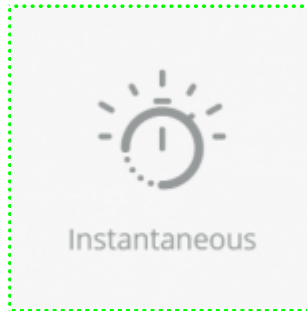
Field	Description
	• Devices – Specifies the Device(s) on which to apply the condition.  • Data – Specifies the property or Event identifier (Event Name plus Type Code) that triggers the Rule. The properties in the drop-down list vary, depending on the Condition Level selected (see above). For example, if the Condition Level is Application, then only properties of an Application will display. The Events in the drop-down list specify the name of the Event for the Application ID/ Product/Device on which to apply the condition. IoT Platform works on a combination

Field	Description
	of the Event Name and Type Code to uniquely identify an Event.
	 Product properties correspond to additional Properties in the Products API endpoints.
	Operator - Specifies the operator to apply to the data selected in the Data. The options that display in the drop-down list vary, depending on the data selected in the Data field.  Value - Specifies the value that triggers the condition. 

10. After specifying all required fields for the condition, click the **Done** button. The condition displays in the list of conditions in the **Conditions** tab.

You can add multiple conditions in a Rule. In such cases, there is an OR relationship between the conditions.

For example, the following describes how to define an Instantaneous condition type:



Instantaneous – For this type of condition, set the following properties:

New Rule

General
Time
Conditions
Actions

Back

Instantaneous

* Condition Name

* Condition Level

Please select

App

* Readings

Is Triggered

Cancel Changes
Next

i An asterisk (*) indicates a mandatory field.

Field	Description
Condition Name	Specifies a name for the condition.
Condition Level	Specifies the type of entity on which the Rule's action is to be performed, such as an Application, Device or Product.
Readings	Specifies the reading that triggers the event.

11. After specifying all required fields for the condition, click **Done**.

The condition displays in the list of conditions in the **Conditions** tab.

Compare Readings – For this type of condition, set the following properties:

New Rule

General

Time

Conditions

4 Actions

↩ Back

↔ Compare Readings

* Condition Name

* Condition Level

Device

Condition

* Device

* Reading

Select from list

Select from list

* Operator

Select from list

* Device

* Reading

Select from list

Select from list

Cancel Changes

Next

Field	Description
Condition Name	Specifies a name for the condition.
Device	Specifies the device to apply the condition.
Device Reading	Specifies the device reading for the condition.
Operator	Specifies the operator to apply to the data selected.
Difference	Add operation for the second device reading value , (i.e. Difference Multiply 2 will be equal to Temperature from room 1 is greater than twice the temperature in room 2).

12. After specifying all required fields for the condition, click **Done**.

The condition displays in the list of conditions in the **Conditions** tab.

13. Click the Next button to move to the Actions tab in the window or click the Actions tab:

New Rule

General

Time

Conditions

Actions

Details

Alarm Instance

☐ Notify when rule restores

Cancel Changes

Save

On this tab, you define the action to be performed once the Rule condition has been met.

14.

Click the  button. The following window displays:

New Rule

General

Time

Conditions

Actions

Back

Send SMS

Send Push Notification

Send email

Call

Send to web service

Send command to device

Change device settings

Cancel Changes

Done

This window contains several boxes. Each box represents a different type of action that can be defined for a Rule.

All action types are defined in a similar manner. Click a box in the window to define that type of action.

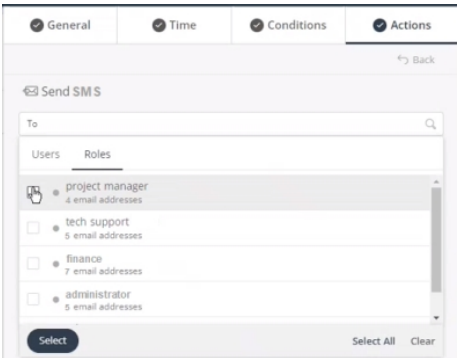
The following types of actions can be defined:

- **Send SMS**

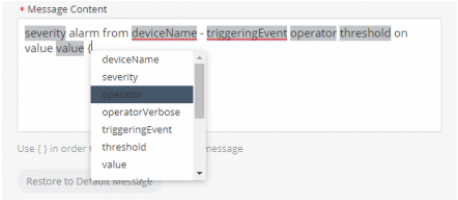
For this action type, set the following properties:

Field	Description
To	Clicking in the To field allows you to specify the recipient(s) for receiving the SMS. Here, you can select: • Users to send the notification to individual people by selecting the application users, or by

Field	Description
	adding a specific phone number/ address. • Roles to send the notification to a group of people. • A combination of the above (Users & Roles).



Message Content	Specifies the content of the SMS message to be sent. The system automatically populates the keywords and the message content according to the Rule you have defined. You can manually add text and keywords, or edit the message, as needed. Alternatively, you can select from the available keywords in the system by typing a curly bracket ({}), and then selecting a relevant keyword in the drop-down menu that displays, as shown below:
-------------------------------	---



IoT Platform keywords can be included in the message inside brackets {}. These keywords enable

Field	Description
	you to include information retrieved by IoT Platform in the message. 1. Restore to Default Message – Click this button to restore the Message Content to its default message. 2. Rule action will repeat – Specifies the number of times to repeat the Rule action and the interval between repetitions. 3. Rule Description – Provides a free-text description of the Rule.

- **Send email**

The screenshot shows the 'New Rule' configuration window with the 'Actions' tab selected. The 'Send email' action is configured with the following details:

- General:** Selected tab.
- Time:** Selected.
- Conditions:** Selected.
- Actions:** Selected tab.
- Send email:** Action selected.
- To:** Input field for the recipient email address.
- * Email subject:** Input field containing the placeholder text '{name} triggered'.
- * Email Content:** Input field containing the text 'severity alarm from name rule has been triggered on datetime', where 'severity', 'name', and 'datetime' are highlighted as variables.
- Footer:** Includes a hint 'Use { } or @ in order to add a variables to the message' and buttons for 'Cancel Changes' and 'Save'.

The properties that you define for this action type are the same as those for the Send SMS action type.

- **Call**

The screenshot shows the 'New Rule' configuration window with the 'Actions' tab selected. The action type is 'Call'. There is a 'To' field with a search icon. Below it, a note states: 'We will add a (+1) prefix to the phone number unless a new prefix is set with the "+" sign'. The 'Message Content' section is marked with a red asterisk and contains the text: 'severity alarm from deviceName - triggeringEvent operator threshold on value value'. Below the message content, there is a note: 'Use { } or @ in order to add a variables to the message'. At the bottom of the message content area is a button labeled 'Restore to Default Message'. At the bottom right of the form are two buttons: 'Cancel Changes' and 'Save'.

The properties that you define for this action type are the same as those for the Send SMS action type.

- **Send to Web Service**

New Rule

General

Time

Conditions

Actions

Send to web service

GET

http://www.google.com

Headers

Content-Type

application/json

Body

Response

Cancel Changes

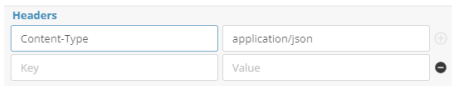
Save

The IoT Platform web service can link to any endpoint system as a result of a rule action. The web service is sent from a closed group of static IPs to ensure proper integration with the system that requires an IP white list.

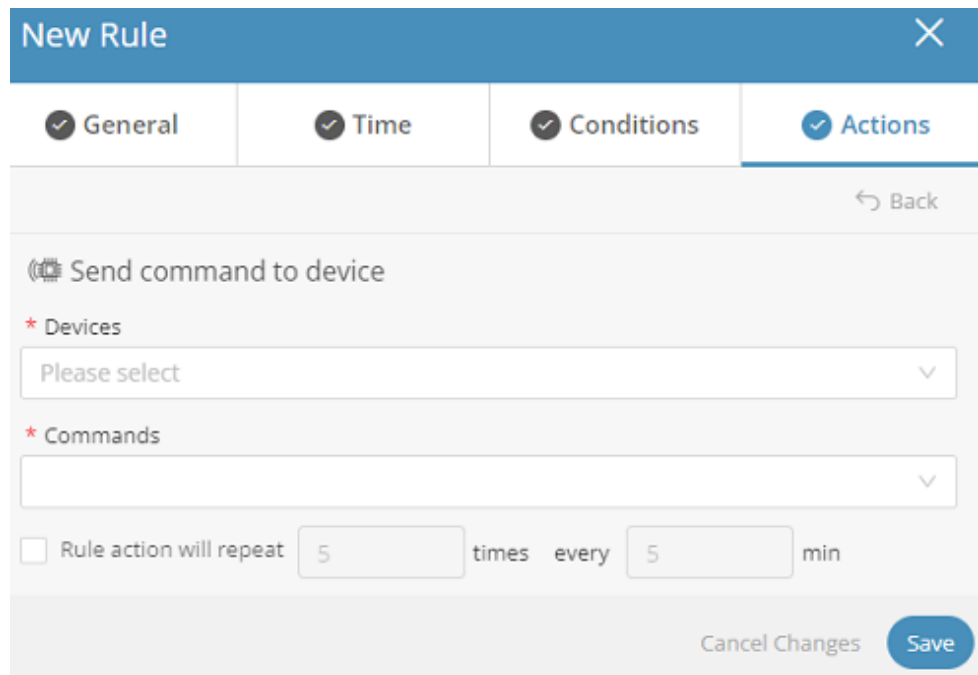
The static IPs used vary, depending on the environment. When developing in the Staging environment, one of the following IPs is used – 52.166.49.187, 40.114.142.65, 40.115.40.56 or 168.63.100.144. When developing in the Production environment, one of the following IPs is used – 40.115.24.132, 104.40.177.115, 40.68.148.115, 40.115.46.91, 40.118.80.207 or 168.63.100.144.

For this action type, set the following properties:

Field	Description
Method	Specifies the method of the web service: • GET • POST • PUT • PATCH • DELETE

Field	Description
	• HEAD
URL	Specifies the URL to which to send the call.
Headers	Click the plus  button to add the key and value properties of the header. These are the key/values that are sent as HTTP headers. The key becomes the header key and the value becomes the header value 
Body	Specifies the body of the HTTP call. You can click the Test button after filling in this field to perform a live test.
Response	Specifies the response received to the HTTP call. You can view the response after doing a live test (see above).
Rule Description	Free text describing the Rule.

◦ **Send Command to Device**



The screenshot shows the 'New Rule' configuration window with the 'Actions' tab selected. The action type is 'Send command to device'. The configuration includes a 'Devices' dropdown menu with the text 'Please select', a 'Commands' dropdown menu, and a checkbox for 'Rule action will repeat' set to '5' times every '5' min. At the bottom, there are 'Cancel Changes' and 'Save' buttons.

For this action type, set the following properties:

Field	Description
Devices	Specifies the Device to which to send the command.
Commands	Specifies the command to send to the Device.
Rule actions will repeat	Specifies the number of times to repeat the Rule action and the interval between repetitions.
Rule Description	Provides a free-text description of the Rule.

- **Change Device Settings**

The screenshot shows a 'New Rule' configuration window with a blue header and a close button (X). Below the header are four tabs: 'General', 'Time', 'Conditions', and 'Actions', each with a checkmark icon. The 'Actions' tab is selected and highlighted with a blue underline. A 'Back' button with a left arrow is located in the top right of the main content area. The main content area has a title 'Change device settings' with a wrench icon. Below the title are two required fields, marked with a red asterisk: '* Devices' and '* Settings', each with a dropdown menu. At the bottom, there is a checkbox labeled 'Rule action will repeat' followed by input fields for '5' times every '5' min. At the very bottom right are 'Cancel Changes' and 'Save' buttons.

For this action type, set the following properties:

Field	Description
Devices	Specifies the Device whose settings are to be changed.
Settings	Specifies the setting to change on the Device.
Value	Specifies the new value to assign to the setting on the Device. You can

Field	Description
	add “ +, -, * ,/ ” so that the property will increment by.

 All other action types are not currently supported.

After specifying all required fields for the action, click **Save**. The Rule is then added to the rule list.

Rules & Alarms

With every rule you create and action you choose, an Alarm event is automatically created - always.

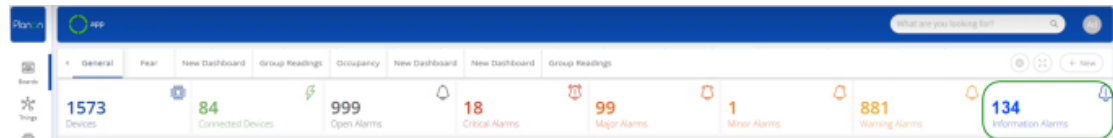
You can view these instances in **All Alarms**. If you have many devices and/or many rules, the number of alarm events may be overwhelming.

Severity

By specifying the rules' **Severity level** you can focus on and distinguish between the urgency of alarms.

You can set the severity level when specifying rules at **All rules > General**. Here, you can select alarm types that require action (*Warning, Minor, Major, Critical*). Or, you can choose an alarm type that is *Information* only and requires no direct follow-up.

For a quick overview of all alarms, you can display alarms of each severity type on a board.



Managing rules & alarms

When a rule is triggered, an alarm instance is created. This alarm is displayed in a list with the status **Open**. An alarm with an **Open** status will remain **Open** until action is taken.

When you [delete a rule](#), the **Open** alarm instances related to the rule will subsequently be deleted as well. When deleting a rule, a dialog box appears prompting you to confirm the action: *Are you sure you want to delete rule 'x'? All open alarms will be closed. Are you sure?"*

If you click **Yes**, all related alarms will be **Closed** and removed.

When you **Deactivate** a rule, the associated alarms are automatically set to **Closed**, but they remain listed in the alarm overview.

Understanding Rule 'Behavior'

When a rule condition is breached and an action is generated, the rule is in breach status. This means that if the next Event also breaches the condition no action will occur.

An event which **unbreaches** the condition must be sent to set the rule back in its triggering status so that when another Event that breaches a condition is sent, the action will be generated.

Example

A rule has a condition to be triggered when Temperature > 25, the following readings are sent:

2, 7, 16, 4, 23, **27**, 26, 32, 26, 42, 18, **26**, 28, 23, **27**

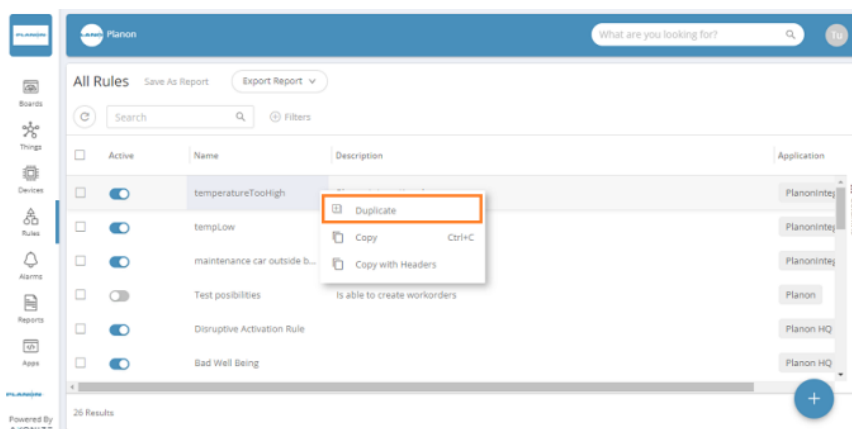
Only the readings in bold will trigger an action!

Duplicating a Rule

Rules can be duplicated, as needed.

Procedure

1. Right-click a rule row and select **Duplicate** in the drop-down menu.



- 2.



In the right pane of the rule definition area, click the icon.

Copy of temperatureTooHigh

General

Time

Conditions

Actions

Name

Copy of temperatureTooHigh

Description

Planon Integration demo

Rule generates an alarm of severity

Warning

Created By

Casper

Creation Date

Oct 13 2021, 8:24:10 PM

Cancel Changes

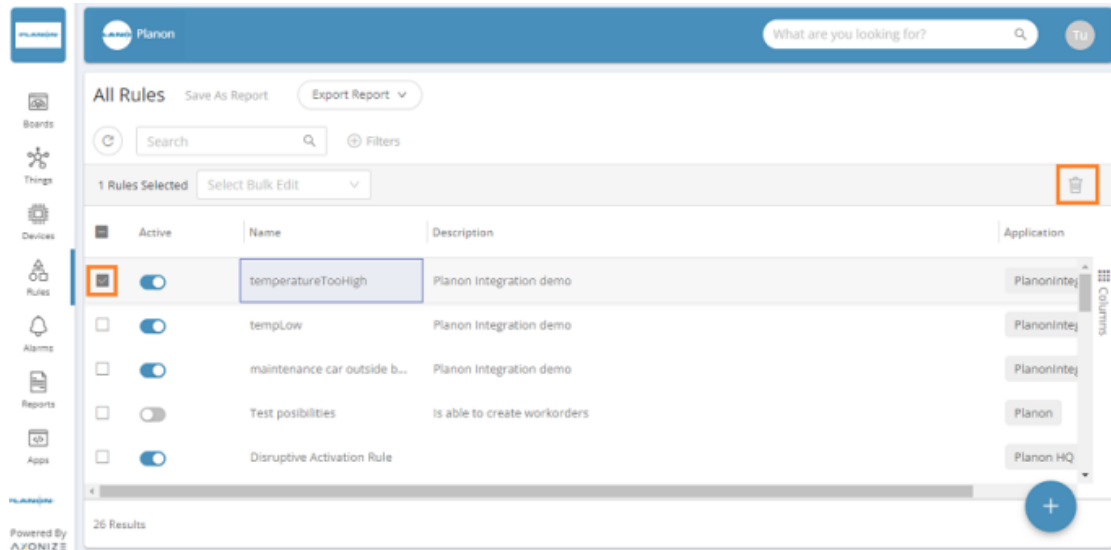
Save

3. If required change the fields.
4. Click Save.

Deleting a Rule

Deleting a rule removes it from the **Rule** tab. During deletion, any alarms created by this rule will be deleted, and therefore any device that was marked as alarmed just because of this rule will be restored to unalarmed state.

In order to remove a rule, click the check box on the left side of the rule you want to delete, this will cause the trashcan to appear at the top of the grid allowing you to delete the rule.



When you [delete a rule](#), the **Open** alarm instances related to the rule will subsequently be deleted as well. When deleting a rule, a dialog box appears prompting you to confirm the action: *Are you sure you want to delete rule 'x'? All open alarms will be closed. Are you sure?"*

If you click **Yes**, all related alarms will be **Closed** and removed.

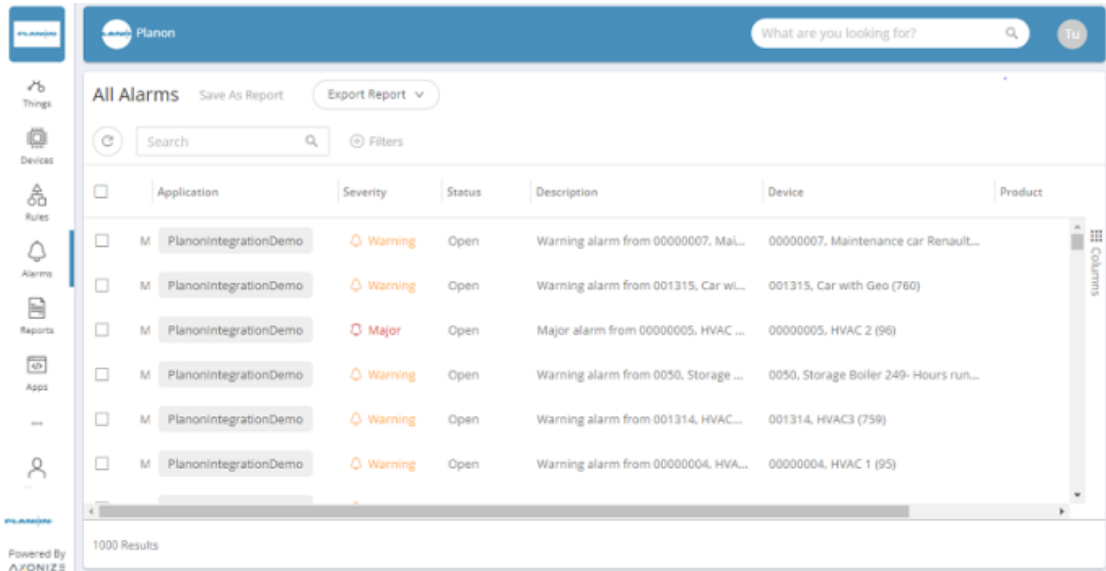
Alarms

In the IoT Platform Portal, the Alarms view enables you to view all the Alarms that have been triggered by **Rules**. Each row represents a different Alarm.

When the conditions of a Rule are matched, an Alarm is created. An example of a Rule that triggers an Alarm is when the **Temperature** of a Device named **Refrigerator #7** goes over **40°**, then an Alarm is sent by the IoT Platform Rule engine indicating the name of the Device, a timestamp of the event and the Alarm's severity among other types of information about the event.



- The conditions of when an Alarm is triggered are defined in a Rule, not in the Alarm itself. The Alarm typically reports on the conditions of a Device at the time the Alarm was triggered.
- The triggering of an Alarm is a mandatory rule action, additional action actions that can be triggered by a Rule when its conditions are matched.



The Alarm view displays the following columns of information:

Field

Description

Selection Checkbox

When checked, indicates that the Alarm is selected to view its details.

Date

Shows the date and time when the Alarm was created.

Rule Name

Shows the name of the Rule that triggered the Alarm.

Application

Shows the name of the Application associated with the Rule that triggered the Alarm. This column only displays when the logged-in user is an Administrator.

Severity

Shows the severity of the Alarm, which can be one of the following:

-  Warning
-  Minor
-  Major
-  Critical

Viewing Alarm Details

1.  Click the **Alarms** button in the left pane to access the Alarm view.
2. Click anywhere in an Alarm row. The following window displays, showing the details for the selected Alarm.

Temperature

Device	Value	Date
Refrigerator - bar greenhouse	6.75	Mar 16 2022, 6:03:26 AM

Rule Description

If Measured temp to high then generate an alarm and Send hook to "https://innovationlab-prod.planoncloud.com/services/sdk/platform/jaxrs/planonsoftware/innovationlab/no

Dismiss

Delete

The following information is displayed for the Alarm:

Field	Description
Device	The name of the 4 that triggered the Alarm.
Value	The value that triggered the Alarm.
Date	The date and time when the Alarm was triggered.
Rule Description	A description of the Rule that triggered the Alarm.

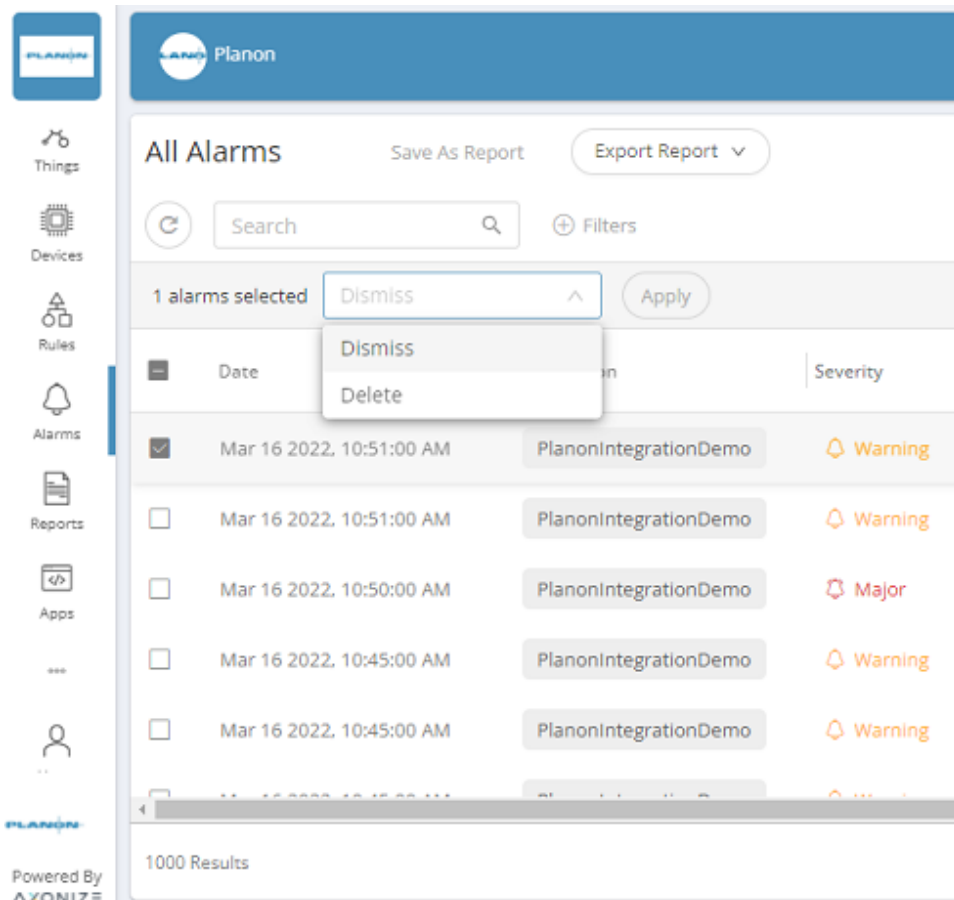
Dismissing an Alarm

You can dismiss an Alarm, as needed. Dismissing an Alarm stops the Rule's action for that Alarm so that the Alarm is no longer triggered and changes the Alarm's status to Closed.

Dismissing an Alarm does not remove the Alarm from the Alarm view.

To dismiss an Alarm: .

- In the Alarms list, select the check box of the Alarm you want to dismiss.
- In the drop-down list at the top left of the window, select **Dismiss**.



- Click **Apply**.

Pausing an Alarm

You can temporarily pause the triggering of a recurring Alarm for a predefined period (minutes).

To pause a recurring Alarm:

- In the Alarm Details window, click **Snooze**.

Alarm Indications on the Map

Each Device that has an Alarm is indicated by a bell shape icon on the Device map view or in the Maps widget.

The icon color is determined based on the alarm severity and is removed once the Alarm is dismissed.

Users

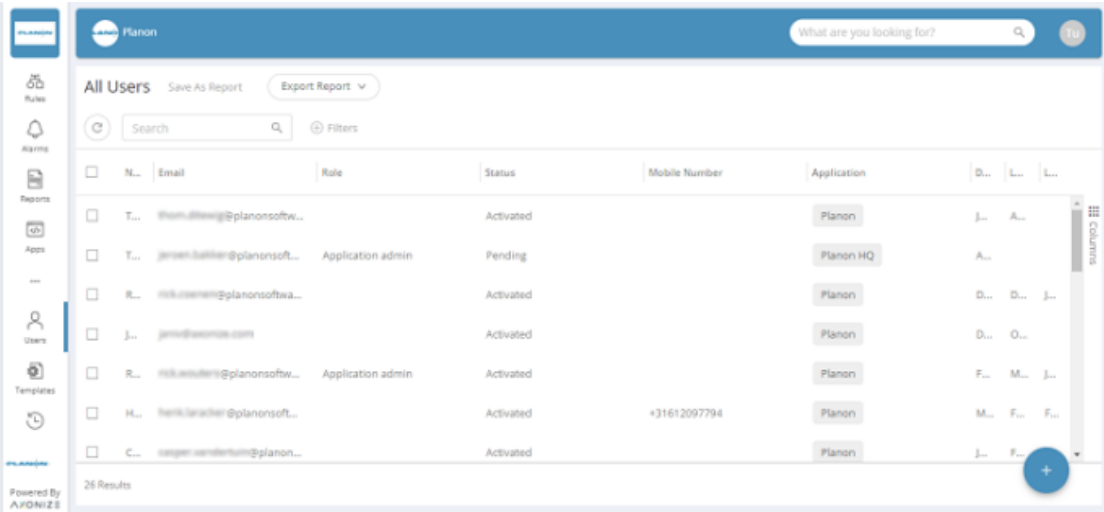
A User is an entity that can log into the portal.

When a User is created, he/she is assigned access to a specific Application. A Tenant User belongs to the Tenant Master Application and can also access all the Applications belonging to the Tenant.

Tenant(s) and/or Sub-tenant(s) are awarded permission to access specific actions according to the [role](#) assigned to them.

The assigned email is the unique identifier (ID) of each User.

The Users view shows all the Users currently defined in the system. Each row represents a different User.



The Users view displays the following information:

Field	Description
Selection check box	When selected, indicates that the User is selected to view his/her details.
Name	Shows the name of the User.

Field	Description
Email	Shows the email address of the User.
Role	Shows the role assigned to the User, which can be one of the following - or a custom-defined role: • Tenant Admin – This role has full access to all IoT Platform functionality for all the Applications of all the Tenants to which this User is assigned. • Project Manager – This role is the same as a Tenant Admin, except that it can only view Devices, Rules and Groups. • Tenant Tech Support – This role can access almost all functionality for the Tenant assigned to him/her, including creating new Devices and new Rules. This role is typically assigned to technical support at the customer. • Application Admin – This role can access almost all functionality for the Application to which he/she is assigned, i.e.

Field	Description
	cannot create new devices.
	• Application Viewer – This role can only view IoT Platform data.
Status	Shows the status of the User, which can be one of the following – Activated, Blocked or Pending.
Mobile number	Shows the mobile phone number of the User.
Application	Shows the name of the Application to which the User is assigned. A value only displays in this column when the User is under the Master Application.

The following overview lists the functions and privileges available to each role for each module in the IoT Platform platform:

Name	Tenants	Applications	Boards	Products	Things	Rules	Alarms	Users	Roles	Profiles	Audit	Group Tem...	Reports
Project Manager													
Tenant tech support													
Application viewer													
Application admin													
Tenant admin													

- **Pencil icon:** View and edit
- **Eye icon:** View only
- **No icon:** Cannot edit nor view

Understanding Users

In IoT Platform , a user has some specific characteristics.

- The level on which users are created determines their level of access. Because access is based on hierarchy, users that are defined on a certain level, automatically have access to all sub-tenants and applications.

This involves specifying the Applications to which each user is allowed access and the permissions they have for accessing these Applications, such as read-only or editing privileges.

See also: [User Access Hierarchy](#).

- An Application can belong to multiple users.
- Each Device belongs to a specific Application.

Uniqueness

Each user is uniquely identified by their email address. A user with the same email can belong to multiple Applications and is considered a *different* user for each, meaning that this user has his/her own password, Client ID/Client Secret, mobile phone number and so on. The information shown in the IoT Platform Portal relates to this user/email address as two different users.

User Access Hierarchy

Users can only access the applications to which they were assigned.

Users created under the master application can access all the applications of that tenant and all the applications of that tenant's sub-tenants.

Sub-tenant users can access all the applications of that sub-tenant.

The auditing feature enables administrators and users to track system activity, including changes in devices, rules, applications and users.

Adding a User

1.



Click the button.

The **New User Form** window displays.

2. Fill in the **Name**, **Email** (must be unique), **Mobile number**, **Role** and **Profile** for the user and then click **Invite**.



All fields except **Mobile number** are mandatory.

3. In the **Invite new user** dialog that appears, indicate whether to:

- **Send invite only by email**

The user will receive an email containing a link to the application.

- **Send invite by email and by SMS**

The user will receive an email and an SMS containing a link to the application.



This option will not be available if the mobile number is not filled in.

Viewing User Details

Procedure

1.



In the left pane, click the **Users** button to display the user list.

2. In the user list, click anywhere in a User row. The following window displays, showing the details for the selected User.

This window contains two tabs **General** and **Audit**.

The **General** tab (earlier) displays the following general information for the User –

Field	Description
Name	Specifies the name of the User.
Company	Specifies the company to which the User belongs.
Email	Specifies the email address of the User.
Mobile Number	Specifies the mobile phone number of the User.
Role	Specifies the role of the User.

The **Audit** tab (shown below) displays the following information for the User. Each row represents a different User action.

User details		×
General		Audit
Date ↓	Action	
Mar 16 2022, 4:41:01 PM	Get Full Reading	
Mar 16 2022, 4:41:01 PM	Login	
Mar 16 2022, 4:26:00 PM	Get Full Reading	
Mar 16 2022, 4:26:00 PM	Login	
Mar 16 2022, 4:11:04 PM	Get Full Reading	

Field	Description
Date	Shows the date and time when the action was performed by the User.
Action	Shows the action performed by the User.

Roles

Roles are set of permissions enabling to control which pages, objects and elements users have access to.

Permissions include Edit, View and No permission. Access to the following items can be set: Tenants, Applications, Boards, Products, Devices, Rules, Alarms, Users, Roles, Profiles, Audit, Report.

There are 5 pre-defined system roles:

- Project manager
- Tenant tech support
- Application viewer
- Application admin
- Tenant admin

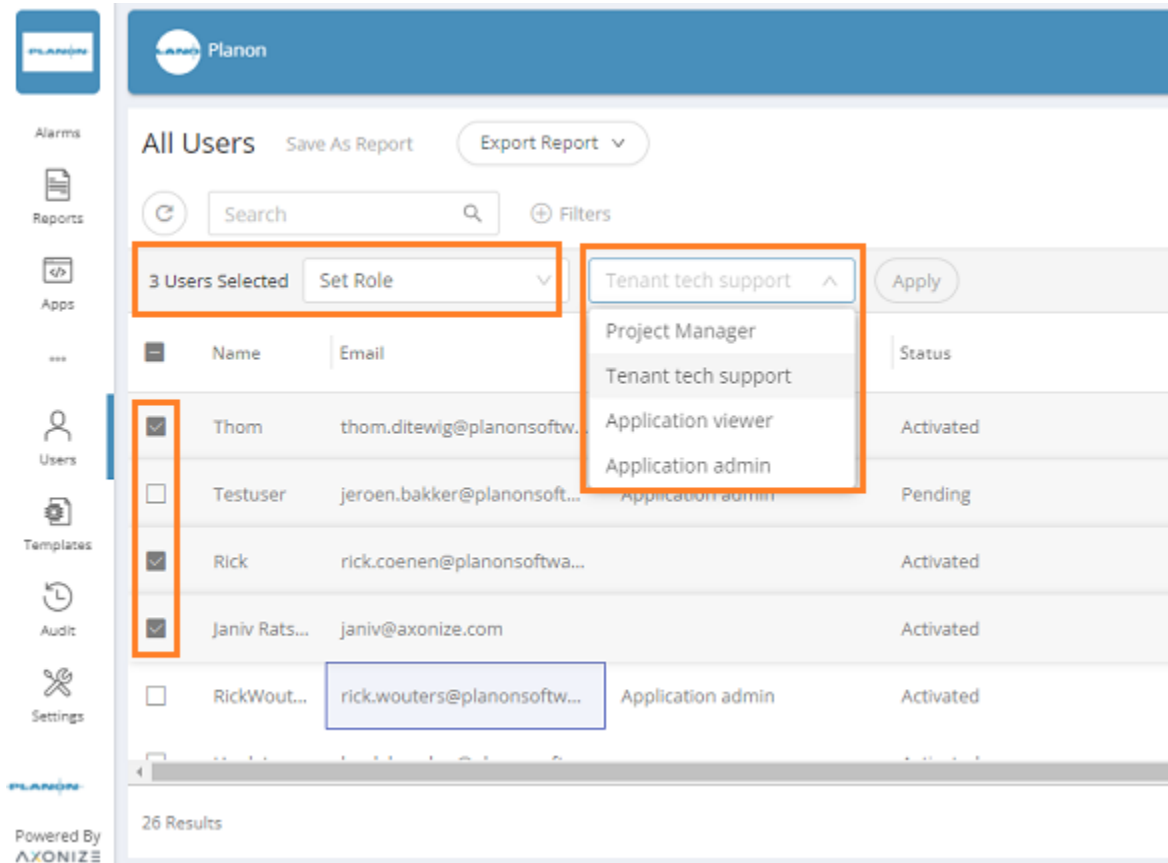
Assigning a Role to Multiple Users

In IoT Platform Portal you can assign a role to multiple **Users** simultaneously.

To assign a role to the multiple Users:

Procedure

1. In the users list, select the check box of the Users to which you want to assign a role.
2. In the drop-down list at the top left of the window, select **Set Role**.



3. In the adjacent **Select Role** drop-down list, select the role to be assigned to the Users.
4. Click **Apply**.
Role is assigned to the selected Users.

Profiles

If Roles decide what a user can view or edit in the system, profiles decide what entities that user can act upon.

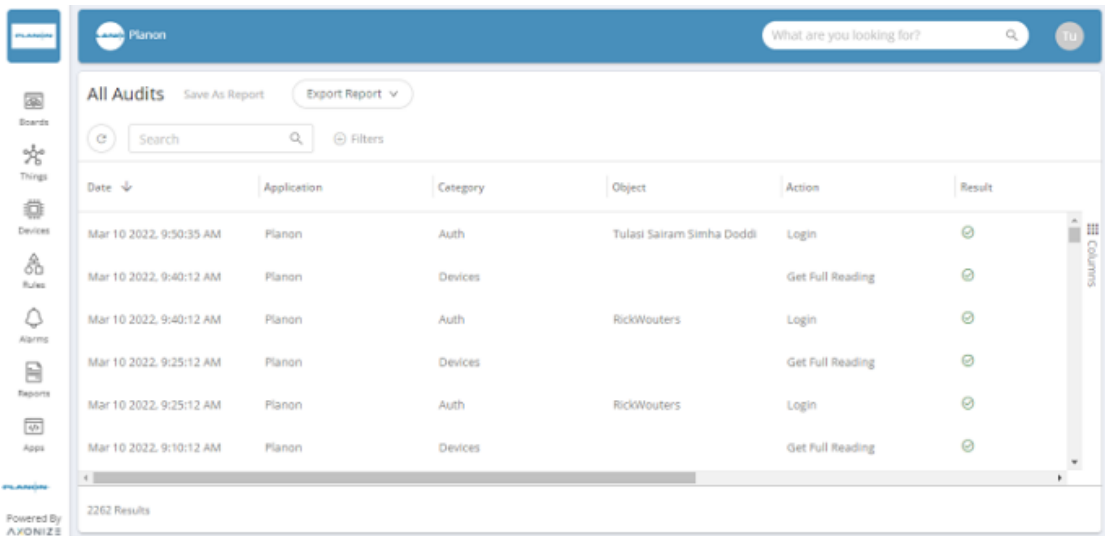
Profiles can be set at a group level or a device level. Once a profile is set for the user, the user will only see those things and in addition all widgets will show data only from these things. Profiles can currently only be created in the non-master applications.

Audits

In the IoT Platform Portal, the Audit view displays all the actions made by Users. Each row represents a different Audit entry.

The auditing feature enables administrators and users to track activity, (both in the IoT Platform Portal and using the REST API), including changes in Devices, Rules, Applications and Users.

Various entities, (such as Applications) have a configurable retention period, which specifies the number of days to keep the Audit entry in the database (cyclic buffer). This retention period is set by the API.

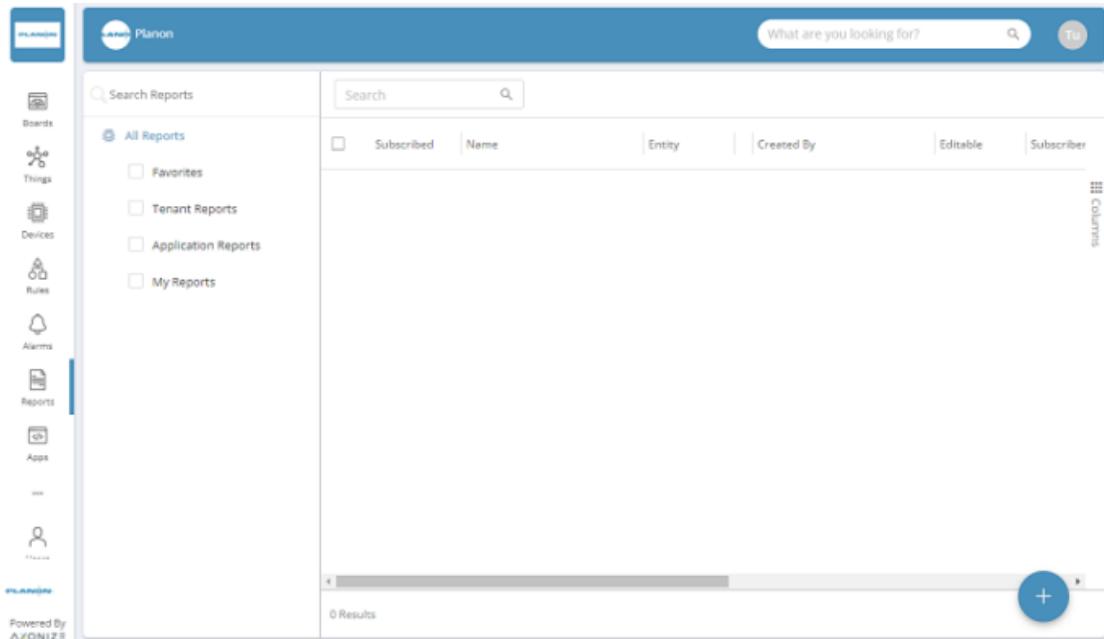


The Audit list displays the following columns of information. All information in this window is read-only:

Field	Description
Date	Shows the date and time when the operation was performed.
Application	Shows the name of the Application associated with the operation.
Category	Shows the name of the IoT Platform platform module that was affected by the operation, such as Users, Rules, Devices and so on.
Object	Shows the category that was affected by the operation. The Object is a property of the Category. For example, if the Category is an Application, then the Object indicates the Application that was affected by the operation. Similarly, if the Category is an Authorization, then the Object

Field	Description
	indicates the name of the affected User.
Action	Shows the type of action affected by the operation., i.e. Login, Delete, Update, etc. For example, if Category = Rules and Object = Rule #3, then the action could be Update Rule, Delete Rule, etc.. Similarly, if Category = Users and Object = Tom (user name), then the action could be Login, Logout, etc.
Result	Indicates whether the operation succeeded or failed.  indicates a successful operation and  a failed one.
User	Shows the name of the User who executed the operation.
Role	Shows the role of the User who executed the operation.
Email	Shows the email address of the User who executed the operation.

Reports



IoT Platform enables you to define reports that present various kinds of data collected, such as Events, Devices, Products, Rules, Users and Applications.

Most of the buttons in the left pane enable you to define a filter that specifies which data

is to be included in a report, such as the  and  buttons.



The  button displays each of these filters as a row and enables you to generate a report from it. When you generate a report (as described below), it shows the latest data according to the defined filter.

Reports can be:

- Displayed in a widget in a [Dashboard](#) as a chart or as a list.
- Shared by email with other IoT Platform users who subscribe to it in your organization. These users automatically receive periodic reports by email.
- Exported as an image or *.CSV file.

Each report contains information about a specific entity (such as Events, Devices and so on) and can comprise one or more filters that you define.

IoT Platform also provides a suite of custom reports that are only available to users of a master application. For more details, see [Custom Reports](#).

Defining a Report

The Devices, Products, Events, Rules, Users and Applications buttons in the left pane of the IoT Platform Portal enable you to define a filter for a report (see [Defining a Filter](#)).

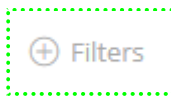


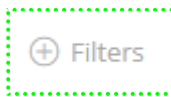
This filter can then be used to generate a report using the **Reports** option (see [Managing Reports](#)).

Defining a Filter

To create a filter

1. Click one of the options in the left pane, such as Devices.
- 2.



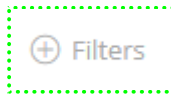
Click the  option at the top left of the window. An Add filter window displays showing the options by which the entity can be filtered.

A different choice of properties is displayed according to the selected entity. For example, Devices can be filtered by Device Name, Product, Application and so on.

Selecting one of these options may display an additional window in which you can enter a value. Wildcards (*) can be used in filter values.

A screenshot of a filter configuration window. It has a label 'Serial Number' followed by a dropdown menu showing 'equals'. To the right is a text input field. Below these are two buttons: 'OK' and 'Clear'.

3. Click Add. Each filter is then displayed to the right of the



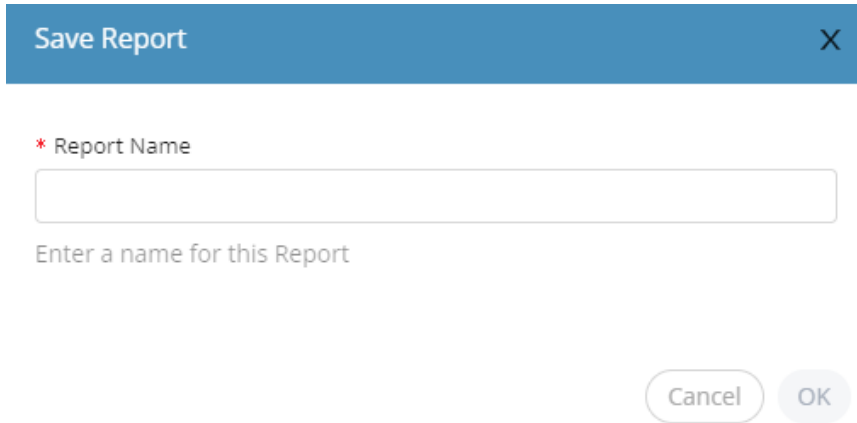
option. Two filters are shown here:

A screenshot showing a list of filters. On the left is a 'Filters' button. To its right are two filter boxes. The first box contains 'Serial Number equals 1' and a close 'X' button. The second box contains 'Custom ID not equals 1' and a close 'X' button.

- To delete a filter, click the  shown above.
 - To edit a filter, click the filter box shown above.
4. Organize the columns to be included and their order. The columns displayed when the filter is saved determine the order of the columns when the **report is generated**.

After you change the definition of a report and before you save it, the words **Name-of-Report – Edited** display at the top left of the window (as a reminder to save it).

5. Click **Save As** to save this filter to be used for a report. The following dialog box displays:

A screenshot of a 'Save Report' dialog box. The title bar is blue with the text 'Save Report' and a close button 'X'. Below the title bar, there is a red asterisk followed by the text '* Report Name'. Underneath is a text input field. Below the input field is the placeholder text 'Enter a name for this Report'. At the bottom right, there are two buttons: 'Cancel' and 'OK'.

6. Enter a name for the report and click **OK**. This report is listed in

the **Reports**  option in the left pane.

Managing Reports

The **Reports** option enables you to generate a report for which a **Filter** was defined.

Procedure

- 1.

 Click the Reports  option in the left pane to display a list of **filters** that were defined.

You can filter this list of filters using the **Search Reports** field.

In addition, the following categories of filters are provided –

 All Reports

☐ Favorites

☐ Tenant Reports

☐ Application Reports

☐ My Reports

- **Favorites** – Lists filters that you marked as a favorite by clicking the **Favorites** option in the **General** tab described below.
 - **Tenant Reports** – Lists the reports according to the Tenant user that created them.
 - **Application Reports** – Lists the reports according to the application user that created them.
 - **My Reports** – Lists filters that were created by the logged-in user.
2. Click one of the rows in the list to display a window containing the following tabs of options for generating a report.

The **General** tab (default) displays general information about the report, such as its **Name**, **Resource** (entity, such as Events or Devices), **Created By** user, **Creation Date** (when the filter was defined), the user who last modified the report (**Modified By**) and the date when the report was last modified (**Modified Date**), the number of users subscribed to it, when a report was last run for this filter and the number of results contained in that last run.

3. Click the **Download Now** button to generate a report containing the latest data according to the selected filter.
4. Click **Save to Dashboard** to add a widget showing the latest data for this filter each time the dashboard is displayed.
 - You can enter a description of this report.
 -

You can mark this report as a **Favorite**



If there is no dashboard defined yet, click **Create Dashboard and Save as Widget**. Your data will be displayed in a new dashboard.

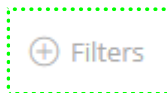
If there already is a dashboard, select it from the list and click **Save**.



- The **Modified By** value is the same as the **Created By** value when the report is initially created.
- The **Modified Date** is the same as the **Creation Date** when the report is initially created.
- The **Modified By** and **Modified Date** change whenever the report is updated.

5. The **Filters** tab shows the filters that were defined for this report and enables you to modify them.

The screenshot shows the 'Alarms Count Report' interface. The 'Filters' tab is selected. A search bar contains 'Date Last week'. Below it is a '+ Filters' button. At the bottom are 'Save to Dashboard', 'Cancel Changes', and 'Next' buttons.



You can click a filter name to edit it, or the  button to remove a filter.



6. The **Sharing** tab shows the people with whom this report is shared.

Users with whom you share a report that are on the same level (meaning that they are users of the same Application, Tenant or the same Sub-tenant) can also edit the definitions of this report:

- Only the user who created a report can edit that report.
- Application users can share with users of the same Application.
- Tenant users can share with all the users of all the Applications of that Tenant or with specific users of that Tenant.
- Sub-tenants can share with users of all the Applications of the same Sub-tenant.

 Tenant users who want to share this report with all the users of a Tenant's Applications should select to share with the Tenant itself (and not by selecting each of the Applications of the Tenant).
By selecting to share with the Tenant itself, this report will also be shared with all the new Applications added to this Tenant or to its Sub-tenants.
To share this report, from the **Shared With** drop-down menu, select the Application(s) to which the users belong.

7. In the **Subscription** tab, mark the **Subscribe** check box to subscribe to receive periodic emails containing this report and define the frequency at which to receive them. Each user must subscribe to the reports they want to receive.

Alarms Count Report

General

Filters

Sharing

Subscription

☐ Subscribe

Timezone
 (GMT+05:30) India Standard Time

Daily Weekly Monthly

Set Hour
 18:38

Select File Type
 PDF Excel CSV

Save to Dashboard Cancel Changes Save

Custom Reports

Custom reports are predefined IoT Platform reports that provide combinations of data that are not available within user-defined reports.

Planon

What are you looking for?

Search Reports

Search

Subscribed	Name	Entity	Creation Date	Created By
☐	D T S R SIMHA		Mar 10 2022, 5:36:36 PM	Tulasi Selram Simha Doddi

1 Results

i Custom reports always show either **System** or **Admin** in the **Created By** column. Typically, custom reports are the only type of reports created by a System or Admin user.

Custom reports work in the same way as other reports. When a custom report is run, it is automatically shared with the entire master application. When running a custom report, the report automatically displays for the relevant entity.

For example, when running a custom report that relates to Devices, such as the Previous Month New Devices Report, the report results automatically display in the **Devices** tab.

IoT Platform provides three custom reports that you can tailor to meet your needs:

- [Alarms Count Report](#)
- [Readings History Report](#)
- [Usability Report](#)
- [Communication Report](#)

Alarms Count Report

This report displays the total number of Alarms grouped by devices or rules.

Readings History Report

This report displays the readings history for multiple Devices or Products. You can filter this report by date, by device or by product.

Usability Report

This report includes the new entities created in an Application and the total number of entities.

The new entities include all IoT Platform entities, such as Devices, Products, Rules, Users, Dashboards and so on.

The **Total** value represents the total of all entities created to date for the Application.

The **New** value represents the number of entities created during the timeframe specified by the report's filter (for example, the previous month).

For example, if you specify a filter of Last Month, the report shows the total entities created to date including the end of the previous month, as well as the new entities created only during the previous month. You can only filter this report by date range.

Communication Report

This report displays all the emails and SMSs that were sent in your system during a specified timeframe. This report can be filtered by date.

Tenant Usage Report

This report provides an overview of all resources created by the tenant.

The report lists the values for all applications:

- Data sources (broken down into Groups, Digital Twins, Physical devices, Virtual devices)
- Users
- Rules

- Products (break down to Products and Group Templates)
- Dashboards
- Widgets

In general, usage reports can be used for invoicing purposes.

Data Source Usage Report

This report provides an overview of the data source usage.

The report lists all events and notifications sent by digital twins and devices.

In general, usage reports can be used for invoicing purposes.

Configuring a Custom Report

To configure a custom report, define the report's characteristics and filters. Report filters vary, depending on the type of custom report you select.

As an example, the following describes how to configure a Communication Report. The process for configuring other custom reports is the same.

Note that the Communication Report, the Reading History Report and the Usability Report do not display on screen and can only be downloaded as an Excel file. To configure a Communication custom report –

Procedure

1.



Click the **Reports** option in the left pane.

2.



Click the **Add** button at the bottom right of the window. The New Report window displays.

New Report

Alarms Count Report

The total number of **alarms**, grouped by **devices** or **rules**

Set Report »

Readings History Report

The **reading history** of a single device or multiple devices

Set Report »

Usability Report

The **total** and **new entities** in your application

Set Report »

Communication Report

Total number of **SMS**, **calls** and **emails** sent in your application

Set Report »

Tenant Usage Report

This report provides an overview of all resources created by the tenant

Set Report »

Data Source Usage Report

This report provides an overview of the data source usage

Set Report »

More reports coming soon

- Click the Set Report option in the Communication Report.

Communication Report

1 General

2 Filters

3 Sharing

4 Subscription

Report Name

Description

Entity

System

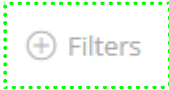
Save to Dashboard

Cancel Changes

Next

4. In the **General** tab, provide the following information for the report:
 - **Report Name** – Specifies a free-text name for the report.
 - **Description** – Provides a description of the report.
 - **Entity** – Specifies the entity(ies) to be included in the report.
5. Click **Next** or click the **Filters** tab to define the filter(s) for the report. The following window displays.

The screenshot shows a window titled "Communication Report" with a close button (X) in the top right corner. Below the title bar are four tabs: "General" (with a checkmark icon), "Filters" (with a checkmark icon and highlighted with a blue underline), "3 Sharing" (with a number 3 icon), and "4 Subscription" (with a number 4 icon). Below the tabs is a search bar containing the text "Date Last week" and a clear button (X). Below the search bar is a section with a plus icon and the text "Filters". At the bottom of the window are three buttons: "Save to Dashboard" (disabled), "Cancel Changes" (disabled), and "Next" (active).

6.  Click the button to add a filter. The following window displays.

Add a filter

X

By Date

Cancel

Add

7. Specify the time frame by which to filter the report. You can select either **Last Week** or **Last Month**.
8. Click Next or click the Sharing tab to define report sharing for this report.

Communication Report

General

Filters

Sharing

Subscription

Share with all applications

This option will share the report with all existing and future applications.

Share

Search

inno lab test

Share

Test

Share

testapp

Share

PlanonIntegrationDemo

Share

Save to Dashboard

Cancel Changes

Next

9. Define the Application(s) with which to share the report. Define the settings On this tab in the same way as for a standard report, as described in Managing Reports.
10. Click Next or click the Subscription tab to define the subscription settings for the report.

Communication Report [X]

☒ General
 ☒ Filters
 ☒ Sharing
 ☒ **Subscription**

☐ Subscribe

Timezone
 (GMT+05:30) India Standard Time [v]

Daily Weekly Monthly

Set Hour
 19:22 [clock icon]

Select File Type
 PDF Excel CSV

Save to Dashboard Cancel Changes Save

11. Define the subscription options for the report. Define the settings on this tab in the same way as for a standard report, as described in Managing Reports.

Duplicating a Report

Reports can be duplicated, as needed.

1. Right-click a report row and select **Duplicate** in the drop-down menu.



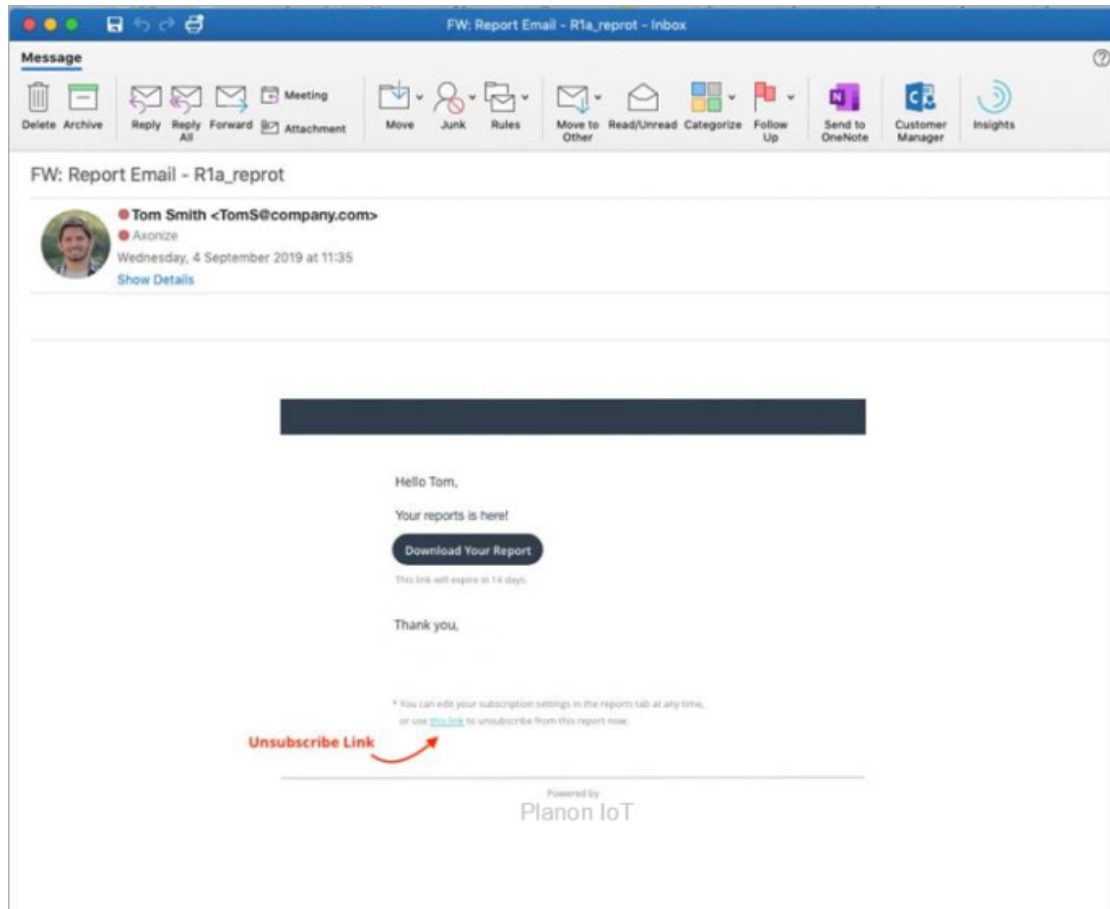
2. In the right pane of the report definition area, click the  icon.

The screenshot shows a web form titled "Copy of Previous Month Usability Report" with a close button (X) in the top right corner. The form has two tabs: "General" (active) and "Subscription". Under the "General" tab, there are three sections: "Report Name" with a text input field containing "Copy of Previous Month Usability Report"; "Description" with a text area containing "Total and new entities of previous month"; and "Entity" with an empty text input field. At the bottom of the form, there are three buttons: "Save to Dashboard" (disabled), "Cancel Changes" (disabled), and "Save" (active).

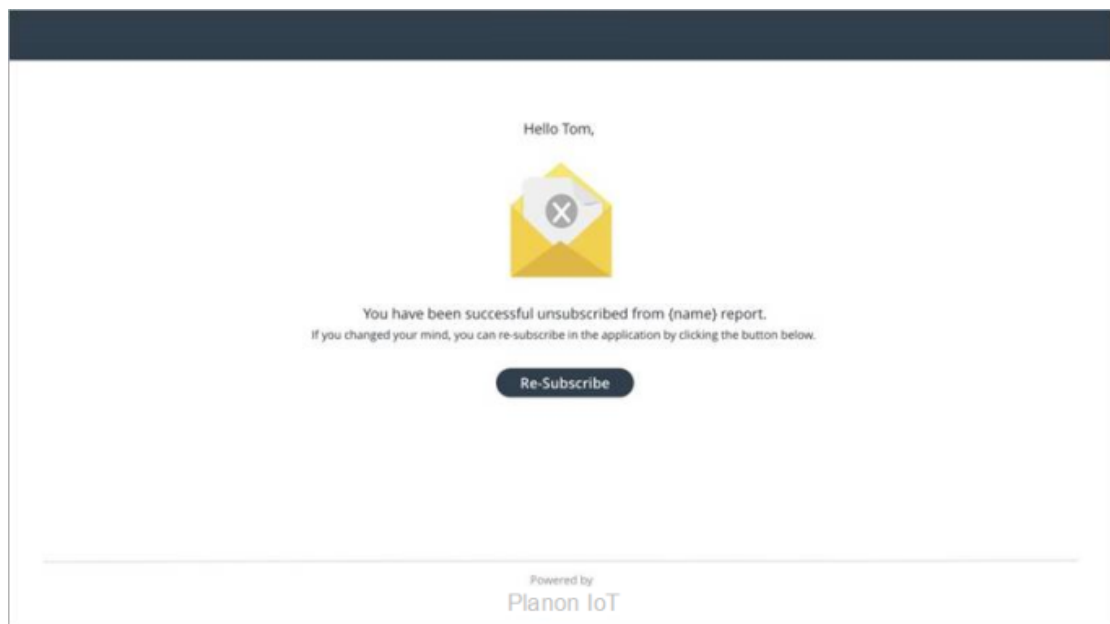
Unsubscribing From Report Emails

You can easily unsubscribe from any report you are currently subscribed to using the unsubscribe link at the bottom of the report email.

Here is an example of a report email:



Here is an example of a successful unsubscribe message:



Applications

An Application is a project managed on the IoT Platform platform. Each Application that you create can be used as a stand-alone portal for monitoring and controlling your IoT Devices.

The Applications view displays all the Applications defined under a Tenant. Each row represents a different Application. Only Users who are logged in to the Master Application can access this window.

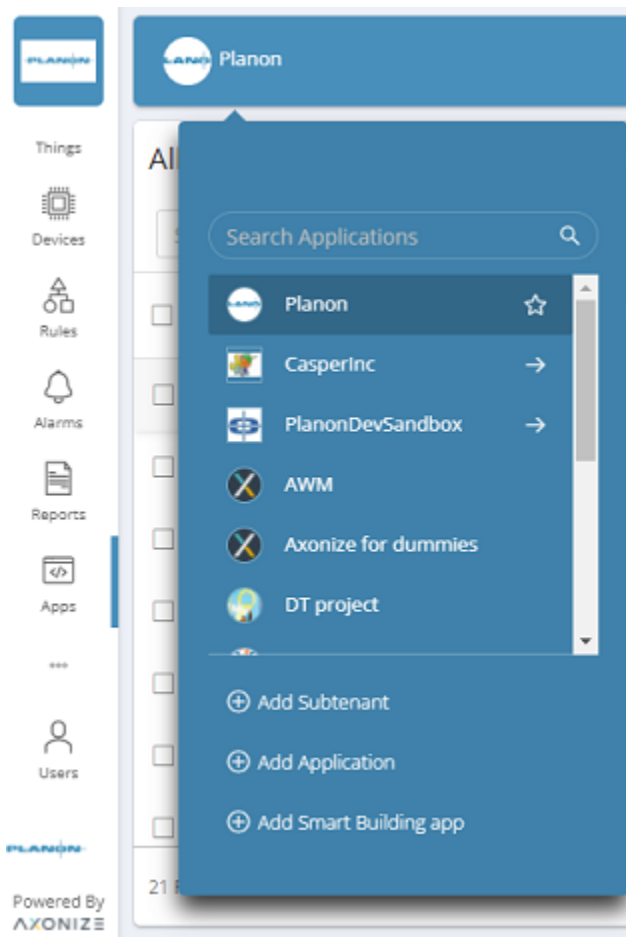
Application	Email	Mobile Number	Line Code	Customer Number	Tenant Name	Date	Action
AOC					AOC	Mar 16 2022, 12:44:18 AM	Login
DEMO					DEMO	Mar 16 2022, 12:45:13 AM	Login
inno lab test					Planon	Nov 25 2021, 7:51:08 PM	Login
PlanonIntegrationDemo					Planon	Oct 8 2021, 6:33:48 PM	Login
Planon					Planon	Jun 11 2020, 3:10:17 PM	Login
MarcinTestFromPost					MarcinTestFromPost	Mar 15 2022, 7:04:42 PM	Login
Planon HQ					Planon	Jun 11 2020, 4:25:53 PM	Login

The Application list displays the following columns of information:

- **Application** – Shows the name of the Application.
- **Company** – Shows the name of the company associated with the Application.
- **Email** – Shows the email address of the contact person associated with the Application.
- **Mobile Number** – Shows the phone number of the contact person associated with the Application.
- **Date** – Shows the date when the Application was created.

Adding an Application

1. Click the **Application logo** at the top left of the window. A list of Tenants and Applications display in the left pane.



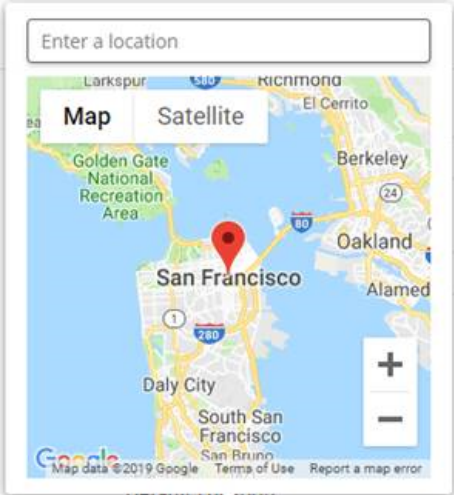
2.

+ Add Application

In the left pane, click the button. Fill in the following fields in the window that displays:

i An asterisk (*) indicates a mandatory field.

Field	Description
Name	A free-text field specifying the name of the Application.
Company	The company to which the Application belongs.
Contact	The name of the contact person associated with the Application.
Email	The email address of the person associated with the Application.

Field	Description
Default Country Code	The default country code used when adding Users to the Application.
Default Location	The default company location used when displaying the Application in a map.
	
Language	The language used on the IoT Platform Portal by the Application.
	
Planon connection	
 The following fields are relevant only if you are using IoT Platform in combination with Planon software.	
Planon environment URL	Enter the base URL of your Planon environment.
Property set	Specify the code of the property set to be used.
Access key	Specify the unique key for connecting to Planon.

3. After specifying all required fields for the Application, click **Save**.

The Application is added to the Application list.

Viewing Application Details

- In the Application list, click anywhere in an Application row. The following window displays, showing the details for the selected Application.

Settings / General

Main Settings
This information will appear on your application profile.

*** Application Name**
PlanonIntegration

Application ID
planonintegration

Time Format
MMM D YYYY, h:mm:ss A
Preview: Feb 9 2022, 12:00:00 AM

Default Country Code
+1
Set your default country code for SMS and calls.

Timezone
Please select

Default View Mode
Map Diagram

Default Location
Set Location
The default location of all the maps in the application

Application Logo
This image will appear on your application logo.
The recommended size is 50px X 50px. Maximum image size 2MB.
* If only one image is uploaded we will use it for both

Light Theme
Upload

Dark Theme
Upload

Preferred Language
Note that a language change can cause the interface to change direction.

Language
English

Delete application
Removing the application will delete its devices and all related resources including rules, alarms etc..

Delete

For a description of the fields in this window, see [Adding an Application](#).

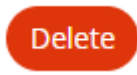
Deleting an Application

You cannot delete an Application that is specifically mentioned in a Rule(s). You must first delete or amend the Rule(s) before the Application can be deleted. An error displays if you attempt to delete an Application that is bound to a Rule(s).

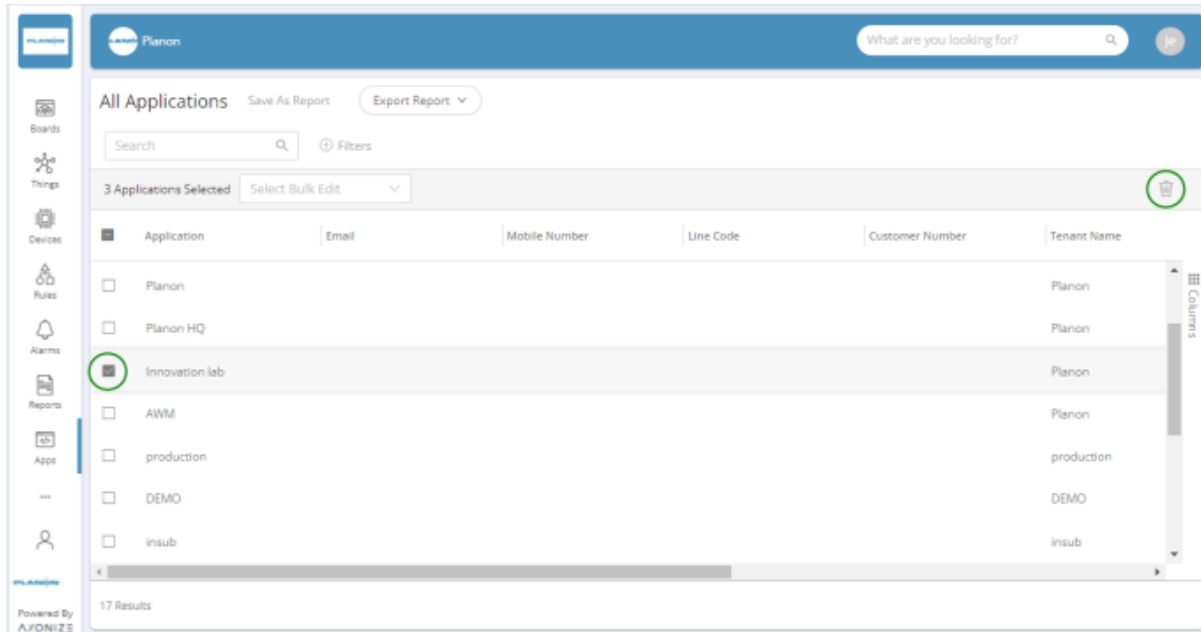
To delete an Application, do one of the following:

Procedure

1. At the bottom of the Application Details window, click

the  button.

2. In the Application list, select the check box of the Application you want to delete and then click the  button in the upper-right corner.

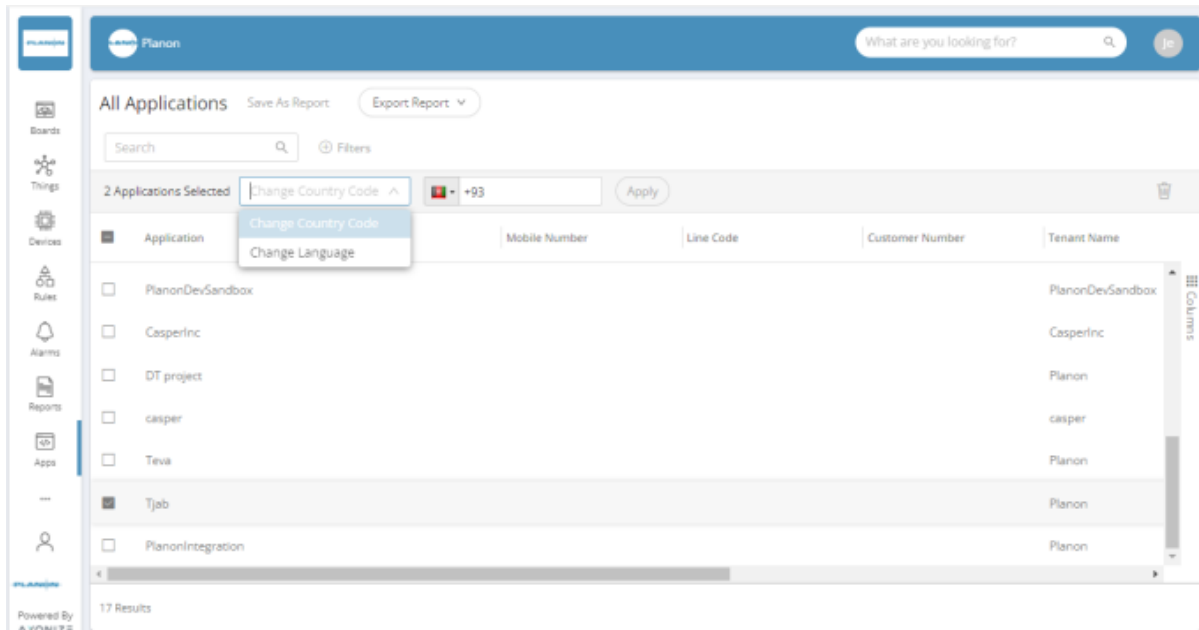


Changing the Application Country Code

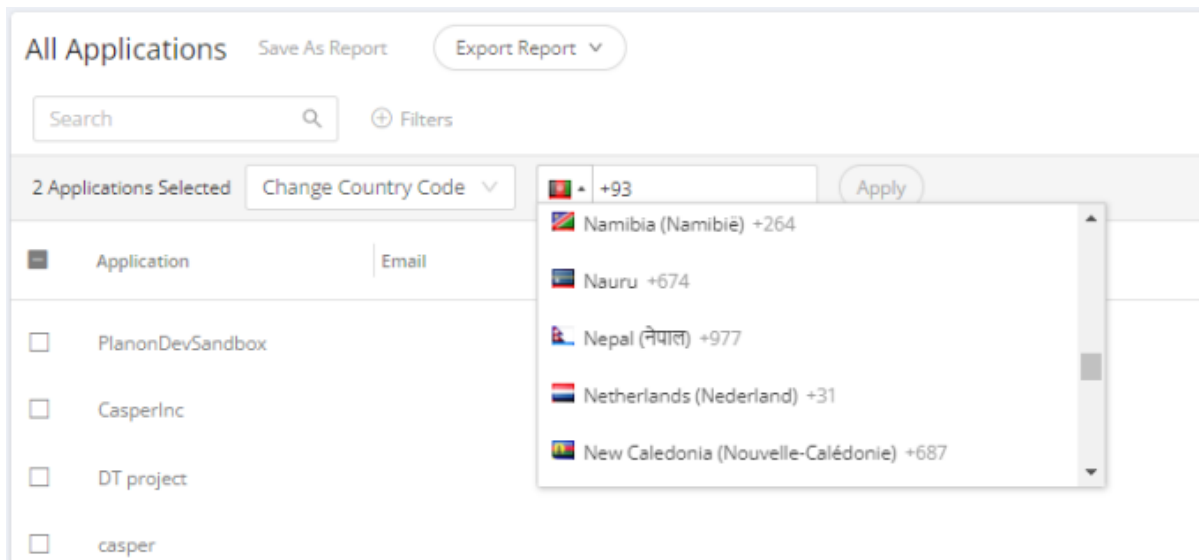
You can change the country code for multiple Applications simultaneously.

To change the country code for multiple Applications, do as follows:

1. In the Application list, select the check boxes of the Applications whose language you want to change.
2. In the drop-down list at the top left of the window, select **Change Country Code**.



3. In the adjacent drop-down list, select the country code for the Applications.



4. Click **Apply**.

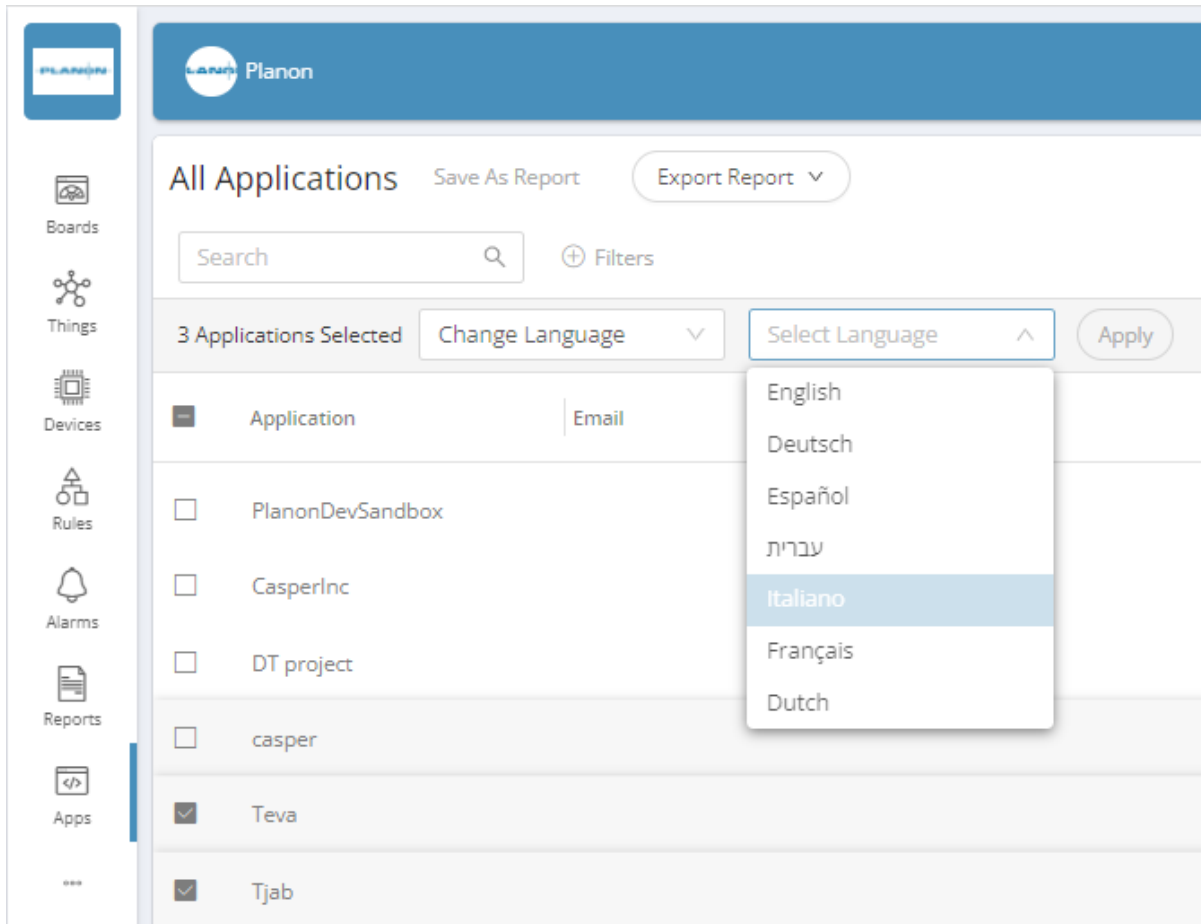
Changing the Application Language

You can change the language for multiple Applications simultaneously.

To change the language for multiple Applications:

1. In the Application list, select the check boxes of the Application(s) whose language you want to change.

2. In the drop-down list at the top left of the window, select **Change Language**.
3. In the adjacent drop-down list, select the language for the applications.



4. Click **Apply**.

Settings

The Settings view enables you to configure various settings in the IoT Platform portal that affect its behavior.

Use this window to configure the following IoT Platform settings:

Field	Description
Main Settings – Configures various Application-related settings for the current Tenant in the window	
An asterisk (*) indicates a mandatory field.	
Application Name	The name of the Application.
Application ID	The ID of the Application.
Time Format	The time format that displays in the IoT Platform Portal.
Timezone	Select the Timezone from the list.
	Time Format MMM D YYYY, h:mm:ss A Preview: Apr 2 2019, 10:25:13 PM
Default Country Code	The default country code used when adding Users to the Application.

Field

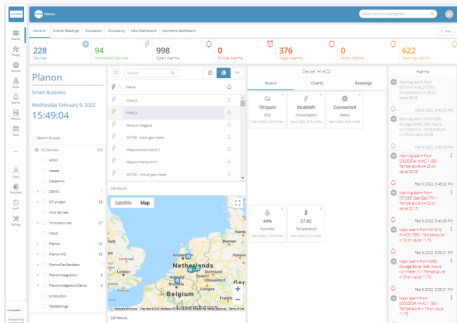
Description

Default Country Code

 +49

Set your default country code for SMS and calls.

Maps are the system default, in case Default View Mode is set to Diagram but no diagram was loaded to the Application/Groups/ Things the Map will be displayed



Map View

Default View Mode

Indicates whether Things display by default in a map view or diagram view, as shown below:



Diagram View

Tenant Color

Specifies the Tenant color as a light or dark theme.

Tenant Color

You can select the main theme color for your Tenant. This will affect all your applications, and will change buttons, header, highlighted elements etc.

Light Theme



Dark Theme



Tenant Logo

Specifies the Tenant logo that displays at the top left of the window, as well as in report emails.

Tenant Logo

This image will appear on your tenant logo. The recommended size is 150px x 50px. Maximum image size 2MB.

* If only one image is uploaded we will use it for both

Light Theme

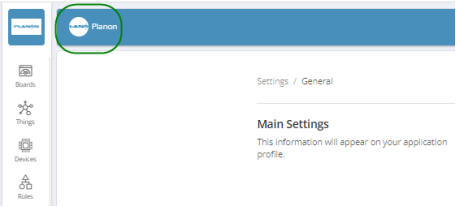
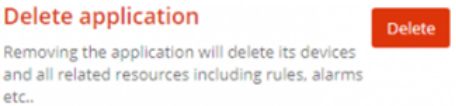
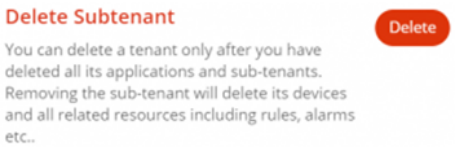


Upload

Dark Theme



Upload

Field	Description
Application Logo	Specifies the Application logo that displays at the top left of the window. 
Preferred Language	Specifies the language used in the Application. 
Delete Application	Removes an Application from the IoT Platform platform. 
Delete Sub-tenant	Removes a Sub-tenant from the IoT Platform platform. 

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