Facility Management Station

Overview

The Facility Management Station (hereinafter “FMS”) supports building maintenance function and energy management function to improve both efficiency and quality of maintenance operations.

[Maintenance Management]

For asset management and facility management, the information about managed facilities is managed as a database. The database is used for the following purposes.

- Status confirmation of equipment fault and repair
- Awareness of proper maintenance cycle
- Awareness of stocked spare items and delivery situation
- Report confirmation of succession matters from predecessors

[Energy Management]

For energy management, point data of digital points, analog points, and totalized points are automatically collected from sub systems via savic-netFX Building Management System and saved as a database. The database is totaled for the respective periods for daily, monthly, yearly, year unit reports to illustrate energy consumption and operating status in graphs and graph data.

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Safety Instructions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual nearby for quick reference.

Restrictions on Use

This product was developed, designed, and manufactured for general air conditioning use.

Do not use the product in a situation where human life may be at risk or for nuclear applications in radiation controlled areas. If you wish to use the product in a radiation controlled area, please contact Azbil Corporation.

Particularly when the product is used in the following applications where safety is required, implementation of fail-safe design, redundant design, regular maintenance, etc., should be considered in order to use the product safely and reliably.

- Safety devices for protecting the human body
- Start/stop control devices for transportation machines
- Aeronautical/aerospace machines

For system design, application design, instructions for use, or product applications, please contact Azbil Corporation.

Azbil Corporation bears no responsibility for any result, or lack of result, deriving from the customer's use of the product.

■ **Caution**

⚠CAUTION Alerts users that improper handling may cause minor injury or material loss.

■ **Sign**

Instructs users to carry out a specific obligatory action to prevent possible danger.
The symbol inside ● graphically indicates the actual action to be carried out.
(For example, the sign on the left indicates general instructions.)

⚠ CAUTION

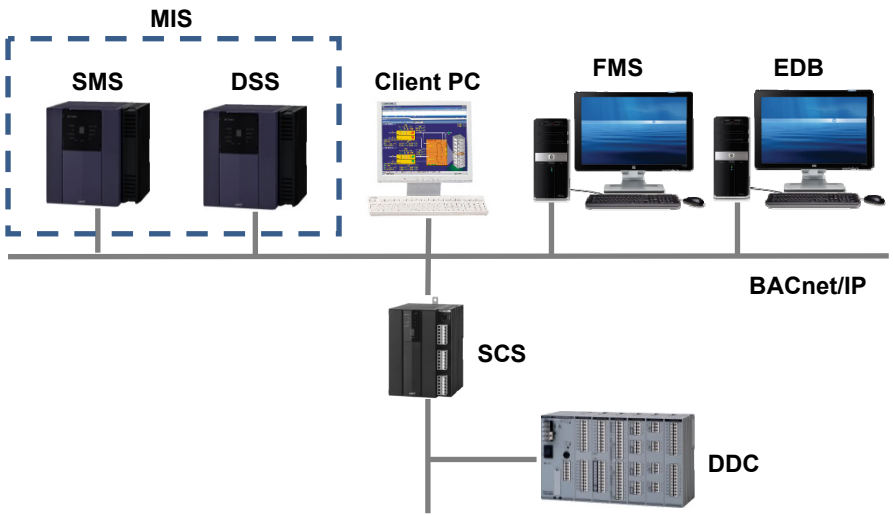
- Installation must be performed by qualified personnel in accordance with all applicable safety standards.

- Use the product under the operating conditions (temperature, humidity, power, vibration, shock, mounting direction, atmospheric condition, etc.) as listed in the specifications.
  Failure to do so might cause fire or device failure.

- Use the product within the rated operating ranges as listed in the specifications.
  Failure to do so might cause device failure.

System Configuration

savic-net™ FX Building Management System



Note: FMS and EDB cannot be installed in the same PC.

Abbreviation:

- DDC stands for Direct Digital Controller.
- DSS stands for Data Storage Server.
- EDB stands for Energy Dashboard Station.
- FMS stands for Facility Management Station.
- MIS stands for Management Integration Server.
- SCS stands for System Core Server.
- SMS stands for System Management Server.

■ Functions

The Facility Management function supports building operation and management work using the database. It has equipment data related to building equipment management or measurement data which comes from BMS. Those data are stored in the database for a long term.

Also, it has a graphic display function, a summarizing and analyzing function, a history record management function and a taking over function. With those functions, "Visualization" of the energy use tendency, the efficiency improvement of the management operation, and the improvement of the management quality can be achieved.

Table 1 Facility Management Functions

Function	Description
Asset management (Max. 3,000 equipment devices) (Max. 50 spec items / equipment) (Max. 1,500 repair records) (Summarized data for 15 fiscal years)	Categorizes the facility equipment in the building in terms of function group (electricity, air conditioning, plumbing, etc.) and controls the maintenance information (installed location, service life, etc.), the capacity of equipment, etc. by implementing database.
Fault management (Max. 15,000 records) (Summarized data for 3 fiscal years)	Manages the results of patrol checking, scheduled checking, and the actions for complaints, troubles reported from the regular maintenance work, and the minor repairs for which facility is not specified, by implementing in database. In addition, in order to understand the trend of troubles and to reduce the troubles, summarizes and analyzes the history data.
Maintenance Schedule Management (Max. 1,000 work items) (3 fiscal years to be managed)	Manages the yearly work schedule for regular inspection, and supports creation of the monthly work schedule based on the planned month, to manage the work reports by inputting the work records. In addition to the regular inspection plan, the plan of repair work caused by unexpected failures can be registered.
Inventory management (Max. 300 items) (Max. 15,000 receiving/shipping histories) (Summarized data for 5 fiscal years)	Manages the number of inventory for the parts of facility (V-belt, filters, etc.) or lamps by registering the number of received and shipped parts to output the usage list by the type of items, and provides the basic data of the inventory management for assessing the budget for the next fiscal year. And, manages the inventory by counting the incoming and outgoing goods.
Labor management (Max. 300 contract points)	Manages the contact point information of the facility equipment maker, construction company, distributor, maintenance company, etc. and the vendors consigned for the various works by the asset management.
Report preparation support (Daily data: Max. 1 year) (Monthly data: Max. 2 years)	In order to utilize the information and to improve the work efficiency, generates the business journal that is used to report the regular work retrieving the information from the history records of maintenance and trouble, repair history records, inventory management records, energy management record.*1 And, by outputting the information managed by the regular facility management functions by month, supports creation of regular work reports.
Actual Runtime Management (optional) (Max 3,000 pieces of equipment) (10 maintenance items) (Max 5 years of monthly data)	Comparing the operation log (operating time or connection count) of the facility equipment with the defined target control values, the function serves to check on whether the log data meets the target values for ensuring a better management. It helps users create Actual Runtime Yearly Report, summing up monthly operating analysis.

Function	Description
Alarm Data Management (optional) (Max 3,000 pieces of equipment) (Max 5 years of data or 30,000 alarm events)	The function collects the alarm data from BMS and compiles the alarm events by category, such as facility and equipment, which then can be shown in a graph form so that users can see the alarm trend and quickly figure out which equipment needs a high degree of maintenance.
Meter Reading (optional) (Max 3,000 meters: 1,500 actual meters + 1,500 logical meters) (Max 50 meter types) (Max 400 tenants)	The function serves to automatically collect meter reads, such as electricity, water, and gas, every month from the meters, which are installed for each tenant in order to invoice tenants individually, and calculate their monthly consumption. It can also detect abnormal meter readings by comparing the current consumption with the previous consumption or the consumption collected in the corresponding month of the previous year.
Charge Calculation*2 (optional) (Max 400 tenants) (50 expense items)	Collecting data of each tenant (each meter) consumption from the Meter Reading database, the function calculates service charges, such as electric bill, gas bill, and water bill, using the formula: the basic rate + the amount of tenant's consumption x the price-per-unit rate. With this function, the fixed charges, such as rent and common area charges, and other expenses that are manually entered by operators can also be included, which can ultimately be converted into billing reports for each tenant in print-ready form (for the international A4 paper).
CSV file output	Using the setting data, collection data, and operation data of the FMS, generates the CSV files freely. There is sample CSV file definition table for the products. You can change the design and create the desired CSV files. Downloads the CSV file output by the FMS server.

*1 It is necessary to have a separate "energy management function" to use the energy management data. If there is no energy management function, the energy data required for creating the report will have to be entered manually.

*2 For the Charge Calculation, please make an agreement with the building owner (those who are in charge of billing) on the billing plan and division of responsibilities.

Note: If the management plan does not exist for the building when the FMS is installed, which is often the case for new buildings, please prepare the plan based on the standard FMS functions. As to existing buildings, which usually have their own management plans, please talk with the building owner to make sure both parties agree on the existing building management plan.

Table 2 Energy Management Functions

Function	Description
Energy Management (optional) (Max. 5,000 points: The number of points other than the actual points (manual Input, logical, filter points) is limited up to 2,500 points.) (Daily report data: 4 years including current year (10-minute data of digital and analog points are also stored.)) (Monthly / Yearly / Year unit report data: 15 years including current year) (Max. 600 graphs: 300 graphs for standard setting, 300 graphs for user setting)	Enables to understand the long term trend of energy consumption in a building so that you judge the energy saving operation is being carried out as intended or energy is consumed properly. Also, displays the trend of energy consumption on graphs.
Energy Dashboard (optional)	The function serves to show the energy consumption trend for a whole building on a big screen. It can visualize the energy data, fetching meter readings from the FMS and converting them into graphs so that users can quickly grasp the trend. It can show not only current data but also old data for comparative analysis. The Energy Dashboard offers graph views, including Representative screen (the multiple graphs view) and various Individual screens (the single graph view), which appear one after another in the slide show. Users can stop the slide show and have one of these view screens keep showing.

Specifications of Energy Management Functions

Functions

Item		Specification
Register of Setup Information		Registers point setting, calculation information, and graph information.
Collection and processing of data		Collects time series data, processes the data into daily, monthly, and yearly reports, and saves them.
	Actual point	Collects time series point data of digital points, analog points, and totalized points from BMS.
	Manual input point	Composes points by manually inputting data of the points except actual points. (Note that 10-minute data cannot be manually input.)
	Logical point	Processes collected actual point data into logical point.
	Filter point	Filters collected actual point data by time zone or status points and creates filter point.
Display of graph/graph data		Creates graphs of specified points in preset graph settings and displays the graphs.
	Indication of standard line	Sets 2 standard values respectively for right and left vertical axes of time-series graphs (trend, bar, stacked bar).
	Save of graphs	Outputs displayed graphs into a file in PNG format.
	Save of graph data	Outputs displayed graph data into a file in CSV format.
User menu setting		Creates user graph menu composed of the graphs selected by user from the registered graphs.

Data collection

Item	Specification	
Target points	Digital, analog, totalized points:	Max. 5,000 points, The number of points other than the actual points (manual Input, logical, filter points) is limited up to 2,500 points.
Collection cycle	Automatic: 1 collection/hour	

Data type

Item	Specification
Digital point	Status*, Runtime, connection count
Analog point	Read value, average, maximum, minimum
Totalized point	Deviation, Read value

* 10 minute data of status/reading point is stored.

Data processing

Item	Specification
Logical operation	• Four arithmetic operation (e.g., used for addition/subtraction of consumption, unit conversion) • Operation based on period coefficient set for every month (e.g., used for cost conversion) • Conditional operation (e.g., used for withdrawing data only in cooling mode by using cooling/heating decision point.) • Functional operation (used for absolute operation to calculate energy based on temperature difference, for value conversion from analog data to totalized data, for enthalpy operation to calculate analytical data, etc.)
Filtering	Interlock filtering (e.g., used for withdrawing necessary data by filtering with a specified time zone, status point, etc.)

Graphs

Item	Specification
Graph types	• Time-series graphs: Trend, bar, stacked bar, bar and trend combination, stacked bar and trend combination • Analytical graphs: Pie, scatter, histogram, status

Graph Samples

Time-series graphs

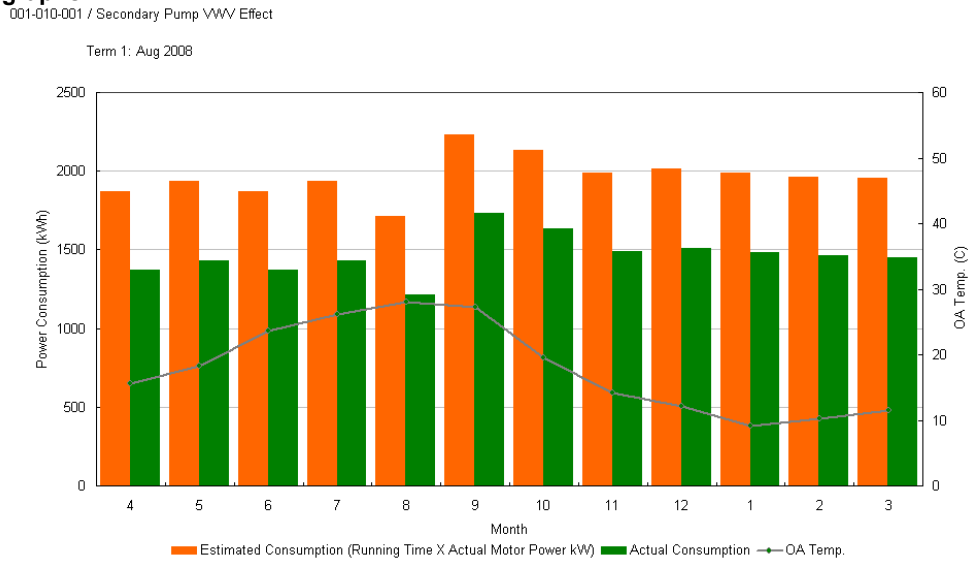


Figure 1. Time-series graph sample: Bar and trend combination

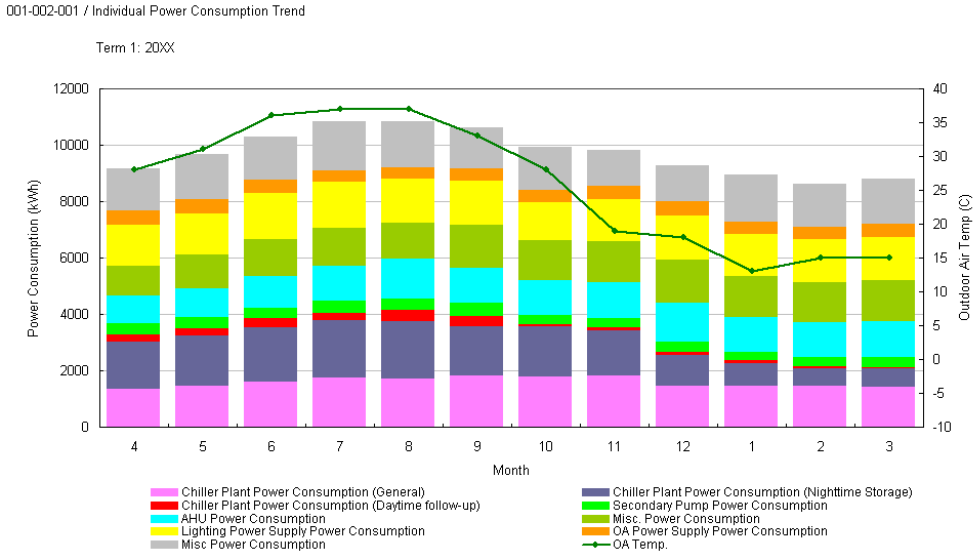


Figure 2. Time-series graph sample: Stacked bar and trend combination (1)

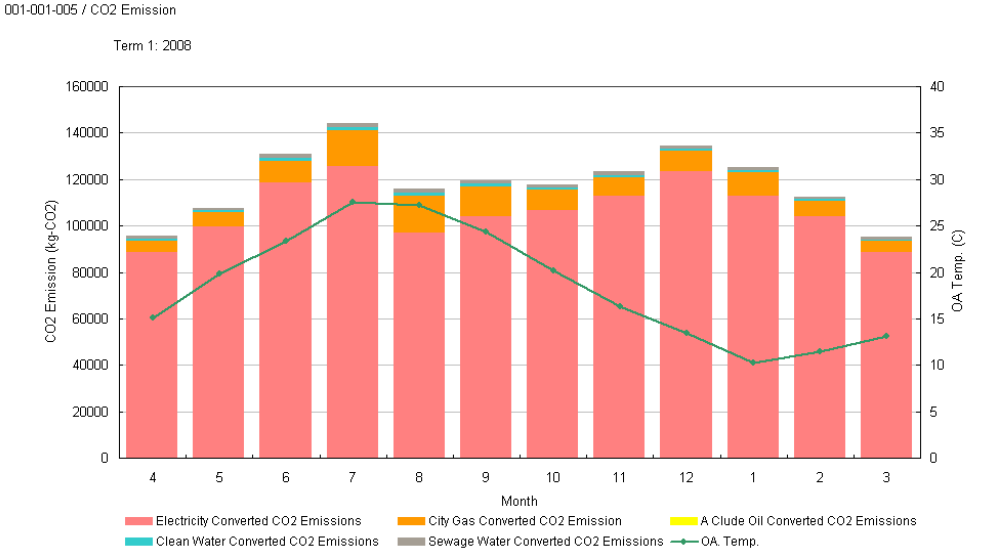


Figure 3. Time-series graph sample: Stacked bar and trend combination (2)

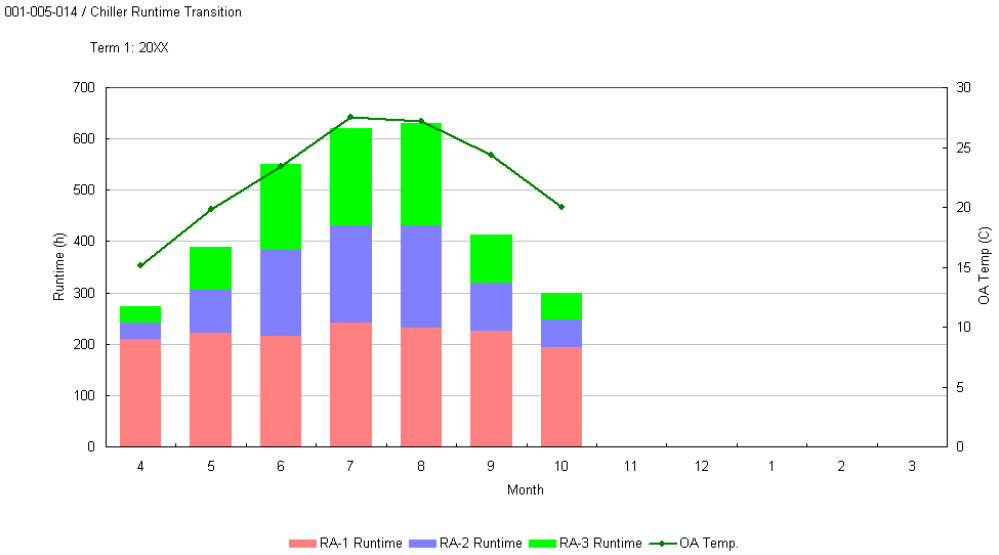


Figure 4. Time-series graph sample: Stacked bar and trend combination (3)

Analytical graphs

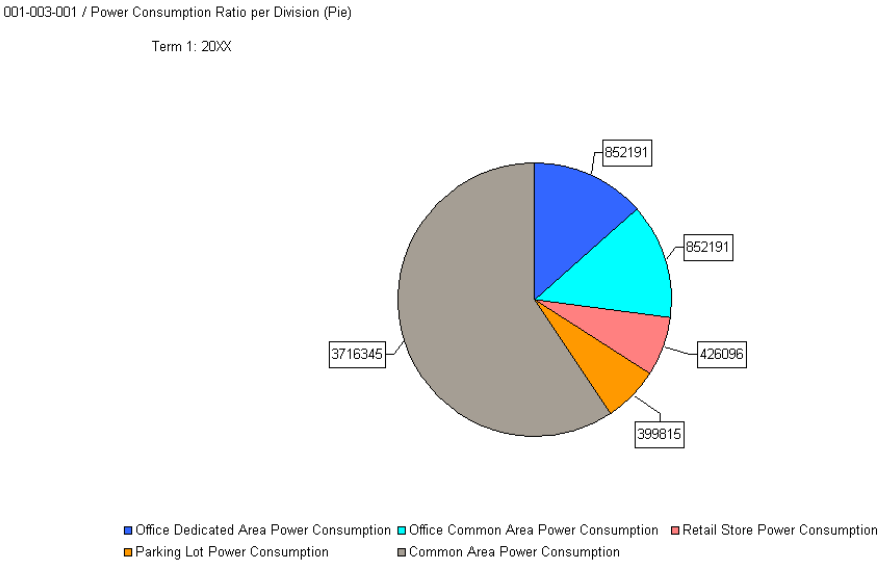


Figure 5. Analytical graph sample: Pie chart

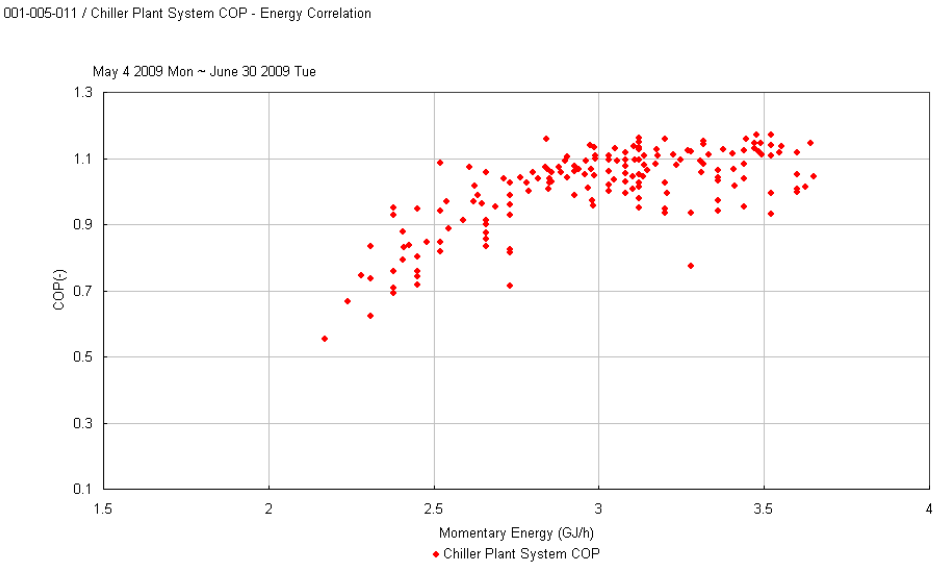


Figure 6. Analytical graph sample: Scatter (1)

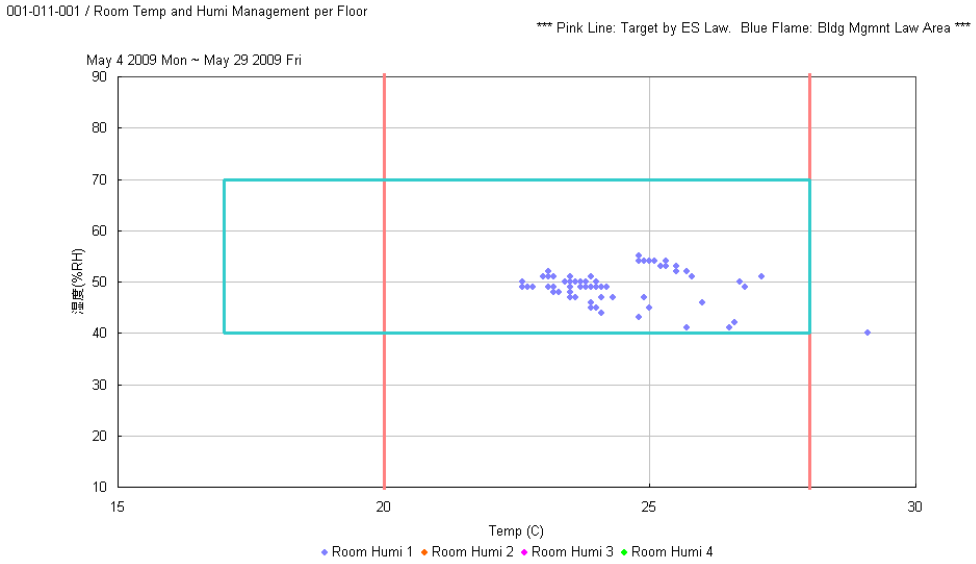


Figure 7. Analytical graph sample: Scatter (2)

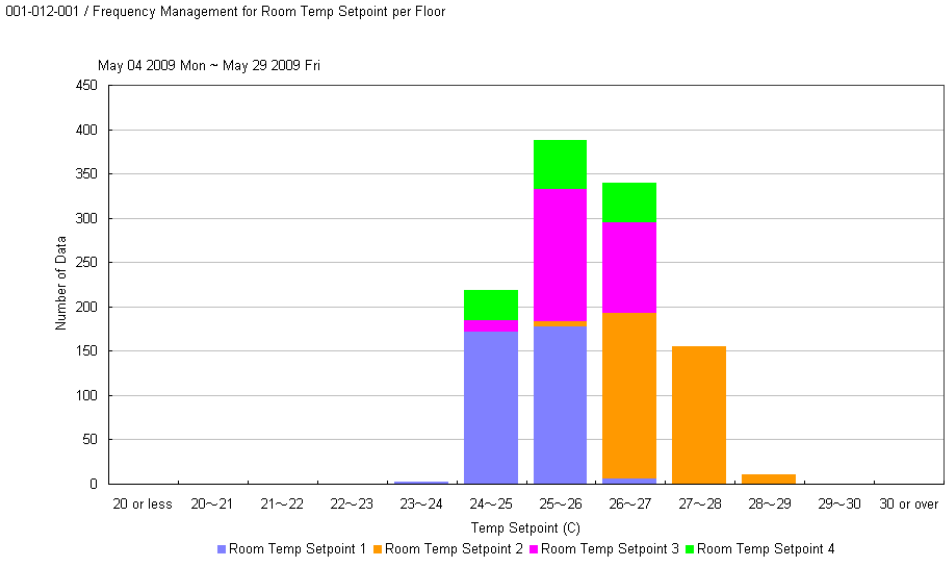


Figure 8. Analytical graph sample: Histogram

Table 3 Specifications of FMS Components - Server PC

Items	Specifications
Operating System	Qualified and fully operational: ● Windows 11 Pro 64-bit (tested version: 24H2)
Browser	● Microsoft Edge version 110.0 or later (in Internet Explorer mode) ● Google Chrome version 50 or later
Excel	Microsoft Excel 2021 64-bit
SQL Server	Microsoft SQL Server 2019 Express (used with Windows 10 Pro)
Recommended minimum PC configuration	● Recommended PC Platform: Latest model of Dell Optiplex (in case of using Windows 11 Pro 64-bit). ● CPU: Intel Core i5-3570 Processor or faster ● Main memory: ➢ To connect to savic-net FX: 4 GB or more ● Hard disk drive (HDD): 500 GB or more ● Resolution: 1920×1080 ● DVD-R Drive ● USB port: 4 ports and above ● Optional: RAID card *, Additional network card * Recommended model for RAID card: ARC-1110 (Areca Technology Corporation) http://www.areca.com.tw/products/pcix.htm ● UPS: It's required to protect HDD of PC and can be shared with other systems.

Table 4 Specifications of FMS Components - Client PC

Items	Specifications
Operating System	● Windows 11 Pro 64-bit (tested version: 24H2)
Browser	● Microsoft Edge version 110.0 or later (in Internet Explorer mode) ● Google Chrome version 50 or later
Excel	Microsoft Excel 2021 32-bit or 64-bit
PDF Reader	Adobe Acrobat Reader DC
Processor	Intel(R) Core 2 Duo, 3.0 GHz or faster
Main memory	4 GB or more
Display resolution	1920 x 1080 or more

Table 5 Specifications of EDB Components

Items	Specifications
Operating System	Windows 11 Pro 64-bit (tested version: 24H2)
Recommended PC platform	Dell Optiplex latest model
Processor	Intel(R) Core i5-3570 Processor or faster
Main memory	4 GB or more
HDD	500 GB or more
USB	4 ports or more
Monitor Resolution	1280 x 1024 or more, 1366 x 768 or more, 1920 x 1080 recommended

Table 6 FMS Basic Software Licenses

Model No.		Product Name
B S Y 4 7 2 0 0 0 0 0 9		FMS Energy Management Software License * English version, Chinese Simplified version, Korean version and Chinese Traditional version * Note: Energy Management Software License can be used without Maintenance Management Software License.
	1	100 graphs
	2	200 graphs
	3	300 graphs
	4	400 graphs
	5	500 graphs
	6	600 graphs

FMS: Facility Management Station

Table 7 FMS Optional Software Licenses

Model No.	Product Name
B S Y 4 7 2 0 0 0 0 0 3 0	FMS Maintenance Management Software License * English version, Chinese Simplified version and Korean version only * Note: Maintenance Management Software License is used as a basic function of FMS, except when you use only Energy Management Software License.
B S Y 4 7 2 0 0 0 0 0 4 0	FMS Actual Runtime Management Software License * English version only
B S Y 4 7 2 0 0 0 0 0 5 0	FMS Alarm Data Management Software License * English version only
B S Y 4 7 2 0 0 0 0 0 6 0	FMS Meter Reading Software License * English version only
B S Y 4 7 2 0 0 0 0 0 7 0	FMS Charge Calculation Software License * English version only * Note: FMS Charge Calculation Software License is used with Meter Reading Software License.
B S Y 4 7 2 0 0 0 0 0 8 0	FMS Billing Software License * English version only * Note: FMS Billing Software License is used with Meter Reading Software License and Charge Calculation Software License.

Table 8 FMS Installation Kits for connecting to savic-net FX

Model No.		Product Name
8 4 5 1 7 1 4 6 -		
	1 4 1	English version supporting Windows 11 Pro 64-bit (tested version: 24H2) with key protection.
	1 4 9	English version supporting Windows 11 Pro 64-bit (tested version: 24H2) WITHOUT key protection. (No USB protection key)

Table 9 EDB Installation Kits

Model No.		Product Name
8 3 1 7 2 6 3 2 -		
	1 5 1	English version supporting Windows 11 Pro 64-bit (tested version: 24H2) with key protection.
	1 5 9	English version supporting Windows 11 Pro 64-bit (tested version: 24H2) WITHOUT key protection. (No USB protection key)

EDB: Energy Dashboard

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