

Metasys[®] Enterprise Management (MEM)

Product Bulletin

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Software Release 1.2

Issued March 2018

Refer to the [QuickLIT website](#) for the most up-to-date version of this document.

Overview

Johnson Controls *Metasys*[®] Enterprise Management (MEM) is a comprehensive analytical cloud-based optimization tool that pro-actively analyzes building energy and equipment data to identify issues, faults and opportunities for improved performance and operational savings. Using parent-child meter/equipment space relationships, MEM provides for enterprise building performance comparisons and lifecycle management.

Powerful analytics root out energy and equipment related problems 24x7. These analytics run in the background and find energy and equipment anomalies. Actionable information is provided to the customer through the Fault Detection and Diagnostic (FDD) feature.

MEM works with *Metasys*[®] Building Automation and 3rd Party Building Automation Systems (BAS) that support BACnet IP communications to provide a holistic view and insights at every space with respect to equipment operation starting from portfolio down to sub-spaces within the building. Coupled with the MEM Data Collector, it has the flexibility to integrate directly with meters using BACnet IP and is easy to configure. The application is easy to use with a built-in intuitive help feature making it easy for users to use the software.

MEM can assist in obtaining ISO 50001 Certification faster.

- MEM is an integral part in the development of an energy management plan and other factors affecting energy performance that can be monitored and influenced by the organization.
- Provides measurement, documentation, and reporting of energy use and consumption.
- Automates energy and system monitoring and verification (no need to go to the facility and write down energy metrics on paper or take photos).
- Performs mandatory energy review automatically required by ISO 50001.

- Ability to set baselines, recalculate it and compare it with historical data to track energy progress.
- MEM is the easiest way to share progress with the energy team and organization using automated reporting tools.

Features and Benefits

Energy Management

Energy Management software automatically collects, analyzes, and displays information for all configured physical meters and virtual meters located in a facilities operation. The information for energy demand and consumption can be aggregated and displayed using various out of the box dashboards. Custom dashboards can also be configured to a user's needs. Easy to understand summary reports can be generated from the dashboard data utilizing the built-in automated reporting tool.

The following additional features are discussed in further detail in this bulletin:

- Energy Density Dashboards
- Energy Summary of Commodities
- Energy Tracker with Baseline
- Energy Forecast
- Weather Normalized Consumption
- Custom Dashboards; dashboards can be configured to display data for space or meters.
 - Line, Area, Column, Bar charts; user can map different points with the same unit of measure or up to four different units of measure in the same chart.
 - Pie Charts; could be used to see the contribution of 4 Buildings Consumption in percentage for that location. Each building shown in a percentage providing an easy view as to which building is contributing the most in consumption.

- Heat Map; can be used for easy detection of “hot spots” leading to high Consumption/ Demand during part of day allowing for quicker corrective actions as to when the hot spots occurred.
- Energy Summary Reports with Auto Scheduling
- Consumption and Demand Comparisons
- Data Cleansing and Normalization
- User Defined Baseline

Used alone, or coupled with Equipment Management software add-on, it provides a system that allows easy enterprise performance comparisons and life cycle management providing detailed visibility into site operations.

Equipment Management (includes Asset Maintenance)

The Equipment Management software add-on of MEM provides the connectivity to monitor, troubleshoot and maintain configured equipment points located in a customer’s facility. Rule driven fault detection, notification and diagnostics are displayed in a time series format with total duration of existence allowing equipment managers to easily pinpoint and fix equipment problems.

All data is displayed in easy to read dashboards and provide for developing custom equipment KPIs.

The following additional features are discussed in further detail in this bulletin:

- Equipment Fault Detection and Diagnostics (FDD)
- Equipment Analysis and Dashboards
- Waterside (Chiller, Boiler, etc.) KPIs
- Custom Equipment Rule Editor
- Standard Rule Library
- Custom Equipment KPIs
- Fault Notification
- FDD Driven Work Orders
- Rule Driven Diagnostics
- Equipment-based FDD Visualization
- Airside (AHU, RT, VAV, Fan Coil, etc.) KPIs
- Equipment Thermal Heat Map

Note: The Equipment Management software is an add-on software for Energy Management. It cannot be licensed without first licensing the Energy Management software.

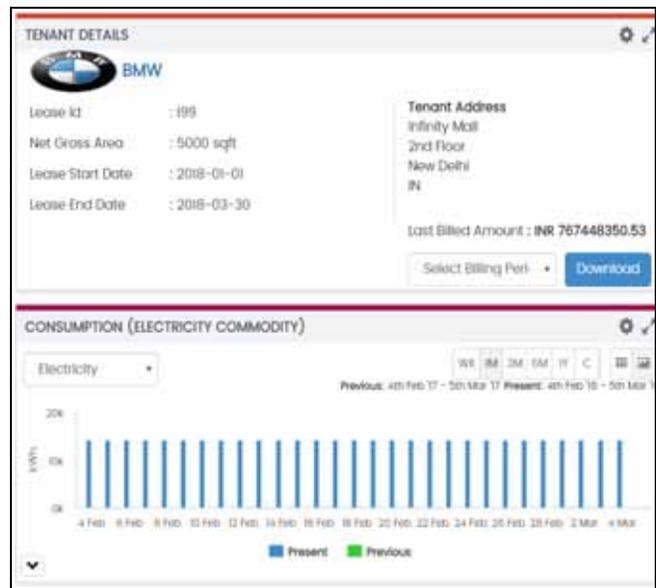
Asset Maintenance

The Asset Maintenance software provides specific dashboards to display information on work orders, service reports and maintenance KPIs. Users can use the information to generate and track Work Orders, check Service Report status, allocate resources to closing tickets, and measure performance of maintenance teams by tracking specific KPIs like Time to Respond, Asset Related Work Orders etc.

MEM revolutionary analytics use main rule, diagnostic rules, work orders and service reports to assist in scheduling and performing predictive maintenance.

Tenant

The Tenant specific portal allows a Tenant to track energy spend and consumption, allows a user to compare the consumption/demand with other tenants, and provides a ranking.



AFTER HOURS REQUESTS		
Tenant	Switch	Path
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1
SMW	Building 1 - Zone 1	New_mirovac - Facility_22.0m - Building 1

The Tenant portal includes:

- Dashboards for tenant details, electrical usage, commodity-wise consumption breakdown, after hours requests and where-you-rank
- Creation of after hours request for one time/weekly/monthly
- View after hours request
- Tenant bill summary
- After hours request summary

The Building Owner portal includes:

- Building owner's view of tenant-wise bill details and after hours details

Tenant Billing module calculates and auto-generates bills for tenants covering consumption for multi-commodities such as Electricity, Water, Gas etc. In addition, it will auto-generate bills specific to After Hours requests. Tenant setup and billing includes:

- Tenant setup (biller details and tenant mapping)
- Tenant user setup and configuration
- Tenant licensing, tenant bill generation sharing via email
- Building owner bill generation and sharing email
- After hours setup
- After hours data collector configuration

Kiosk

The MEM Kiosk connects to Metasys or 3rd Party building automation systems to monitor energy data.



The Kiosk display shows live data including current energy and water usage, reductions in CO₂ emissions, outdoor air conditions (temperature, humidity, wind direction/speed) and more.

Users and visitors can view information about the organization, its history, programs, goals and objectives. This information serves to increase understanding about the environmental impact and builds awareness of LEED® certification requirements, ENERGY STAR® criteria and sustainability goals

The MEM Kiosk also provides historical data for energy consumption. In addition, the software is easily configured, allowing changes to content, color scheme and logos as required to keep information current and relevant.

System Architecture

The MEM system is comprised of various hardware and software components working closely together to provide monitoring over a site's meters, HVAC and other building systems.

Data Collector

The *Metasys*[®] Enterprise Management Data Collector is an industrial PC that provides connectivity to meters and building automation systems to extract data for the MEM application. This gateway uses Internet of Things (IOT) capabilities to collect and push data to the cloud.

The MEM Data Collector is protected by Microsoft Security Essentials (Windows Defender). Click on the link below to read the test reports on Microsoft Security Essentials:

<https://www.av-test.org/en/antivirus/home-windows/windows-7/february-2017/microsoft-security-essentials-4.10-170547/>.

Communication Protocols

MEM works with *Metasys*[®] Building Automation and other Building Automation Systems (BAS) that support BACnet IP communications. It also has the flexibility to integrate directly with meters using BACnet IP.

Refer to *Metasys*[®] Enterprise Management Data Collector Product Bulletin (LIT-12012343) for further information.

Secure

MEM uses industry-standard system security and encoding protocols to protect against unauthorized access to data and control systems, and includes the following security features:

- HTTPS and Security Certificates provide ease of mind by preventing unauthorized access for secure encrypted communication.

- Self-signed certificates are installed on supported products with the option of configuring trusted certificates.

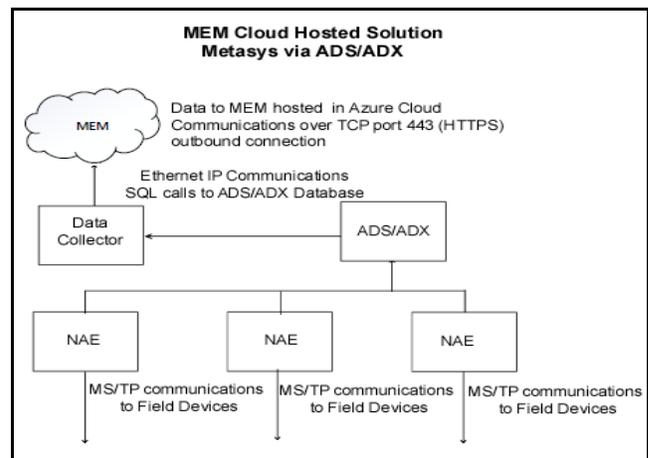
Scalable

MEM system architecture is scalable to the user's facilities energy needs and equipment monitoring requirements. Components can be added as needed to:

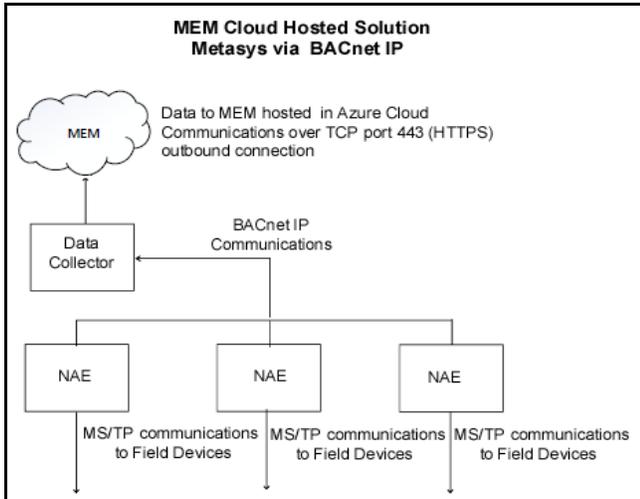
- control buildings and systems of varying complexity, size and scope;
- integrate with third-party BAS systems to unify operations with MEM;
- integrate earlier generations of components to modernize and unify the operation;
- software is modular to grow with the user's functionality and site monitoring needs.

MEM Cloud Hosted Solutions

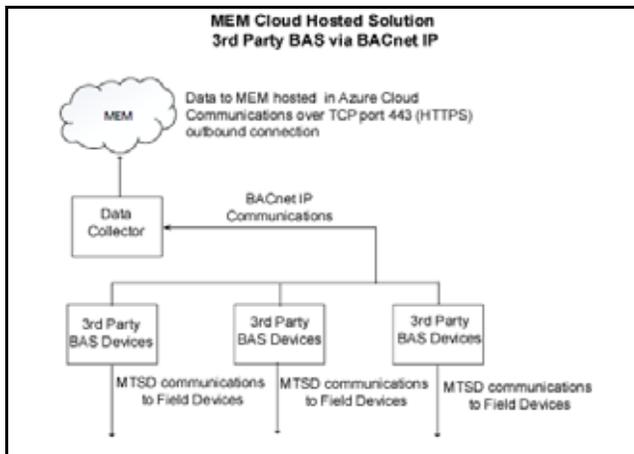
MEM Cloud Hosted Solution *Metasys* via ADS/ADS is used to support existing *Metasys* applications installed in customer's facilities.



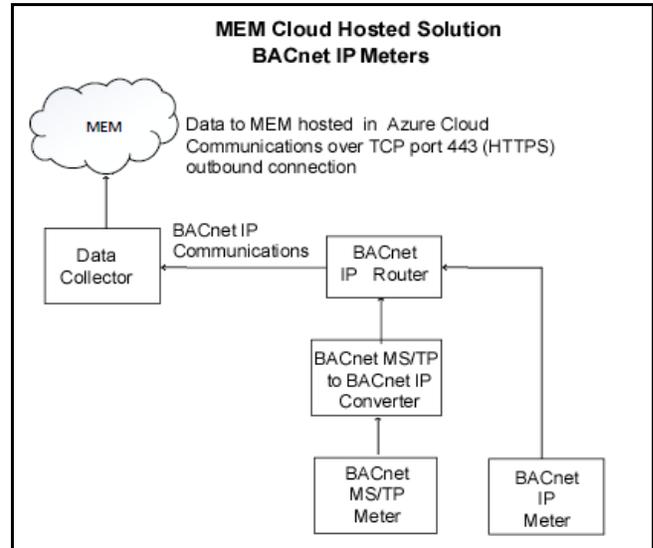
MEM Cloud Hosted Solution Metasys via BACnet IP is used to support existing BACnet IP communications.



MEM Cloud Hosted Solution 3rd Party BAS via BACnet IP is used to support existing Building Automation Systems (BAS) via BACnet IP communications.



MEM Cloud Hosted Solution BACnet IP Meters is used to support existing BACnet IP/Meters communications.



Navigation

Enterprise and Location Overview

The Enterprise Overview screen shows the sites connected to MEM platform on a Google map interface. Energy Density and Fault Summary will be displayed for the enterprise. Location specific details such as comparison of energy density along with energy and equipment faults heat map for the portfolio can be viewed also.



Further details like Energy Performance, Energy Savings, Energy Forecast, Key Improvement Areas, Equipment Performance, and Health KPIs are visible for each location.



Navigation Tree

MEM has a very flexible navigation space tree. Users can navigate to the location/spaces/meters/equipment by clicking them on the left hand navigation of the screen.

The navigation allows the user to search on locations, buildings, floors, wings, rooms or meters by entering keywords in the Search box.

User Provisioning

User Provisioning helps relevant user to access *Metasys*[®] Enterprise Management.

There are two default roles; Admin and User. Additional roles may be added if required. The Admin can define rights for the user with respect to which dashboards/reports/navigation can be viewed which ensures that unauthorized users cannot view data that they should not have access to. Multiple users of same profile (Operators, Technicians, Energy managers) can be set up under a single group for ease of scheduling, automated Email of reports, faults, etc.

Configuration

Through the use of easy to follow drop down menus, Energy Management and Equipment Management allows the user to configure the software to the needs and requirements of their portfolios.

Data Sources

The data sources tab allows the data to be fetched from different communication protocols:

- *Metasys* – SQL Driver for ADX
- BACnet – BACnet IP

Once the data source is configured, the system allows the user to discover devices/points, fetch historic data for selected points (*Metasys* Historian SQL driver only), set point attributes, and sync with the platform.

Spaces

The Space Tree feature allows the user to create a space hierarchy reflecting actual physical locations within the portfolio including the following:

- Portfolio
- Location (including weather information)
- Building

Space re-ordering allows the admin to setup the space hierarchy to reflect how the user wishes to view the spaces.

Below the Building level user has the flexibility to add space (e.g. floor, wing and rooms). Each one can be named per customers requirements to provide ultimate flexibility.

The accurate creation of the space tree is critical to the functioning of the MEM system. Setting up the tree to exactly mirror the physical portfolio allows the energy analysis to be accurate and precise.

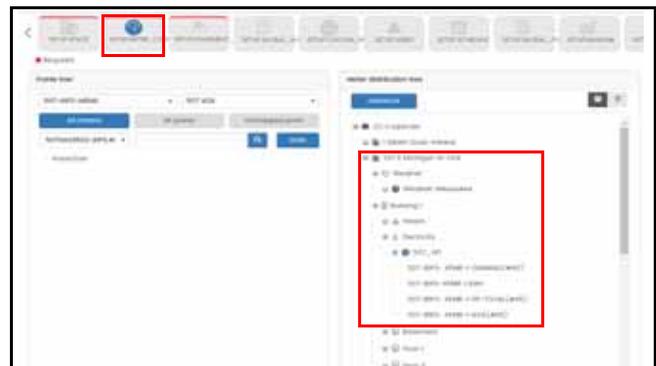
Meters/Equipment

The user can add in Meters or Equipment points including the following:

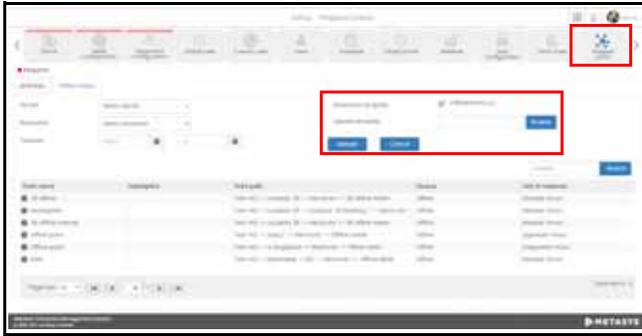
- Add/Edit the attributes of data source points
- Historical Fetch and Sync
- Create meters/submeters and map the points

Online and virtual meters are represented by unique icons that help a user to distinguish different types of meters. Meters can include commodities such as electricity, natural gas, water, steam, etc.

Offline meters, Virtual meters and points can be added under the Setup>Meter configuration tab.



The offline data for the offline meters can be uploaded in the Setup>Mapped points>Offline points tab.



Equipment setup can include categories such as chillers, air handling units, boilers, pumps, fans, etc. that can be monitored for performance.

Baselines

The Baseline feature is a reference tool allowing comparison of actual energy use to a predefined baseline for all energy parameters for a space or meter. It allows the user to compare energy performance before and after a change has been made to the site or system.

Baselines can be created for:

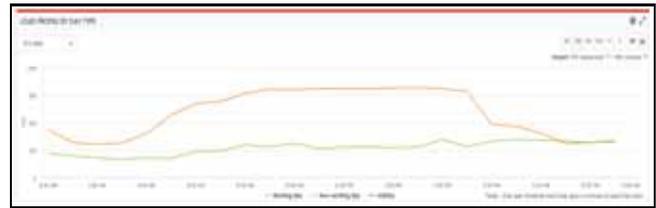
- Location Energy Performance (KPIs)
- Custom Dashboards
- Plant Room Dashboard

From the Baseline tab, users can upload baseline details through a spreadsheet or use the baseline templates provided to amend the information to configure their own baselines.

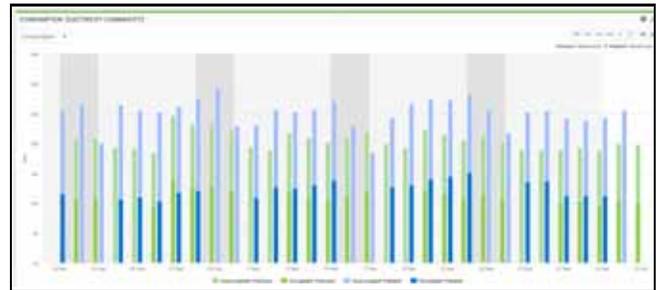


Schedules

The Schedule function allows a user to configure the workday, non-workday and holidays.



The impact of Schedule can be viewed in Consumption/Demand KPI and Load Profile KPI.



Overview of Energy Management Features

Energy Density Dashboards

MEM dashboards allow the user to comprehend energy data intuitively. The information displayed identifies inefficiencies in building operation to help reduce energy costs.

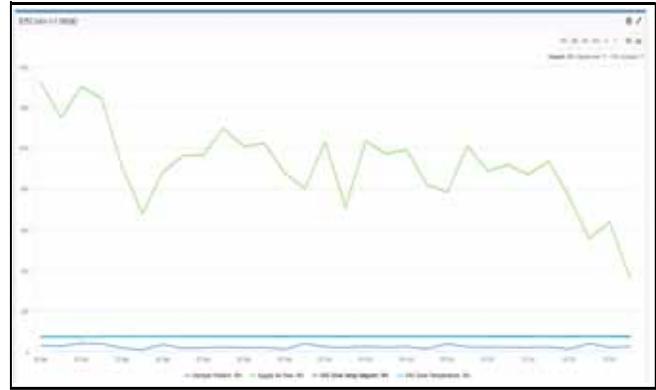
The dashboards are user friendly. The data on the dashboards is organized for customers to easily navigate through their portfolio and quickly prioritize which facilities need attention. All data from dashboards can be exported and used for further reference and analysis or appended with a report. MEM has built-in default reporting templates which captures essential data at a periodic basis and makes it easy to distribute these reports to the stakeholders. The reports and dashboards are also useful to track and report regulatory reporting and emissions.



Weather Normalization

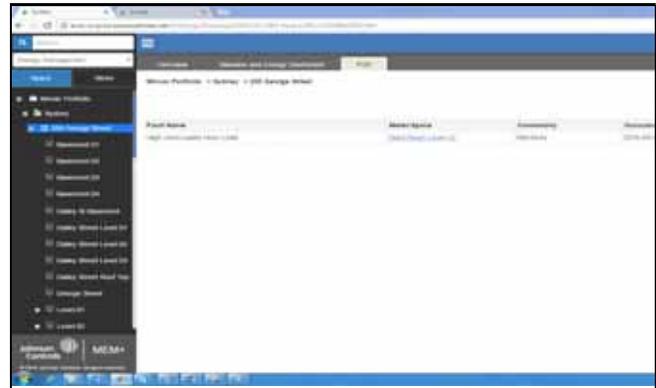
The Weather Normalization feature normalizes the consumption information by utilizing degree days, cooling degree days or heating degree days, to account for large swings in weather that might impact a buildings energy usage.

Degree days can be configured to account for the average consumption of a specific day based on the weather conditions. Average energy consumption can then be viewed based on the weather conditions. The *Metasys*[®] Enterprise Management application displays this data in a chart format, making it easier to analyze the information.



Energy Fault Detection and Diagnosis (FDD)

MEM Energy FDD contains a variety of options that user can configure. These options include: Energy Monitoring (High Unoccupied and Weekend consumption), Meter Faults (Data missing, resets, spikes) and Energy Performance (Exceeds baseline and Low Power Factor).



Energy Tracker with Baseline

The Energy Consumption Tracker is present at Portfolio, Location or Building level and is used to show all commodities energy consumption. Users can view commodities consumption data either in chart or tabular format. The current month commodities consumption is shown by default. Summary chart can be configured to show data by week, by month, 3 months, 6 months or by year and can be exported as an SVG, PNG, JPEG image or as a PDF file.

This KPI gives quick access to the user to compare the Consumption/Demand (demand only for electricity) against the target (Baseline).

It provides the ability to define a Baseline across Commodities (Electricity, Natural Gas, Hot water, Chilled Water Etc.) at both space and meter level and displays the information in an easy to understand graphical representation of difference from the target (Baseline).

Energy Forecast

MEM proactively predicts future energy usage by employing pattern analysis allowing users to quickly and seamlessly understand the return on efficiency investments, It provides the data required by customers to develop and execute smart strategies to improve operational efficiency and maximize savings.

Custom Dashboards

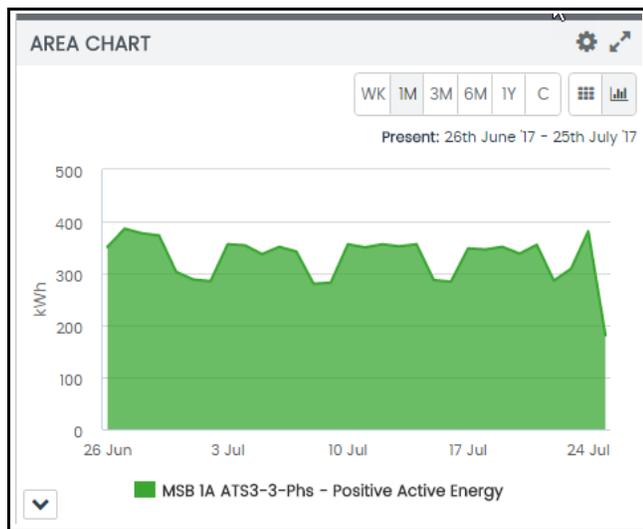
Based on the individual needs of the customers, dashboards can be configured using the Custom Dashboard feature to display data for space or meters. Available custom dashboards include:

Line Chart

The user can map different points with the same unit of measure, or up to four different units of measure in the same chart; it can display multiple y-axis.

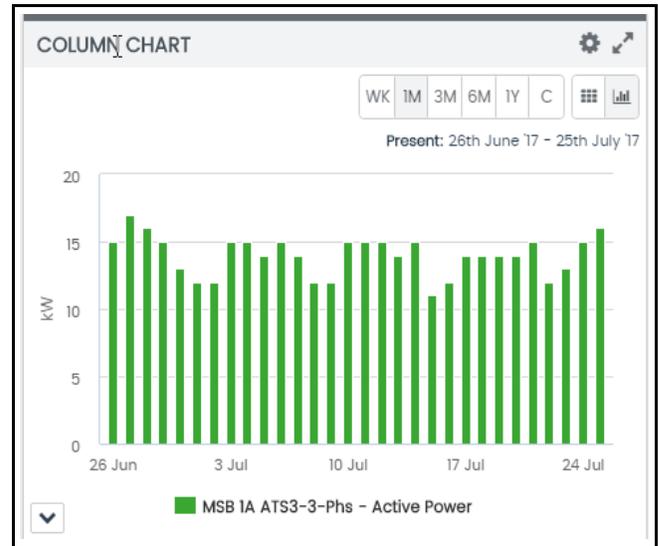
Area Chart

The user can map different points with the same units of measure, or up to four different units of measure in the same chart; it can display multiple y-axis.



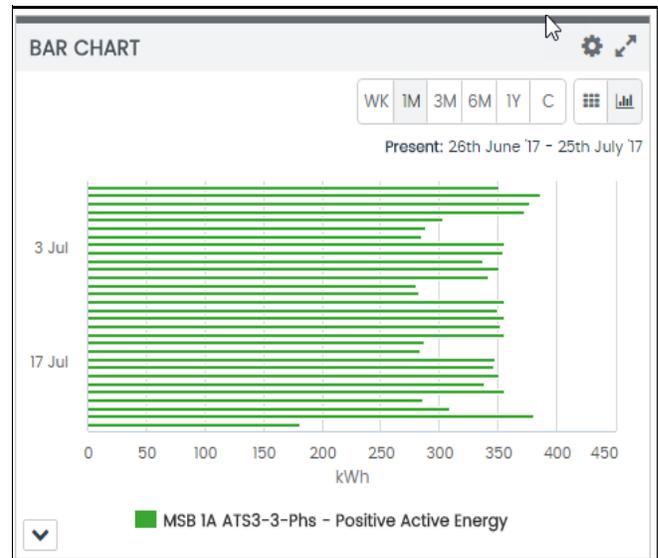
Column Chart

The user can map different points with the same units of measure, or up to four different units of measure in the same chart; it can display multiple y-axis.



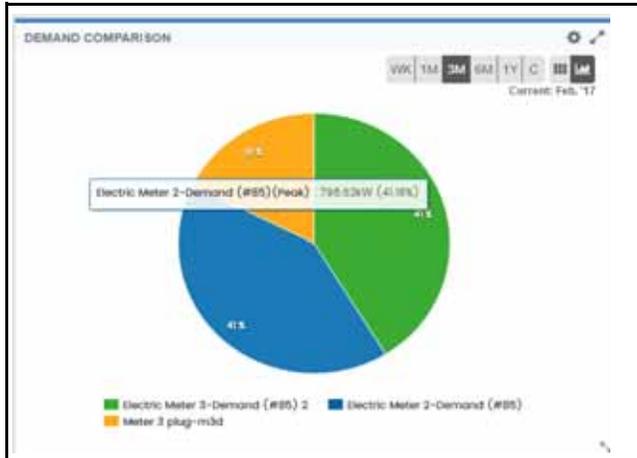
Bar Chart

The user can map different points with the same units of measure, or up to four different units of measure in the same chart; it can display multiple y-axis.



Pie Chart

A Pie Chart could be used to see the contribution of 4 Buildings Consumption in percentage for that location. The contribution from each building will also be shown in a percentage which gives an easy view to the user which building is contributing the most in consumption.



Heat Map Chart

A Heat Map can be used for easy detection of “hot spots” leading to high Consumption/Demand during part of day allowing for quicker corrective actions as to when the hot spots occurred.

The user can map a single point at a time. The minimum and maximum color range is automatically populated but can be edited.

Consumption and Demand Comparisons

Consumption Comparison

This feature helps the user to compare the consumption (current and previous) at various timelines.

- User can view data at various resolutions hourly, daily and weekly to analyze the data more thoroughly.
- The representation of workday, non-workday and holiday helps a user to understand weekly energy pattern.
- Data Aggregation gives the unique ability to dig deeper into the data.

Demand Comparison

This feature helps the user to track energy demand and helps to reduce the demand charges.

- User can view data at various resolutions hourly, daily and weekly to analyze the data more thoroughly.
- The representation of weekday, weekend and holidays helps a user to understand weekly energy pattern.
- The options min, max and avg in the dropdown menu helps user analyze demand.
- Data Aggregation gives the unique ability to dig deeper into the data.

Data Cleansing and Normalization

MEM gathers data sets from various sources along with other customer-specific data and normalizes them in a central location. The data can then be analyzed to look for anomalies and potential problems to identify opportunities for improvement or optimization.

Data Cleansers provide the user with an ability to see the anomalies with respect to the boundaries the user has defined

Data Spike shows the spike for Demand/ Consumption providing the user with information to address the sudden spike and thereby maintaining the loads avoiding penalties (For example: Demand Limiting)

Missing data helps the user to see how much data is missing at the portfolio and facility level (later releases will have this feature down to the equipment level). The user can take corrective action to rectify the issues for the devices which are not sending the data to *Metasys*[®] Energy Management.

Out of range Data eliminates noises with respect to the limits defined by user per point and displays the cleansed data on the dashboards.

Meter Roll Over logic addresses the scenario in which the meter consumption value gets reset once it exceeds the maximum value for that meter. The logic takes care of how the difference in calculation occurs when the meter reset occurs.

Overview of Equipment Management Features

Overview Dashboard

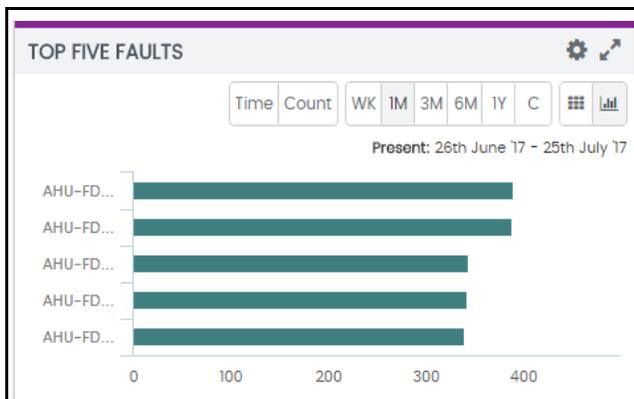
Overview dashboard provides holistic view and insights at every space with respect to equipment operation starting from portfolio to sub spaces within the building.



Portfolio and Location Level – Top 5 Faults

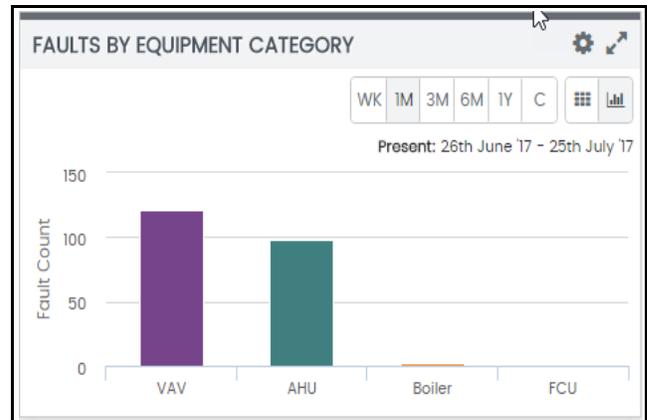
The top 5 faults at Portfolio and Location level provide impactful insights on the recurring priority problem areas and specific equipment that require attention.

- The user can easily switch between time and count. Time displays top faults based on the duration for which a fault has persisted in a selected timeline.
- Count displays top faults which have occurred for the most number of times.



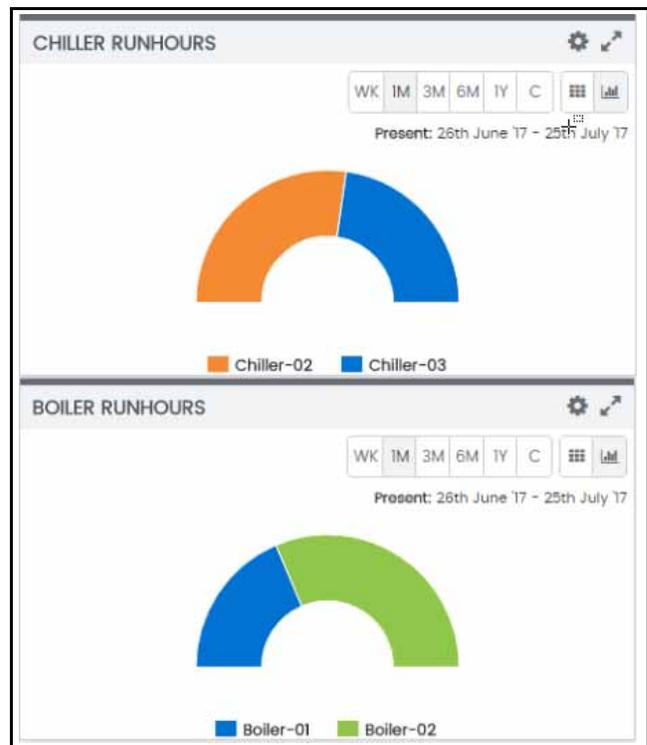
This adds perspective and helps in analyzing the equipment performance behavior

Faults by equipment category segregates faults based on the equipment categories and is a very powerful source of information when managing multiple equipment types.



Portfolio and Location Level – Chiller Run Hours and Boiler Run Hours

Aggregated run hours of chillers/boilers at a location or building provides a comprehensive view to compare the chiller/boiler run hours with other locations in the portfolio or buildings in the location.



Building Level

Overview dashboard at Building Level provides holistic view and insights at building level with respect to faults.

It also gives details in the form of a tree map of the faults under the spaces defined below the building.

A trend of Fault Count and Fault Duration on the same KPI provides useful information for analysis.

Building Level Scorecard

The Building Level Scorecard provides the Chiller scorecard which gives invaluable insights that can help facilities realize many energy savings themselves.

Sub-Spaces within Building

The thermal map appears for sub-spaces defined under a building with floor type set as Office area.

This KPI displays the heat map for the zone temperatures of the equipment like AHU, VAV etc. serving the space.

Plant Room

The Plant Room dashboard provides a complete view of the plant room with respect to its performance and optimization opportunities that it has to provide.

Run Hours Comparison KPI will display the run hours comparison for equipment, such as chillers, primary pumps, and secondary pumps for the selected time resolution.

Chiller Consumption Baseline KPI will correlate energy with Chiller system. IT will display the energy consumption against a reference energy consumption baseline.



Chiller Supply Temperature and Chiller Active Power KPI will provide optimization opportunities for individual chillers by correlating the energy counterpart with the respective equipment for the selected time resolution.

Cooling Tower Leaving Temperature and Active Power KPI will provide optimization opportunities for cooling towers by correlating the energy counterpart with the system for the selected time resolution.



Building Cooling Load & OAT KPI displays the total cooling load against outside air temperature for the selected time resolution; which helps to understand how the building load varies with changing ambient temperature.

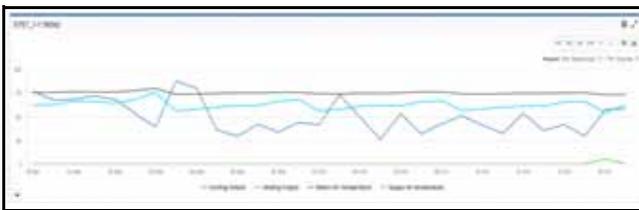


Equipment specific (AHU, Relief Air fans, Exhaust Fans, Supply Fans, Packaged unit, FCU, Active Chilled beam)

Modes of Operation KPI displays the various modes of operation for a particular equipment in a time series format for the selected time resolution.

Equipment Fault KPI enlists the faults encountered in a particular equipment in a time series format for the selected time resolution.

Equipment Trend KPI displays trends of important parameters related to the equipment operation for the selected time resolution. The parameters will change based on the equipment selected from the equipment tree.



Equipment Specific – Chiller

Chiller Fault KPI displays the faults encountered in the Chiller in a time series format for the selected time resolution.

Chiller COP KPI displays chiller efficiency (COP) for the selected chiller from the equipment tree for the selected time resolution.

Chiller Trend KPI displays trends of important parameters related to the Chiller's operation for the selected time resolution.

Chiller Run hours & OAT KPI displays chiller specific run hours against outside air temperature for the selected time resolution; which helps to understand how run hours duration vary with changing ambient conditions.

Equipment Specific – Boiler

Boiler Fault KPI displays the faults encountered in the Boiler in a time series format for the selected time resolution.

Boiler Trend KPI displays trends of important parameters related to the Boiler's operation for the selected time resolution.

Boiler Run hours & OAT KPI displays Boiler specific run hours against outside air temperature for the selected time resolution; which helps to understand how run hours duration vary with changing ambient conditions.

Equipment Specific – Cooling Tower

Fault KPI displays the faults encountered in the Cooling Tower in a time series format for the selected time resolution.

Efficiency and Wet Bulb Temperature KPI displays cooling Tower specific efficiency against wet bulb temperature for the selected time resolution.

Trend KPI displays trends of important parameters related to the Cooling Tower's operation for the selected time resolution.

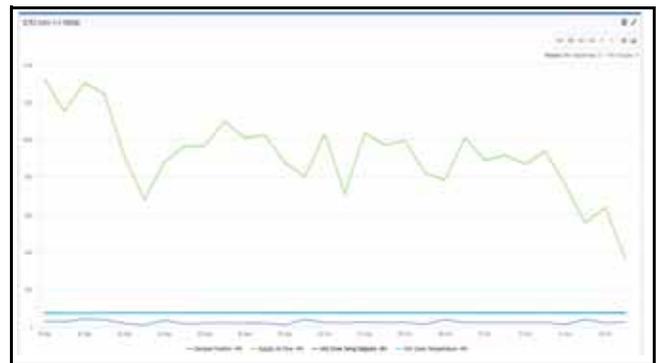
Run hours & OAT KPI displays cooling tower specific run hours against outside air temperature for the selected time resolution; which helps to understand how run hours duration vary with changing ambient conditions.

Equipment Specific – VAV

Modes of Operation KPI displays the various modes of operation for a particular equipment in a time series format for the selected time resolution.

Equipment Fault KPI enlists the faults encountered in a particular equipment in a time series format for the selected time resolution.

Equipment Trend KPI displays trends of important parameters related to the equipment operation for the selected time resolution. The parameters will change based on the equipment selected from the equipment tree.

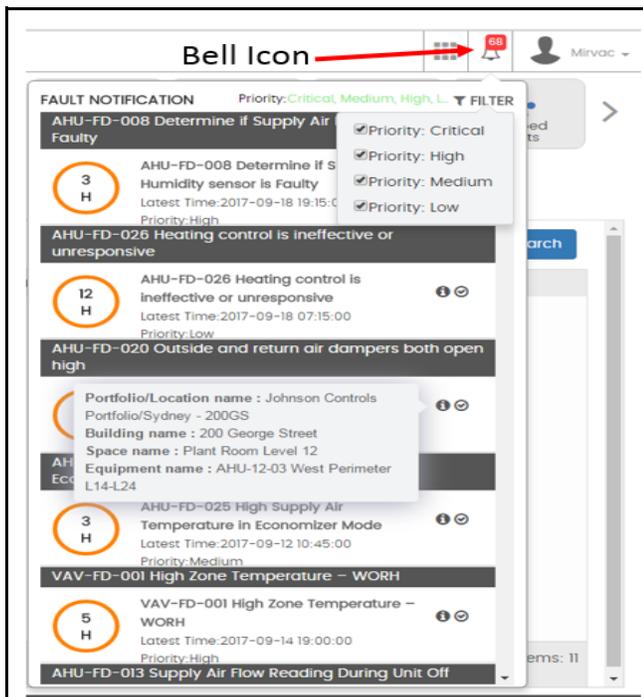


Equipment Fault Detection and Diagnostics (FDD)

Equipment FDD gathers data from sensors and equipment, then applies complex algorithms to uncover potential problems alerting staff to an impending issue and identifying the issue's cause. Easy-to-understand visual displays help technicians quickly zero in on a preventative solution dramatically reducing baseline energy consumption, capital costs and equipment wear.

A Bell icon, which is an indicator of Fault Notification, is located in the upper right corner of the screen and notifies the user of all the latest faults. This Bell notification icon is present throughout the application, including the setup screen. The user can see all the faults by clicking the Bell icon.

- The Number on the bell icon is representative of the number of all unacknowledged faults from the last 30 days.
- Clicking the FILTER icon in the upper right-hand corner allows the user to filter and display the faults by priority.
- Clicking the Information icon ⓘ on the right-hand side of the fault displays the Portfolio, Location and Equipment associated with the fault.
- Clicking the Acknowledge icon Ⓞ on the right-hand side of the fault acknowledges and removes the fault from the notification screen.



Fault Dashboards

Fault Dashboards help the user to quickly and easily Identify what Spaces are affected by faults. Both Dimensions of Fault Counts and Fault Duration are covered. The Percentage deviation gives an easy view of the fault trend compared to last period. Major benefits include:

- Provides user an complete view of looking at the Faults and prioritizing them
- Categorical distinguishing of faults
- Fault By Space – gives Faults Count/Duration at the selected Space Level
- Fault By equipment – Gives faults Count/Duration at the selected Equipment Level
- Fault by Type- Gives faults count/Duration by Fault Types (fault Names)
- Easy navigation to get to the fault root cause with the Space to Equipment link.
- Equipment to points causing Fault View (Fault Trend View)

Use the Search function to search for equipment names, fault names, etc.

Clicking on a fault reveals the details.

A single fault may have multiple diagnostics. Each diagnostic runs on equation and its duration is calculated separately. The diagnostic with the highest duration will be shown at the top which helps the user to decide at the most probable diagnostic.

Each diagnostic can have multiple reasons mapped. These will appear when clicking a particular diagnostic.

The equipment relationship gives the fault status of the parent/child equipment in a color code of red (fault) and green (No fault).

Clicking on an equipment will navigate to the FDD dashboard of the respective equipment.

Standard Rule Library / Rule Driven Diagnostics

MEM comes equipped with a standard Rule Library for Fault Detection and Diagnostics. The analytics run on the data of the configured point parameter of the specific rule.

Rules Editor

The Custom Equipment Rules Editor function allows the user to create new rules applicable to their facilities operation. The Custom Equipment Rule Editor allows a user to define other equations as well as the threshold limits for each rule to detect as a breach from the normal condition.

When logged in as a super Admin, s/he can access the Rules Editor which provides the templates and information required to create new rules to supplement the Global Fault Library.

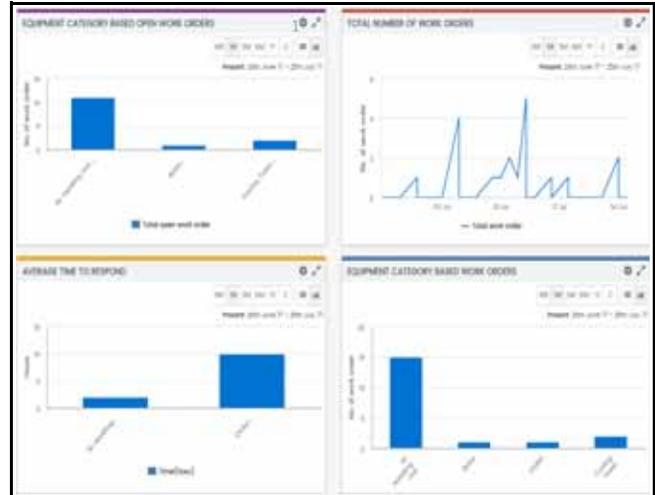
Overview of Asset Management Features

Fault Detection and Diagnostics (FDD) Work Orders

Scheduled maintenance activities don't address issues that could crop up in-between schedules. MEM analyzes patterns, recognizes issues and auto-generates work-orders to designated personnel at a scheduled point in time when the maintenance is most cost effective and before the equipment loses performance within a threshold.

Work orders can be created directly from the FDD equipment page.

- Work order information is pre-filled using data from configuration information;
- Additional tasks can be added as required;
- The tasks can be checked/unchecked to include/exclude them from the task list;
- Resource names belonging to a maintenance team can be reviewed by clicking on the "View Resources" button;
- The Work Order is sent to all users in the maintenance team;
- Upon completion of the assigned task, maintenance technician generates a service report and updates the status.
- The Summary Dashboard measures performance of maintenance teams by tracking specific KPIs, like Time to Respond, Asset Related Work Orders, etc.



Reports

Reports give the user an insight to arrive at meaningful conclusions with respect to the energy leakages. By exporting in either PDF or CSV format, the user can easily share this information to the other stakeholders. The reports are also useful to track and report regulatory reporting and emissions.

The following are the Types of Reports for the Current Release:

Energy Report By Meter helps the user to see the Consumption, Demand and Power Factor Trending data for the selected meters in a selected period. It supports multiple Commodities as well.

Example: If the user wants to take the report of all the main meters of the building and see how its consumption, demand and power factor are trending for current period, and also deviation compared to previous period, this report gives an easy way to access this data.

Energy Comparison Report By Meter compares Consumption data and maximum Demand data for different meters for the same period.

Example: If the user wants to compare Meters from Building 1 and Building 2 which have same area and hours of operation, this report will do the comparison allowing the user to see the difference between these two building meters.

Energy Comparison Report By Period for Meter compares a single meter's Consumption and Max Demand for different periods.

Example: If the user wants to compare the meter catering to HVAC load this summer compared to last summer and looks for any deviations, this report will help the user to see this.

Energy Comparison Report By Location compares the Consumption/Max Demand of different spaces for the same period. There is a data normalization feature along with the normal comparison which, when selected, eliminates the effect of weather.

Example: If a building owner wants to compare consumption or demand of Floor1 and Floor 2 which are leased to same company, the owner can use this report to see which of the two floors were responsible for Max demand which resulted in a penalty.

Energy Comparison Report By Period For Location compares the Consumption/Max Demand for the same space but for different periods. There is a data weather normalization feature along with the normal comparison which, when selected, eliminates the effect of weather.

The Weather Normalization feature enhances this capability by normalizing the effect of weather on this building.

Example: If a User wants to compare Consumption from Building -1 from Winter of this year to winter of last year, the user can do that and see what changes have occurred

Licensing

Refer to the *Metasys® Enterprise Management (MEM) Catalog Page (LIT-1901052)*.



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