



ATBRO Systems
Control at your fingertips



METASYS[®]

MASTER YOUR ENVIRONMENT

**Johnson
Controls**



Introduction to Building Automation:

Johnson Controls is the industry leader, internationally in Building Management Systems and controls.

With international support and development available we can ensure our customers use not only the latest technology, but also the most reliable and energy efficient software and controls.

The BMS Software developed by Johnson Controls is called Metasys.

Metasys has been labelled as the “World’s Smartest Building Management System”.

Metasys is a web based building automation system.

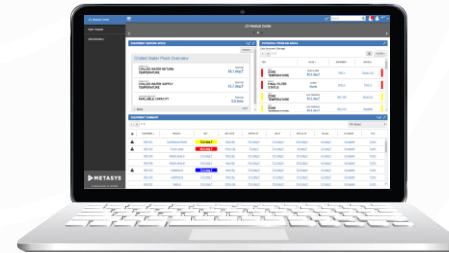
The Metasys User experience is a portal into a site that you can tailor to fit the needs of all system users.

The user experience provided by Metasys can evolve and scale to match the needs of any single facility or campus.

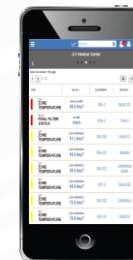


Metasys User Interface (UI)

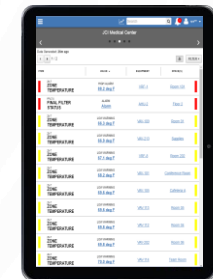
- Views of all equipment serving a space or another piece of equipment
- A single view of all items in alarm, warning, overridden, out of service, and offline states within a space
- A single view to understand the correlation between disparate events within the system
- Trends of historical equipment data for up to 10 points (computer platform) and four points (tablet and phone platforms) at a time
- Views of all relationships a piece of equipment has with other equipment, spaces, and network field controllers
- Comparisons of all similar equipment that directly serves the space and all downstream spaces
- Viewing floor plan and equipment graphics without the need for third party plugins or additional spaces
- Viewing alarms by space and equipment as well as managing alarms
- Viewing alarms while not logged in (Alarm Monitor)
- View and edit space and equipment schedules



Large Format (PC, MAC)



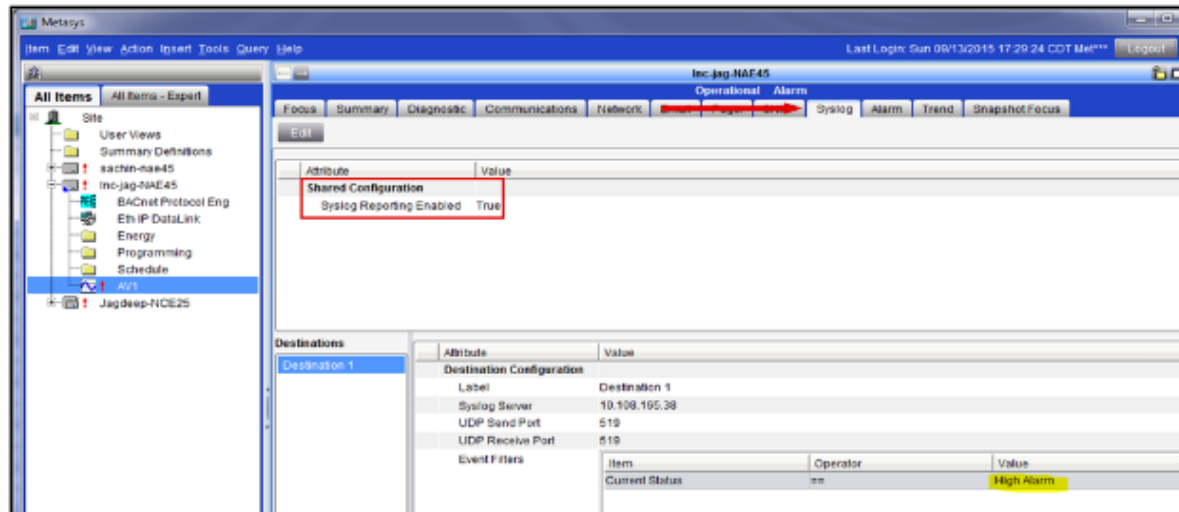
Small Format
(Phones,
iPad Mini)



Medium Format
(Tablets)

Metasys Site Management Portal

- Pop-up alarm windows
- Navigation tree—you can create multiple custom trees to best represent the logical layout of the facility
- Dynamic graphics of systems and floor plans that you can zoom in on to show fine details.
- Multiple display areas you can size and control individually
- Global search function and sorting capability that helps you find system information within seconds
- The entire user manual available in the Help system



Overview of Metasys

The purpose of the Metasys System allowed for is to ensure seamless integration between the various systems within the building.

Metasys is configured to ensure that the building operates efficiently and at optimal conditions.

Metasys has the following features and capabilities:

- 1) **Advanced Automated Reporting**
 - a) Reports will be generated at scheduled intervals and emailed to the relevant departments.
 - b) Contents of the customized report will be confirmed by the Client prior to implementation.
 - c) These reports will contain a combination of information such as:
 - a) Energy Consumption – Electrical and Water
 - b) Information required for billing purposes
 - c) History of usage time for meeting rooms
 - d) Running times of equipment to determine maintenance intervals.
 - e) Alarm history.
 - f) User activity history.
- 2) Mobile user interface for all authorised users to access the system based on the priority levels set out by the client.
- 3) Trending of the following:
 - a) Energy usage
 - b) Electrical Consumption
 - c) Water Consumption
 - d) Building Occupancy
- 4) Data storage and exporting for billing purposes
- 5) Energy Management to reduce energy consumption and associated costs
- 6) Alarming for critical items
- 7) Alarming and reporting for preventative maintenance purposes rather than reactive maintenance such as:
 - 1) Cleaning of Filters
 - 2) Servicing of generators
 - 3) Servicing of pumps
- 8) Scheduling for all connected systems and meeting rooms
- 9) Provide a high level interface to connect all standalone systems into 1 interface.



Control at your fingertips

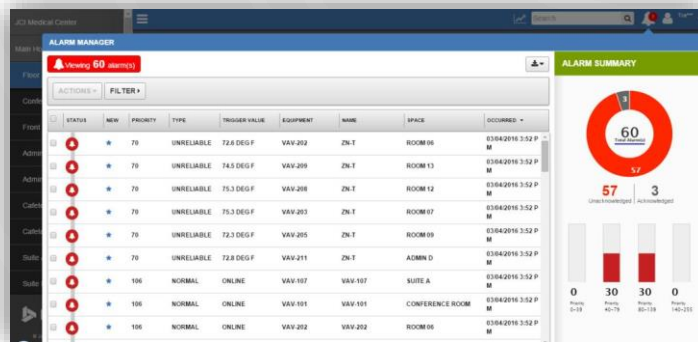
Metasys System Capabilities:

Time Management

The time and date used by all devices connected to a site are synchronized automatically, preventing errors from manual time entry and clocks that become inaccurate over time.

Network-wide time management ensures that scheduling, trending, audit trailing, data collecting, time-stamping of alarms, and other functions requiring accurate time management use the same time and date consistently for all system operations.

Priority	New	Type	Trigger Value	Equipment	Name	Space	Occurred
200	True	Normal	Off		BO-1		05/02/2016 1:40 PM
200	True	Normal	08:00		AV-3		05/02/2016 1:40 PM
120	True	Off	False		Toggle		05/02/2016 1:40 PM
200	True	Normal	True		BN-2		05/02/2016 1:40 PM
70	True	Alarm	Active		BN-1		05/02/2016 1:43 PM
100	True	Alarm	Offline		CCV Sequencer Application 01		05/02/2016 1:41 PM
70	True	Alarm	Fault		NORTH CAROLINA Perspectives 12 36 Party MCHNET		05/02/2016 1:34 PM
70	False	Alarm	Active	Scheduled Items	BN-1	SystemHD-ONE	05/02/2016 1:24 PM
100	False	Normal	Online	VAV-44	VAV-44	VAV-44	05/02/2016 1:19 PM
100	False	Normal	Online	VAV-43	VAV-43	VAV-43	05/02/2016 1:15 PM
100	False	Normal	Online	VAV-40	VAV-40	VAV-40	05/02/2016 1:19 PM
127	False	High Warning	1010		Local Audit Repository		05/02/2016 1:10 PM
100	False	Online			SystemHD-79		05/02/2016 1:10 PM
70	False	Alarm	Active	Scheduled Items	BN-1	Floor 0	05/02/2016 1:00 PM
70	False	Alarm	Active	Scheduled Items	BN-2	Floor 0	05/02/2016 1:00 PM
70	False	Alarm	Active	Scheduled Items	BN-1	Floor 0	05/02/2016 1:00 PM
70	False	Alarm	Fault		NORTH CAROLINA Suni Greenland 12		05/02/2016 12:45 PM
100	False	Alarm	Offline		CCV Sequencer Application 03		05/02/2016 12:41 PM



Alarm and Event Management

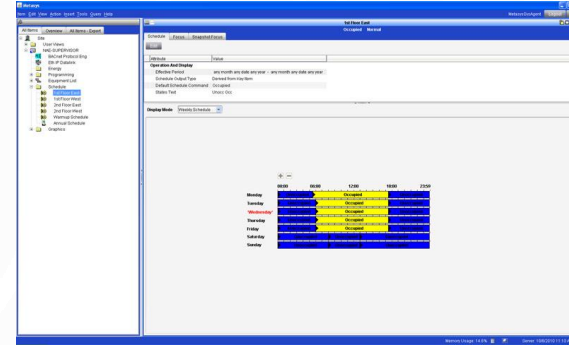
The alarm and event feature provides event management for the system and allows you to configure the routing of event messages to destinations such as the server for permanent storage.

The Metasys Site Management Portal UI features a pop-up alarms window, which alerts the operator to potential problems whenever the operator is logged in to the system; and an event viewer, which provides for greater analysis or a history of alarms and events in the system.

Metasys System Capabilities:

Scheduling

Scheduling provides a graphical user interface that illustrates when events are scheduled to occur. Scheduling automates routine functions, such as transferring a room from occupied mode to unoccupied mode for heating and cooling needs, and energy optimization.

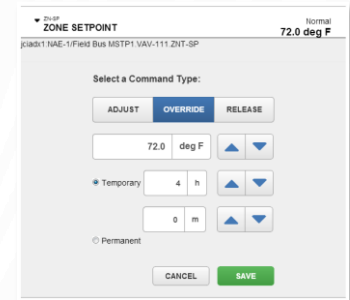


Monitoring and Commanding

Monitoring and commanding allows you to efficiently navigate through items associated with your building operations as well as view, analyse, and modify these items.

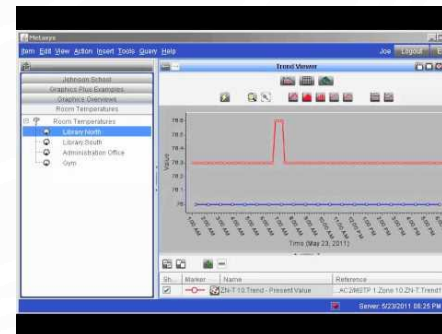
Use these features to:

- access, view, and modify item data
- send commands to items
- run reports to analyse item information



Historical Data Management (Trend)

The Metasys Historical Data Management capability allows you to collect, store, and view historical samples of object data. With the information generated by this feature, you can manage energy usage, prove compliance to standards, and diagnose problems in your facility.



Metasys System Capabilities:

Demand Limiting and Load Rolling

The Demand Limiting (DL) feature reduces utility bills by limiting peak energy usage.

DL electively turns off (sheds) equipment, such as fans and lights, or adjusts setpoints to limit energy use during peak times.

The Load Rolling (LR) feature helps save money by reducing overall energy consumption. LR acts continuously to maintain a specified energy reduction by shedding unnecessary loads.

Audit Trails (Transaction Data Management)

The Audit Trail feature records events generated either by user actions or system activity.

Johnson Clinic

EQUIPMENT SUMMARY

EQUIPMENT	SPACE	ZN-T	ZN-SP	ENH-TS-SP	ENH-CO-SP	SA
Cooling Only	Lobby	> 74 deg F	> 74 deg F	> 72 deg F	> 75 deg F	
Cooling Only	Lobby	> 77 deg F	> 76 deg F			
Cooling Only	Interview 1	> 72 deg F	> 76 deg F			
Cooling Only	Interview 2	> 72 deg F	> 76 deg F			
Cooling Only	Waiting Room	> 77 deg F	> 76 deg F			
Cooling Only	Bathrooms	> 74 deg F	> 76 deg F			
Cooling Only	Exam 1	> 69.9 deg F	> 72 deg F		> 140.0 deg F	
Cooling Only	Exam 2	> 65.4 deg F	> 72 deg F		> 148.0 deg F	
Cooling Only	Exam 3	> 65.5 deg F	> 72 deg F		> 148.0 deg F	
	Doctor					

VAV Boxes

- Air Handlers
- Chiller Plant
- Exhaust System
- Heating Plant
- VAV Boxes

EQUIPMENT ACTIVITY

FILTER

- October 14th, 2014
 - > ZN-T Unreliable 1d 78.6
- October 13th, 2014
 - > ZN-T Unreliable 2d 79.4
- October 10th, 2014
 - > ZN-T Unreliable 5d 77.1
- October 9th, 2014
 - > ZN-T Unreliable 6d 78.0
- October 8th, 2014
 - > ZN-T Unreliable 7d 78.0
 - > ZN-SP Command Adjust 7d 74

LOAD MORE

Metasys System Capabilities:

Metasys Advanced Reporting System

The web-based reporting interface provides standard report sets to allow users to review the alarm and trend configuration of their site, run summary and detail reports to monitor alarm and event information, view offline information, combine alarm and audit information in a single report, and provide summary and detailed trend aggregations.

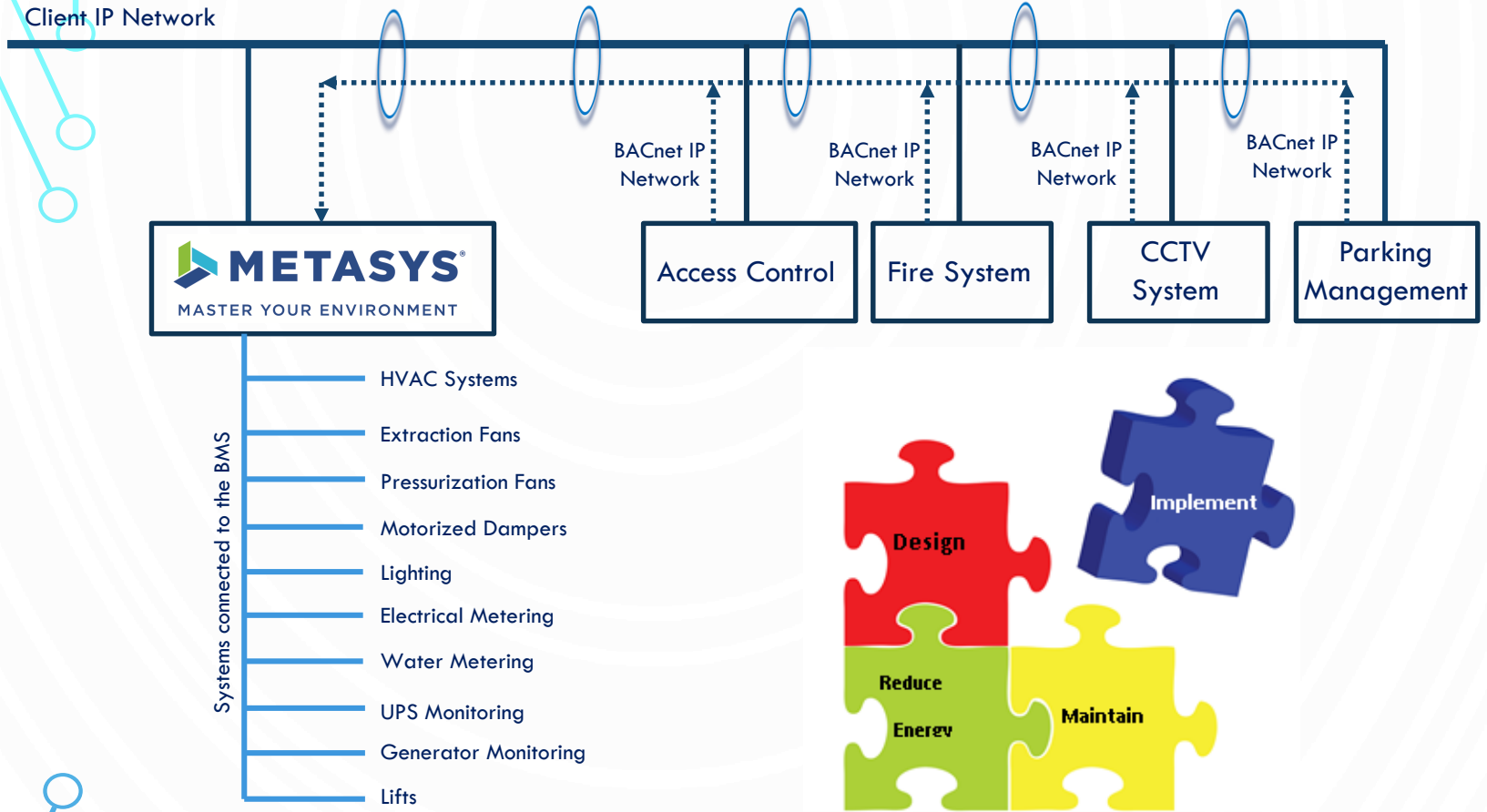
Energy Essentials

Energy Essentials is an optional software feature that can be added to the Metasys Advanced Reporting System. It offers seven types of energy reports that provide a high-level view of normalized energy use across your site, and presents your daily electrical demand graphically

The screenshot shows the Metasys software interface. The main window is titled "507 Campus" and displays the "Energy Essentials Trend Setup" configuration screen. A table lists the following data:

Object Name	Present Value	Description	Log Enable	Repository Enabled	Sample Interval	Transfer Setpoint
507-111.SF_STAT	On	SUPPLY FAN STATUS	True	True	0 seconds	9
507.4R1.SF_STAT	On	SF STATUS	True	True	0 seconds	9
507.5R1 Supply Fan Status	On	Supply Fan Status	True	True	0 seconds	130
507_102.SF_STAT	On	FAN STATUS	True	False	0 seconds	9
507_105.SF_STAT	Off	Supply Fan Status	True	False	0 seconds	9
507_121.SF_STAT	On	SUPPLY FAN STATUS	True	False	0 seconds	9
507_163.SF_STAT	On	SUPPLY FAN STATUS	True	False	0 seconds	9
507_211.SF_STAT	On	SUPPLY FAN STATUS	True	False	0 seconds	9

Typical BMS Interface Topology



Graphics Examples

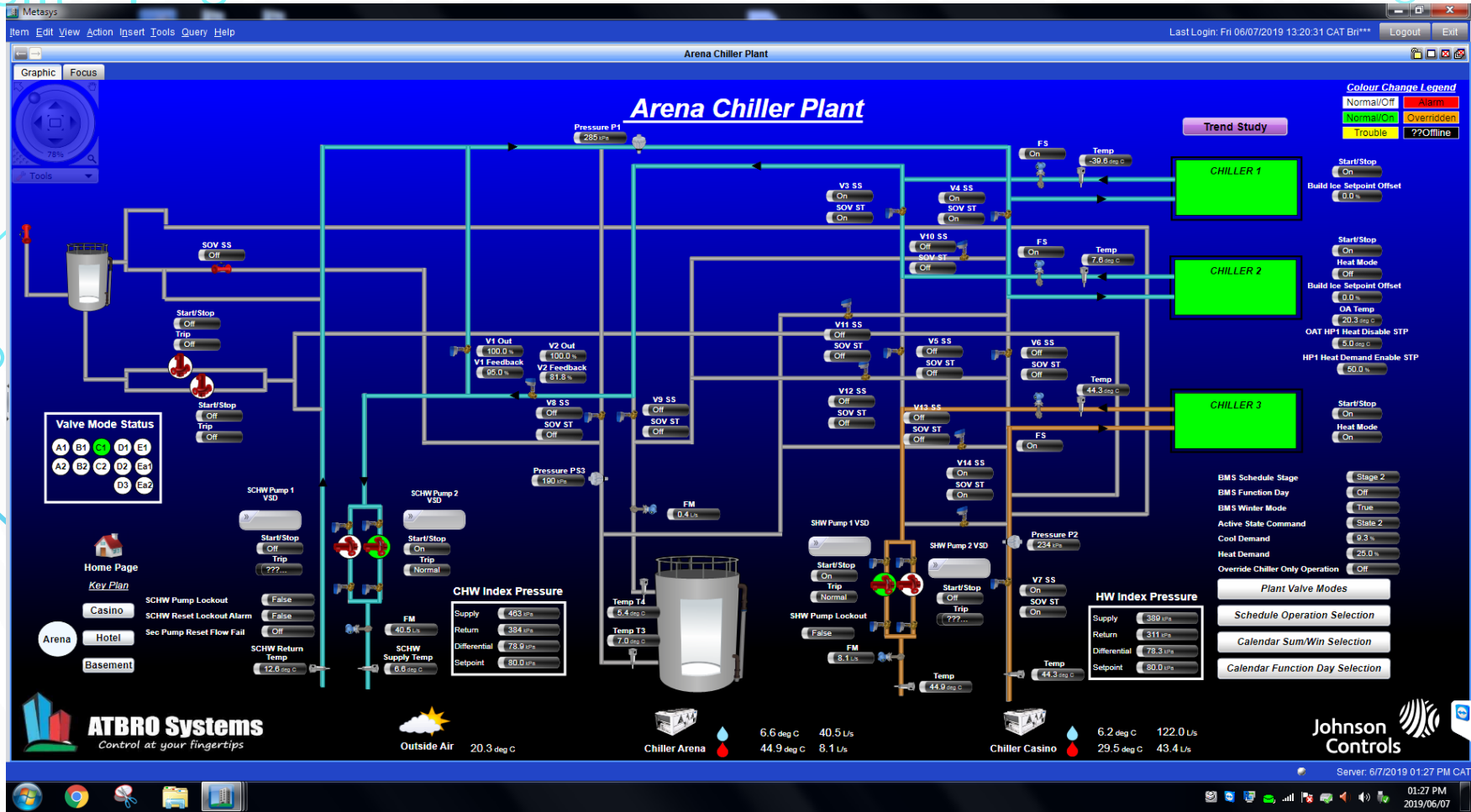
GRAPHICS

HOME PAGE
FLOOR NAVIGATION
ENERGY CENTRE

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OA Temperature
SCHW Supply Temperature
SCHW Return Temperature
Main Essential : Active Power Total
Main Non Essential : Active Power Total

Botswana
INNOVATION HUB



All Floors Navigation: Diffusers / Lights / Equipment Rooms

Colour Change Legend

Normal/Off	Alarm
Normal/On	Overload
Trouble	Offline

Navigation Panel (Left):

- HOME PAGE
- SCHEDULES
- TRENDS
- WATER
- HVAC
- FIRE
- FLOORS
- ELECTRICAL
- BMS ALARMS
- DIAMOND CLEANING PLANT

3D Model Labels:

- Roof Level
- Roof Level Equipment
- 3rd Floor Tech Sort
- 3rd Floor Level
- Diffusers
- Lighting & Equipment Rooms
- 2nd Floor Level
- Diffusers
- Lighting & Equipment Rooms
- 1st Floor Level
- Diffusers
- Lighting & Equipment Rooms
- Ground Floor Level
- Diffusers
- Lighting & Equipment Rooms
- 2nd Floor Level
- Diffusers
- Lighting
- Diamond Cleaning Plant
- Entrance Security Area

Status Panels (Bottom):

- Outside Air: Temperature (???? ????), Humidity (???? ????)
- Trans Chiller 1: CHW Leaving (???? ????), CHW Entering (???? ????)
- Trans Chiller 2: CHW Leaving (???? ????), CHW Entering (???? ????)
- Trans Chiller 3: CHW Leaving (???? ????), CHW Entering (???? ????)

Logos: ATBRO Systems (Control at your fingertips), Johnson Controls



Basement Pool Pumps: West End

Colour Change Legend
 Normal/Off Alarm
 Normal/On Override
 Trouble Offline



HOME PAGE



SCHEDULES



TRENDS



WATER



HVAC



FIRE



FLOORS



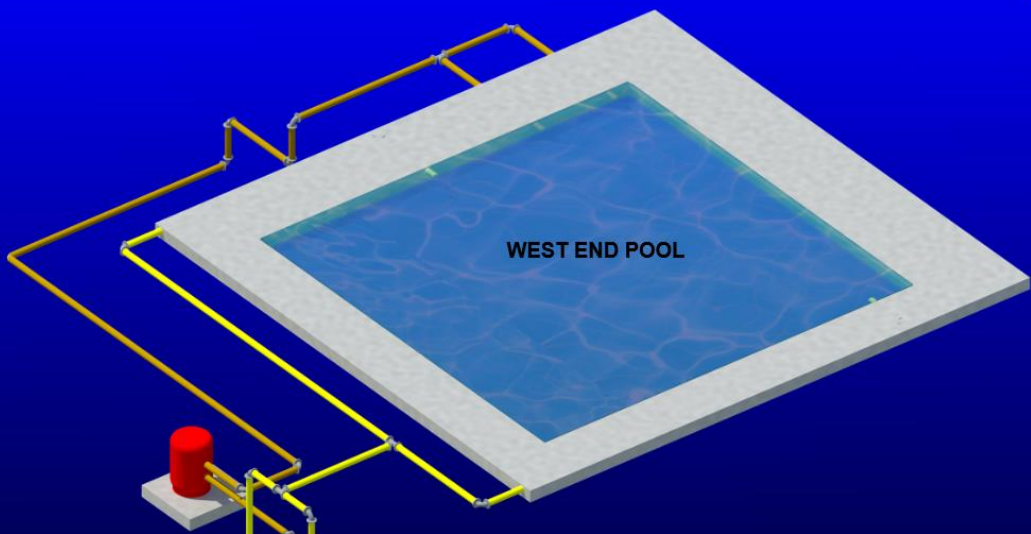
ELECTRICAL



SMS ALARMS



DIAMOND CLEANING PLANT



PUMP 28 RUN	???? ???? 	PUMP 27 RUN	???? ????
PUMP 28 TRIP	???? ???? 	PUMP 27 TRIP	???? ????
PUMP 28 FILTER	???? ???? 	PUMP 27 FILTER	???? ????

Outside Air
 Temperature
 ???? ????
 Humidity
 ???? ????

Trane Chiller 1
 CHW Leaving
 ???? ????
 CHW Entering
 ???? ????

Trane Chiller 2
 CHW Leaving
 ???? ????
 CHW Entering
 ???? ????

Trane Chiller 3
 CHW Leaving
 ???? ????
 CHW Entering
 ???? ????



Help JP Logout Exit

Indoor Dam & Domestic Water

Graphic Focus

Ticketpro Dome : Indoor Dam & Domestic Water

Colour Change Legend
 Normal/Off (Red)
 Normal/On (Green)
 Trouble (Yellow)
 Offline (Black)

General Alarm Alarm

Indoor Dam Pump Enable Off

Domestic Water

Level 3: Normal

Level 2: Normal

Level 1: Normal

Pump A: Off

Pump B: Off

Indoor Dam

Main Pump 1 Status: On

Main Pump 2 Status: Off

Sec Pump 1 Status: Off

Sec Pump 2 Status: Off

High Level Status: On

Low Level Status: Off

HOME PAGE

SCHEDULES

TRENDS

BVAC

ELECTRICAL

LIGHTING

DOOR MONITORING

FIRE DETECTION

WATER

EXHAUST FANS

Evac Alarm: Inactive

Maximum Demand: 410.5 kVA

Server Room Temp: 20.1 deg C

Fire Alarm: Inactive

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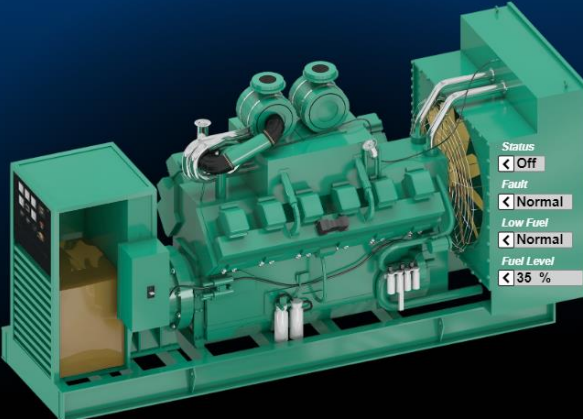
Spaces Network **Generators** met™

ATBRO Systems > Demo_Building > Electrical Page 1

Demographic: Demo Building, Typical Floor, HVAC Plant, **Electrical**, Server Room


Generators

Generator #1




- Status Off
- Fault Normal
- Low Fuel Normal
- Fuel Level 35 %


Generator #2




- Status On
- Fault Normal
- Low Fuel On
- Fuel Level 35 %




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Ambient
17.9 deg C




Normal Power
On
Earth Leakage
On




Generator Power
Off



Water Pressure
146 kPa
Low Tank Level
Normal



Alarm System
Normal



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Spaces Network HT/LT

ATBRO Systems Demo Building > Electrical Page 1

HT/LT

HT/LT

Phase 1

- 228.1 V
- 12.7 A
- 2,655.0 W

Phase 2

- 225.2 V
- 14.9 A
- 3,103.2 W

Phase 3

- 226.7 V
- 14.0 A
- 3,002.3 W

Fan Status

- Flow

Trip Status

- Normal

METASYS

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ATBRO Systems
Control at your fingertips

Ambient 17.9 deg C

Normal Power On
Earth Leakage Off

Generator Power Off

Water Pressure 140 kPa
Low Tank Level Normal

Alarm System Normal

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Spaces Network Water Management

ATBRO Systems ATBRO Systems > Services Press F11 to exit full screen Page 1

Services

- CCTV
- Electricity
- VRF Systems
- Water Management**

Zoom: 100%

Domestic Water

The diagram illustrates a domestic water supply system. A central green cylindrical tank is labeled "Water Supply Selection Backup Tank". It is connected to a network of blue pipes. Key components include:

- Mains Pressure:** 126 kPa
- Solenoid #1:** Open
- Solenoid #2:** Close
- High Level:** Off
- Low Level Alarm:** Normal
- Water Pressure:** 126 kPa
- Low Tank Level:** Normal
- Generator Power:** Off
- Normal Power:** On
- Earth Leakage:** On
- Alarm System:** Normal

 Other labeled parts include a Manual Valve, Meter, and Non-Return Valve. The interface includes a search icon, a user profile icon labeled "met***", and a "Page 1" indicator. A status bar at the bottom of the graphics area contains various system icons and their current states.

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