Optimize Your Asset Management Strategy Within Plantweb Optics v1.6

Executive Summary

The Plantweb Optics asset performance platform helps customers adopt essential competencies required for digital transformation including automating workflow processes, supporting decisions with analytics, and connecting people to information with mobile tools. By enabling these competencies, your facility can access the data that matters, drive meaningful decisions, and empower your workforce.

Providing contextualized information to the appropriate users when and where they need it enables collaboration between plant personnel and allows for faster, better decisions.

To maximize the value of automatic health scores, actionable insights, and meaningful information to plant personnel, Plantweb Optics should be configured to fit your organization's workflow. This configuration focuses on three areas: data source optimization, defining the asset hierarchy, and user message optimization. The following sections will detail the opportunities for each area.

Table of Contents

Definitions

■ Asset Class – a type of equipment (examples: pumps, gearbox, compressor, motor, device)

■ Data Source – an application that handles asset data (AMS Device Manager, Plantweb Insight)

■ Asset Source Interface – the service that connects a data source to Plantweb Optics

■ Asset Hierarchy – the defined logical structure of assets for an organization or site

Steps to Optimizing Asset Management Strategy

There are three primary steps in optimizing your asset management strategy within Plantweb Optics: optimizing data sources, developing an asset hierarchy, and aligning users to the developed asset hierarchy. The below figure details the high-level flow of this process. This document will detail the considerations for each step by following the flow diagram below.
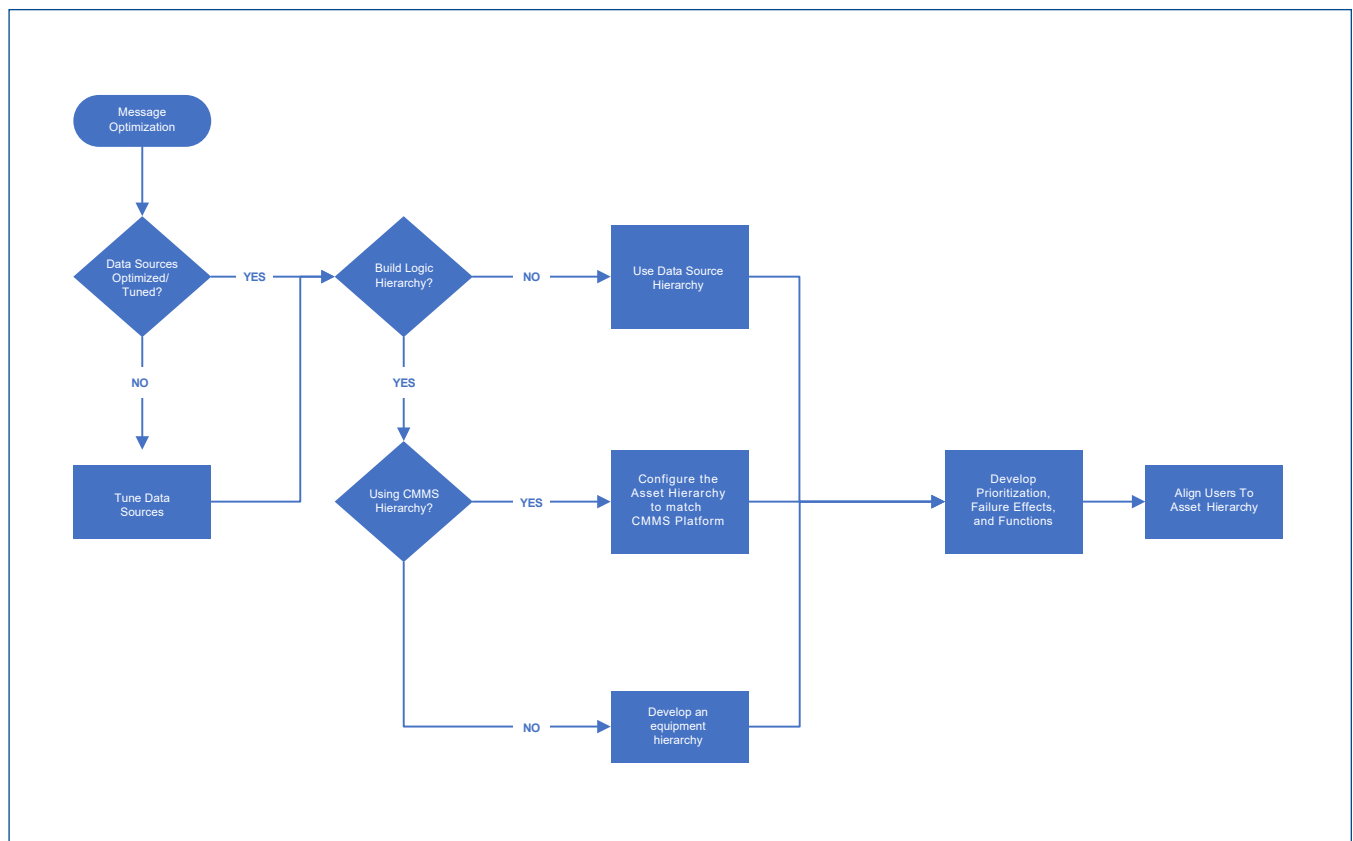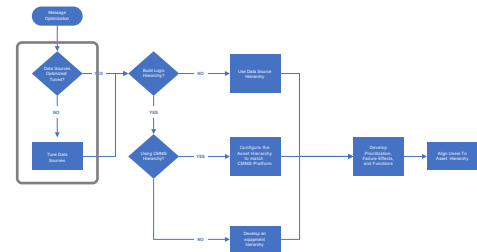

Message Optimization Decision Flow.

Optimization of Data Sources

Overview

Asset source interfaces (ASIs) provide the asset status, parameter values, recommended actions, and notifications to Plantweb Optics from the underlying data sources. Each of these data sources can bring insights to better manage all asset classes in your facility.

> While it is recommended to optimize data sources as a first step, this is not mandatory to realize significant value from Plantweb Optics. To understand more about how to optimize each data source, contact your Emerson solutions architect or sales partner.

AMS Device Manager ASI

Connects existing AMS Device Manager installations to Plantweb Optics and allows you to monitor device health from anywhere. AMS Device Manager helps avoid unnecessary downtime with a window into the health of intelligent field devices.

AMS Machinery Manager ASI

Connects existing Machinery Manager installations to Plantweb Optics for discovery, monitoring, and reporting of rotating equipment assets. AMS Machinery Manager integrates multiple predictive maintenance techniques with comprehensive analysis tools to provide easy and accurate assessment of the machinery health across different types of mechanical assets in your facility.

Machine Works ASI

Provides predictive analytics for data acquired through the Emerson Wireless Gateway and AMS Device Manager using AMS 9420 Wireless Vibration Transmitter and the AMS 6500 ATG. AMS Machine Works combines predictive maintenance techniques with comprehensive analysis tools to provide easy and accurate assessment of the machinery health in your facility.

Plantweb Insight ASI

Brings analytics based on decades of process and industry experience into Plantweb Optics. Plantweb Optics users now have timely, actionable information about key assets such as Pumps, Heat Exchangers, Steam Traps, and Air-Cooled Heat Exchangers.

Emerson Wireless Gateway ASI

Connects 1410/1420 gateways and Cisco 1552 WU to Plantweb Optics for discovering and reporting on the health of all devices connected to the gateway.

DeltaV Control Loop ASI

Connect multiple DeltaV Systems to a single Plantweb Optics installation to improve operational performance by easily identifying underperforming DeltaV control loops. DeltaV™ InSight improves process control by monitoring and reporting control performance, identifying and diagnosing problem loops, and recommending tuning and maintenance improvements.

KNet ASI

Drives corrective action based on information from analytical models. Provides understanding of the root cause of process deviations.

UE Systems ASI

Delivers ultrasound monitoring data for bearing inspection, leak detection, and electrical inspection from Ultratrend Data Management System (DMS) to Plantweb Optics.
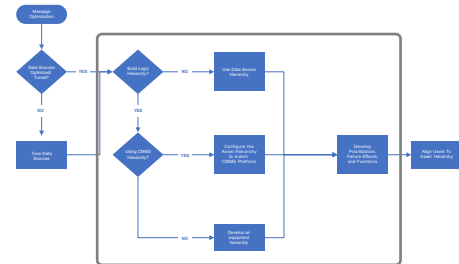
AMS Asset Monitor ASI

Provide sitewide visibility of health status of all AMS Asset Monitor units and unlock predictive analytics results, allowing relevant personnel to collaboratively work on preventing unexpected failures / downtime.
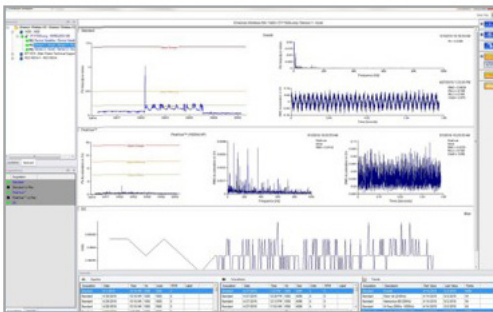
Asset Hierarchy

After optimizing the data source(s), the hierarchy of assets must be structured in a way that best serves Plantweb Optics users. The purpose of the Plantweb Optics hierarchy is to create a holistic view of your assets that logically represents how the physical assets exist in your facility. Representing the logical assets this way provides a single pane of glass to fully understand the condition of your assets.

Many different approaches can work to effectively provide this holistic visibility. To be successful, you need an approach that fits your organizational strategy and can continue to scale as you grow to manage more asset classes. Plantweb Optics is a scalable solution where you can continue to add data sources to enable the effective management of your assets. Assets can be grouped together by plant location, allowing the clustering of assets in similar areas (plant, department, process, equipment, etc.). Different assets can also be combined to provide an aggregated score. Depending on your needs, the desired structure can vary. There are three best-practice methods to develop the asset hierarchy that will support faster analysis and decision making in your facility. This paper will discuss the benefits and drawbacks of each. These methods are conceptual, and the hierarchy in Plantweb Optics can be customized as needed.
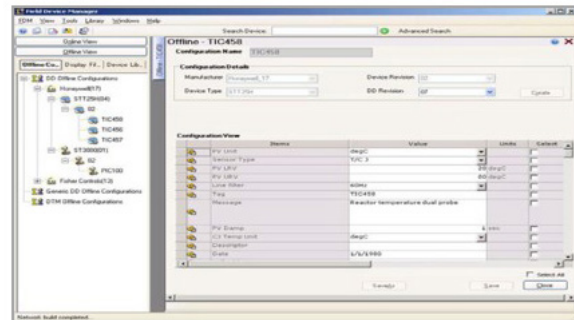
Current Asset Representation

Many Systems, Many Personas, Limited Visibility

Rotating Machinery

Instruments and Valves


Performance Analytics

Fixed-Asset Monitoring

1. Equipment hierarchy

Plantweb Optics can collect assets together based on location
and combine assets into logical equipment groups.
Developing an equipment hierarchy is appropriate when you:

- have multiple data sources

- want to organize assets by functional locations

- have multiple data sources providing insight to the same piece
  of equipment (for example: pressure transmitters on a pump into AMS Device Manager and vibration probes into
  AMS Machinery Manager)

- want to aggregate asset health scores into an overall score (like a plant score, department score, or other logical score)

- have a large number of assets
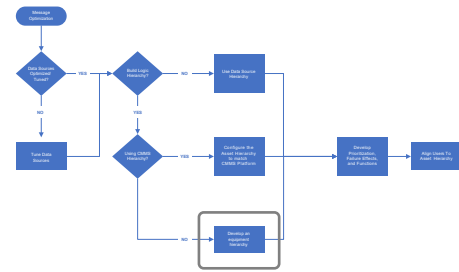
This option provides the most flexibility, as there are no bounds in which to create the hierarchy. This flexibility is useful,
as the hierarchy can be molded to your needs.

**To better understand how to develop an equipment hierarchy for your facility, an Emerson solutions architect can
work with you to design the hierarchy according to Emerson best practice methods.**

A best-practice structure should identify each level of the hierarchy. Rules for where equipment can be installed in the
hierarchy, along with naming and numbering conventions, should be applied consistently across the enterprise.
Such a structure enables end users to locate the appropriate location/equipment when alerted and quickly diagnose how
this asset may impact operations. This will also allow users to search and filter by asset class, which can save significant time
accessing the information you need to effectively manage your assets ISO 14224 provides a comprehensive basis for
the collection of reliability and maintenance data in a standard format for equipment in all facilities and operations.
To fully realize the benefits of standardized data, ISO 14224 must be expanded upon and customized to meet the unique
needs of an organization. The Emerson-recommended levels, modified from the ISO recommendations, are described in the
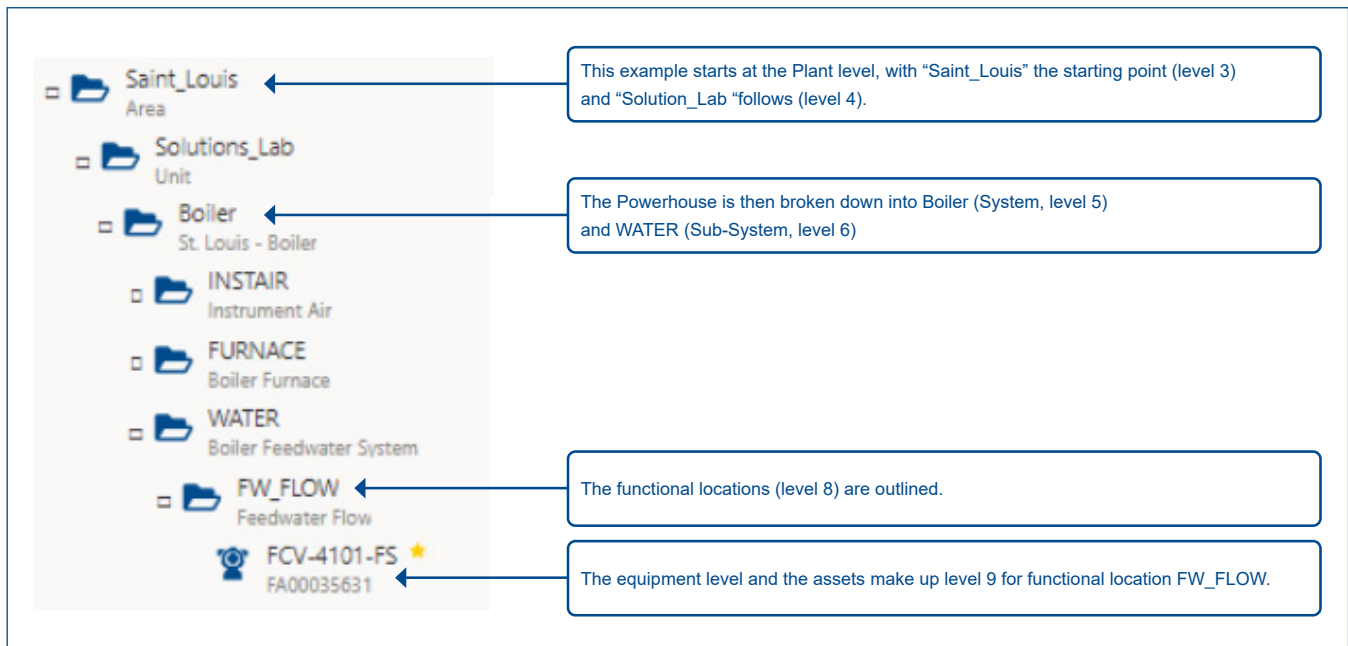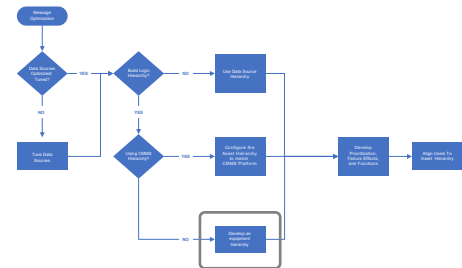following table.

Level	Hierarchy Description	Definition	Examples
1	Company	Company Name	Emerson
2	Business Unit	Name of the Business Unit	Digital Solutions
3	Plant/Rig/Site	Specific Plant, Rig, or Site	St. Louis, Houston, Costa Rica
4	Asset Group/Unit	High Level Processes within the site	Drilling, Catalytic Cracker, Powerhouse
5	System	Main systems within the Unit or Asset Group	Thrusters, Reactors, Distillation System, Boiler
6	Sub-System	Sub-system utilized for the holistic operation of the previous system	Cooling, Lubrication, Feedwater
7	Sub-Sub-System	Complex sub-systems that require further breakdown	Pump shaft seal assemblies, motor cooling
8	Complex Equipment	The actual Machine Train including Driver if applicable	Pump 101, Generator, Tank 101
9	Equipment	A Single Piece of Equipment. This should be the lowest maintainable item.	Pump, motor, tank, monitoring devices

In order to develop this type of structure, rules and naming conventions must be available or developed. Piping and Instrument Diagrams (P&IDs) are a good reference and, if available, should be used as the basis in the development of the asset hierarchy.

Example

The following shows an example hierarchy using the methodology outlined above, using a utility boiler as the example.

In order to develop this structure, a visioning workshop between Emerson solutions architects and the customer is required to ensure alignment when developing an equipment hierarchy. Though work upfront is required, providing a well-defined structure will help segment messages to the appropriate users.


This example starts at the Plant level, with "Saint_Louis" the starting point (level 3) and "Solution_Lab "follows (level 4).

The Powerhouse is then broken down into Boiler (System, level 5) and WATER (Sub-System, level 6)

The functional locations (level 8) are outlined.

The equipment level and the assets make up level 9 for functional location FW_FLOW.

Using the Emerson-preferred asset hierarchy structure.

2. CMMS Hierarchy

A well-defined CMMS hierarchy provides many benefits to an organization and is a foundational piece on a customer's journey to top-quartile reliability. For many, the CMMS is the single source of truth regarding their assets, Plantweb Optics is structured to align with your existing work processes.

With Plantweb Optics' ability to combine and group assets together, alignment with an existing maintenance management structure is encouraged. Aligning the Plantweb Optics hierarchy with the existing CMMS hierarchy is beneficial when you:

■ are familiar with their CMMS structure and desire to mirror your CMMS hierarchy in Plantweb Optics

■ have SAP or Maximo CMMS and intend to use Plantweb Optics to generate work orders, either currently or in the future

---
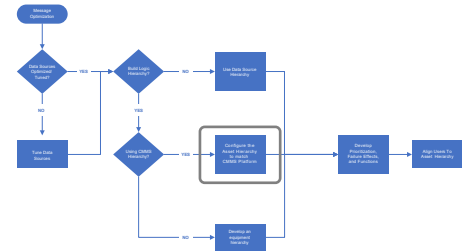
If you desire to use the CMMS, but the CMMS structure needs refinement, Emerson professional services can help define, update, and implement the desired changes.

Example

The structure for the CMMS will look like the example shown in the equipment hierarchy section. Using this methodology is positive as the CMMS and Plantweb Optics systems are linked with a single workflow. The efficiencies provided by this method can reduce the time to create work orders and ensure that the events are captured in the CMMS.

Work order creation within Plantweb Optics also allows for proper asset maintenance cost tracking. Maintenance personnel can accurately charge parts and labor to the newly generated work order, ensuring that these costs are captured.

Another benefit of using Plantweb Optics to generate work orders is that plant personnel without access to the CMMS can now submit their requests, rather than relying on verbal communications. This ensures that their requests are entered into the master maintenance work list and can be planned accordingly.

Using the CMMS as the structure is the most complicated of all the hierarchy options. Each CMMS is customized for the needs of the site; therefore, evaluation and alignment of the CMMS must occur before the implementation of Plantweb Optics. A CMMS for a site can contain thousands if not millions of assets, many of which will not need inclusion in Plantweb Optics. There will be a sizeable effort to mirror the CMMS in Plantweb Optics and significant planning is needed before implementation. An Emerson solutions architect can provide understanding of the considerations for using the CMMS as the asset hierarchy.

3. Data Source Hierarchy

This option uses the existing hierarchy as constructed from the
underlying data source. Using the data source as the hierarchy
is a good option when you:

- have one asset source and are very familiar with their
  asset source structure(s)

- have a very well-defined asset source structure

- want to group their assets by type (for example: group all pressure transmitters together)

- want to minimize configuration and do not foresee expanding to additional data sources in the future
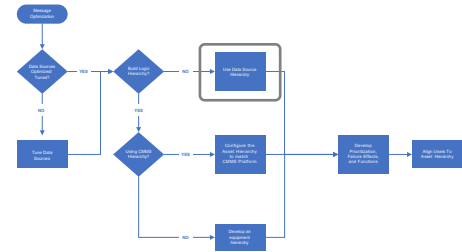
Using the data source hierarchy as currently constructed can help users who are familiar with accessing the asset source
directly, as the hierarchy will be the same.

A feature of Plantweb Optics is the ability to pull the hierarchy directly from the data source automatically without need for
adjustment. This automatic transfer prevents any changes to the hierarchy. Therefore, if this feature is used, it is beneficial that
the data sources hierarchy is structured as needed before transfer. It is not necessary to use this feature and it is possible to
replicate the data source hierarchy manually without the restriction.

Example

The below example shows how Plantweb Optics can mirror an existing data source hierarchy. The assets are organized by
device type in AMS Device Manager, and that same structure can be built in Plantweb Optics.
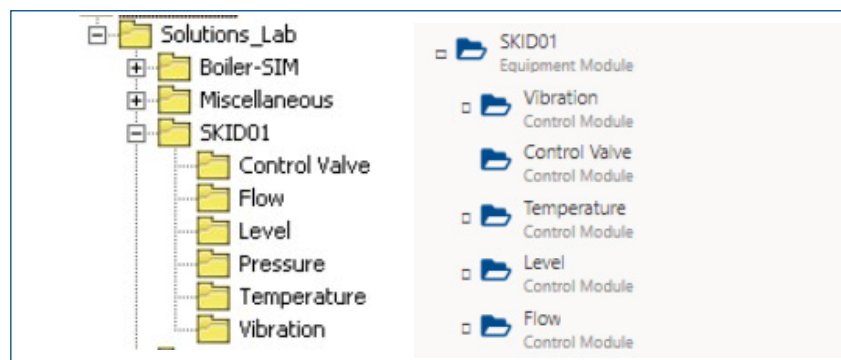
*The SKID01 hierarchy in Plantweb Optics (right) mirrors that of SKID01 hierarchy
in AMS Device Manager.*

One of the features of Plantweb Optics is the ability to combine assets, aggregating the individual asset scores into a single
score. Using the data source hierarchies is not the preferred method if you are connecting multiple data sources because
it creates data silos within the platform and prevents a holistic asset approach. Therefore, if the desire is to aggregate asset
scores, it is preferable to use one of the other above methods.

If the data source hierarchy is preferred, it is recommended to clean up the hierarchy before implementing the same hierarchy
in Plantweb Optics, ensuring the propagated data is free from unwanted alerts and configuration in Plantweb Optics is minimal.

Classification of Assets

Once the asset hierarchy has been developed, assignment of the priority, failure effects, and functions fields to the assets within Plantweb Optics will provide meaning to the alerts. Use of these classifications are not required but will contextualize the alerts further and make the system more meaningful.

Criticality Ranking

Within Plantweb Optics, it is possible to assign a criticality ranking to the assets or folders. This ranking will help filter alerts, ensuring that alerts for assets with a low criticality reach the responsible users, while ensuring that alerts are issued to those who can help remedy the problem in a timely fashion for assets of high criticality.

Asset criticality within Plantweb Optics uses a numeric scale. If a criticality ranking methodology already exists, alignment between the existing scale and Plantweb Optics must be performed.
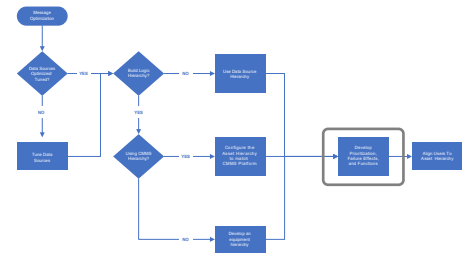
> **If you know your assets are not ranked by criticality, an Emerson consultant can assist in developing the criticality methodology.**

Failure Effects

Plantweb Optics also has the capability of assigning labels based on "failure effects." A failure effect categorizes the asset into how it impacts the business. The included failure effects are:

- Safety Critical
- Air Pollution Control
- Hazardous Material Control
- Environmental Control
- Production Control
- Critical Pump

Failure effects ensure that certain asset information reaches the appropriate user. For instance, a plant safety engineer could be interested in only the assets categorized as "safety critical," while a reliability engineer would want to maintain focus on the critical pumps. Additional failure effects can be created and added to Plantweb Optics to meet the needs of your organization.

Functions

Assigning "functions" to assets can also provide meaning to alerts. These functions focus specifically on categorizing the type of asset or what the asset helps monitor or control. A few examples of the functions are:

- Vibration
- Temperature
- Flow
- Digital Positioner
- Valve
- Transmitter

These functions can also be used to prevent users from receiving unwanted alerts. For instance, a mechanic may be assigned to the assets that have a function category "vibration", while an instrumentation technician may only be interested in "transmitter".

Library

Applying classes to assets enables efficient management of change practices. Links, documents, photos, failure effects, and functions can be applied to a class, and any asset with that class will inherit those traits. By applying these classes, the management of change process for updating documentation can be applied to all assets in the class.

Adding additional context to asset classes of Plantweb Optics must be done **before** connecting a data source and creating your logical assets.
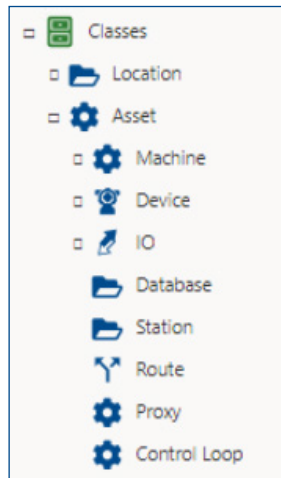
*Examples of Asset Classes.*

User Optimization

Following data source optimization and developing the asset hierarchy,
the final step is to align the users with the previous efforts.
A clear understanding of which users are interested in which assets,
in addition to how the users wish to receive the information, is needed in
order to maximize the value of Plantweb Optics. Aligning users to locations,
assigning message subscriptions, and assigning user responsibility settings
will ensure the appropriate messages reach the appropriate users.
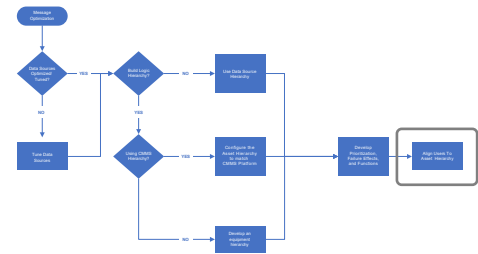
Filters

Plantweb Optics v1.6 adds additional functionality to message and notification configuration. The filter feature within Plantweb Optics Asset View will help users customize messages and notifications. The filter feature allows users to customize asset message and health information based on location, alert type, and user responsibility. After configuring and selecting a filter, the feature will update the dashboard, showing user only the health of the assets they are interested in and updating the bad actor report, KPI's, and messages to only see asset that meet the filter criteria. These filters can be easily updated and modified based on the user's preference, and once a filter is configured, it can be saved for future use.

For example, a key performance indicator for a facility could be the health status of safety critical devices. A "safety critical" filter could be created, and the status of all devices categorized as safety critical can be reported on using this filter. These filters use plant locations, asset classes, and user responsibilities to contextualize messages.
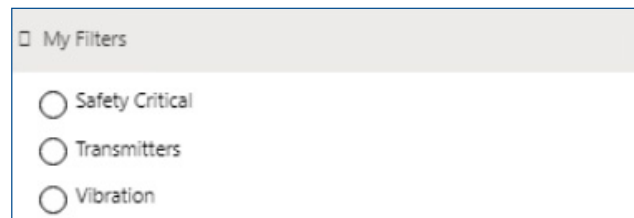
Examples of the Types of Filters Customizable to a User's Needs.
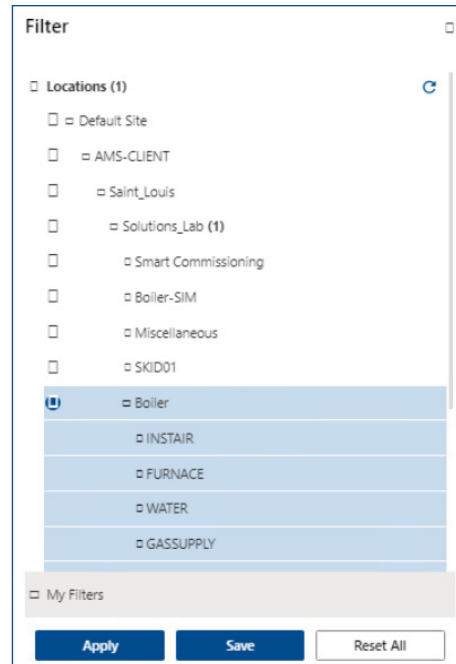
Locations

Assigning users to locations is a simple way of providing contextualized information to a user. Oftentimes, plant personnel are only interested in portions of the plant, rather than the entire plant (though there may be interest by some personnel for the entire plant). Using the asset hierarchy, users should be assigned based to assets in which they are interested or responsible. It is pivotal that the asset hierarchy has well-defined locations so users receive the appropriate messages. Using the filter features in v1.6, users can select the desired locations in Asset View. Once configured, the filter can be saved for future use.

Classes

Classes define the type of assets that a user is interested it. From the class filter, users can get as general as pumps or devices, but also as specific to filter only on an individual valve type such as a Fisher DVC 6200.

Responsibilities

The asset classifications applied in the hierarchy configuration can be used to further filter assets. As mentioned above, a safety critical filter can be applied to only see safety assets. Plantweb Optics provides pre-defined classifications and new ones can also be created as needed.

*Version 1.6 Allows Users to Filter
by Location.*

Messages and Notifications

This section describes the considerations for users subscribing to messages and notifications. Messages are a subset of events and while all events are recorded and saved in Plantweb Optics, not all events should result in a message. Emerson recommends only creating messages on event that drive action in a facility. Notifications refer to the emails and mobile notifications users receive when an event occurs. Emerson recommends only setting notifications on the most critical assets to reserve email inboxes for updates on only the most critical assets.

Messages

Within Plantweb Optics, it is possible to select the types of data source alerts on a user basis. Each user can receive messages based on the type of alert for each data source.
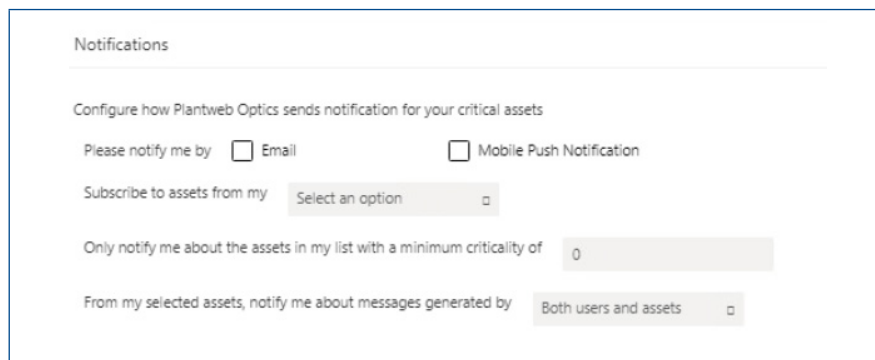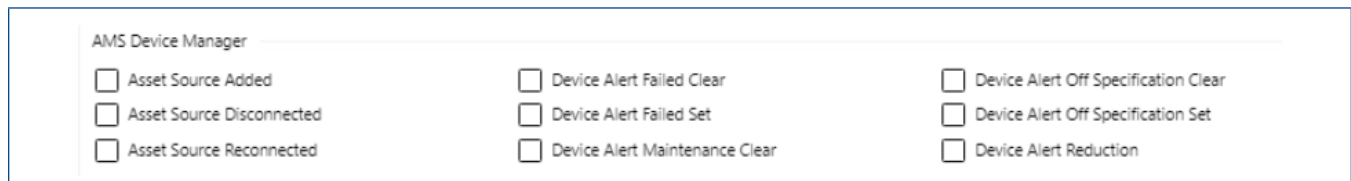

The Message Subscription Options allow types of asset source alerts to be selected/deselected.

In conjunction with the data source optimization effort, selecting specific alert types for each data source will help prevent nuisance alerts. This is another way to differentiate messages to users. For example, an instrumentation technician may be interested in all the AMS Device Manager alerts, including advisory alerts that are not necessarily critical. The maintenance manager may only be interested when alerts indicate a failure. This differentiation will prevent the maintenance manager from receiving messages for routine methods while ensuring the critical events are escalated appropriately.

By default, users will only be subscribed to messages that impact the health score of an asset. For example, an alert from AMS Device Manager indicating that a valve is experiencing a travel problem will generate a message in Plantweb Optics. For a user to receive a Plantweb Optics message due to the creation of a CMMS work order, the user must subscribe specifically for that type of message.
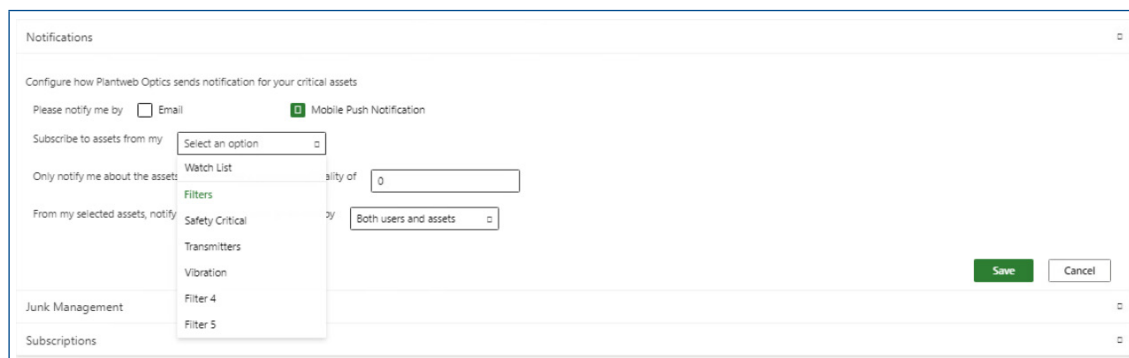
Notifications

Plantweb Optics can notify users of plant events using email or push notifications. These notifications can be handled differently than messages within the application. It is possible to filter email or push notifications based on the asset criticality ranking. This feature is especially useful to plant personnel who may not need to access Plantweb Optics directly but are still part of the plant RACI workflows. Setting notifications also allows Plantweb Optics to watch your assets for you, and alert you to a potential problem. Additional details can then be found by accessing Plantweb Optics on your desktop or mobile application.

The Notifications settings allow notifications to be set based on asset criticality.

Using the filters or the watch list feature within Plantweb Optics Asset View, users can further customize the types of notifications they would like to receive. Using the previous example, a user could leverage the "safety critical" filter and receive emails and/or push notifications based on changes in the health of those assets.

Selecting a Filter for Customizing Notifications.

Conclusion

Gaining insight into your critical assets is possible through the optimization of data sources, defining an asset hierarchy, and aligning the messages to the users. Developing a customized equipment hierarchy is the preferred asset hierarchy method, but existing site CMMS or data source hierarchies can be used when they best meet your needs.

Contact Us
🌐 www.emerson.com/contactus

EMERSON