Agile Workplace Management

Planon Software Suite
Version: L105

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.

Table of Contents

Introduction

Welcome to Planon's Agile Workplace Management solution! Designed to enhance efficiency and user experience, this software offers a comprehensive suite of tools for optimizing your organization's workspace.

From space planning and workplace services and IoT integration, our solution empowers you to create a flexible and productive work environment. With robust analytics and real-time data insights, managing your workplace has never been easier. Let's explore how Planon can transform your workplace management practices.

This document

The features described here apply to Agile Workplace Management but to some extent they equally apply to Planon Workplace edition.

For more information about Planon Workplace edition, see planonsoftware.com or the WebHelp.

Hence, where applicable, the current document applies to both.

> In Planon Workplace edition, the TSI **Agile Workplace Management** is called **Sensor Integration**.

About Agile Workplace Management

This document

The features described here apply to Agile Workplace Management. However, to a large extend, these features overlap with Planon Workplace Insights. Hence, where applicable, the current document applies to both.

Agile Workplace Management (AWM)

Agile Workplace Management enables you to measure the actual occupancy and environmental variables of workspaces, meeting rooms, in general referred to as locations in this document. Measuring the occupancy of locations serves a twofold purpose:

- Enabling your staff to find available locations (a workspace, meeting room) based on real-time occupancy data.

- Enabling business intelligence analyses of locations (are there sufficient locations available, are the locations sufficiently large to accommodate staff). This will allow your organization to improve efficiency in location supply.

Agile Workplace Management consists of a set of components that collaborate dynamically:

- **Sensoring system**: A set of measurement devices providing real-time sensor data displaying the actual location occupancy. Sensors can be any kind of measurement equipment, see also Sensors.

- **Data engine**: Agile Workplace Management module receiving occupancy data from the sensoring system and providing it to Planon Software Suite.

- **Connector**: A reference to the Sensoring System web service (Planon managed) or Platform app (Custom managed) that provides sensor data to the data engine system. The connector is an interface between the sensoring system and the data engine system.

  The following image depicts the AWM components and how they interact.
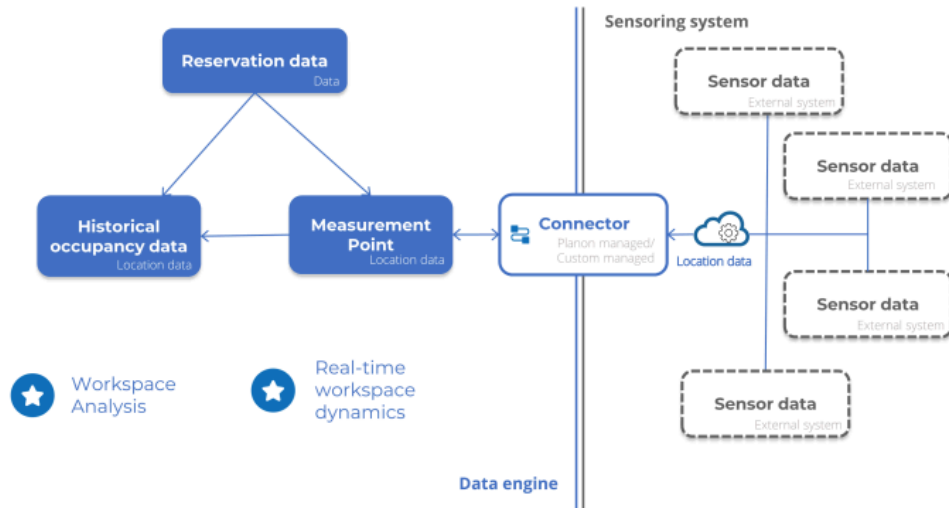
> ℹ️
> • The term *location* in this document refers to a location to which a measurement point is linked.
> • The Planon application does not process data of individual sensors, but it expects the Sensoring system to accumulate this data on location level. Therefore, a measurement point in the Planon application represents a location and not an individual sensor.
> • For a more detailed description of the architecture, see AWM Technical Reference.

Agile Workplace Management - Concepts

This section describes AWM concepts and how they interact. The following concepts apply to AWM:

- Availability
- API
- Connector
  - Planon managed
  - Custom managed
- Data engine
- Events
- Location
- Mapping
- Measurement point
- Measurement point definition
- Measurement point role
- Occupancy
- Polling
- Privacy
- Sensor
- Sensoring system
- Summarization

Availability

Availability indicates whether a location is actually available for use/reservable. The availability is based on comparing the physical occupancy status and the reservation status.

Reservable:
- Workspaces
- Rooms

(Non-) reservable:
- Workspaces
- Rooms

Reservations

Reservations
TSI

AWM
TSI

Occupancy

Statuses
- Reserved
- Not Reserved

Statuses
- Occupied
- Not occupied
- Idle
- Reserved
- Immeasurable
- Pause
- Inactive

Location Availability

Kiosk   Apps   Miscellaneous
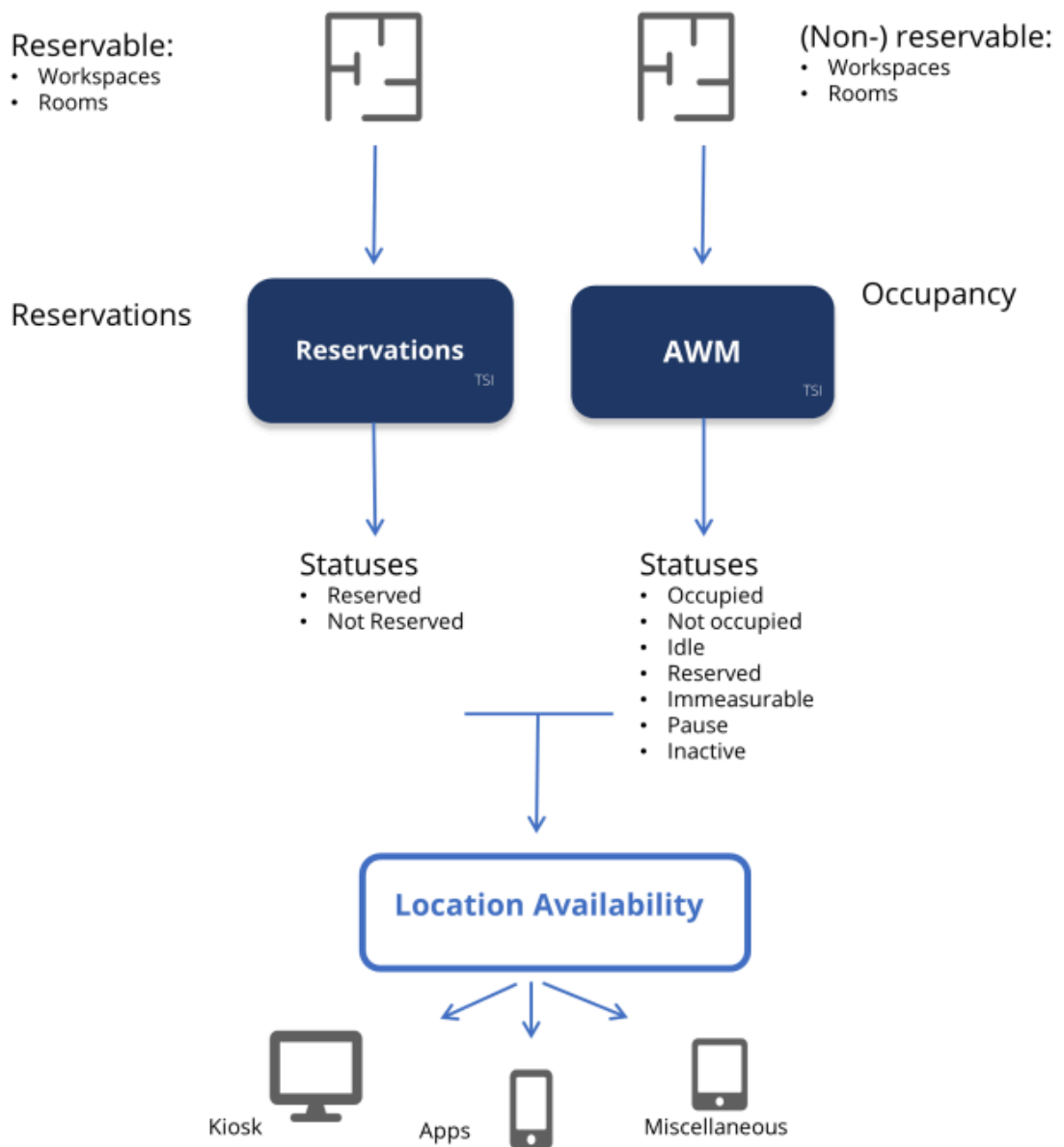
> ℹ The bottom layer represents the presentation layer, which is display-only.
> When comparing the location's reservation status and the occupancy status, the
> reservation status is leading.

Example

Consider the following situations:

	Reserved	Occupied
Location A	Yes	No
Location B	No	No
Location C	Yes	Yes
Location D	No	Yes

Location A (checked for No Show and Early Departure)	Reserved, Not occupied	During the specified idle time, the location remains unavailable. After the idle time, the room is made available again.
Location B	Not reserved, not occupied	Available
Location C	Reserved, Occupied	Not available
Location D	Not reserved, Occupied	Not available

API

A web service, published by the sensoring system and used for data exchange between the sensoring system and the Planon data engine.

The API version should be supported by Planon.

- Version 3 can handle the exchange of changed data only and it includes synchronization and polling with multiple systems.

- Version 4 is similar to Version 3, except that it has a specific field for storing the person count. This **Person count** field is only filled if occupancy is actually measured by the sensoring system. The data of this field will be used to populate the Utilization chart, because of which this chart displays clear data.

> ℹ The Planon IoT platform only supports API version 3. For API version 4, Planon requires the support of third-party sensing systems such as SWYCS, but using other vendors is possible.

Connector

The AWM connector configures the connection with the sensing system.

Connectors can be made available for different types of sensing systems.

- **Planon managed connector**: the sensing system publishes the Planon (REST) API.

- **Custom managed connector**: an AWM Platform app is used to links sensors. (Most of the AWM Platform apps will add this connector type automatically).

- **Planon IoT measurement point connector**: AWM can make use of a sensor system that is linked and managed by Planon IoT. A specific connector type is available 'PlanonIot connector, which requires an integration with Planon IoT. In this integration, most of the settings are already preconfigured.

  For most of the sensor systems a separate Platform app is available (same as for Custom managed connecter). The goal of such an app is to automate all various onboarding actions and change management. The sensing system determines the features that are available.

> ℹ It is possible to create a combination of sensors and connector types.

Connector statuses

A connector has different statuses that indicate whether it is available for Planon Software Suite. These statuses must be set manually.

The following list is an overview of the available connector statuses:

Status	Description
Active	In this status, the data engine system connects to the sensing system.
Inactive	In this status, the data engine does not connect to the sensing system. This is the default status (manually set).
Immeasurable	This status is assigned if the connector has a connection problem (system set).

> ℹ If a connection with the API fails, the Connector will retry polling twice. If this still fails, the status is set to immeasurable. This rules out unrelated temporary disturbances such as internet connection issues.

Status	Description
	When this happens, the administrators (email list) are notified about this issue.

Connector options

An AWM connector defines and configures the connection with an external sensoring system.

Planon distinguishes the following types of connectors:

- Planon managed connector
- Custom managed connector
- Planon IoT connector

Planon managed

For a Planon managed connector, the partner sensoring system must publish a (Restful) API based on Planon specifications.

The Planon AWM system sends requests to this API in a time interval (polling, default every 60 seconds).

> To retrieve data, a Planon managed connector uses polling.
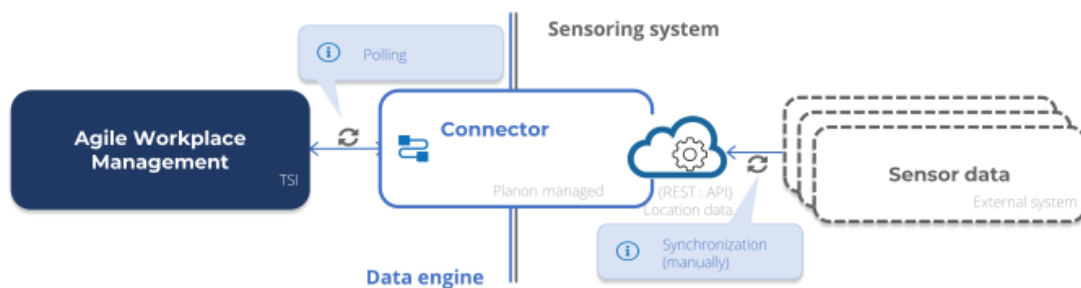
There are two possible requests to the API:

- Synchronization

    During synchronization, the whole list with measurement points and related sensors is published to the sensoring system. This synchronization is only required if something has changed in the measurement point and/or sensors.

> This could be newly added measurement points or sensors, but also changes in the measurement point ID or sensor IDs. The same is true when measurement points or sensors are deleted.

During synchronization, all measurement points that have a valid sensor linked will be published. It does not matter if the sensor is **Active** or not. Triggering synchronization is a manual process started at the **Connector** tab. If this event is triggered, the connector is flagged for synchronization.

> **i** The actual synchronization will take place at the next polling.

- Measurement update

During a measurement update, a request is sent for all active measurement points. If there is new measurement data, this will be routed to Planon for further processing.

> **i** Most of the fields that need to be filled in are related to the identification and authentication of the external API.

Custom managed

For a custom managed connector, a dedicated AWM Platform app takes care of the communication and processing of the external data.

The AWM Platform app is a Planon embedded application that is developed for a specific task (e.g. communication with a partner sensoring system).

> **i** To retrieve data, a custom managed connector uses either a pull or a push method (via a webhook or websocket protocol).
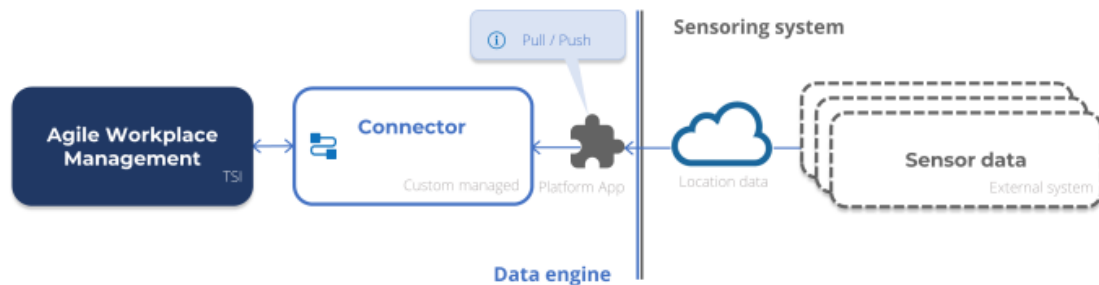
The relation of this Platform app is based on the Connector code. You can add this type of connector manually, but the app can also automatically add a connector at activation.

Planon distinguishes two types of custom managed connectors, based on its strategy:

- **Pull**

A custom managed connector that **pulls** the data from the external system at a specific interval, similar to the Planon managed connectors.

In this case, the **Class name** field at the AWM Connector needs to be filled in to identify the process:

Field	Description
Class name	Select one of the available classes, installed by apps, that performs the polling.

Field	Description
App name	The value in this read-only field is filled in automatically based on the selected class.
App module name	The value in this read-only field is filled in automatically based on the selected class.
Partner identifier	The value in this read-only field is filled in automatically based on the selected class.

- **Push**

   A custom managed connector that works with events that **push** the data from the external system to Planon. When the sensoring system publishes a new measurement, it will be updated at the measurement point. All available functions depend on the AWM Platform app related to the connector.

> When using the Push method, note that the **Class name** field should be left empty.

Planon IoT connector

When using a Planon IoT connector, the onboarding of sensors and registration of readings is automatically handled by the Planon IoT platform.

In this integration, most of the settings are already preconfigured.
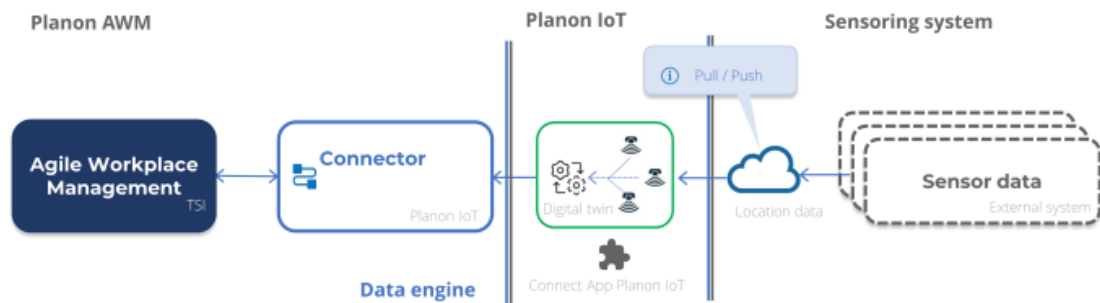
For most of the sensor systems a separate Platform app is available (same as for Custom managed connector). The goal of such an app is to automate all various onboarding actions and change management. The sensoring system determines the features that are available.

Data engine

The AWM component that drives the data exchange and data processing. On the **Data engine** level you can specify the polling interval.

The connector communicates with the sensoring system to retrieve the occupancy data for a selected set of locations. There are two methods available for retrieving data: pull- or push strategy.

Events

If the location is defined as a reservation unit, based on the occupancy of the location, the following two types of events can be determined:

- **No show** - This event occurs if a location is reserved, but the attendees did not arrive (on time). Depending on the allowed idle time, the unit becomes available again.

- **Early departure** – This event occurs if a location is reserved, and the attendees leave before the reservation end time. Depending on the idle time, the location becomes available again.

Location

Any type of space or room whose occupancy can be detected by using sensors (reservable/available). The following locations are currently available:

- Reservation unit (workspace or room)
- Non-reservable workspace
- Non-reservable room
- Non-reservable zone
- Non-reservable floor
- Non-reservable building
- Non-reservable rentable unit

Mapping

The process of maintaining data between the sensoring system and the data engine.

The sensoring system maintains a configuration table mapping locations (related measurement point IDs) and sensor IDs. This data can be stored in Planon Software Suite and is published to the sensoring system. To enable this, the **Sensors** business object is available, which is date-aware. Consequently, if you want to change or add locations and/or sensors, you do not require access to the sensoring system, but can simply update these in Planon Software Suite. Subsequently, the sensoring system will process these changes by updating and synchronizing the configuration table.

> For more information, see Synchronization.

Measurement point

A representation of a location for which you want to measure and maintain occupancy data and, if applicable, environmental values. AWM only processes locations to which a measurement point is linked.

Measurement points can be linked to any of the locations defined in Planon. A location can be a space, a reservation unit, a rentable unit, a workspace, a property, a property zone or a floor.

A measurement point can have an Inactive or Active status and these can be set manually. AWM only processes measurement points in the Active status.

> **i** The Planon application does not process data of individual sensors, but it expects the Sensoring system to accumulate this data on location level. Therefore, a measurement point in the Planon application represents a location and not an individual sensor.

Measurement point definition

The measurement point definition allows you to define the settings for all the related locations.

Consider, for example, an organization that has multiple properties and uses various methods for measuring occupancy. By using a measurement point definition, you can set up profiles for each property and group all its locations.

Measurement point role

In the Planon application, a measurement point is distinguished by its role.

A measurement point can be either of the following roles:

- Primary measurement point

  This is the main measurement point for collecting data (data of all *subordinate* measurement points is aggregated to this measurement point).

  A primary measurement point can be used to display availability (in Kiosk, CAD viewer, apps):

  ◦ **Primary A**: the readings of the measurement point are used to determine the location's availability. Occupancy related fields will contain actually measured data.

    The **Display availability** field will be set to **Yes**.

  ◦ **Primary B**: the reservation for a location rather than the measurement point reading is leading in determining its availability.

    Occupancy related fields will not be taken into account; only indoor air quality values will be used.

The **Display availability** field will be set to **No**.

- Supplementary measurement point

  This type of measurement point is introduced to process data correctly when using multiple connectors per location. When doing so, it is important to ensure that data of one connector is not blocking the data of another connector. This is achieved by using supplementary measurement points. Its data is passed on to the primary measurement point (A or B).

  Supplementary measurement points are not used to record occupancy, but a set of environmental data:

  - Free field 1/3 for vendor specific readings
  - Battery status
  - Carbon dioxide
  - Humidity
  - Light
  - Noise
  - Power level
  - Temperature
  - Radon
  - Volatile organic compounds (VOCs)
  - Particle matter (PM2,5 / PM10)
  - Free measurement field 1-10

  In order to know which data should be copied, you must link the data fields to the respective supplementary measurement point.

> ℹ️ For more information, see Linking fields to supplementary measurement points.

  The readings of supplementary measurement points are stored at the primary measurement point. They are not stored on the supplementary measurement points themselves to ensure system performance.

- Secondary measurement point

  Rather than occupancy, this type of measurement point is meant for providing auxiliary information, such as whether the waste bin is full or for testing new sensors. Consequently, its data is not collected and aggregated to the primary measurement point.
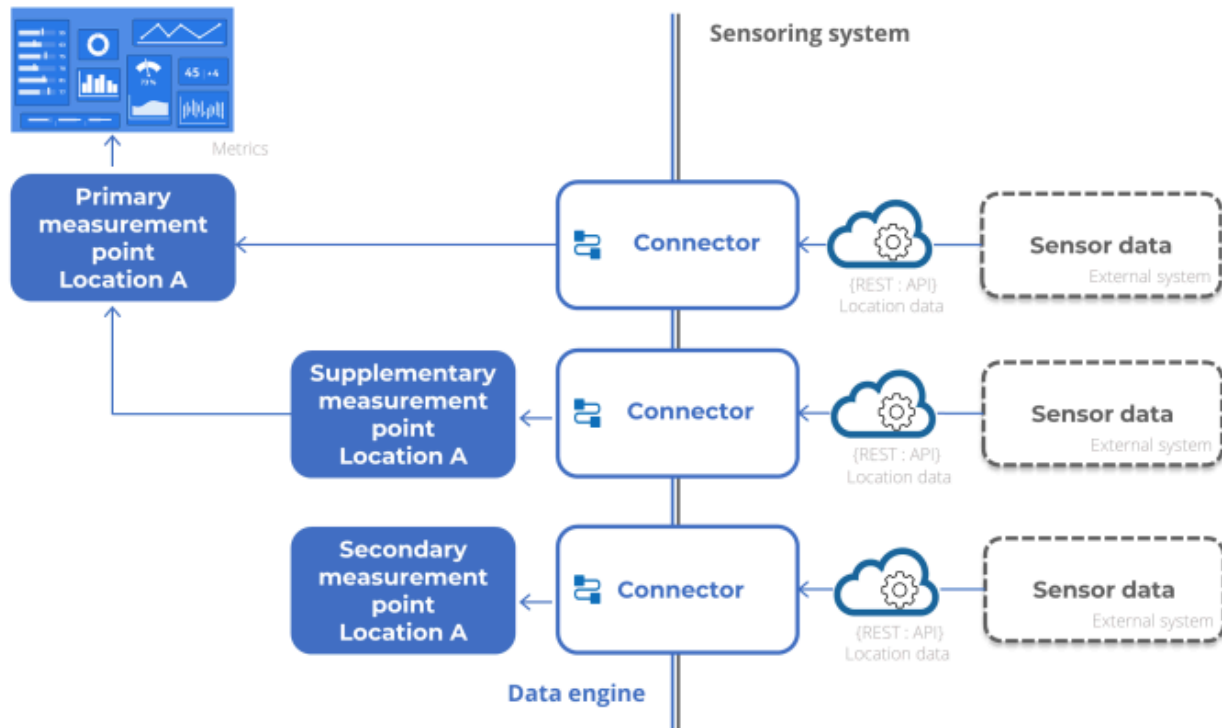
[Measurement point - fields](#)

Occupancy

Occupancy is used to indicate whether a location is actually in use (physically).

A location's occupancy is detected by using sensors.
In Planon Software Suite, a location's occupancy (to which an active measurement point is linked) is represented by an Occupancy status and a Reading value (displaying the number of people, in API 3).

Occupancy statuses

The data engine continuously updates occupancy statuses into Planon Software Suite. For calculating an occupancy status, the readings of the sensoring system and the previous occupancy status are taken into account.

The following occupancy statuses are updated by the data engine:

- Occupied

- Non-occupied

- Reservation imminent

- Idle

- Inactive

- Immeasurable

- Pause

Occupancy measurement

The type of sensor in a sensoring system determines how occupancy is measured.

A sensoring system can either:

- Detect occupancy (returns 0 or 1, Null - the equivalent of no/yes/ unknown)
- Count occupancy (returns a digit or a number or Null)

This information, when returned by the connector, is stored in the Planon application.

Field	Value	Remark
Occupancy value	0 or 1	0 = not occupied 1 = occupied Empty: occupancy cannot be determined by the sensoring system.
Person count	Empty, a digit / number	Empty: The sensoring system cannot count occupancy. A digit or a number: The actual count of occupancy.

See also Measurement point - fields.

Active occupancy

The number of individuals currently using or occupying a space or a facility at a given time. This term indicates the current utilization or presence of people in a specific area (Space, Workspace or Reservation unit).

Passive occupancy

A location is passively occupied if there is no actual person occupying it, but it is blocked by personal belongings that are left to indicate occupancy.

For example: a laptop that is sitting on the desk, a laptop bag, a coat that is hung over the chair.

Typically, passive occupancy is measured by using a combination of a camera system and artificial intelligence (to be able to identify passive occupancy).

The distinction between active and passive occupancy gives a clearer picture of the actual occupancy. This could further be clarified by specific business intelligence.

Measurements

The following table shows how passive occupancy is derived:

Passive occupancy measured?	Passively occupied?	Occupancy status	Passive occupancy field
No	N.A.	Various	Null
Yes	No	Occupied	0
Yes	No	Not occupied Soon reserved Idle	0
Yes	Yes	Not occupied Soon reserved Idle	1
Yes	Yes	Occupied	0
Yes	N.A.	Is active Paused Immeasurable	Null

Polling

Periodically sampling the occupancy status of a set of locations by the data engine.

The polling capabilities are determined by the API version of the connector:

- API Version 3-4: all changed data is returned based on the time stamp that is given to the sensoring system.

> ℹ Polling from multiple Planon environments (for example for DTAP) is supported.

During polling, two actions can be performed:

- Synchronization: needs to be done manually.
- Data update (occupancy status): this is always done during polling.

Privacy

Planon uses sensors to determine whether a location is occupied.

Continuously, newer generations of sensors are being developed and put on the market. The sophistication, the quality and the range of sensors changes invariably. While this technological innovation is going on, both the thinking and the legislation around privacy is affected.

Planon does not store personal information nor does the Planon application track people by using sensors. Instead, Planon uses sensors to gain insight into workspace occupancy. In any case, Planon is held by and complies with GDPR legislation.

Processing cycles

The processing of all measurement data and of the execution of Planon logic is performed in different cycles.

Cycle 1 - Processing of measurement data

For a Planon managed connector AND for a Custom managed connector, this is performed each time interval after polling the external API. (For Custom managed connector, only when the method is pull).

For a Custom managed connector, this is performed when the AWM Platform app receives the measurements and processes it in **Agile Workplace Management**.

Cycle 2 - Execution of Planon logic

For both types of connectors, this is performed each time interval. It executes Planon logic such as the no-show/ early departure check, but also populates fields with information about reservations (time, etc.).

Cycle 3 - Merging supplementary measurement points

During this stage, the readings registered by supplementary measurement points is merged into the readings of their corresponding measurement points.

Sensor

A device that is linked to a location and measures its occupancy as well as environmental values, if applicable.

Sensors can use various measurement techniques, for example:

- Motion - occupancy is detected by motion.
- Heat - occupancy is detected based on body heat.
- Video - occupancy is detected by video interpretation.

ℹ️ More advanced sensors can support a combination of these methods/ and/or other methods (laser techniques, etc.).

Sensoring system

A network of sensors that communicates with the Data engine. When requested by the data engine, the sensoring system provides occupancy information on its locations, based on the sensor data.

In order to provide meaningful data to the data engine, the sensoring system maintains a configuration table mapping locations and sensors.

Summarization

The process of compressing data into smaller time components: hours, days and months, decreasing the number of historical data and feeding that data into the data warehouse (summarized readings).

By continuously retrieving and storing data from the data engine, data storage and analysis may become an issue. By compressing this data, less storage is needed and analyses are easier to perform.

ℹ️ • Almost all AWM analytics are based on summarized data.
• Not all measurement fields are included in the summarization process. Some fields are (Free field 1/3 for vendor specific readings) alphanumerical and cannot be summarized. Only numerical fields can be summarized.

Configuration

Working with Agile Workplace Management

This section describes the steps that need to be performed in **Agile Workplace Management** in order to configure your setup.

> ℹ️ It is assumed that locations have already been specified at this point.

See the links below for more information:

- Adding an AWMDATAENGINEADMIN user
- Adding a data engine
- Adding a connector
- Adding measurement point definitions
- Monitoring notifications
- Linking reservation statuses
- Automatic onboarding of measurement points
- Linking fields to supplementary measurement points
- Configuring different reservation event settings
- Adding measurement points
- Adding sensors
- Viewing historical readings and summarized data
- Deleting measurement point(s)

Adding an AWMDATAENGINEADMIN user

The AWMDATAENGINEADMIN user performs all the AWM processes, initialized by the AWM data engine. Therefore, this user must be available and must have sufficient authorizations and must be linked to the correct product definitions and property set.

> ℹ️ Per Planon installation you can only have one AWMDATAENGINEADMIN user. Consequently, you can set up AWM for one property set.

> ❗ The AWMDATAENGINEADMIN user should be used as a system user. Do not use this account for manually logging in to Planon.

1. Create the AWMDATAENGINEADMIN user. The name of this user is case sensitive.

2. Select the check box Password never expires for this user. If this is not selected, the data engine may be unavailable because the user's password has expired.

3. Link this user to a user group with 'full functionality'.

4. Link to this user to the following product definitions:

    ◦ AWMDataEngine

    ◦ EnterpriseServiceAPI

    ◦ EventConnector

    ◦ JsonServices

5. Link this user to the property set in which the AWM TSI is configured.

> ℹ️ If the AWMDATAENGINEADMIN user is not linked to the correct property set, the data engine will not work.

AWMDATAENGINEADMIN user

Adding a data engine

Specify the details of your data engine. Here, you specify and maintain the data engine's schedule for polling the sensoring system.

1. Go to Data engines > Data engines step.

2. On the action menu, click Add.

3. Complete the fields in the data section.

For an overview of the available fields, refer to Data engine - fields.

4. Click Save. A new data engine is added to AWM. You can continue to add a connector to this data engine.

Currently it is only possible to add a single data engine.

Data engine

Adding a connector

Based on configuration, a connection is established between the data engine and the sensoring system.

Specify the details of the sensoring system connector. You can choose to add two different types of connectors:

• **Planon managed connector**

The sensoring system has a Restful API to which the AWM connector interfaces. This connector is system-specific. In order to update the occupancy information, Planon regularly polls the sensoring system for updates.

- **Custom managed connector**

The connection with the sensoring system is handled via Event Connector, a generic gateway between third-party applications and Planon. A great many configuration details (connection, transformation of raw messages into messages) is handled by a Platform app. Unlike the Planon managed connector, the custom managed connector receives the data as soon as it is available (real time).

> ℹ Currently, AWM can only process inbound messages.

- **Planon IoT measurement point connector**: Planon IoT is used to manage sensor readings from the IoT layer. Because of the integration with the Planon application, the setup is simplified to take the burden off the customer.

AWM can have multiple connectors for different kinds of sensoring systems.

P r o c e d u r e

1. Go to Connectors > Connectors.
2. On the action menu, click Add.

Select the type of connector that you want to add.

3. Complete the fields in the data section.

   For a description of these fields, refer to Connectors - fields / Planon IoT Connector - fields.

4. Click Save.
   A new connector is added to AWM. You can now add measurement point definitions to this connector.

Connector

Enabling monitoring mode

It is possible to enable monitoring mode of connectors. By enabling monitoring mode, all API requests, response and communication is added to the connector's event log.

By being able to check the issues that are logged, it is easier to troubleshoot errors.

P r o c e d u r e

1. Go to Connectors selection level.

2. On the action panel, click Monitor communication.

A warning message appears, informing you that an event log will be created at the next polling.

3. Click Proceed to complete the setting.

The field Activate monitoring mode? will be set to Yes: monitoring mode has been enabled.

Planon-managed connector

At the next polling, a record is added to the **Configurations & logging** step. This record will make it possible to troubleshoot errors that the Connector(s) encountered (debug).

Also, when the connector is *Immeasurable*, this action is launched and a record is added to the event log.

Custom-managed connector

The information is logged in the web server's Tomcat log.

> • In addition to the technical logs, the information is also displayed in the Configurations & logging > Event logs step. Here, some information is given about the current and next polling cycle, the number of measurement points, and so on.
> • After creating the event log, the **Activate monitoring mode?** field is set to **No** again.

> After a successful run, the application switches off the **Activate monitoring mode?** and **Synchronize** fields automatically. However, if encountering issues, the application will continue to try and do this for some time, clogging the process. To overcome this situation, you can inactivate the connector. By inactivating the connector, the **Activate monitoring mode?** and **Synchronize** fields will be switched off and the process is reset. After activating the connector again, you can manually enable these fields.

Adding measurement point definitions

A measurement point definition defines settings for a group of measurement points and links them to a connector.

Complete the following steps to add a new measurement point definition.

Procedure

1. Go to Configurations & logging > Definitions.
2. On the action menu, click Add.
3. Complete the fields in the data section.

   For a description of these fields, refer to Configurations & logging - fields.

4. Click Save.

A new measurement point definition is added. Now, you can add measurement points to this definition. AWM can contain multiple measurement point definitions simultaneously.

Monitoring notifications

A sensoring system and data engine consist of many different components that rely on "communication".

If the *communication* in this intricate system of connectors and measurement point definitions stalls, it is important to be informed as soon as possible.

For measurement point definitions and connectors in Planon, you can set up notifications in two ways:

- **AWM** notification options.
  - By using the available notification options for *measurement point definitions* and *connectors*, a specified list of persons can be informed if an error situation occurs.

    The notification is a quick-and-dirty solution that consist of a system message, lacking formatting.
    The notification is based on the fields **Email address for notification** and **Email address(es)** on measurement point definitions and connectors.

  - By enabling the monitoring mode for *connectors*.
- Planon **Alerts** notification options.

  By using Alerts, recipients can be notified or alerted when a specific condition is met. The notifications can be customized using email templates. For more information, see Alerts.

Adding measurement points

Measurement points are added to their location to be able to store actual reading data received from the connector. A measurement point also displays its occupancy status.

Complete the following steps to add a new measurement point.

   Procedure

1. Go to Measurement points > Measurement points.
2. On the action menu, click Add.
3. Complete the fields in the data section.

   For a description of these fields, refer to Measurement point - fields.

4. Click Save.

A new measurement point is added. Now, the actual readings from the data engine can be analyzed. The measurement point readings store the actual readings from the sensoring system.

For information on measurement point reading fields, refer to Sensor - fields.

Adding sensors

Sensors refer to the real measuring equipment that can be used to measure occupancy.

- A sensor is always linked to its corresponding measurement point.
- You can link more than one sensor to a measurement point.
- Sensors are identified by their IDs.
- The sensor IDs can be used to publish to the sensoring system, this process is called synchronization.

Complete the following steps to add a new measurement point sensor.

> ℹ️ Adding sensors is only possible for Planon Managed connectors.

Procedure

1. Go to Details > Sensors.
2. On the action menu, click Add.
3. Complete the fields in the data section.

   For a description of these fields, refer to Sensor - fields.

4. Click Save.

A new sensor is added.

Viewing historical readings and summarized data

After setting up the connection to the sensoring system and configuring the data engine, operational data will be collected and stored. On the **Details** level it is possible to view this data for further analysis.

> ℹ️ For a description of the fields available on this level, see Details - fields.
> For more details on summarized data, refer to Summarization update process and Starting summarization.
> For more details on analyzing data, refer to AWM dashboards.

Linking reservation statuses

When a measurement point is part of a reservation unit, the statuses of the reservation (user-defined) can be linked to its measurement point definition.
This enables you to apply the status transitions of user-defined reservations to the measurement point. When **Early departure/No show/No reservation** events occur, these statuses will be applied.

> For more information on reservation statuses, refer to *Reservations*.

Linking early departure statuses

When reserved, locations remain in this status until the reservation end time is reached. In daily practice, meetings may sometimes end ahead of schedule. Based on the availability information, AWM can check for early departure, and make a reserved location available for use.

> To make a reserved location available, the idle time must have been reached first.

Complete the following steps to link user-defined reservation statuses to the measurement point definition. When **Early departure** events occur, these statuses will be applied (*Canceled*, *Made*, *Administratively completed*).

> If you do not link an early departure status, it will not be possible to set a status transition. In such a case, the room reservation status remains unchanged, but it will still be possible to change the reservation end time based on the **Change reservation end time (early departure event)** field.

Procedure

1. Go to Configurations & logging > Definitions.
2. Select a Measurement point definition to which you want to link the Reservation status(es) for the early departure completion event.
3. On the action menu, click Link early departure statuses.
4. In the dialog box, move the user defined reservation status(es) to In use.
5. Click OK.

   The linked status(es) is/are displayed in the **Early departure statuses** section. When an early departure event occurs and checking has been enabled, the reservation status will change to the corresponding status configured.

Linking no-show statuses

When reserved, locations remain in the 'Reservation imminent' status until the 'Allowed delay' time is reached. In daily practice, meetings are sometimes skipped. Based on the availability information, AWM checks for non-attendance (no show), and makes a reserved location available for use when this occurs.

Complete the following steps to link user-defined reservation statuses to a measurement point definition. When **No-show** events occur, these statuses will be applied (*Canceled*, *Made*, *Administratively completed*).

Procedure

1. Go to Configurations & logging > Definitions.
2. Select the Measurement point definition to which you want to link the Reservation status(es) for the No-show event.
3. On the action menu, click Link no-show statuses.
4. In the dialog box, move the user-defined reservation status(es) to In use.
5. Click OK.

   The linked status(es) is/are displayed in the **No-show statuses** section. When a no-show event occurs and checking has been enabled, the reservation status will change to the corresponding status configured.

Linking no-check statuses

In specific cases you want to temporarily stop the system from checking the availability of locations, e.g. when doing maintenance on a location. By switching the status of the location to a 'no check' status, this effectively excludes the location from being checked.

Complete the following steps to link user-defined reservation statuses to the measurement point definition. When **No-check** events occur, these statuses will be applied.

Procedure

1. Go to Configurations & logging > Definitions.
2. Select the Measurement point definition to which you want to link the Reservation status(es) for the no-check event.
3. On the action menu, click Link no-check statuses.
4. In the dialog box, move the user-defined reservation status(es) to In use.
5. Click OK.

The linked status(es) will be displayed in the **No-check statuses** section.

Configuring different reservation event settings

For reservations, the (reservation event) settings of the definition linked to the measurement point are applied. To facilitate more flexibility, you can now also create a definition and link it to a reservation (based on a standard order whose order group is linked to *Meeting Services*).

This makes it possible to create various reservation types and specify settings accordingly.

Procedure

1. In Layouts, add the Measurement point definition (MeasurementPointDefinitionRef) to

   ◦ Standard order

   ◦ Reservations (used for meeting rooms)

   By having this reference field available, you can create a standard order and reference that from the reservation.

2. Go to AWM > Configurations & Logging > Definitions level, create a definition and specify its settings.

3. Create a standard order, specify its details and link the definition was created in step 2.

4. In Reservations, you can now add a reservation and link the definition that was created in step 2.

Typically, what would happen is that a reservation is created and the settings of the definition linked to the measurement point would be applied. However, now, *for the duration of the reservation*, this mechanism is overruled by the settings of the newly linked definition.

Similarly, you can also select the standard order in the reservation. When you do that, the settings of the standard order will be applied and the respective fields in the reservation will be autopopulated and the settings of the linked definition will be applied.

Linking fields to supplementary measurement points

Supplementary measurement points are used to capture data that is not related to occupancy.

In the interplay of measurement point roles, reading data of supplementary measurement points is copied to the primary measurement point.

In order to know which data should be copied, you must link the data fields to the respective supplementary measurement point.

1. Go to Configurations & logging **>** Definitions level and select or create the definition you want to use for capturing environmental data, such as humidity, noise levels, etc.
2. On the action panel, click Link supplementary measurement point. Here, you can move the required fields to In use.
3. Click OK to confirm and close the dialog box.

When activated, the data of the supplementary measurement point will be copied to the primary measurement point, the collection point of all related readings.

Automatic onboarding of measurement points

You can manually add measurement points in Agile Workplace Management, but it is also possible to automatically onboard measurement points in bulk.

> ⓘ Automatically onboarding measurement points only works for custom-managed connectors; consequently, it requires an app to communicate with the sensoring system.

Data preparation

The data in the Planon application is mapped to the data of the sensoring system. A mapping table ensures that both parties can identify their components uniquely. This unique ID, known as an external ID, is used to identify the stored objects.

Onboarding app

A 'Connector app' that communicates with an IoT vendor system. This app offers a class for polling data (IAWMPollingTask) and, optionally, a class for onboarding (IAWMOnboardingTask). Developing an app is part of the Planon as a Platform solution.

Subsequently, this app needs to be installed in the AppCenter.

AWM

On **Connectors**/**Onboarding** step, you can select your onboarding app and specify its settings.

To continue the process, proceed with Onboarding of measurement points.

Onboarding of measurement points

Complete the following steps to start onboarding.

> ℹ️ Make sure the (custom managed) connector is set to **Inactive**.

P r o c e d u r e

1. Go to Connectors > Onboarding step, click Add to add an onboarding action and select the required Onboarding class.

This is the reference to the app's onboarding task for onboarding measurement points. Depending on the class you select, it is possible that you can specify settings for onboarding (these settings are app-dependent).

2. Go back to Connectors step and select your Onboarding reference (the reference to the onboarding record you have created in Step 1).

3. On the action panel, click Onboard.

> ℹ️ The **Onboard** action is only available if the connector's status is **Inactive**.

The Properties dialog box is displayed, listing all the properties that have digital twins.

4. Select one or more properties and click **OK**.

The onboarding processing is started: Raw inbound messages > Inbound messages > Processed messages.

Once the process is completed, the measurement points appear on the Measurement points level.

5. After verifying the data, you can select the **Active** status for the connector.

> ℹ️ • You can use this process to add new measurement points.
> • Existing measurement points will not be updated (to prevent overwriting settings).
> • If a measurement point is deleted and you click **Onboard** again, it will reappear.

Deleting measurement point(s)

If you want to delete measurement points when maintaining your AWM setup, these may still have linked readings and sensors. Take a hierarchical approach in order to fine-tune your selection.

> ⚠️ Deleting data is irreversible, make sure your selection is correct before you delete data.

1. Go to Connectors level and select the connector for which you want to delete measurement points.
2. On the Configurations & logging **>** Definitions step, select the definition for which you want to delete measurement points.
3. On the Measurement points, select the measurement points that you want to delete.
4. On the Details step, delete your reading, summarized readings and your sensors (by using Action on selection).
5. Go back to Measurement points level and set the measurement points to Inactive.

You can now delete the measurement points.

6. Go back to Connectors level and synchronize your system to let the sensoring system know that these measurement points are no longer used.

People flow

People flow monitors and records the inflow and outflow of people of a given space.

Typically, this feature is not used to count the actual number of people in order to measure capacity use, but rather it is used to measure utilization. In the office world, it is used, for example, to measure and possibly predict the waiting queue at the company restaurant. Or, it can also be used to measure the inflow and outflow of people of a building or of an event. It can help building managers to:

- Assess the size of meetings rooms to match usage
- Display wait times for amenities
- Optimize cleaning based on usage levels
- Detect when fire-loading limits are crossed
- Optimize layout based on people flow

> ℹ️ People flow is measured by a specify type of sensor. The readings of these sensors provide real-time data. This sensor type is reset at the end of the day and starts measuring

anew at the beginning of each new day (specified at the connector or at the sensoring system).

Please note that utilization and people flow is NOT highly accurate regarding capturing occupancy.

How people flow works

People flow is a specific implementation - here you can read how it works

The values are captured on measurement point (exactly the same as on measurement point readings). These captured readings represent real-time values and they are displayed as a summed, incremental value.

Consequently, if you would display it graphically, it would resemble the following figure.
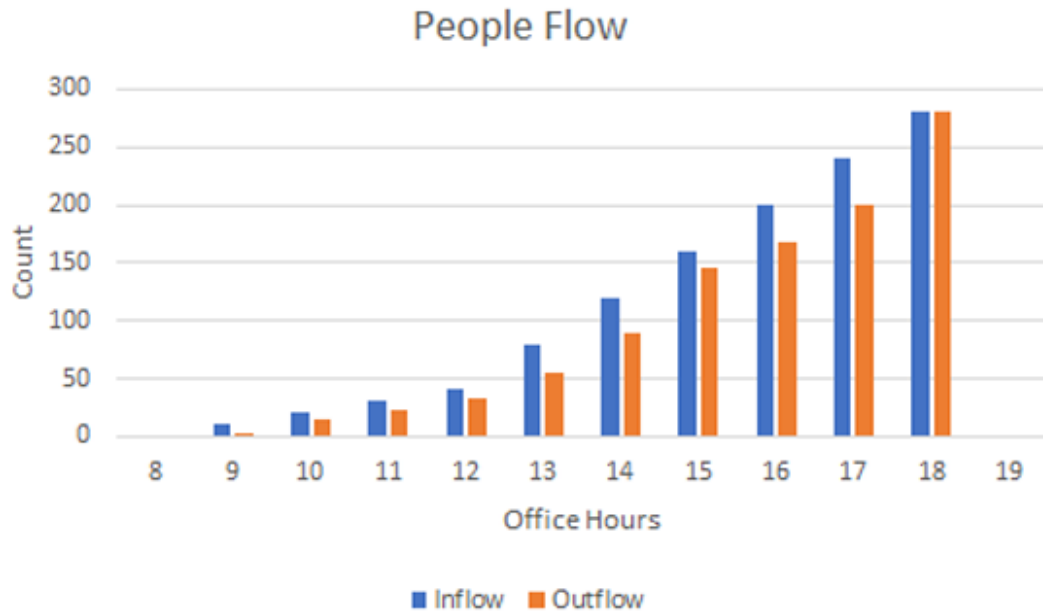
This is true for both the **People in** and the **People out** readings, so, theoretically, both readings would be the same at the end of the day (the number of people inflow and outflow is the same).

Summarized readings

Subsequently, the readings are passed on to the summarized readings (hourly, daily, monthly).

Hourly summarized readings

The values displayed as hourly summarized reading represent incremental values. This is best explained by an example.

To calculate the hourly summarized reading, the application looks at two values:

- The last reading of the preceding hour (X1)

- The last reading of the current hour (X2)

> ℹ️ *The calculation is X2-X1.*

Readings	People in (Measurement point reading)	Hourly summarized reading	
8:59	10	10	8:00-8:59
9:45	15	5	9:00-9:59
10:10	65	50	10:00-10:59
11:30	100	35	11:00-11:59

Daily summarized readings

Daily summarized readings is the sum of all hourly summarized values.

Monthly summarized readings

Monthly summarized readings is the sum of all daily summarized values.

People flow

Time-out monitoring

In addition to enabling monitoring logging and using condition-based notifications to notify system administrators, a third option is to enable time-out monitoring.

If there is a connection issue with the connector, data updates are stalled. It is therefore critical to intervene as soon as possible when such a situation occurs.

To help identify connection issues early, the Planon application provides time-out monitoring functionality. What it does is simply to monitor the connector response - if the IoT backend does not respond within 5 (minimum value) polling cycles, it will set the connector to *Immeasurable*.

A response can either be an update of the connector itself or a data update of any of the measurement points.

In addition to the monitoring the connector, the same time-out monitoring is available for measurement points. If the measurement point does not receive a response within x polling cycles, it will be set to *Immeasurable*.

> ℹ️ • This functionality only works for IoT systems that periodically (with a fixed specified time interval) send a heartbeat/update message for all its measurement points.
> • Activating this feature results in additional processing time needed on the Planon side. This could affect the system performance, so use with care and only when strictly necessary!
> • The connector monitoring is only performed if the AWM connector is *Active* or *Immeasurable*
> • If it is configured that updates should only occur during office hours, connector monitoring is restricted to office hours too.

How time-out monitoring works

The following diagram and description explain the process of time-out monitoring.
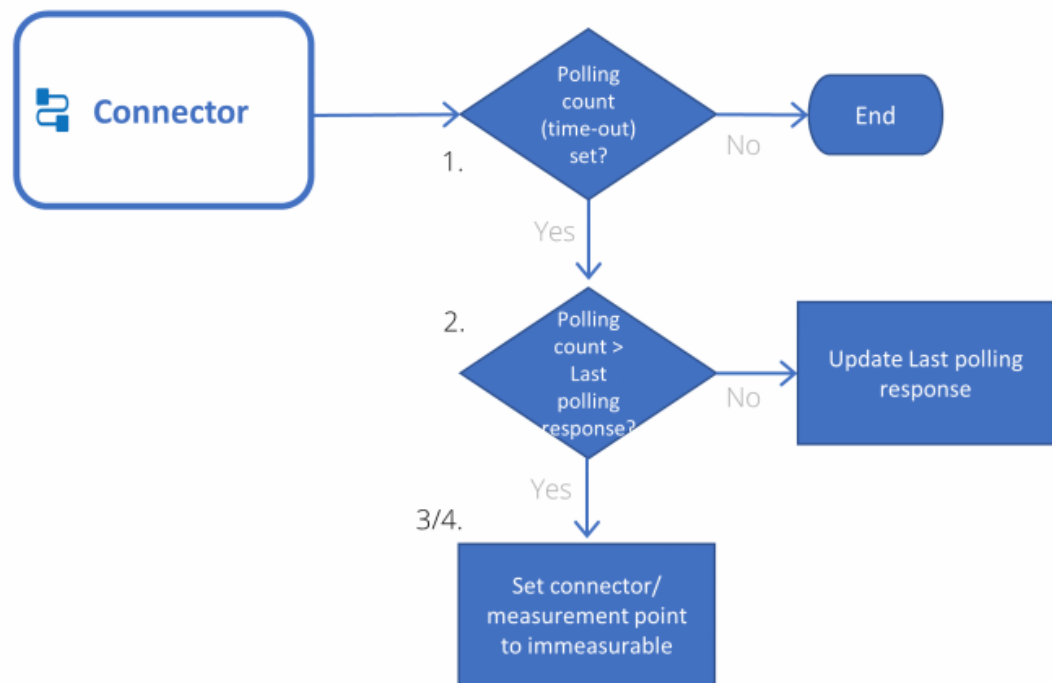
1. When a **Polling count (time-out)** is set on the connector, a time-out check is executed at the end of each polling cycle performed by the AWM data engine.

2. It determines the time stamp of the **Last polling response** of the connector and its measurement points.

  a. If the difference exceeds the **Polling count (time-out)** x polling cycle time, the connector and its measurement point are set to *Immeasurable*.

  b. If not, the **Last polling response** date-time stamp of the connector is updated.

4. For each active measurement point, determine the difference between the current time and the **Last polling response** date-time stamp. If the difference exceeds the **Polling count (time-out)** x polling cycle time, then the measurement point is set to *Immeasurable*.

Understanding the maximum capacity value

The maximum capacity is recorded or displayed at various levels.

- Measurement point (MaximumCapacity)
- Measurement point reading (NrOfPeopleCapacity)
- Measurement point summarized reading (TotalMaximumPersonCountOT)

Because of this fact, a specific logic is used to determine which value is to be displayed in the application.

1. The **Measurement point** > **MaximumCapacity** field is leading. If this field contains a value, it will be used always.

2. The **Measurement point reading** > **NrOfPeopleCapacity** field is filled by the Planon application - it is not a measured value. To determine the value, the following logic is followed:
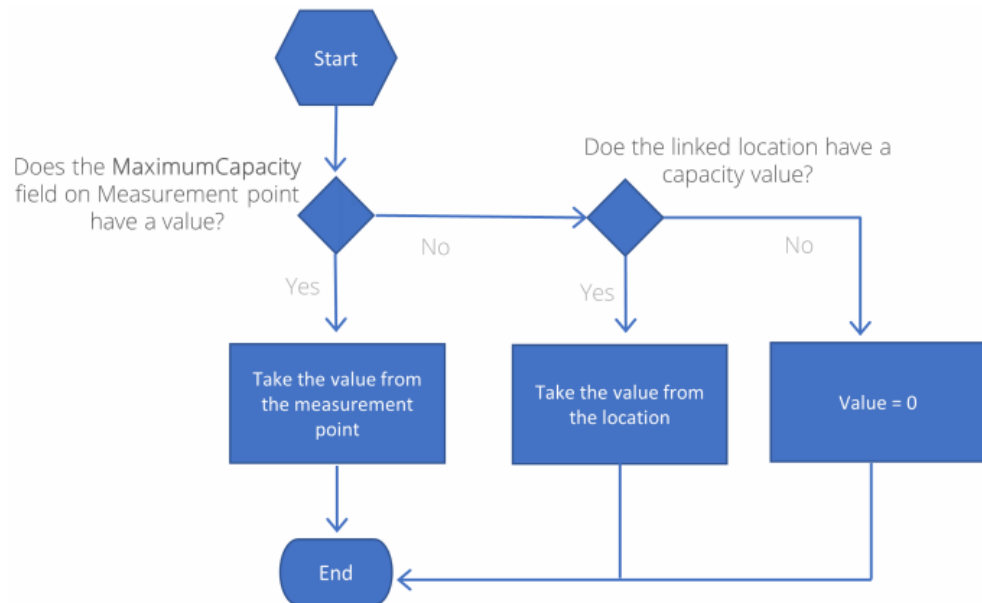
3. The measurement point summarized reading values reflect the calculations performed in summarization (hourly/daily/monthly). For an example, see Summarization - calculations.

Extrapolating secondary location data

There is a limit to the data that is being measured, but this does not mean that this information cannot be logically derived.

By combining data that is known to the application, it is possible to extrapolate this information. This is possible because the location data is hierarchical.

For example, if the space is known, it is possible to deduct the floor and the property.

The location that is known to the application is considered a *primary location*. The location that can be derived from the primary location is considered a *secondary location*.

Based on the location type and its position within the property hierarchy, you can extrapolate specific information - as shown in the following overview:

Measurement point	Summarized readings				
Location	Property	Floor	Space	Workspace	Reservation unit
Property	Primary	-	-	-	-
Floor	Secondary	← Primary	-	-	-
Space	Secondary	Secondary	← Primary	-	-
Workspace	Secondary	Secondary	Secondary	← Primary	-
Space unit	Secondary	-	Secondary	-	← Primary
Asset unit	Secondary	-	-	-	← Primary
Flexible workspace	Secondary	Secondary	Secondary	-	← Primary

> ℹ️ • The primary location is the one on the measurement point.
> • If a secondary reference is not filled in, the value will be empty.
> • The secondary references are only taken over if they are fields on the primary business object.
> • Space unit, asset unit and flexible workspace on measurement point are all combined as *reservation unit* on summarized readings.

Configuring polling

By default, the application polls every active polling connector with each polling cycle.

To prevent performance load issues, specifically when using multiple connectors, you can configure when the polling of individual connectors needs to take place.

To do so, you can configure two **Connector** fields:

- **Polling offset**
- **Poll every x cycles**

The combination of these fields can be used to configure polling as illustrated by the following image.

In this image you can see that the data engine will poll every 60 seconds (default).

Based on that setting, Connector 1 is polled with each cycle.

Connector 2 is polled every other cycle, because it's offset is set to 1 (every other cycle)

Connector 3 is not offset to the data engine setting, but is configured to skip every other cycle.

Polling

Agile Workplace Management - Field Descriptions

Data engine - fields

Field	Description
Code	Enter a code (alphanumeric) to identify the data engine.
Name	Enter a meaningful name.
Comment	Enter remarks as a note for system administrators.
Polling interval (sec)	Specify the time interval for polling the sensoring system (in seconds). The default setting is 60 seconds.
Last response date	The value in this field is used to determine whether the Data Engine is still polling.
	The engine is updated every 10 minutes (fixed time interval). If this time stamp has not been updated for more than 10 minutes, this indicates that the engine is down and action is required to revive it.

> **i**
> • If AWM is critical to your business process, we recommend to closely monitor this field, for example by specifying an alert for it.
> • Keep in mind that the Data Engine runs on server time. If the web server runs in the Cloud, the time zone is UTC+0. A notification is based on the user's time zone, take this into account when setting a notification schedule.

Connector - fields

> **i**
> The following **Connector** fields are available in the Planon application.
> • Note that not all fields are available for all connector types.
> • Fields with an asterisk (*) are Planon managed connectors only. Most fields are only editable if the connector is *Inactive*.

Field	Description
Code	Enter a unique code for the connector.
Name	Enter a description for the connector.
Comment	Enter notes (optional). The notes that you enter will be visible to the Planon administrator only.
Data engine	Select the data engine to which you want to link the connector.
URL*	Enter the URL of the web service published by the sensoring system.
Login ID*	Enter the login ID of the web service (connector) to connect to the data engine.
Password*	Enter the password for the login ID.
API version*	Indicate the API version to be used for communication between the Data Engine and the sensoring system. The following options are available: • Version 3-4 This version is based on the REST protocol and can handle full data return and changed data returns. It includes Synchronization and Polling with multiple systems.
LoRa AppEUI*	A hexadecimal identifier for the LoRa gateway. 🛈 Only applicable when using a LoRa connection. The value in this field must comply with hexadecimal format and length.
System status	Indicates the connector status: **Active** – the connector is operational. **Inactive** – the connector is not operational.

Field	Description
	Immeasurable – the status of the connector cannot be resolved. The cause of the error (going from Active to Immeasurable) is printed in the event log.
Synchronize*	Indicate whether the selected connector should be included in the synchronization process.
	When set to **Yes**, a sync will happen during the next polling cycle.
	ℹ️ After a successful run, the application switches off the **Activate monitoring mode?** and **Synchronize** fields automatically. However, if encountering issues, the application will continue to try and do this for some time, clogging the process. To overcome this situation, you can inactivate the connector. By inactivating the connector, the **Activate monitoring mode?** and **Synchronize** fields will be switched off and the process is reset. After activating the connector again, you can manually enable these fields.
Latest synchronization*	Displays the date and time that the connector last synchronized with the sensoring system.
Person	Indicate the field of BO **Person** to be used as lookup field by the sensoring system. This field will be used to display the person occupying the location.
	ℹ️ Measuring person data is not mandatory and can violate privacy laws. • The sensoring system determines whether measuring persons is actually possible. (See also Occupancy calculation).
Activate monitoring mode?	When set to **Yes**, a record will be added to the event log at the next polling. You can activate monitoring mode by clicking **Monitor communication** on the action panel.

Field	Description
	See also, Enabling monitoring mode.
	ℹ️ After a successful run, the application switches off the **Activate monitoring mode?** and **Synchronize** fields automatically. However, if encountering issues, the application will continue to try and do this for some time, clogging the process. To overcome this situation, you can inactivate the connector. By inactivating the connector, the **Activate monitoring mode?** and **Synchronize** fields will be switched off and the process is reset. After activating the connector again, you can manually enable these fields.
Polling count (time-out)	When a Polling count (time-out) is set, a time-out check is executed at the end of each polling cycle performed by the data engine.
	This setting determines whether a connector or measurement point needs to be set to *Immeasurable.*
	Specify the number of polling cycles for the connector to time-out (minimum value is 5).
	If this field is available and a value is filled in, the AWM connector will be set to *Immeasurable* if AWM does not receive a response within x polls of the AWMDataEngine.
	See also: • Time-out monitoring. • How time-out monitoring works.
Polling offset	To balance the load of the polling cycle, you can use this field to fine-tune the polling cycles.
	When specified, the connector will not be polled immediately in the first polling cycle, but it will wait for the polling cycle that matches the offset.

Field	Description
	Example
	If the **Polling offset** is 2, polling will only happen every second cycle.
	See also Configuring polling.
Poll every x cycles	To balance the load of the polling cycle, you can use this field to fine-tune the polling cycles.
	When specified, the connector will only poll every <value specified here> cycles.
	Example
	If the **Polling interval** on the data engine is set to 60 seconds and the **Poll every x cycles** is 5, then the polling will be done every 300 seconds.
	See also Configuring polling.
Last polling response	Date time stamp of last polling response (*heart beat*) received by the connector or its measurement points (server time zone).
Email address for notification	When set to **Yes**, an email will be sent to the members of the **Email address(es)** (AlertEmailList) if the measurement point/connector is set to *Immeasurable*.
Email address(es)	Enter the email address of the person(s) who should receive an email alert when the connector is set to **Immeasurable**.
	To enter multiple email addresses, use a comma (,) or semi-colon (;) as separator.
Classname	Select one of the available classes, installed by apps, that performs the polling.
App name	The value in this read-only field is filled in automatically based on the selected class.

Field	Description
App module name	The value in this read-only field is filled in automatically based on the selected class.
Partner identifier	The value in this read-only field is filled in automatically based on the selected class.
Onboarding class	Specify the app's class for onboarding (optional). See also Automatic onboarding of measurement points.
Polling class	Specify the app's class that collects the data for the measurement point (optional).
Settings **Settings example** **Settings schema**	Custom managed connectors can feature settings that are *app specific*. Typically, app settings are specified in the **AppCenter**, but for custom managed connectors, there can be a split in **module settings** and **component settings**. The **component settings** are then moved to the Connector (**Settings**, **Settings example**, **Settings schema** tabs), these are connector-specific. The **module settings** remain in the app (**AppCenter**) - these are settings that are valid for the entire app. For more information about the required values of these settings, see the specific app documentation.

Planon IoT Connector - fields

The following table lists the names and descriptions of fields specific to the Planon IoT connector.

Field	Description
Code	Enter a unique code for the connector.
Name	Enter a description for the connector.

Field	Description
Comment	Enter notes (optional). The notes that you enter will be visible to the Planon administrator only.
Data engine	Select the data engine to which you want to link the connector.
System status	Indicates the connector status: **Active** – the connector is operational. **Inactive** – the connector is not operational. **Immeasurable** – the status of the connector cannot be resolved. The cause of the error (going from Active to Immeasurable) is printed in the event log.
Activate monitoring mode?	When set to **Yes**, a record will be added to the event log at the next polling. You can activate monitoring mode by clicking **Monitor communication** on the action panel. See also, Enabling monitoring mode.

> **i** After a successful run, the application switches off the **Activate monitoring mode?** and **Synchronize** fields automatically. However, if encountering issues, the application will continue to try and do this for some time, clogging the process. To overcome this situation, you can inactivate the connector. By inactivating the connector, the **Activate monitoring mode?** and **Synchronize** fields will be switched off and the process is reset. After activating the connector again, you can manually enable these fields.

Field	Description
Polling count (time-out)	For Planon IoT connector: Polling count should be managed by the Planon IoT platform to avoid duplicate checks. Therefore, in this situation, leave the field empty. For other connectors: When a Polling count (time-out) is set, a time-out check is executed at the

Field	Description
	end of each polling cycle performed by the data engine.
	This setting determines whether a connector or measurement point needs to be set to *Immeasurable*.
	Specify the number of polling cycles for the connector to time-out (minimum value is 5).
	If this field is available and a value is filled in, the AWM connector will be set to *Immeasurable* if AWM does not receive a response within x polls of the AWMDataEngine.
	See also: • Time-out monitoring. • How time-out monitoring works.
Polling offset	To balance the load of the polling cycle, you can use this field to fine-tune the polling cycles.
	When specified, the connector will not be polled immediately in the first polling cycle, but it will wait for the polling cycle that matches the offset.
	Example
	If the **Polling offset** is 2, polling will only happen every second cycle.
	See also Configuring polling.
Poll every x cycles	To balance the load of the polling cycle, you can use this field to fine-tune the polling cycles.
	When specified, the connector will only poll every <value specified here> cycles.
	Example
	If the **Polling interval** on the data engine is set to 60 seconds and the **Poll every x cycles** is 5, then the polling will be done every 300 seconds.

Field	Description
	See also Configuring polling.
Last polling response	Date time stamp of last polling response (*heart beat*) received by the connector or its measurement points (server time zone).
Email address for notification	When set to **Yes**, an email will be sent to the members of the **Email address(es)** (AlertEmailList) if the measurement point/connector is set to *Immeasurable*.
Email address(es)	Enter the email address of the person(s) who should receive an email alert when the connector is set to **Immeasurable**.
	To enter multiple email addresses, use a comma (,) or semi-colon (;) as separator.

Configurations & logging - fields

The **Configurations & logging** level contains three steps:

- Definitions step
- Measurement point types step
- Event logs step

Definitions step

Field	Description
Code	Enter a code for the measurement point definition.
Name	Enter a description for the measurement point definition.
Connector	Select a connector from the list to which the measurement point definition should be linked.
Dimension	The unit of occupancy. Currently, the default value is always **PP, Per person**.
Comment	Enter notes (optional). The notes that you enter will be visible to the Planon administrator only.

Field	Description
Pre-reservation time (min)	Specify a time in minutes that denotes the pre-reservation time. Here, the status of the reservation unit is changed to 'Reservation imminent' before the start of actual reservation time.
	The purpose of this setting is to ensure that the location is not claimed shortly before a reservation starts.
Allowed delay reservation time	Specify a time in minutes that denotes the allowed delay in reservation time.
	During this time window, the location remains unavailable for reservation even though the reservation unit may be vacant.
	After the delay time has passed and the location remains vacant, the reservation status will be updated to 'No show'.
Start break 1-3	Specify the break start times (1-3).
	When idle time is detected and this coincides with a predefined break, the idle time is extended until the end of the break.
End break 1-3	Specify the break end times (1-3).
Idle time - no valid reservation (min)	Specify a time in minutes that denotes the idle time when temporarily leaving an un-reserved location. The location remains unavailable during the time frame specified.
Idle time - valid reservation (min)	Specify a time in minutes that denotes the idle time when temporarily leaving a reserved location. The location remains unavailable during the time frame specified
Check no-show events	If this value is set to **Yes** for all measurement points linked to reservation units, AWM will check for no-show events and will carry out the configured actions.
Change reservation end time (no-show event)	If set to **Yes**, the reservation end time will be changed to the time of the no-show event if the following conditions apply
	• A no-show event occurs
	• Checking for no-show events has been enabled

Field	Description
	In addition, the status of the reservation is changed to the configured status (See also Linking no-show statuses).
	If set to **No**, only the status will be changed.
Check early departure events	If this values is set to **Yes** for all measurement points linked to reservation units, AWM will check for early departure events and will carry out the configured actions.
Change reservation end time (early departure event)	If set to **Yes**, the reservation end time will be changed to the time of the early departure event if the following conditions apply • An early departure event occurs • Checking for early departure events has been enabled In addition, the status of the reservation is changed to the configured status (See also Linking no-show statuses). If set to **No**, only the status will be changed.
No-show statuses	This field lists the status that is assigned when a no-show event occurs. See also Linking no-show statuses.
Early departure statuses	This field lists the early departure status(es) linked to the definition. See also Linking early departure statuses.
No-check statuses	This field lists the status(es) in which the location should not be checked for reservation events. See also Linking no-check statuses.
Email address for notification	When set to **Yes**, an email will be sent to the members of the **Email address(es)** (AlertEmailList) if the measurement point/connector is set to *Immeasurable*.
Email address(es)	Enter the email address of the person(s) who should receive an email alert when the measurement point definition is set to Immeasurable. To enter multiple email addresses, use a comma (,) or semi-colon (;) as separator.

Field	Description
	If this field is empty, the Connector's **Email address(es)** will be used instead. If both fields are empty, no notification can be sent at all.

Measurement point types step

> Using measurement point types is optional. This feature can be used for being able to filter on specific types of measurement points in the AWM Dashboard, such as: meeting rooms vs. conference rooms.

Field	Description
Code	Enter a code for the measurement point type.
Name	Enter a description for the measurement point type.

Event logs step

> • Note that events logged here are issues that are reported on the connector, not on the measurement point!
> • The log also displays useful information about the current and next polling cycle, the number of measurement points, and more.

Field	Description
Application log type	Displays the type of information that is logged: • Error • Warning • Information
Source	Displays the process causing the event.
Log message	Provides an overview of the event, if possible.
Details	Displays log details.
User	Displays the name of the user on whose name the process is executed.
Transferred to archive?	Indicates whether this log message is archived.

Measurement point - fields

There are three types of measurement point fields:

- Read only: these are system fields that are filled by the data engine

- Configuration items: these are fields whose values can only edit when the measurement point is *Inactive*

- Free changeable fields, which do not affect the processing of data.

Field	Description
General tab	
Code	Enter an ID for the measurement point.
Name	Enter a description for the measurement point.
Comment	Enter notes (optional). The notes that you enter will be visible to the Planon administrator only.
Measurement point type	Select the type of measurement point. The measurement point types are defined on Configurations & logging > Measurement point types step. You can differentiate between various measurement point types. Working with a predefined set of measurement point types will enable the sensoring system to better interpret measurements. ⓘ For some sensoring systems, the measurement point type is mandatory, in which case it should be made mandatory on the layout in Planon.
Measurement point definition	Select a measurement point definition from the list to which the measurement points should belong.
Measurement point role	Select your measurement point's role, which is more or less synonymous with the function it is going to play. You can choose from: • Primary A Occupancy is derived from the measurement point readings. When you select this role, the **Display availability** field on the **Configuration** tab is set to **Yes**. ⓘ Data of all related measurement point roles will be aggregated at this level. • Primary B

Field	Description
	Occupancy is derived from the reservation data.
	When you select this role, the **Display availability** field on the **Configuration** tab is set to **No**.

> ℹ️ Data of all related measurement point roles will be aggregated at this level.

Field	Description
	• Supplementary
	Role that enables you to use a different set of sensors (measuring data other than occupancy). By having this role, you can mix sensors of different vendors.
	When you select this role, the **Display availability** field on the **Configuration** tab is set to **No**.
	• Secondary
	Role for providing auxiliary information. When you select this role, the **Display availability** field on the **Configuration** tab is set to **No**.
Status	Indicate the measurement point status (set manually):
	Active – the measurement point is operational.
	Inactive – the measurement point is not operational.
Occupancy measurement	
Occupancy value	Indicates whether the location is occupied.
	The occupancy value can be:
	• 0: not occupied
	• 1: occupied
	• Null: no information received
	For more information, see Occupancy measurement.
Passive occupancy	Indicates whether a location is passively occupied:
	• 0: not passively occupied
	• 1: passively occupied
	• empty: not measured
	See Passive occupancy.

Field	Description
Person count	The values in this field can either be:
	• a digit / number: the actual occupancy value
	• empty: the sensoring system cannot count occupancy
	For more information, see Occupancy measurement.
People in (cum.)	Displays the (cumulative) value of the inflow of people.
	ℹ This field only works for primary measurement points.
	For more information, see How people flow works.
People out (cum.)	Displays the (cumulative) value of the outflow of people.
	ℹ This field only works for primary measurement points.
	The values are registered for secondary measurment points, but these are not taken into account by the primary measurement point.
	For more information, see How people flow works.
Passive occupied (in min.)	Displays the number of minutes during office hours within the summarization time frame when the location was passively occupied (personal belongings detected).
	0 = not passive occupied
	1 = is active occupied
Active occupied (in min.)	Displays the number of minutes during office hours within the summarization time frame when the location was actively occupied.
Reading date/time	Displays the latest reading date/time given by the sensoring system. This is the date/time given in the time zone of the sensoring system.
Normalized date/time	Displays the latest normalized reading date/time of the data engine. The normalized time is the local time calculated by the data engine based on the time zone of measurement point location. If no time zone is provided, the system time of the data engine is used.
	The occupancy status is calculated based on the normalized date and time.

Field	Description
Previous occupancy status	Displays the previous occupancy status of the location.
Occupancy status change date-time	Displays the date/time of the last change in the occupancy status (based on normalized reading date-time).
Occupancy status	Displays the status of occupancy of the measurement point. For more information refer to, Occupancy statuses.
Last polling response	Date time stamp of last polling response received by the measurement point (server time zone). See: Time-out monitoring.
Pause reason	Displays the reason why a measurement point's occupancy status is put on *Pause*. This is a read-only field that can only be set by the Data Engine. Its values can be: • Connector inactive • Update next polling/event • Outside working hours By including the Pause status, the relevant readings can also be viewed.
Person	Displays the person to which the measurement point is linked. See also Linking persons. ℹ This field can only be filled if supported by the sensoring system. See also Occupancy measurement.
Reservation	Displays the reservation that is currently valid and was created for the location, if applicable.

Environmental measurements

Battery status (voltage)	Displays the battery indication (voltage) received from the connector. The value indicates the status of the sensor's power supply. If multiple sensors are linked to the measurement point, the lowest battery voltage is returned.
Light intensity (lux)	Displays the luminous intensity or lux (lx) received from the connector.

Field	Description
Carbon dioxide (ppm)	Displays the carbon dioxide level received from the connector. The measurement point's carbon dioxide level is given in parts per million (ppm).
Humidity (%)	Displays the humidity percentage received from the connector.
VOCs (ppb)	Displays the reading for volatile organic compounds (VOCs) in parts per billion (ppb).
Noise (dB)	Displays the loudness level received from the connector. The measurement point's loudness level is given in decibel (dB).
Temperature (degrees)	Displays the temperature received from the connector. The measurement point's temperature is given in degrees Celsius or Fahrenheit, which is determined by the sensoring system.
Power level (kWh)	Displays the power level value received from the connector. The power level indicates the energy usage in kilowatt (kWh).
Radon (pCi/L)	Displays the reading for Radon in picocuries per liter (pCi/L).

> ℹ️ One pCi/L equals 37 Bq/m^3. If a sensor is measuring Bq/m, the connector needs to convert this value to pCi/L, the unit the Planon application is expecting.

Field	Description
PM2.5	Displays the indoor air quality readings of particles less than 2,5 μm in diameter. The value is given in μg/m^3. If there are no particles measured, the value is Null.
PM10	Displays the indoor air quality readings of particles less than 10 μm in diameter. The value is given in μg/m^3. If there are no particles measured, the value is Null.
Free field 1/3 for vendor specific readings	Displays any vendor specific values collected from the sensoring system. See also Sensoring system data > free fields.
Free measurement field 1/10	Free fields made available for capturing numeric values, e.g. number of particles in a given time frame. This data must be supplied by the sensoring system. Because they are numeric values, they can be summarized and used in analysis.

Field	Description

Configuration

Field	Description
Display availability?	Read-only field that indicates whether the measurement point should be taken into account when displaying availability in Kiosk, Room booking panel and Apps.
	If set to **Yes**:
	• The availability of the related unit will also be determined by the occupancy of the measurement point.
	• The data is available to Planon Apps, Room booking panel and Kiosk.

> ℹ When multiple measurement points are linked to the same location, only one is considered the primary measurement point (determined by setting this field **Yes**.)

Field	Description
Store historical readings	**Yes** is selected by default. Select **No**, if you do not want to store historical data on the **Details** level. A record will not be created in the **Measurement point readings** list.
	If you switch a measurement point from *Primary* to *Supplementary*, this field is automatically switched off and made read-only. When switching the measurement point back to *Primary* or *Secondary*, readings are enabled by default, but can still be disabled if necessary.
Update during office hours only	Select **Yes** if you want to update the measurement point linked to a specific location during office hours *only*. **No** is selected by default.
	If you select **Yes**, the data engine continues to run, but will not record updates *outside* office hours.
Store during office hours only	Select **Yes** if you want to store the measurement point readings during office hours *only*. **No** is selected by default.
	If you select **Yes**, the data engine continues to run, but will not store updates *outside* office hours.
Maximum capacity (No.) - [MaximumCapacity]	Enter the maximum occupancy capacity of the location to which you are linking the measurement point.

Field	Description
	ℹ️ • This field is used for utilization calculations. • This field is leading when calculating the maximum capacity of a location. See also: Understanding the maximum capacity value
Property / Property zone / Floor / Space / Workspace / Reservation unit / Rentable unit	Select a location to which you want to link the measurement point. You can only select one location per measurement point.
Time zone	Indicates the time zone of the measurement point.
Calendar	Select the calendar for the measurement point.
	ℹ️ The calendar is important for summarization - it determines the time-frame for conducting measurements.
	You can select a specific calendar to be used, deviating from the location's calendar. If you do not select a specific calendar, the location calendar will be used. Using a separate calendar for measurement points can be important if, for example, you have reservation units with different office hours. When you do, the summarization process will be affected.
	⚠️ Note: data that is already summarized will remain based on the previously configured calendar. • By deleting summarized data and subsequently synchronizing again, the summarization will be based on the current calendar. • If you delete summarized data, purge all three levels (hours, days, months). • You can only summarize anew for the period for which you have summarized readings.
Error monitoring	
Error code	Displays the error code that is published by the connector when encountering an error situation for the measurement point (not applicable for API).
Monitor data	Indicate whether you want to enable monitoring logging for the selected measurement point. If you click **Yes**, the data from the sensoring system is logged in the System feedback field.
System feedback	It displays an error message if the measurement point is *Immeasurable*. When monitoring is enabled, this

Field	Description
	field displays all data exchange (response) collected by the data engine.

Measurement point role

Details - fields

The **Details** level contains the following steps:

- Readings
- Summarized readings:
  - Hourly summarized readings
  - Daily summarized readings
  - Monthly summarized readings
- Sensors
- Sensor types

Readings step

Field	Description
Measurement point	Displays the measurement point.
Occupancy value	Indicates whether the location is occupied. The occupancy value can be: • 0: not occupied • 1: occupied • Null: no information received For more information, see Occupancy measurement.
Passive occupancy	Indicates whether a location is passively occupied: • 0: not passively occupied • 1: passively occupied • empty: not measured See Passive occupancy.
Pause reason	Displays the reason why a measurement point's occupancy status is put on *Pause*. This is a read-

Field	Description
	only field that can only be set by the Data Engine. Its values can be: • Connector inactive • Update next polling/event • Outside working hours By including the Pause status, the relevant readings can also be viewed.
Person count	The values in this field can either be: • a digit / number: the actual occupancy value • empty: the sensoring system cannot count occupancy For more information, see Occupancy measurement.
People in (cum.)	Displays the (cumulative) value of the inflow of people. ℹ️ This field only works for primary measurement points. For more information, see How people flow works.
People out (cum.)	Displays the (cumulative) value of the outflow of people. ℹ️ This field only works for primary measurement points. The values are registered for secondary measurment points, but these are not taken into account by the primary measurement point. For more information, see How people flow works.
Reading date/time	Displays the sensoring system's last reading date/time.
Normalized date/time reading	Displays the data engine's last reading date/time in the time zone of the location linked to your measurement point.
Previous normalized date/time reading	Displays the data engine's normalized reading date/time before last.
Occupancy status	Displays the status of occupancy of the measurement point: *Inactive*, *Pause*,

Field	Description
	Immeasurable, *Not occupied*, *Idle*, *Reservation imminent* and *Occupied*.
Occupancy status change date-time	Displays the date/time of the last occupancy status change.
Previous occupancy status	Displays the status before the current status.
Within office hours	**Yes** indicates that the readings of the measurement point are taken during office hours. (Based on the calendar linked to the measurement point).
Person	Displays the person who occupies the location.

> ℹ Only if this was actually measured. Most sensoring systems measure values anonymously.

Field	Description
Location reserved	**Yes** indicates that the location was reserved.
Reservation	Displays the reservation that is active during reading time.
No show	**Yes** indicates that the measurement point experienced a 'No show' event.
Time saving from 'no show'	Displays the net time savings as a result of making a space available by detecting a 'no show'.
Early departure	**Yes** indicates that the measurement point experienced an 'Early departure' event.
Time saving from 'early departure'	Displays the net time savings as a result of making a space available by detecting an 'early departure'.
Maximum capacity (No.) - [NrOfPeopleCapacity]	Displays the maximum number of people the reservation unit can accommodate. The value is either taken from the measurement point, or from the linked location. See also: Understanding the maximum capacity value.
Reserved capacity	Displays the number of people for whom the location was reserved.
Battery status (voltage)	Displays the battery indication (voltage) received from the connector. The value indicates the status of the sensor's power supply.

Field	Description
	If multiple sensors are linked to the measurement point, the lowest battery voltage is returned.
Light intensity (lux)	Displays the luminous intensity or lux (lx) received from the connector.
Carbon dioxide (ppm)	Displays the carbon dioxide level received from the connector. The measurement point's carbon dioxide level is given in parts per million (ppm).
Humidity (%)	Displays the humidity percentage received from the connector.
Noise (dB)	Displays the loudness level received from the connector. The measurement point's loudness level is given in decibel (dB).
Temperature (degrees)	Displays the temperature received from the connector. The measurement point's temperature is given in degrees Celsius or Fahrenheit, which is determined by the sensoring system.
Radon (pCi/L)	Displays the reading for Radon in picocuries per liter (pCi/L).

> **i** One pCi/L equals 37 Bq/m^3. If a sensor is measuring Bq/m, the connector needs to convert this value to pCi/L, the unit the Planon application is expecting.

Field	Description
PM2.5	Displays the indoor air quality readings of particles less than 2,5 μm in diameter. The value is given in $μg/m^3$. If there are no particles measured, the value is Null.
PM10	Displays the indoor air quality readings of particles less than 10 μm in diameter. The value is given in $μg/m^3$. If there are no particles measured, the value is Null.
Free field 1/3 for vendor specific readings	Displays any vendor specific values collected from the sensoring system. See also Sensoring system data > free fields.
Error code	Displays the error code that is published by the connector when encountering an error situation for the measurement point (not applicable for API).
System feedback	It displays an error message if the measurement point is *Immeasurable*. When monitoring is

Field	Description
	enabled, this field displays all data exchange (response) collected by the data engine.
Free measurement field 1/10	Free fields made available for capturing numeric values, e.g. number of particles in a given time frame. This data must be supplied by the sensoring system. Because they are numeric values, they can be summarized and used in analysis.

Summarized readings - fields

The following table lists the fields and their descriptions available for summarized readings on the **Details** level.

Field	Description
Measurement point	Displays the linked measurement point.
Location details	
Property / Floor / Space / Workspace / Reservation unit	These fields are populated by extrapolation from the measurement point.
	For more information about extrapolation, see Extrapolating secondary location data.
Space category	If the location is a space, the space category is taken over from the **Space usage**.
	This BO is reference date aware, so there could be multiple space usages in a given time frame. If this is the case, this field will be empty.
	See also Summarization of reference-date aware fields.
Space type	If the location is a space, the space type is taken over from the **Space usage**.
	This BO is reference date aware, so there could be multiple space usages in a given time frame. If this is the case, this field will be empty.
	See also Summarization of reference-date aware fields.
Department	If the location is a Space or Workspace, this field retrieves the department of the location.

Field	Description
	See also Summarization of reference-date aware fields.
Cost center	If the Location is a Space or Workspace, this field retrieves the cost center of the location. See also Summarization of reference-date aware fields.
Location capacity	Indicates the capacity of the location. It is not a cumulative value, it is the actual capacity as defined for the location of the measurement point at the moment of the summarization.

Location capacity

> ℹ If data is not measured on the reading, the summarized value here will be empty instead of displaying a zero (0).

If the location is a:

- **Property**: the value is derived from the **Property > MaxAllowedPeople** field.

- **Floor**: the value is derived from the **Floor attribute > MaxAllowedPeople** field.

> ℹ This BO is reference date aware.

- **Space**: the value is derived from the **Space usage > WorkSpaceCount** field.

> ℹ This BO is reference date aware.

  When you have multiple valid space usages on the same date, this field will display he sum of the **WorkSpaceCount** field.

- **Reservation unit**: the value is derived from the **BaseReservationUnit > MaximumPersonCount** field.

- **Workspace**: the value is derived from the

Field	Description
	WorkSpaceDetail > **MaxOccupancy** field.
	ℹ️ This BO is reference date aware.
	MaxOccupancy is a percentage field (1 person equals 100%, 2 persons equal 200% etc.). Capacity is calculated as: MaxOccupancy / 100.
	ℹ️ **Rentable unit** and **Property zone** are currently not considered as location types.
	For information about summarization of reference-date aware BOs/fields, see Summarization of reference-date aware fields
Period	
Type	Displays and identifies the summarization type (hourly, daily, monthly).
Year	Indicates the year of the summarization period.
Month	Indicates the month of the summarization period.
Day	Indicates the day of the summarization period, if applicable.
Hour	Indicates the hour of the summarization period, if applicable.
Composed date-time	The value in this field is composed of the preceding four reading field values for Year, Month, Day and Hours.
	By using this field, it is now possible to create a From-To analysis for a period.
	Hour summarization
	Start date-time of hour:
	Year: 2020 Month: 06 Day: 25 Hour: 14
	Composed data-time: 25-06-2020H14.00
	Day summarization
	Start date-time of day:
	Year: 2020 Month: 06 Day: 25

Field	Description
	Composed date-time: 25-06-2020H00.00
	Month summarization
	Start date-time of month
	Year: 2020 Month: 06
	Composed date-time: 01-06-2020H00.00
Occupancy measurement	
Readings (in min.) during office hours	Displays the number of minutes of valid readings (in the status **Non-occupied**, **Reservation imminent**, **Occupied** or **Idle**) within the the summarization time frame.
Valid readings?	Displays whether the readings are considered valid. This is based on the previous field (Readings (in min.) during office hours).
	If the number of valid reading in **Readings (in min.) during office hours** field is >= 80% of the timeblock, this value is considered as valid and the field is set to **Yes**.
	If the number of valid readings is < 80%, the value of this field will be set to **No**.
Time slot	Displays the actual number of minutes in the office calender within the summarization time frame (day/week/month).

Example (hour)

Office hours = 8:30 - 17:00

For time bucket 8, the time slot will be 30 minutes

For time bucket 9-17, it will be 60 minutes each.

Hours	Time slot	# minutes
8-9 am	8	30
9-10 am	9	60
10-11 am	10	60
11-12 am	11	60
12-13 pm	12	60
13-14 pm	13	60
14-15 pm	14	60
15-16 pm	15	60
16-17 pm	16	60

Calculation % of valid reservations:

Field	Description
	(mins. of valid reservation / time slot) * 100.0
Reserved status (in min.)	Displays the number of minutes in the status **Reserved** during office hours within the summarization time frame.
Non-occupied status (in min.)	Displays the number of minutes in the status **Non-occupied** during office hours, within the summarization time frame.
Total occupancy value	Displays the number of minutes in the status **Occupied** during office hours within the summarization time frame.
Passively occupied (in min.)	Displays the number of minutes in the status **Passively occupied** during office hours during the summarization time frame.
Idle status (in min.)	Displays the number of minutes in the status **Idle** during office hours within the summarization time frame.
Immeasurable status (in min.)	Displays the number of minutes in the status **Immeasurable** during office hours within the summarization time frame.
Minimum occupancy value	Displays the minimum occupancy value during office hours for readings in status **Occupied** within the summarization time frame.
Maximum occupancy value	Displays the maximum occupancy value during office hours for readings in the status **Occupied** within the time frame.

Measurement results - reservations

Field	Description
Valid reservations (in min.)	Displays the number of minutes for which a valid reservation existed for the measurement point during office hours within the summarization time frame. This is based on the value in the **Time block** field.
Total occupancy value	Displays the sum of all occupancy values during office hours in the status **Occupied** within the summarization time frame. The sum is based on the **Person count** field. **Example** When measuring 10 minutes occupancy for 8 persons in one hour, the value is 80.

Field	Description
People in	Displays the actual value of the inflow of people during the summarization timeframe.
	ℹ️ This field only works for primary measurement points.
	For more information, see How people flow works.
	ℹ️ If data is not measured on the reading, the summarized value here will be empty instead of displaying a zero (0).
People out	Displays the actual value of the outflow of people during the summarization timeframe.
	ℹ️ This field only works for primary measurement points.
	For more information, see How people flow works.
	ℹ️ If data is not measured on the reading, the summarized value here will be empty instead of displaying a zero (0).
Max. capacity - [TotalMaximumPersonCountOT]	Displays the sum of all maximum capacity values during office hours in the status **Occupied** within the time frame.
	For a calculation example, see Summarization - calculations
Reserved capacity	Displays the sum of all people for whom a reservation was planned during office hours in the status **Occupied** within the time frame.
Number of 'no-show' events	Displays the number of **No-show** events during office hours.
Time saving from 'no show'	Displays the net time savings as a result of making a space available by detecting a 'no show'.
Number of 'early departure' events	Displays the number of **Early departure** events during office hours.
Time saving from 'early departure'	Displays the net time savings as a result of making a space available by detecting an 'early departure'.

Field	Description
Free measurement field 1/10	Free fields made available for capturing numeric values, e.g. number of particles in a given time frame. This data must be supplied by the sensoring system. Because they are numeric values, they can be summarized and used in analysis.

Environmental measurements

> • Environmental measurements all display summarized values of valid measurements.
> • When data is not measured on the reading, the summarized value here will be empty instead of displaying a zero (0).

Battery status (voltage)	Displays the battery indication (voltage) received from the connector. The value indicates the status of the sensor's power supply.
	If multiple sensors are linked to the measurement point, the lowest battery voltage is returned.
Light intensity (lux)	Displays the luminous intensity or lux (lx) received from the connector.
Carbon dioxide (ppm)	Displays the carbon dioxide level received from the connector. The measurement point's carbon dioxide level is given in parts per million (ppm).
Humidity (%)	Displays the humidity percentage received from the connector.
Noise (dB)	Displays the loudness level received from the connector. The measurement point's loudness level is given in decibel (dB).
Temperature (degrees)	Displays the temperature received from the connector. The measurement point's temperature is given in degrees Celsius or Fahrenheit, which is determined by the sensoring system.
Power level (kWh)	Displays the power level value received from the connector. The power level indicates the energy usage in kilowatt (kWh).
Radon (pCi/L)	Displays the reading for Radon in picocuries per liter (pCi/L).

> One pCi/L equals 37 Bq/m^3. If a sensor is measuring Bq/m, the connector needs to convert

Field	Description
	this value to pCi/L, the unit the Planon application is expecting.
VOCs (ppb)	Displays the reading for volatile organic compounds (VOCs) in parts per billion (ppb).
PM2.5	Displays the indoor air quality readings of particles less than 2,5 μm in diameter. The value is given in $\mu g/m^3$. If there are no particles measured, the value is Null.
PM10	Displays the indoor air quality readings of particles less than 10 μm in diameter. The value is given in $\mu g/m^3$. If there are no particles measured, the value is Null.

Sensor - fields

Field	Description
Measurement point	Select a measurement point from the list to which you want to link a sensor.
Sensor ID 1 – 5	Enter a sensor ID to uniquely identify a sensor. You can have a maximum of 5 IDs per sensor.
	ℹ The sensoring system used determines which Sensor ID fields will be used for identification.
	The combination of these 5 fields will render the sensor ID. It is not mandatory to use all 5 fields.
Sensor type	Select the sensor type from the picklist. This list must be consistent with your specific sensoring system.
Secondary sensor?	Indicates whether the sensor serves a secondary role. If **Yes**, the sensor is used to correct the primary sensors. For example, the combination of people counting sensors (primary role) and motion sensors (secondary role).
Comment	Enter additional information if necessary.
Start date	Enter a start date for sensor activation.
End date	Enter an end date for sensor activation.

Field	Description
	The start date and end date are used for synchronization. Sensors with an invalid date are excluded from the synchronization run.

Sensor types

On this step you can create and distinguish between various sensor types. For example, types of sensors for measuring occupancy only and those that measure environmental values also.

The distinction could be based on sensor variables (vendor-specific):

- ELSYS_NO_ENVIRON: non of the environmental measurements of this sensor are used.

- ELSYS_NO_TEMP: this sensor is not used for measuring temperature.

Example

A location is fitted with three sensors. Two are positioned on the ceiling and one is fitted on thermostat height. You would not want to take the ceiling sensors into account when measuring the location's temperature as this would throw off the average value.

 Specifying sensor types is optional. The above example is based on the SWYCS sensoring system.

Data engine

The data engine is an installed component that communicates with the active sensoring systems and updates/adds the occupancy information in the Planon Software Suite. The reading process is performed at specified time intervals (for example, each minute).

> ℹ️ For more information about the time interval setting, see Data engine - fields.

AWMDATAENGINEADMIN user

- The data engine requires its own user (AWMDATAENGINEADMIN) to log on to Planon.

- This user should be available and linked to a user group that should be linked to the AWMDataEngine product definition and this system user should have full functionality.

- The check box **Password never expires** must be selected for this user. If this is not selected, the data engine may be unavailable because the user's password has expired.

- It is good practice to create a separate user group for the data engine.

- The AWMDATAENGINEADMIN must be linked to the right product definitions (see: Adding an AWMDATAENGINEADMIN user).

Adding an AWMDATAENGINEADMIN user

Reading (polling) cycle

During the reading intervals, the following tasks are performed:

> ℹ️ Polling can apply to both Planon managed, and custom managed connectors (but only when the latter is using the **Pull** mechanism).

- Collects all active connectors.

- A connector is active if its status in Planon Software Suite is set to **Active** manually.

- Collects all active measurement points linked to these connectors.

- A measurement point is active if its status in Planon Software Suite is set to **Active** manually.

- Communicates with the sensoring system(s) and collects occupancy data from all active measurement points.

- The connector defines the API to the sensoring system (web service).

- Updates every active measurement point based on the occupancy data received (only when a change is detected). This update is performed on the measurement point, linked to the location.

- Stores historical data.

> ℹ Some of these tasks depend on configuration settings.

Polling

Sensoring system data

The following data is collected from the sensoring system for each location to which an active measurement point is linked:

Field	Description
Measurement point ID	Displays the measurement point.
Person ID	Displays the person linked to the sensoring system. This field is optional.
Date/time of last reading	Date/time of last reading (server time).
Occupancy value	Indicates whether the location is occupied. The occupancy value can be: • 0: not occupied • 1: occupied • Null: no information received For more information, see Occupancy measurement.
Passive occupancy	Indicates whether a location is passively occupied: • 0: not passively occupied • 1: passively occupied • empty: not measured See Passive occupancy.

Field	Description
Person count	The values in this field can either be: • a digit / number: the actual occupancy value • empty: the sensoring system cannot count occupancy For more information, see Occupancy measurement.

> ℹ The sensoring system determines whether the value 1 just means "Occupied" or whether it means "Occupied by one person". For a description of these values, and how to resolve issues, see *AWM Technical Reference*.

Field	Description
Free field 1-3 for vendor specific readings	It is possible to store additional vendor data here, if available.
Free measurement field 1/10	Free fields made available for capturing numeric values, e.g. number of particles in a given time frame. This data must be supplied by the sensoring system. Because they are numeric values, they can be summarized and used in analysis.

Environmental values

Field	Description
Battery status (voltage)	Displays the battery indication (voltage) received from the connector. The value indicates the status of the sensor's power supply. If multiple sensors are linked to the measurement point, the lowest battery voltage is returned.
Light intensity (lux)	Displays the luminous intensity or lux (lx) received from the connector.
Carbon dioxide (ppm)	Displays the carbon dioxide level received from the connector. The measurement point's carbon dioxide level is given in parts per million (ppm).
Humidity (%)	Displays the humidity percentage received from the connector.
Noise (dB)	Displays the loudness level received from the connector. The measurement point's loudness level is given in decibel (dB).
Temperature (degrees)	Displays the temperature received from the connector. The measurement point's temperature

Field	Description
	is given in degrees Celsius or Fahrenheit, which is determined by the sensoring system.
Power level (kWh)	Displays the power level value received from the connector. The power level indicates the energy usage in kilowatt (kWh).
Radon (pCi/L)	Displays the reading for Radon in picocuries per liter (pCi/L).

> **i** One pCi/L equals 37 Bq/m^3. If a sensor is measuring Bq/m, the connector needs to convert this value to pCi/L, the unit the Planon application is expecting.

Field	Description
Error code	Displays the error code that is published by the connector when encountering an error situation for the measurement point (not applicable for API).
System feedback	It displays an error message if the measurement point is *Immeasurable*. When monitoring is enabled, this field displays all data exchange (response) collected by the data engine.

Linking persons

Depending on the sensoring system, it is possible to configure and enable the AWM solution to identify availability on the level of individual persons. In that case the sensoring system will provide a person's ID. However, most sensoring systems are anonymous and will not be able to identify the person that is occupying the location.

On the **Connector** level the Person key field is configured. Based on the person ID received and the configured field, the reader will try to find the person. If there is a match and the person is found, he/she is linked to the measurement point; in all other cases the measurement point **Person** field will be left empty.

Statuses

Communication of AWM components is status-driven. This section describes the possible statuses available and their significance.

Connector statuses

The connector can have the following statuses:

Status	Description
Active	The connector is operational; this status is set manually.
Inactive	The connector is not operational; this status is set manually.
Immeasurable	The connector is not operational. It is not possible to establish a communication with the connector.
	If the communication is restored the data engine will automatically switch the status to Active again.

Measurement point (system) statuses

The measurement point can have the following statuses:

Status	Description
Active	The measurement point is operational (data will be updated); this status is set manually.
Inactive	The measurement point is not operational (data will not be updated); this status is set manually.

Switching status manually

In Planon Software Suite, the connector and the measurement point (system) statuses can be changed manually.

> **i** Note that this status differs from the occupancy status.

Action	Result
Switching the connector to inactive	All related measurement points that are in the Active status will be switched to occupancy status Pause. Communication between the data engine and the sensoring system is not possible.
Switching the connector to active	All related measurement points that are in occupancy status Pause will be switched to the actual occupancy status (occupied/unoccupied) following the next reading cycle.
Switching the measurement point to inactive	The measurement point occupancy status will be switched Inactive.

Action	Result
Switching the measurement point to active	The measurement point occupancy status is switched to Pause and will be set to the actual occupancy status following the next reading cycle.

Occupancy statuses

The occupancy status is determined based on the reading value of a measurement point:

Status	Description	Related configurations
Occupied	The location is physically occupied by one or more people.	
Not occupied	The location is not occupied nor in status "Reservation imminent", "Idle".	
Reservation imminent	The location is not occupied but is (soon) reserved based on a Planon reservation.	Determined by: • Pre-reservation time • Allowed delay reservation time
Idle	The location in use by one or more people, who have left the location temporarily.	Determined by: • Idle time reservable location • Idle time non-reservable location • Break time 1-3
Inactive	The location is set to Inactive by a Planon user; no	

| Status	Description	Related configurations
	measurements are performed.	
Immeasurable	The location is set to Immeasurable; it cannot be measured temporarily. This can have various, technical reasons, such as: a sensor is not available, the web service is not operational.	
Pause	Indicates that the measurement time is either: • outside office hours. • the measurement point is waiting to be updated by the next polling cycle. • the connector is inactive.	Measurement point: Update during office hours only.

Synchronization

Synchronization is the process of publishing the links between the measurement points (locations) and their sensor(s) to the corresponding sensoring system.

> ℹ️ Synchronization is only applicable for Planon Managed Connectors.

- Both measurement points and sensors are identified by their ID.
- You can maintain measurement points and sensors on the **Sensors** business object.
- A sensor is linked to its corresponding measurement point.
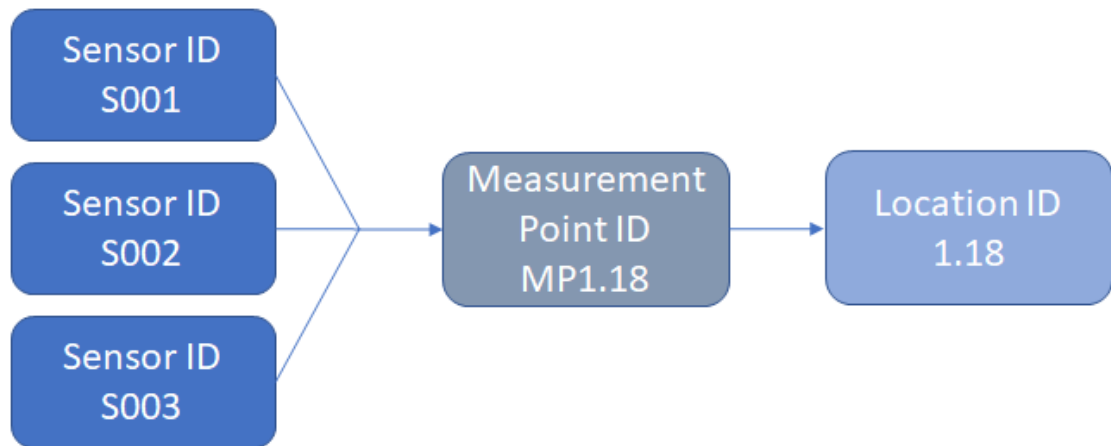
In the above configuration, the following mapping should be published to the sensoring system:

Sensor ID	Measurement point ID
S001	MP1.18
S002	MP1.18
S003	MP1.18

To enable rearranging or adding sensors, the sensor reference is date-aware. This implies that the synchronization process only takes into account the sensor records that correspond with the period of the server date of synchronization.

During synchronization, the measurement/sensor mappings of all measurements points (Planon status: **Active** and **Inactive**) are published to their corresponding sensoring system. The **Sensors** business object is date-aware. Synchronization only takes into account *Planon-managed* connectors with an **Active** status.

> ℹ️ After a successful run, the application switches off the **Activate monitoring mode?** and **Synchronize** fields automatically. However, if encountering issues, the application will continue to try and do this for some time, clogging the process. To overcome this situation, you can inactivate the connector. By inactivating the connector, the **Activate monitoring mode?** and **Synchronize** fields will be switched off and the process is reset. After activating the connector again, you can manually enable these fields.

Triggering synchronization

This section describes the process of triggering synchronization.

If the connector is defined for API Version 3 or 4, the synchronization of measurement points can be triggered via the **Synchronize** action on the **Connectors** level.

If the value of the **Synchronize** field is set to **Yes**, the measurement points that are linked to the connector are transmitted to the sensoring system to be synchronized. When the synchronization is completed, the value of the **Synchronize** field is changed to **No**.

Failures during the synchronization process will be returned as errors resulting in a list in the Connector's event log.

> ℹ️
> - The sensoring system is responsible for the correctness of registration of measurement points.
> - You can automate synchronization by using a scheduled action in Alerts on the **Sensoring system connectors** business object. The action will set the **Synchronize** field on the connector to **Yes**, so that the synchronization process is picked up at the next polling cycle.

Synchronization process

During synchronization, a list of the relations between a measurement point and its corresponding sensors is created for each connector. The sensoring system determines which of the following sensor properties are required:

- Connector code
- Measurement point code (mandatory)
- Measurement point name
- Measurement point capacity
- Measurement point type
- Sensor IDs (1-5) (mandatory)
- Sensor type
- Is secondary sensor

This list is published to the corresponding sensoring system, so that it can update its configuration table mapping the physical sensor IDs and their measurement point IDs.

⚠️ Per API Version 3 Planon supports polling by multiple Planon environments. Be careful when simultaneously linking two different Planon environments to one sensoring system, e.g. in the case of DTAP. When changing settings to the measurement points in a test environment and synchronizing these changes with the sensoring system, this will result in a production environment that is out of sync.

There are two ways to perform synchronization, manually triggering the action or by scheduling it. Typically, synchronization is required only if something has changed; usually manually triggering the action suffices.

Summarization

The process of compressing data into smaller time components: hours, days and months, decreasing the number of historical data and feeding that data into the data warehouse (summarized readings).

By continuously retrieving and storing data from the data engine, data storage and analysis may become an issue. By compressing this data, less storage is needed and analyses are easier to perform.

> • Almost all AWM analytics are based on summarized data.
> • Not all measurement fields are included in the summarization process. Some fields are (Free field 1/3 for vendor specific readings) alphanumerical and cannot be summarized. Only numerical fields can be summarized.

Configuration

Configuration

Configuration for summarization can be performed at the business object settings of the **Summarized readings** (MeasurementPointSummarizedReading) business object. To adjust these settings, go to **FieldDefiner** and the set the (base) business object to **Under construction**.

Field	Description
Number of days for storing historical readings	The number of days during which actual readings will be stored. Older actual reading records will be purged by the summarization process.
Number of days for storing hourly summarized readings	The number of days during which hour readings will be stored. Older summarized hour readings will be summarized to day readings. Corresponds with "Value X" in the Summarization example.
Number of days for storing readings summarized per day	The number of days during which summarized day readings will be stored. Older summarized day readings will be summarized to month readings. Corresponds with "Value Y" in the Summarization example.

| Field	Description
Number of months for storing readings summarized per month	The number of summarized month readings that will be stored. Older summarized month readings will be purged.
	Corresponds with "Value Z" in the Summarization example.

Summarization

Summarization - calculations

The following example explains how summarized values are calculated.

Hourly summarization

Summarization takes place from 9:00-9:59. Each minute, all readings are summarized. If there are no new readings, we assume the value is still the same.

Example
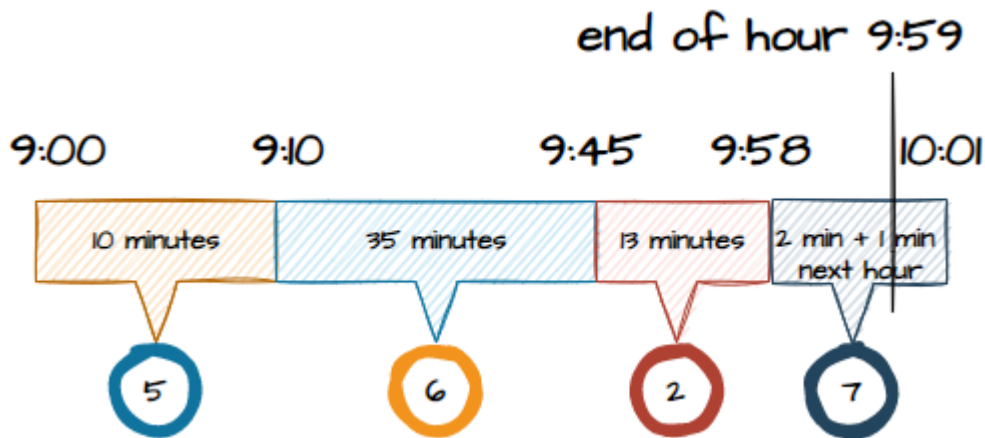
Reading time	Minutes	Count	Calculation
9:00 - 9:09	10	5	10 * 5 = 50
9:10 - 9:44	35	6	35 * 6 = 210

Reading time	Minutes	Count	Calculation
9:45 - 9:57	13	2	13 * 2 = 26
9:58 - 9:59	2	7	2 * 7 = 14
10:00 - 10:01	\<Next hourly summarization>	7	

The summarization value that is stored for 9 o'clock is:

50 + 210 + 26 + 4 = 300

Daily summarization

Daily summarization is a sum of the hourly summarized reading values.

Monthly summarization

Monthly summarization is a sum of the daily summarized reading values.

Summarization update process

A summarization process can be launched manually or can be triggered by the Planon scheduler.

Historical data can be stored as actual *readings* or as *summarized data*. Both types will be processed by the summarization process.

During the summarization process the following steps will be performed:

- Delete actual data if the number of days exceeds the **Days for storing historical readings** (DaysOfActualReadingsToStore) setting. Older data will be purged.

- Update summarized data for hour-, day- and month summarization. Summarized data is processed for measurements up to and including today -1 (yesterday).

Summarization is performed chronologically, starting today -1 day (yesterday) and going from this point backwards, as is shown in the following figure:
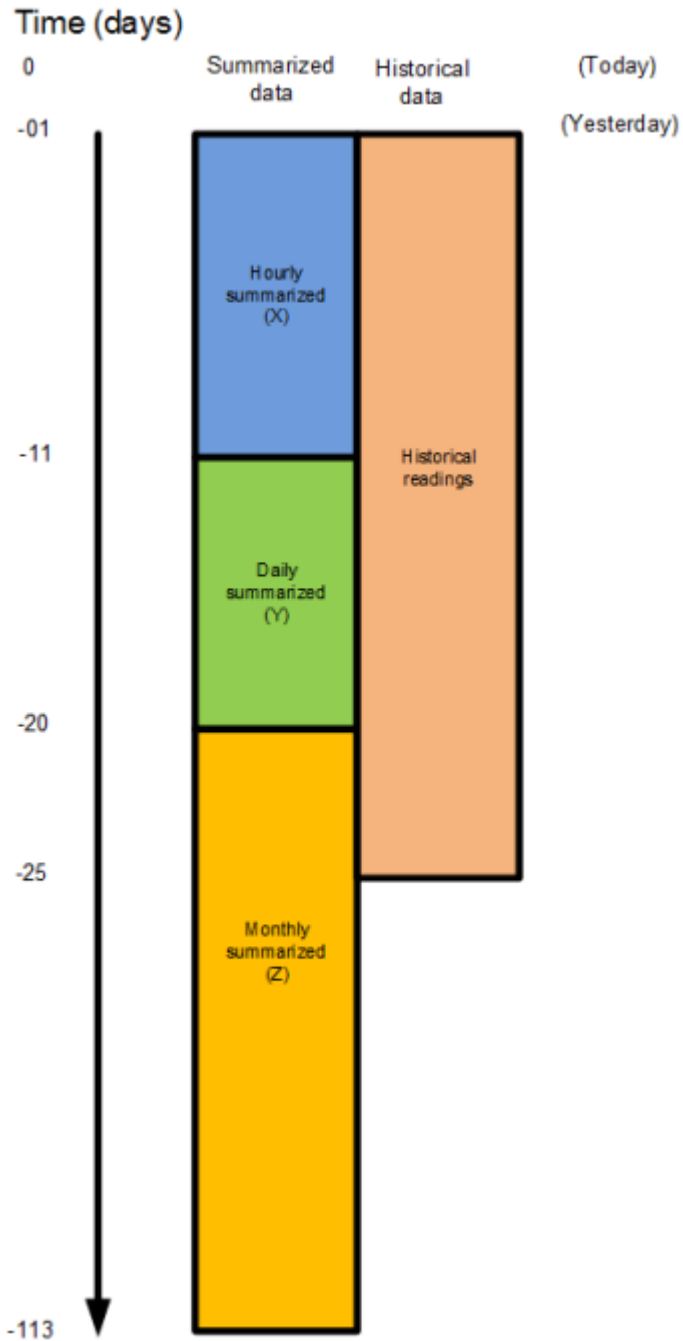
| | These data sets do not overlap. As shown in the figure above, these represent consecutive time blocks. |

| | Historical data and summarized data differ in detail. By virtue of compression, the summarized data, logically, contain fewer information compared to the historical data. The summarized data is used by AWM Dashboards and by (internal and external) business intelligence tooling. Historical data can be viewed and analyzed in Planon itself (by using reporting in Planon). |

Summarization update process

Explanation

> ⚠️ NOTE: In order not to miss any data, make sure your historical readings are kept for a number of years!

- Hourly summarized readings are kept for 10 days.
- Daily summarized readings are kept for 9 days.
- Monthly summarized readings are kept for 3 months.
- Historical readings are kept for 25 days.

> ℹ️ For historical data, records are only added if a change in the reading data occurred. All AWM dashboards are based on summarized readings:
>
> - When viewing year and month, data of all three time blocks is used.
> - Zooming in to days limits the view on the data set to the period that hour and daily summarized data was stored (in the above example: X + Y).
> - Zooming in to hours limits the view on the data set to the period that summarized data was stored for hours (in the above example: X).

Consequently, the choice of the summarized periods influences the detail and zooming options of your summarized data. At the same time, it helps you prevent an overflow of your storage capacity.

Starting summarization

There are two ways in which you can start the summarization process:

- Manually
- Via an action definition (Alerts)

Manual summarization

You can manually start the summarization process on the **Measurement points** selection level. Here, on the action panel, the **Summarize readings** action is available. The result of this action is split on the **Details** level into:

- Hourly reading
- Daily readings
- Monthly readings

Via an action definition (Alerts)

Typically, it is a good practice to schedule the summarization process on a daily basis, so that only the newly added historical readings of the former day need to be summarized. Summarized data is always available for analysis (through dashboards) until the current day -1 (yesterday).

You can use an action definition to automatically schedule summarization.

- To schedule summarization using an action definition, go to Alerts >
  Action definitions.

1. Add an action definition for the **Measurement points** business object.
2. Add a filter on **System status** = **Active**.
3. Select **Summarize readings**.
4. Set a daily schedule.

    Make sure your schedule starts after 12 PM because the processing includes data of the previous day.

5. Specify a start time (preferably outside office hours).
6. Set the action definition to **Active**.

ℹ️ Repeat these steps for all summarization actions that you want to schedule.

ℹ️ For more information on scheduling, see *Alerts*.

Summarization of reference-date aware fields

Field data is bound to change over time. For reference data aware business objects and fields, the relationship between data and date is captured.

This section examines how reference date aware data is summarized cumulatively.

Summarization diagram
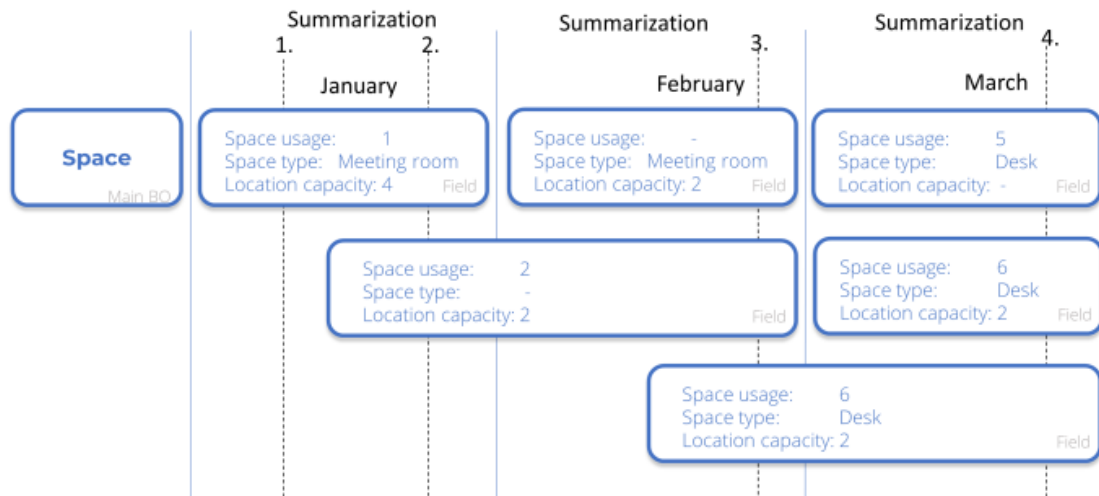
Based on this diagram, the summarization details are as follows:

Summarization	Space usage	Space type	Location capacity
At date-time of summarization (composed date-time)			
1.	1	Meeting room	4
2.	-	-	6
3.	-	-	6
4.	-	-	4

Reports and Dashboards

There are various reports and dashboards available for Agile Workplace Management.

The various reports and dashboards graphically represent the business analytics side of AWM.

AWM system reports

The system reports available on the **Measurement points** tab enable you to interpret occupancy data. You can use this information to set up a space and workspace policy for your company.

The reports take into account the selected measurement points, independent of their status, type, etc. and they are based on summarized historical readings. The data contains occupancy and reservation information of measurement points during office hours. Some report parameters are configurable per system report (see AWM report settings).

> ℹ️ To ensure a valid interpretation, make sure that your measurements are comparable. For example, your source data should not contain a mix of periods and office hours. If your data collection includes measurement points that have contributed to the data set for a longer period of time, this will affect (the validity of) the results.

AWM report settings

The following report settings are available when you click **Edit report settings**.

Field	Description
Start date	Enter the report start date. The data collection will include the summarized historical readings from this day onward.
End date	Enter the report end date. If there is data missing during this whole period, only the available data will be included.
Number of rows to show	Enter the number of rows to be displayed in the (Peak values) report.

System report - summarized data

The Measurement points > Report features a system report that provides a graphical view of the following indicators:

- **Occupancy (%)**

Agile Workplace Management Summarized Report
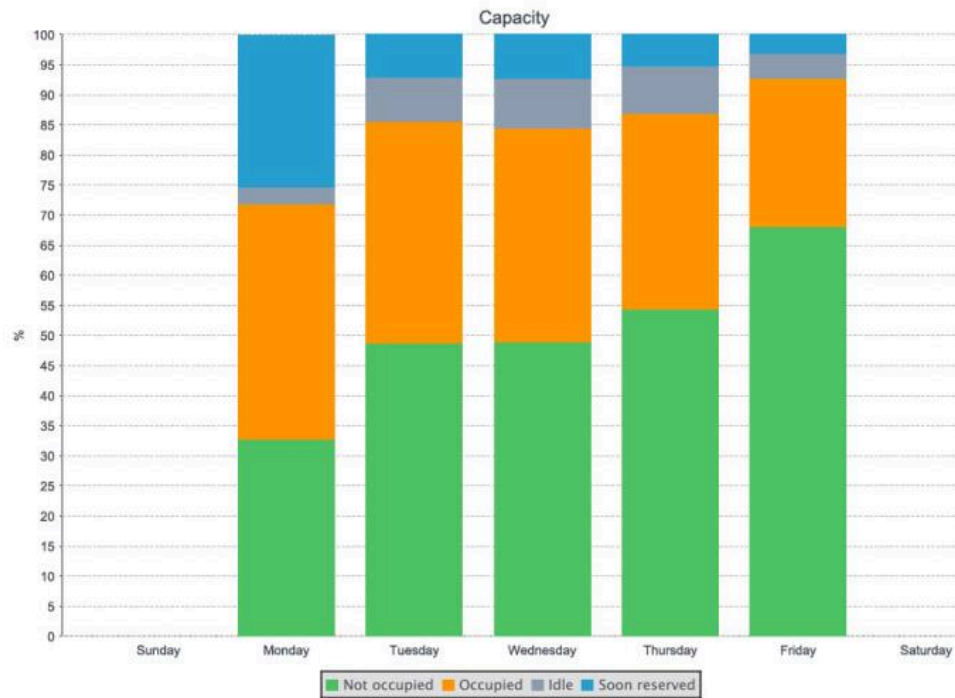
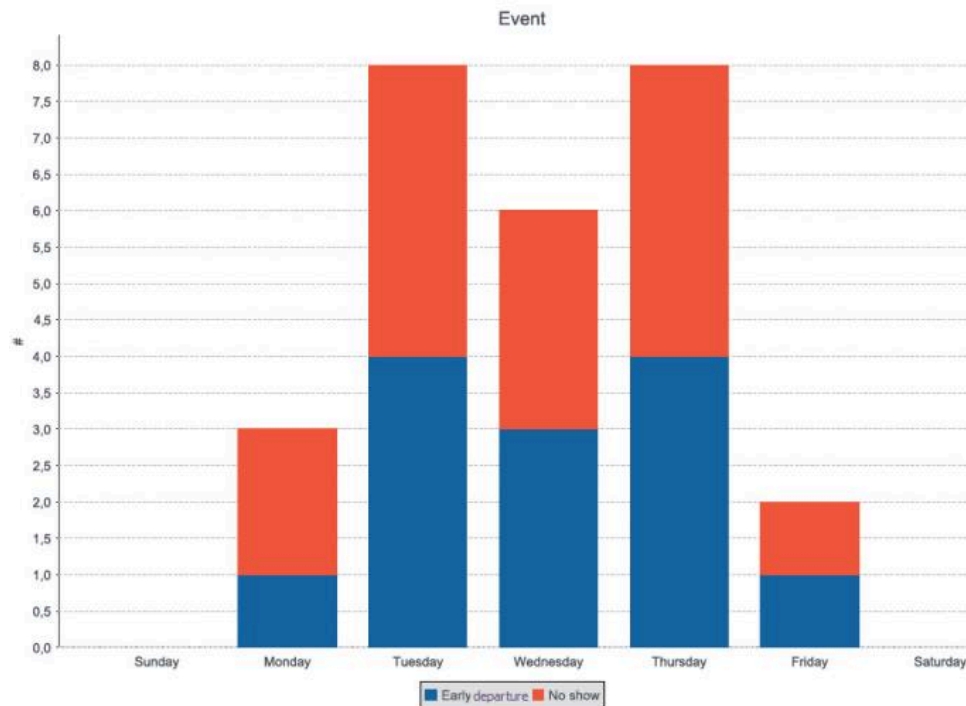| Report start date	Jul 13, 2015
Report end date	Jul 31, 2015
Selected measurement point(s)	Multiple

Occupancy matrix

The data is shown as a percentage.

- **Capacity usage (%)**

The data is shown as a percentage.

- **Events (#)**

The data is shown as the number of events.

> ℹ️ • Before running this report, make sure to run the summarization action for the selected measurement point(s). If there is no summarized data, the report will have no data to show.
> • You can run the report for a single measurement point or for a selection of measurement points.

Peak values

The Peak values report provides an overview of the highest occupancy percentages by unit of time. The results are listed in descending mode (highest on top).

The report is instrumental in gaining insight into the usage of your workspaces and reservation units. The calculation is based on the available time during office hours.

Example

Field	Description
Office hours	08:00-18:00 (10 hours / 600 minutes)
Valid readings	600 minutes
Occupied	395 minutes

Field	Description
Occupancy percentage	395 / 600 * 100 = 65,8%

Report overview

The report displays the following information:

- Highest occupancy peaks (by month/week/day/hour)

    Displays the highest peaks by time unit for the selected measurement points and period. The data is displayed in columns (see Report columns).

- Highest occupancy by measurement point (by month/week/day/hour)

    Displays the highest occupancy peak by measurement point and time unit. The data is displayed in columns (see Report columns).

Report columns

Column	Description
Percentage occupied	Percentage of occupancy during the report period.
Percentage reserved	Percentage of valid reservations during the report period.
Period	Hour/day/week/month.
Minute readings	Number of valid minute readings used for the percentage occupied/reserved calculation.
Percentage of valid readings	Average percentage of minute readings of all available minutes within the period (the reading is excluded if it is less than 80%).

Calculations

The Peak values report contains data that is calculated. This section explains these calculations.

Measurements are limited to values measured during office hours (in the following examples, the office hours are from 08:00-18:00 = 600 minutes).

Percentage valid readings

Percentage valid readings

Valid readings / Office hours in minutes	525 / 600	*100	=	87,5%

> ℹ️ A reading is valid if the measurement point is not in the **Immeasurable** status.

Percentage occupied

Percentage occupied (measurement point)

Number of minutes in status **Occupied** or **Idle** / Valid readings in minutes	350 / 600	*100	=	58,3%

Percentage reserved

Percentage reserved (measurement point)

Number of minutes with valid reservations linked to MP / Valid readings in minutes	485 / 600	*100	=	80,8%

> ℹ️ MP stands for measurement point.
>
> The occupancy and reservation calculations are based on the office hours in minutes. If the result is 50 % this means that the workspace was occupied or reserved during 50% of the office hours.
>
> To ensure valid calculations, only those results are taken into account if the readings cover at least 80% of the available period. This filter is especially meaningful for individual measurement points.

AWM Dashboards

AWM measures the following attributes:

- Occupancy

- Reservations

- Utilization

- Number of reservation events (early departure and no show)

The measurement type determines what you can measure:

- Reservable locations: you can measure all four attributes

- Reservable workspaces: you can measure all except utilization

- Non-reservable workspaces: only occupancy

- Non-reservable units: utilization and occupancy

> ℹ️ In addition to the AWM dashboards, there is also a system report available on the **Measurement point** level.

Using dashboards

1. The filter bar on top allows a wide range of filter attributes that you can use to fine-tune your view by choosing your selection criteria.

2. After completing your selection, press the charts icon on the right:

   Your chart will appear.

   By clicking in the chart area, you can further zoom to display chart details.

After zooming in, you can click **Level up** to zoom out one level.

By clicking a legend item, you can switch off/on its graphical representation in the chart area.

Utilization

Utilization is the number that indicates the occupancy of reservable spaces (meeting rooms) that can hold multiple persons. The utilization percentage can be used to indicate the effectiveness of a meeting room.

When setting AWM Dashboard settings > Show utilization charts to **Yes**, the utilization chart will be displayed. Default, the chart is not shown.

For *API 4* valid data is only provided if the occupancy was actually measured (based on the **Person count** field).

For *API 3*, utilitzation needs to be interpreted based on the **Occupancy value** field (0, 1, >1). Here, the question is whether the value 1 means *Occupancy=yes* or *Occupancy=1 person*.

Only use this utilization chart in API 3 if your sensoring system actually measures occupancy.

Utilization calculation

- The actual occupancy data is collected per minute.

- This number is divided by the number of minutes during which a location was valid (in status 3,4) multiplied by the number of persons the location can hold (capacity).

- The result is a list of data per minute, which is aggregated per hour:

Time	Occupancy
11:00	0
11:01	0
11:02	0
11:03	0
11:04	0
11:05	0
11:06	2
11:07	4
11:08	4

Time	Occupancy
11:09	5
11:10	8
11:11	8
11:12	8
Total: 13 minutes	39 cumulative occupancy

Example

The utilization is calculated as the cumulative occupancy (39) divided by the number of minutes during which the location was occupied (7) times the maximum capacity of the location (8). The outcome of this calculation is multiplied by 100 and the result is the utilization (expressed in a percentage):

Utilization

Cumulative occupancy / Minutes in status: 3, 4	39 / (7*8)	* 100	=	69,6%

ℹ️ Including only valid measurements ensures that the focus remains on actual reservations and that it is possible to compare data over time.

Occupancy

Occupancy indicates the percentage of time during which a location is used by one or more person.
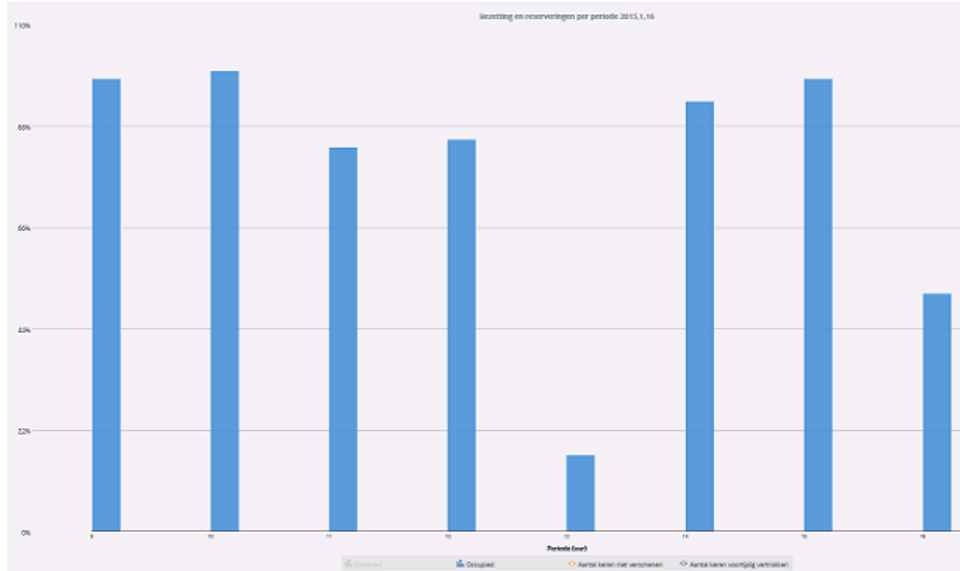
Occupancy calculation

- Occupancy is calculated by measuring the number minutes in an hour that a location was occupied (status 3, 4)

- Divided by the number of minutes a location was valid (status 1, 2, 3, 4)

    Example

Occupancy

Minutes in status 3, 4 / Minutes in status 1, 2, 3, 4	34 / 60	*100	=	56,67%

Graphically, this is depicted as follows:

The X-axis shows the time windows (labels can be configured to show the date-time windows).

The Y-axis shows the occupancy percentage.

Reservations

The reservation percentage indicates the percentage that a valid reservation is registered for a location. You can compare this result against the actual occupancy of that location.

Reservation calculation

The calculation of the reservation percentage is as follows:

- Reservations are measured by the number of minutes in an hour for which a valid reservation is linked to a location.

- This number is divided by the number of minutes available in the office calendar within the time frame.
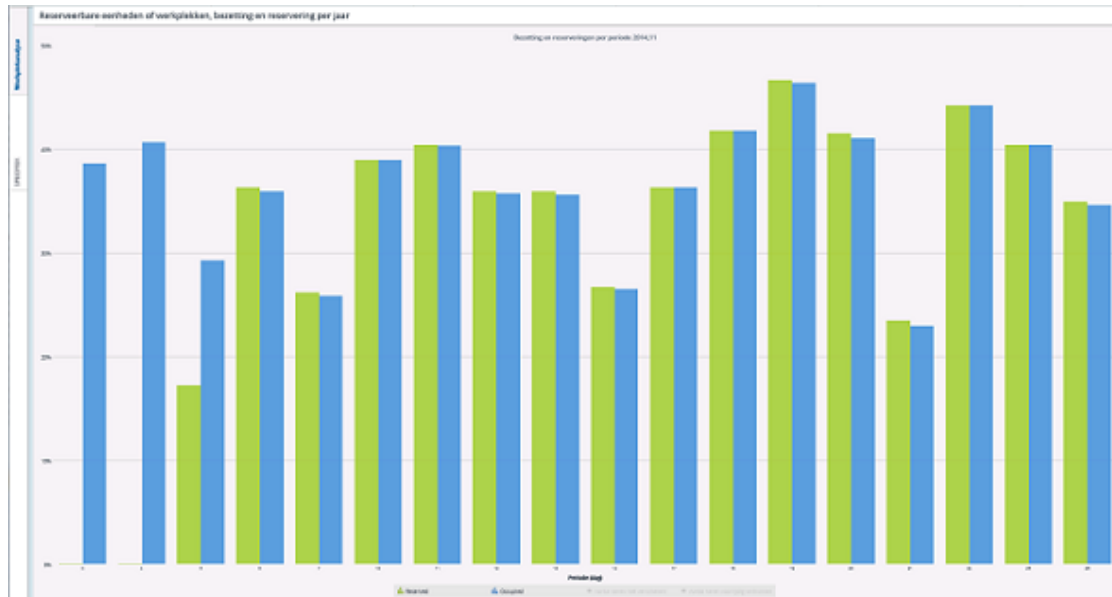
ℹ Including only valid measurements ensures that the focus remains on actual reservations and that it is possible to compare data over time.

Example

Reservations			
Minutes of valid reservations /	40 /	*	66,67%
Minutes available in time slot	60	100	

Graphically, this is depicted as follows:

The X-axis shows the time slots

The Y-axis shows the occupancy percentage

By selecting a single workspace, you can start at the top level of data aggregation: a single year.

By clicking in the chart area, you can zoom in to display details: year > month > days > hours (xx:00 – xx:59)

Here, the annual occupancy exceeds the reservations, which indicates that the location has been used without being reserved.

Reservation events

The number of No show events or Early departure events is indicated by the number of occurrences of events per time. It is a simple counter that is incremented whenever an event occurs.

On all graphs, only the time parts are shown for which we have valid measured data. Because of the possible mix of locations with different time zones, some parts are based on more locations than others.

Profiles & targets

Nowadays, measuring office space comfort levels is more than just measuring temperature. Science has shown that personal health and productivity may be impacted by various environmental values.
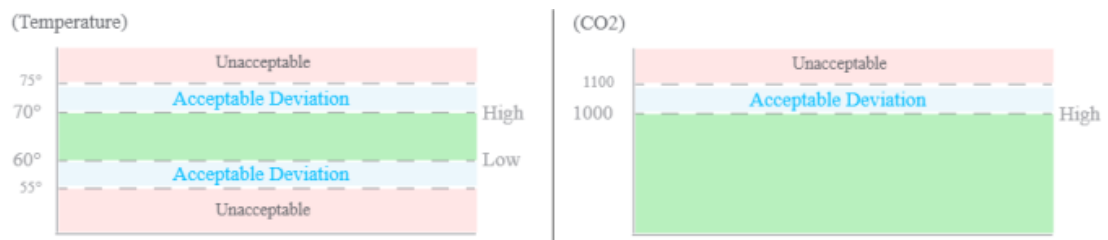
By specifying targets per property, you can define comfort levels on a large number of factors that contribute to well-being.

How it works

Depending on the factor, you can specify:

- An upper limit (high)
- A lower limit (low)
- A margin

The result, in a diagram, is visualized as follows:

This will quickly enable you to verify whether a given value falls within the acceptable parameters as specified. Any value beyond the margin automatically becomes *unacceptable*.

In addition of showing data in floor maps or dashboards, the data is also transformed into a profile score - an indication of how well a space complies with its defined limits.

> The coloring of the spaces has been adapted to the target values of the environmental dashboards.

Concepts

The following topics describe the concepts that are key to understanding the functionality.

Profile

A profile is an umbrella component for capturing a set of targets defining critical values for related measurements.

Creating a profile is the starting point for specifying target values.

You can have one default profile for all locations or specify a profile for a specific property if you want to deviate from the default. You can only have one profile as default.

> **i** By having only one profile, you can easily compare the profile score across your organization's/company's properties.

Profile score

A profile score provides an indication of how well a space complies with expectations.

It does so by approximating the percentage of time that temperature, humidity, CO2, and volatile organic compound (VOC) values stay within targeted ranges.

Profile scores enable you to monitor and compare the overall target values of spaces located throughout your facility. You also use them to evaluate changes over time.

Working with...

This section describes the various functions available.

Adding a target

Procedure

1. On Profiles, add or select the profile for which you want to specify target values.
2. Go to Target values and click Add.
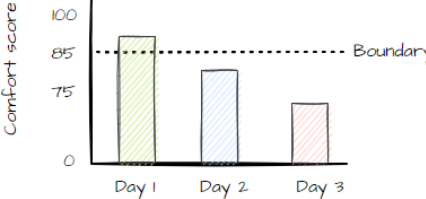3. Fill out the fields in the data panel.

You can specify targets for each measurement field. Or, in other words, add targets for each measurement field. For information about the fields, see Target values - fields

Field descriptions

The following section(s) describe(s) the fields, their purpose and meaning.

Profiles - fields

Field	Description
Code	Enter a code to identify your profile.
Name	Enter a name for your profile.

Field	Description
Is default?	Specify whether the profile you are specifying is considered the default profile. The default profile is used for locations for which no specific profile is defined on the property. ℹ There can only be one default profile.
Under capacity	Specify a percentage (a number between 0-100) that will be used to calculate what is considered underutilization of the capacity. Under capacity is a percentage of the maximum capacity, rounded down to the next available integer. **Example** 50% capacity for a 3 person location: • 2 would be OK • 1 would be too few
Comfort score boundary	Specify a value to indicate what is (not) acceptable: *the boundary*. The **Comfort score boundary** is a value between 0 and 100.

Target values - fields

The following fields are available for target values:

Field	Description
Profile	Select the profile for which you are specifying these targets.

Field	Description
Measurement point field	Select the field for which you want to specify the limits. You can select either of the following measurement point fields: • Carbon dioxide (ppm) • Humidity (%) • Light intensity (lux) • Noise (dB) • Temperature (degrees) • VOCs (ppb) • Power level (kWh) • Radon (pCi/L) • PM2.5 • PM10 • Free measurement field 1-10 ℹ For more information about these fields, see: Measurement point - fields.
Calculated measurement point	Select a calculated measurement point from the list. This allows for adjusting the coloring of the **Occupancy dashboards**. ℹ For more information, see Active occupancy and Passive occupancy.
High	Specify the maximum acceptable value.
Low	Specify the minimum acceptable value.
Margin	Specify the margin for which the high or low value may deviate.

Planon Workplace Insights

Planon Workplace Insights is a preconfigured implementation of Agile Workplace Management.

> ℹ️ While Planon Workplace Insights is predominantly preconfigured, it's important to note that for configuration options the information described in Agile Workplace Management also pertains to Planon Workplace Insights.

To jump start, it is possible to purchase and implement Planon Workplace Insigts in addition to Agile Workplace Management.

Planon Workplace Insights is a cloud-based, data analytics and visualization subscription software underpinned by IOT sensor technology that provide actionable insights in 4 key areas occupancy, utilization, flow and indoor air quality (IAQ) to enable organizations to -

- Deliver a frictionless workplace experience by understanding how employees use the space and adapt workplace design to support their patterns, habits and needs

- Enhance occupant health and well-being

- Maximize existing real estate footprint

- Reduce facilities operating costs

For a short introductory video, click Planon Workplace Insights.

Insights dashboards

This section describes some key aspects and terminology of Dashboards & Analytics.

Terminology

Module	Name	Value	Unit of measurement	Description
Occupancy	Time-based occupancy	Time occupied	%	100% means that the room is 100% of the time within office hours (conform linked company calendar) occupied.

Module	Name	Value	Unit of measurement	Description
				This value is calculated by the length of time a space was occupied by at least one person, divided by the total available time.
		Daily peak	%	The highest (hourly) time occupied measured during a day.
				ℹ️ This value is only available for a daily aggregate and therefore only visible for a week and a month view.
	Space-based occupancy	Spaces occupied	%	100% means that all spaces within your selection where occupied (at least 1 minute) during the selected time.
		Daily peak	%	The highest (hourly) spaces occupied measured during a day.
				ℹ️ This value is only available for a daily aggregate and therefore only visible for a week and a month view.
Utilization	Net utilization	Net utilization	%	100% means that during occupancy the entire capacity

Module	Name	Value	Unit of measurement	Description
				of the room is used. Occupant count vs net capacity.
				Calculation gives you an impression on how well your spaces are utilized during the time they are used. It tells you if the capacity of the rooms suits the need of your building users.
		Daily peak	%	The highest (hourly) net capacity utilized measured during a day.
				This value is only available for a daily aggregate and therefore only visible for a week and a month view.
	Occupant count	Net occupant count	Number	The (hourly) average number of people present in the room during occupancy
		Daily peak	Number	The highest (hourly) average number of people present in the room during occupancy.

Module	Name	Value	Unit of measurement	Description
				(i) This value is only available for a daily aggregate and therefore only visible for a week and a month view.
Flow	Inflow	Occupant count	Number	Total number of people entering a location
	Outflow	Occupant count	Number	Total number of people leaving a location
	Occupant count	Net occupant count	Number	The (hourly) average number of occupants present in the room during occupancy
		Daily peak (maximum)	Number	The **single highest number** of occupants that were measured during a certain time period.
Environment	Comfort score	Score	0 - 100	Comfort score provides an indication of how well a space complies with comfort expectations. It does so by approximating the scores per hour that the temperature, humidity, CO# and/or VOC values stay within target ranges, within margin and/

Module	Name	Value	Unit of measurement	Description
				or outside the target ranges.
	Temperature	Degrees	°	This can be either Fahrenheit or Celsius
	CO_2	CO_2	ppm	
	Humidity	Relative humidity	%	
	Light		Lx	
	Sound		DbA	
	VOCs		ppb	
	Radon			
	PM2.5	Decimal number	Micrograms per cubic meter (**µg/m^3**)	Very small particles usually found in smoke. They have a diameter of 2.5 micrometers (0.0025 mm) or smaller.
	PM10	Decimal number	Micrograms per cubic meter (**µg/m^3**)	Very small particles found in dust and smoke. They have a diameter of 10 micrometers (0.01 mm) or smaller.

Profiles & targets

Nowadays, measuring office space comfort levels is more than just measuring temperature. Science has shown that personal health and productivity may be impacted by various environmental values.
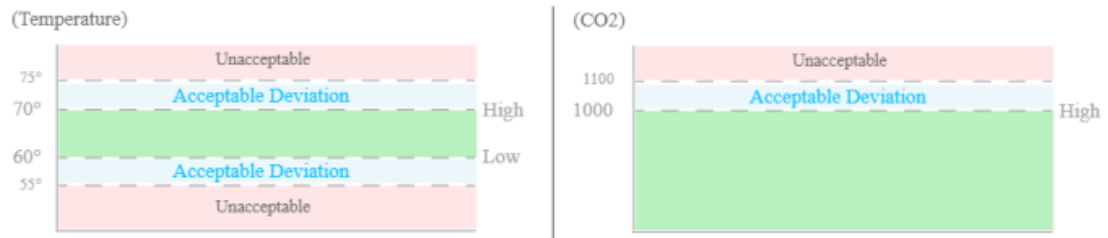
By specifying targets per property, you can define comfort levels on a large number of factors that contribute to well-being.

How it works

Depending on the factor, you can specify:

- An upper limit (high)

- A lower limit (low)

- A margin

The result, in a diagram, is visualized as follows:

This will quickly enable you to verify whether a given value falls within the acceptable parameters as specified. Any value beyond the margin automatically becomes *unacceptable*.

In addition of showing data in floor maps or dashboards, the data is also transformed into a profile score - an indication of how well a space complies with its defined limits.

> **i** The coloring of the spaces has been adapted to the target values of the environmental dashboards.

Occupancy

Occupancy is used to indicate whether a location is actually in use (physically).

A location's occupancy is detected by using sensors.
In Planon Software Suite, a location's occupancy (to which an active measurement point is linked) is represented by an Occupancy status and a Reading value (displaying the number of people, in API 3).

Occupancy statuses

The data engine continuously updates occupancy statuses into Planon Software Suite. For calculating an occupancy status, the readings of the sensoring system and the previous occupancy status are taken into account.

The following occupancy statuses are updated by the data engine:

- Occupied

- Non-occupied

- Reservation imminent

- Idle

- Inactive
- Immeasurable
- Pause

Utilization

Net utilization

This set of graphs shows the net utilization (occupant count versus room capacity) during occupancy for a selected set of workplace locations in a time series.

Calculation examples

Example for room 'SIM01'

Office calendar from 9:00 – 18:00, that makes 540 minutes of 'workplace service'.

SIM01 has a capacity for 8 occupants.

On Wednesday 01-12-2021 the following occupant count cumulative values were measured for SIM01:

Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period
9:00 – 9:59	0	0	0 mins	0%
10:00 – 10:59	40	80	10 mins	40/80*100.0 = 50.0%
11:00 – 11:59	205	480	60 mins	205/480*100.0 = 42.7%
12:00 – 12:59	120	200	25 mins	120/200*100.0 = 60.0%
13:00 – 13:59	300	440	55 mins	300/440*100.0 = 68.2%
14:00 – 14:59	60	240	30 mins	60/240*100.0 = 25.0%

Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period
15:00 – 15:59	200	400	50 mins	200/400*100.0 = 50.0%
16:00 – 16:59	60	480	60 mins	60/480*100.0 = 12.5%
17:00 – 17:59	5	40	5 mins	5/40*100.0 = 12.5%
Day total:	990	2360	295 mins	990/2360*100.0 = 41.9%

Average net utilization for SIM01 for this day: 41.9%

Average peak value for SIM01 for this day is 68.2.% (13:00 - 13:59)

On Wednesday 01-12-2021 the following max occupant count values were measured for SIM01:

Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period based on max number of occupants
9:00 – 9:59	0	0	0 mins	n.a.
10:00 – 10:59	60	80	10 mins	60/80*100.0 = 75.0%
11:00 – 11:59	420	480	60 mins	420/480*100.0 = 87.5%
12:00 – 12:59	125	200	25 mins	125/200*100.0 = 62.5%
13:00 – 13:59	440	440	55 mins	440/440*100.0 = 100.0%
14:00 – 14:59	60	240	30 mins	60/240*100.0 = 25.0%
15:00 – 15:59	200	400	50 mins	200/400*100.0 = 50.0%
16:00 – 16:59	60	480	60 mins	60/480*100.0 = 12.5%

Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period based on max number of occupants
17:00 – 17:59	5	40	5 mins	5/40*100.0 = 12.5%

Absolute peak value for SIM01 for this day is 100% (13:00 - 13:59)

Example for room 'SIM01' and 'SIM02' combined

SIM01

Office calendar from 9:00 – 18:00, that makes 540 minutes of 'workplace service'.

SIM01 has a capacity for 8 occupants.

SIM02

Office calendar from 8:00 – 19:00, that makes 660 minutes of 'workplace service'.

SIM02 has a capacity for 4 occupants.

On Wednesday 01-12-2021 the following occupant count cumulative values were measured for SIM01 and SIM02:

Room	Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period
SIM01	9:00 – 9:59	0	0	0 mins	0%
	10:00 – 10:59	40	80	10 mins	40/80*100.0 = 50.0%
	11:00 – 11:59	205	480	60 mins	205/480*100.0 = 42.7%
	12:00 – 12:59	120	200	25 mins	120/200*100.0 = 60.0%
	13:00 – 13:59	300	440	55 mins	300/440*100.0 = 68.2%
	14:00 – 14:59	60	240	30 mins	60/240*100.0 = 25.0%

Room	Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period
	15:00 – 15:59	200	400	50 mins	200/400*100.0 = 50.0%
	16:00 – 16:59	60	480	60 mins	60/480*100.0 = 12.5%
	17:00 – 17:59	5	40	5 mins	5/40*100.0 = 12.5%
	Day total:	990	2360	295 mins	
SIM02	8:00 – 8:59	40	40	10 mins	40/80*100.0 = 50.0%
	9:00 – 9:59	0	0	0 mins	0%
	10:00 – 10:59	240	240	60 mins	240/240*100.0 = 50.0%
	11:00 – 11:59	50	200	50 mins	50/200*100.0 = 25.0%
	12:00 – 12:59	5	20	5 mins	5/20*100.0 = 25.0%
	13:00 – 13:59	50	60	15 mins	50/60*100.0 = 83.3%
	14:00 – 14:59	60	120	30 mins	60/120*100.0 = 50.0%
	15:00 – 15:59	200	240	60 mins	200/240*100.0 = 83.3%

Room	Office hours	Cum. Occupant count	Cum. Capacity	Mins occupied	Net utilization per period
	16:00 – 16:59	40	40	10 mins	40/40*100.0 = 100.0%
	17:00 – 17:59	40	40	10 mins	40/80*100.0 = 100.0%
	18:00 – 18:59	0	0	0 mins	0%
	Day total SIM02	725	1000	250 mins	
	Combined total	1715	3360	545 mins	1715/3360*100.0 = 51.0%

Average net utilization for SIM01 and SIM02 combined for this day: 51.0%

People flow

People flow monitors and records the inflow and outflow of people of a given space.

Typically, this feature is not used to count the actual number of people in order to measure capacity use, but rather it is used to measure utilization. In the office world, it is used, for example, to measure and possibly predict the waiting queue at the company restaurant. Or, it can also be used to measure the inflow and outflow of people of a building or of an event. It can help building managers to:

- Assess the size of meetings rooms to match usage

- Display wait times for amenities

- Optimize cleaning based on usage levels

- Detect when fire-loading limits are crossed

- Optimize layout based on people flow

> ℹ️ People flow is measured by a specify type of sensor. The readings of these sensors provide real-time data. This sensor type is reset at the end of the day and starts measuring anew at the beginning of each new day (specified at the connector or at the sensoring system).

> Please note that utilization and people flow is NOT highly accurate regarding capturing occupancy.

How people flow works

Environment (Indoor air quality)

Indoor air quality

This module contains a set of graphs showing environmental values for a selected set of workplace locations in a time series.

More than just your household measurements, the data behind these graphs intricately measure and express wellbeing.

Calculation examples

Example for room 'SIM01'

Office calendar from 9:00 – 18:00, that makes 540 minutes of 'workplace service'.

On Wednesday 01-12-2021 the following temperature cumulative values were measured for SIM01:

Office hours	Cum. temperature	Reading mins	AVG temp per period
9:00 – 9:59	1320	60 mins	1320 / 60 = 22.0 °C
10:00 – 10:59	1330	60 mins	1330 / 60 = 22.2 °C
11:00 – 11:59	1329	60 mins	1329 / 60 = 22.2 °C
12:00 – 12:59	1345	60 mins	1345 / 60 = 22.4 °C
13:00 – 13:59	1342	60 mins	1342 / 60 = 22.4 °C
14:00 – 14:59	1367	60 mins	1367 / 60 = 22.8 °C

Office hours	Cum. temperature	Reading mins	AVG temp per period
15:00 – 15:59	1370	60 mins	1370 / 60 = 22.8 °C
16:00 – 16:59	1365	60 mins	1365 / 60 = 22.8 °C
17:00 – 17:59	1368	60 mins	1368 / 60 = 22.8 °C
Day total:	12136	540 mins	12136 / 540 = 22.5 °C

Average measured temperature for SIM01 for this day: 22.5 °C

Example for room 'SIM01' and 'SIM02' combined

SIM01:

Office calendar from 9:00 – 18:00, that makes 540 minutes of 'workplace service'.

SIM02:

Office calendar from 8:00 – 19:00, that makes 660 minutes of 'workplace service'.

On Wednesday 01-12-2021 the following temperature cumulative values were measured for SIM01 and SIM02:

Room	Office hours	Cum. temperature	Reading mins	AVG temp per period
SIM01	9:00 – 9:59	1320	60 mins	1320 / 60 = 22.0 °C
	10:00 – 10:59	1330	60 mins	1330 / 60 = 22.2 °C
	11:00 – 11:59	1329	60 mins	1329 / 60 = 22.2 °C
	12:00 – 12:59	1345	60 mins	1345 / 60 = 22.4 °C

Room	Office hours	Cum. temperature	Reading mins	AVG temp per period
	13:00 – 13:59	1342	60 mins	1342 / 60 = 22.4 °C
	14:00 – 14:59	1367	60 mins	1367 / 60 = 22.8 °C
	15:00 – 15:59	1370	60 mins	1370 / 60 = 22.8 °C
	16:00 – 16:59	1365	60 mins	1365 / 60 = 22.8 °C
	17:00 – 17:59	1368	60 mins	1368 / 60 = 22.8 °C
	Day total SIM01:	12136	540 mins	
SIM02	8:00 – 8:59	1150	60 mins	1150 / 60 = 19.2 °C
	9:00 – 9:59	1125	60 mins	1125 / 60 = 18.8 °C
	10:00 – 10:59	1195	60 mins	1195 / 60 = 19.9 °C
	11:00 – 11:59	1210	60 mins	1210 / 60 = 20.2 °C
	12:00 – 12:59	1220	60 mins	1220 / 60 = 20.3 °C

Room	Office hours	Cum. temperature	Reading mins	AVG temp per period
	13:00 – 13:59	1225	60 mins	1225 / 60 = 20.4 °C
	14:00 – 14:59	1250	60 mins	1250 / 60 = 20.8 °C
	15:00 – 15:59	1280	60 mins	1280 / 60 = 21.3 °C
	16:00 – 16:59	1275	60 mins	1275 / 60 = 21.3 °C
	17:00 – 17:59	1235	60 mins	1235 / 60 = 20.6 °C
	18:00 – 18:59	1190	60 mins	1190 / 60 = 19.8 °C
	Day total SIM02	13335	660 mins	
	Combined total	25491	1200	25491 / 1200 = 21.2 °C

Average measured temperature for SIM01 and SIM02 combined for this day: 21.2 °C

Deep dives

Each Planon Workplace Insights module has a corresponding Deep dive section.

These are charts that have been specifically designed to enable workplace strategists to

- Analyze a broader trailing 12-month data set to make strategic decisions about their RE & workplace portfolio.

- Aggregate or combine data for multiple properties to get a bird's eye view of the selected portfolio.
- Benchmark properties to analyze time-based occupancy and net utilization metrics.

> **i** To populate these charts, please note that you require a valid filter.

Occupancy

The following screen capture is an example of the **Occupancy** deep dive, displaying the occupancy and daily peak values in one chart.
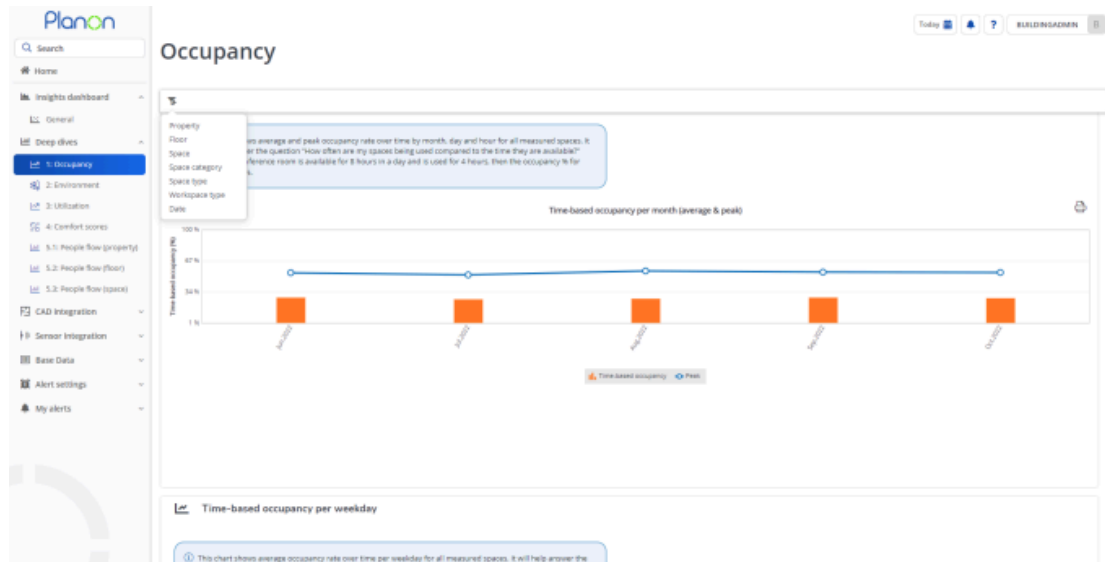
> **i** Note that you can further zoom into details by using the filtering options available.

Working with Dashboards & Analytics

This section describes instructions for working with Planon Workplace Insights dashboard.
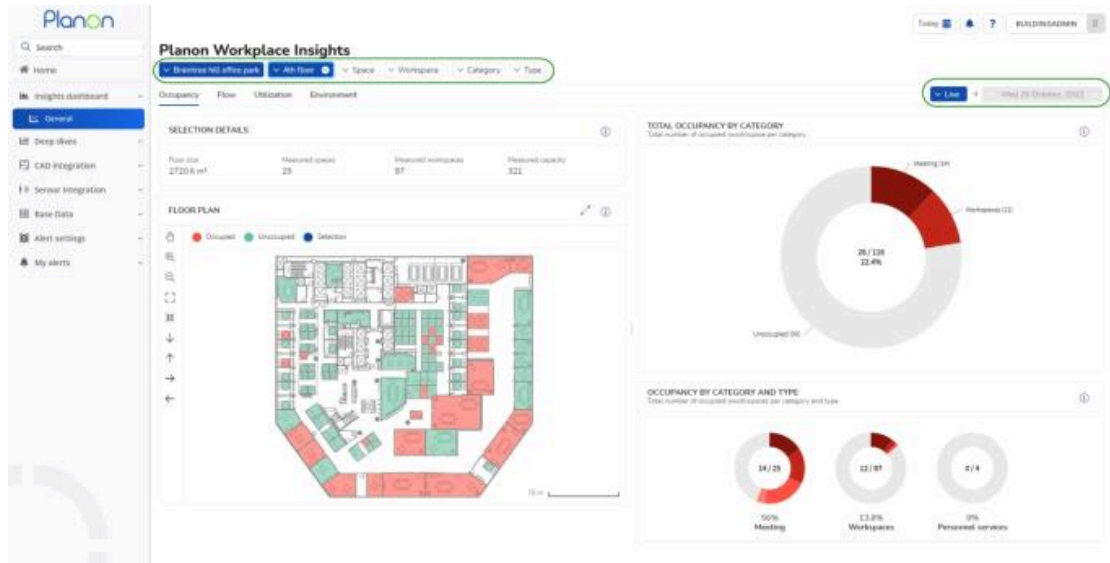
Filter options
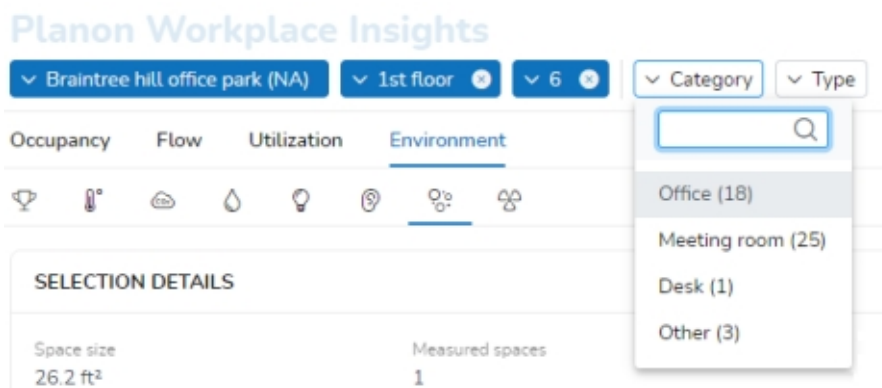
Use filters to analyze aggregated datasets quickly. Standard filter options include:

- Property
- Floor
- Space
- Workspace
- Space category
- Space type
- Workspace type

Prerequisites to ensure dashboard is properly populated with summarized sensor reading -

1. The dashboard supports a single select filter for *category* and *type*.

a. A category is either a *space category* or a *dummy category* for grouping workspaces.

b. A type is a *space type* or a *workspace type*.

    2. The dashboard expects a link between the space category and space type. Workspace types will automatically be grouped under the dummy category *Workspaces*.

    3. If a space is not linked to a category or type it will not be included in the dashboard.

      In the [Flow module](), the space category and space type selection is disabled (Flow always displays only 1 measurement point).

Data selection

Dashboard supports flexible aggregation by time to track trends like week-over-week, day of the week, or by hour of the day, allowing quick analysis at your fingertips. Customers are no longer required to download the data and do complex data analysis using spreadsheets.
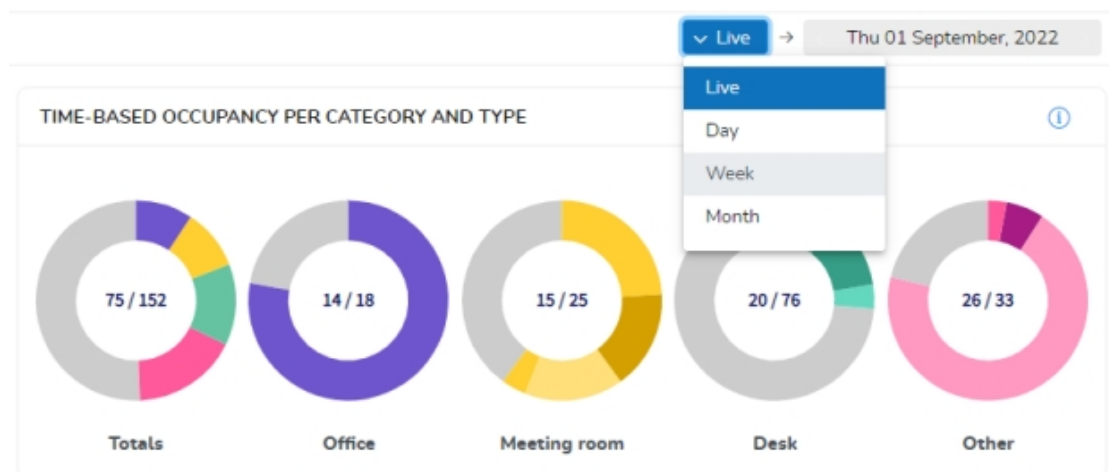
1. **Live**, provides near real-time view of your portfolio based on data captured from your sensor system.

2. **Day**, provides insights of measured values of a specific day (in history) usually displayed in an aggregate of hourly values.

3. **Week**, provides insights of measured values of a specific week (in history) usually displayed in an aggregate of daily values.

4. **Month**, provides insights of measured values of a specific month (in history) usually displayed in an aggregate of daily values.

Troubleshooting - Software

This section describes possible errors and how to mitigate them.

Data engine stopped working

The data engine represents all the communication with the sensoring system and processing the data received.

Description

The data engine **Last response date-time** field should be updated every 10 minutes (date-time value is in UTC timezone). If the field is empty or not updated in time, the AWM data engine is malfunctioning.

Cause

This is a very rare situation, probably the system has run out of memory because of a very large load of data to process. Maybe the Planon 'WildFly' log (home page) can give more information about the exact cause of stopping.

Solution

First check if the user AWMDATAENGINEADMIN is available and has 'full functionality' function profile.

If this looks good, go to Home > Environment management gadget > Danger zone and restart the Planon instance.

Make sure that no users are still active in the Planon application.

A restart can take 10–20 minutes, during this time, the Planon application is not available.

Sensoring system connector is in status 'Immeasurable'

The Sensoring system connector describes the direct communication with the external sensoring system.

Description

If the Sensoring system connector is malfunctioning, the data engine will set its status to 'Immeasurable'.

The monitoring mode of the connector is automatically switched on if the connector is in the *Immeasurable* status. Information about the issue is displayed in Configuration & logging > Event logs. You can also enable monitoring manually.

Cause

If the sensoring system connector is put on 'Immeasurable' by the Planon system, it means that communication with the related sensoring system is no longer possible.

First check the error message in the Connector's event log (at **Configurations & logging**), maybe it already points to the reason of the malfunctioning.

Possibly, the Planon web server 'Tomcat' log (home page) can provide more information about the exact cause of the Connector being *Immeasurable*.

Solution

1. **Check Data Engine (Planon processing system)**

   Where: AWM/Sensor management - Data engine

   ◦ Make sure that data engine is running

   ◦ Check the **Last response date-time** field. The value should be updated with the current UTC time every 10 minutes.

   ◦ If this is not the case, please contact Planon Support.

2. **Check related connector app**

   Where: AppCenter

   ◦ Check if related connector app status is **Active**.

   ◦ Check if connector app settings are configured properly (see specific app documentation for more information).

> ⓘ Beware, app settings can be also added to the connector directly on the **Settings** tab (see Connector fields)

◦ Check if The connector app license is valid and not expired - If not: update the connector app settings if possible, or contact Planon Support.

Measurement point is in status 'Immeasurable'

The measurement point describes the Planon location for which (sensor) measurements can be received.

Description

If a measurement point is malfunctioning, the data engine will set its (occupancy) status to *Immeasurable*.

The measurement point's monitoring mode is automatically switched on if the measurement point is in the *Immeasurable* status. Information about the issue is displayed in the (Measurement points > Error monitoring tab) **System feedback** field. You can also enable monitoring manually.

Cause

If the Planon application sets a measurement point to (occupancy) status *Immeasurable*, it means that no measurement information can be received for that specific measurement point.

Most common reasons are:

- Related Connector is in status *Immeasurable*.

- Sensoring system does not recognize the measurement ID (error code -1).

- Sensoring system has received no data for the specific measurement point (error code -2) in a time-out period.

At the Error monitoring > System feedback more information is given about the error.

Solution

1. **Check Connector**

    Where: AWM/Sensor management – Connectors

   ◦ Check if the related connector is not in status *Immeasurable*.

   ◦ Investigate and resolve the issue with connector.

2. **Check measurement point**

Where: AWM/Sensor management – Measurement points

- ◦ Check if the measurement point is available in the partner sensoring system (error code -1)

  Missing measurement point must be onboarded or *Inactivated*.

- ◦ Check if the measurement point receives measured data (error code -2, -9, -10, -98).

  Mostly identified by a time-out check of the measurement point.
  Resolve issue at the sensoring system, the related sensors or other hardware have issues.

> ℹ️ In some situations, a measurement point will be kept in the *Pause* status with reason 'Waiting for an upcoming update' for a long period. In that case, also no data is received for that specific measurement point. Therefore, it is recommended to configure a timeout check at the connector in order to receive feedback.

Troubleshooting - Hardware

This section lists a number of resources for solving hardware related issues.

The resources are listed by hardware vendor:

- Density.io
- Airthings
- VergeSense
- Relogix

Density.io

If you encounter malfunctions with sensor hardware from our partner **Density.io**, please use these resources to troubleshoot first:

Resources

- Entry Sensors
  - Offline Entry Sensor
- Open Area Sensors
  - Offline Open Area Sensor

If these resources still do not resolve your issues, please contact Density.io via:

Contact

- Support Email:support@density.io
- Support Hours: Monday to Friday, 9 a.m.-8 p.m. ET

Airthings

If you encounter malfunctions with sensor hardware from our partner **Airthings**, please use these resources to troubleshoot first:

Resources

- Airthings Business Support page – troubleshoot section
- Airthings Youtube Channel
- Airthings Set Up Manual

If these resources still do not resolve your issues, please contact Airthings Support via:

Contact

- Support Email:business-support@airthings.com
- General availability within office hours: 9AM-10PM (CET)
- Availability exceptions can be made during severe or critical support cases
- Initial response time within 24h

VergeSense

If you encounter malfunctions with sensor hardware from our partner **VergeSense**, please submit a ticket for VergeSense Support via:

Contact

- VergeSense Support Portal
- Support Email:Support@VergeSense.com

Relogix

If you encounter malfunctions with sensor hardware from our partner **Relogix**, please submit a ticket for Relogix Support via:

Contact

- Support Email:support@relogix.com

Index