

Facility AnalytiX™

Product Brief for V10.6

July 2011



Predictive Software for Facilities Management

Corporations and Government entities today demand that their facility portfolios are managed with ever tightening goals for both cost efficiency and environmental impact. The ability to integrate information from all building equipment, environmental sensors, occupancy tracking and energy metering, and to visualize it in a meaningful manner is critical to achieving operational goals.



Facility AnalytiX Dashboard for the Water Industry

Facility AnalytiX™ is a predictive building automation solution that uses an advanced Fault Detection and Diagnostics (FDD) Engine. It incorporates algorithms that weigh the probability of faults and advise management, operators and maintenance personnel of actions to prevent equipment failures or excessive use of energy. When equipment failures occur, advanced software technology provides automatic guidance to a list of causes sorted by probability, resulting in reduced downtime and lower costs to diagnose and repair. Information obtained from Facility AnalytiX can be used to:

- Predict, reduce and eliminate equipment downtime
- Automate fault detection and deliver real-time notifications
- Reduce maintenance and determine probable causes
- Improve reliability and control
- Improve overall environmental quality
- Be notified “anywhere, anytime and on any platform”

Features and Benefits

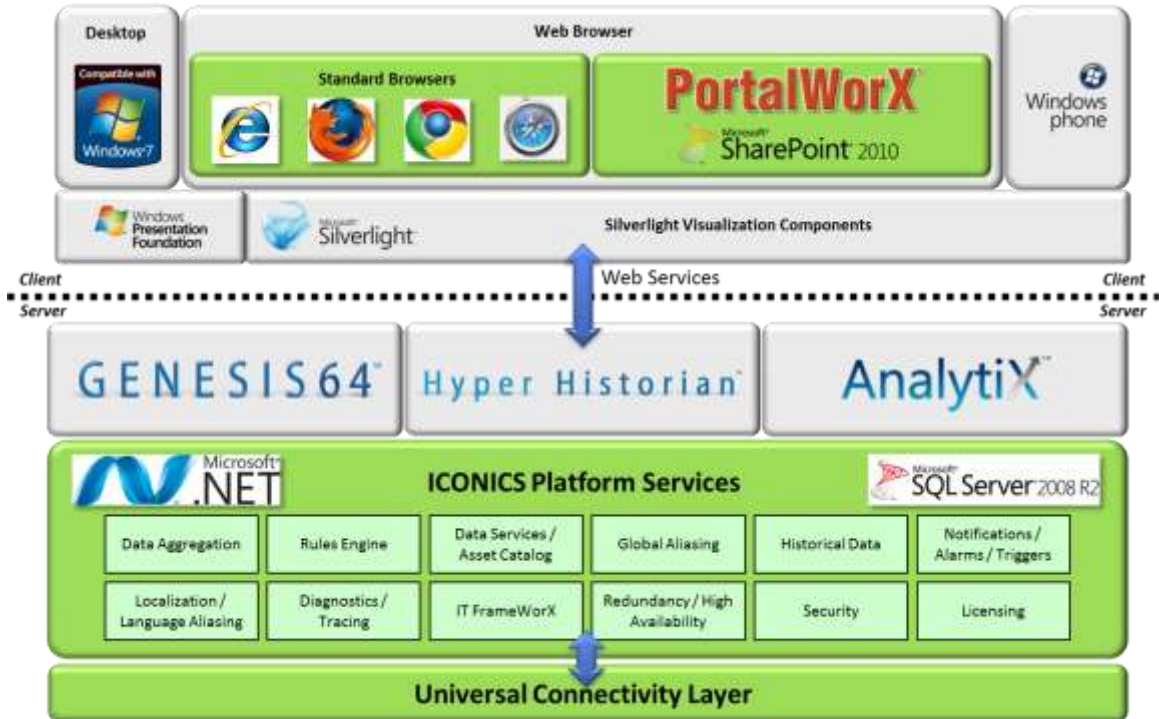
The goal of Facility AnalytiX is to detect and diagnose faults for various types of building and manufacturing equipment. The Facility AnalytiX service uses powerful Fault Detection and Diagnostics algorithms for determining probable causes when abnormal conditions are detected on monitored equipment. The following is a list of high-level features and benefits of Facility AnalytiX:



Feature	Benefit
Automatic Fault Detection and Real-time Notifications	Enables users to predict, reduce and eliminate equipment downtime.
Universal Connectivity	Universal Connectivity includes integrated OPC, OPC UA, BACnet, SNMP, Modbus, Databases, Web Services and many more, enabling immediate collection of data.
Robust and Scalable	Built on top of the powerful ICONICS Platform Services, the system is proven to collect data from just a few assets, to multi-campus or multi-site deployments.
Quick to Deploy	Faster ROI leads to more immediate realization of maintenance savings achieved through the insight provided by Facility AnalytiX.
Highly Configurable Visualization Interface with Drill-down Charts and Grids	Insightful analysis results in reduced maintenance time by determining probable causes, and allows users to drill down into the root cause of equipment faults.
Standard Fault Diagnostic Models for Popular Building Equipment	Speeds time to deployment by allowing users to leverage pre-defined models and templates.
Preconfigured Fault Reports	Reports delivered on a schedule, on demand or on event help to pinpoint efficiency offenders.
Be Notified Anywhere, Any Time and on Any Platform	Information can be delivered to the desktop, to any browser, be built into Microsoft SharePoint® collaboration portals, or to the Windows Phone 7.

Facility AnalytiX Solution Architecture

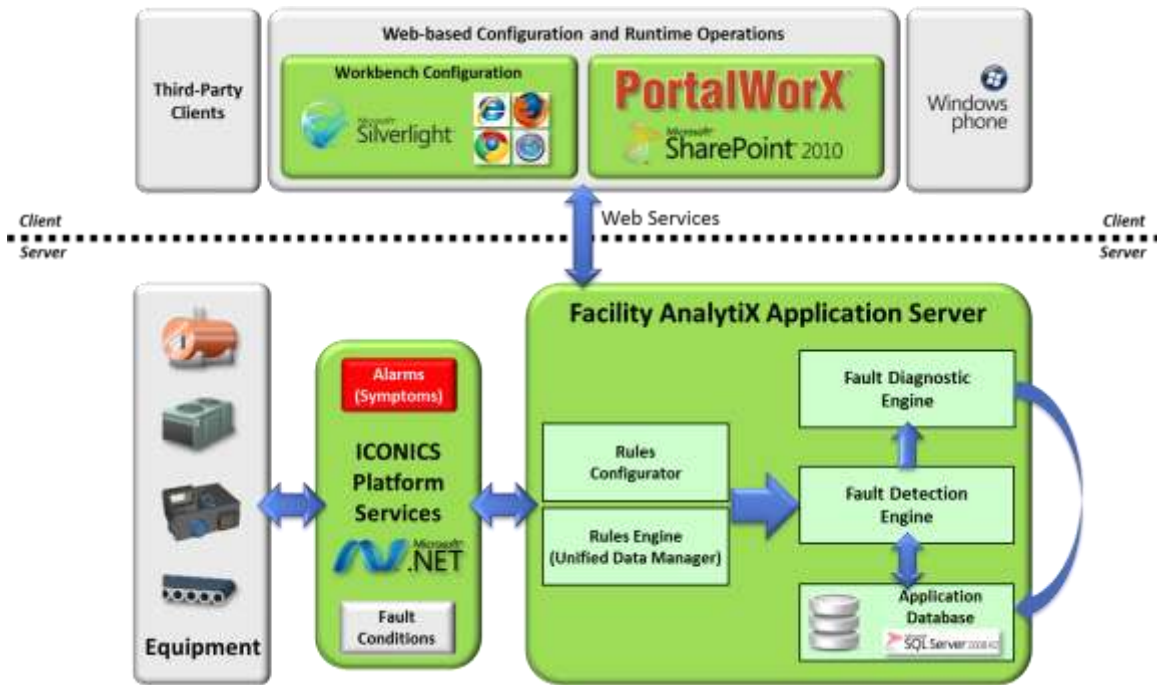
Facility AnalytiX is part of the AnalytiX suite of operational excellence solutions from ICONICS, built on top of the powerful Platform Services and fits into the overall ICONICS V10 system architecture as shown in the diagram below:



ICONICS V10 System Architecture

Facility AnalytiX monitors the system for faults and uses its advanced Fault Diagnostic Engine to determine and suggest the most likely causes for each fault to the user. The Fault Diagnostic Engine populates the Facility AnalytiX application database tables with information about each fault along with its probable causes and some relevant metadata for querying purposes.

The Facility AnalytiX solution architecture (shown below) is broken up into several different key areas: the Silverlight Workbench configuration provider, which allows users to configure assets, faults and diagnostic models, and includes a comprehensive Rules configurator for faults, Silverlight Runtime Views via PortalWorX, Application Database, Fault Detection Engine, Fault Diagnostic Engine, and a comprehensive web services framework that connects it all together.



Facility AnalytiX Solution Architecture

Facility AnalytiX uses a Microsoft SQL Server database engine as its configuration and runtime data storage repository. When the Facility AnalytiX engine detects a fault, it analyzes the active symptoms from the relevant Diagnostic Model in order to determine the most likely cause for that fault. This is a new and unique approach to Fault Detection and Diagnostics that relieves the end user from the complicated task of tracking the active symptoms and guessing at the most likely cause based on knowledge alone, or calculating complex probabilities by hand.

Information can then be retrieved by asset or by fault, and distributed over time: hourly, daily, weekly, monthly or annually summarized data. As a result, users can quickly leverage highly sophisticated data queries and reports with ease to visualize fault information using the Facility AnalytiX Viewer or any open database compatible client.

Fault diagnostics information is available to clients such as ReportWorX™, PortalWorX™, GraphWorX64™, MobileHMI™, and third-party systems. Information can be accessed either via open database connectivity methods or WCF-enabled RIA web services methods, and of course via the rich visualization tools provided out of the box as part of Facility AnalytiX.

Fault Detection and Diagnostics Solution for Any Industry

Any manufacturing plant, building or facility interested in analyzing its equipment for faults and diagnosing probable causes is a great fit for Facility AnalytiX. It is the ideal solution for reducing downtime, preventing equipment failure, and notifying users when corrective action should be taken. Facility AnalytiX simply plugs into your existing network and easily connects up to equipment as desired. It is best suited for corporations that are looking to reduce equipment downtime and reduce overall operational costs, and is most-commonly used for the industries of facilities management, utilities, large industrial plants, manufacturing plants and multi-site industries such as retail. Below are some examples of the industries that can benefit from Facility AnalytiX:

- Building Controls and HVAC
- Air Conditioning and Lighting
- Wind Turbine and Wind Parks
- Utilities and City Heating Stations
- Solar Facilities
- Geo Thermal and Bio Gas Power
- Water and Wastewater
- Heating and Cooling
- Oil and Gas
- Conveying and Packaging
- Pharmaceutical
- Heavy Industry



Automatic Fault Detection and Diagnostics Engine

In modern automation and in most control systems in general, a great deal of attention is devoted to the problem of Fault Detection and Diagnostics. One part of FDD methodology deals with the ability of a control system to detect and report (or, in some cases, predict) equipment failures or abnormal operating conditions while another part focuses on problem analysis and failure cause diagnostics.

The concept of fault detection usually falls under the area of Alarms and Events management. OPC Alarms and Events specifications define how OPC A&E-enabled servers generate events to notify operators about various occurrences in the system. ICONICS' AlarmWorX32 and AlarmWorX64 Alarm Servers are both fully OPC A&E-compliant event servers. Facility AnalytiX leverages the OPC A&E standard to make sense of complex alarm systems in order to guide operators to a list of causes sorted by probability.

Drag a column header and drop it here to group by that column			
Photo	Name	Date/Time	Fault
	Inlet Water Pump	3/15/2011 12:00:00 AM	Pump Low Pressure Output
	Inlet Water Pump	3/15/2011 12:10:00 AM	Pump Overheating

Causes	
Drag a column header and drop it here to group by that column	
Probability	Possible Causes
60	Discharge Blocked - Valve Fault
50	Motor Fault - Loss of Power
50	Sediment Overload in Pump Housing

Facility AnalytiX Viewer showing causes sorted by probability

Facility AnalytiX' FDD technology addresses the need for a set of tools to perform fault analysis and diagnostics, with a goal to determine a root cause or a limited set of possible reasons that lead to the appearance of specific faults. Both ideal simulation and historical pattern search approaches to fault diagnostics require very specific detailed knowledge of the equipment types being diagnosed.

Facility AnalytiX algorithms are based on advanced research standardized by the National Institute of Standards and Technology (NIST). Traditionally, ICONICS' SCADA applications were developed to target the most generic types of devices without regards to specific details about particular pieces of equipment like boilers, air handler units, VAV boxes, etc. This alarm pattern recognition technique allows formal generalizations to be applied to any equipment type to create a powerful solution.

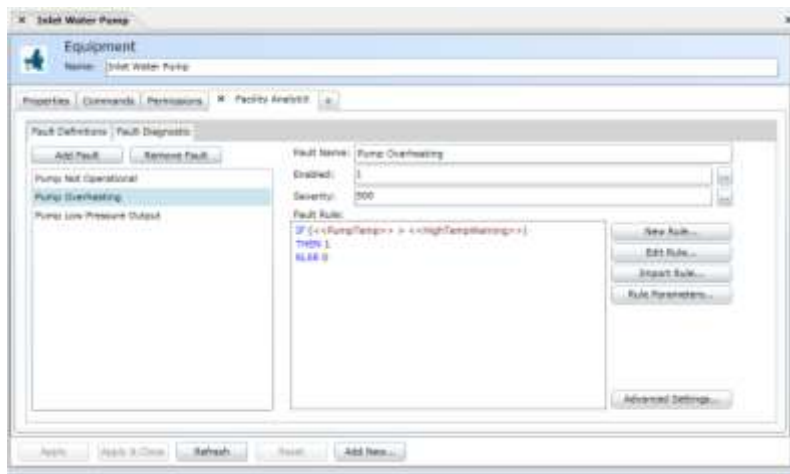
What is a Fault?

Within the context of Facility AnalytiX, a fault is a rule or expression based on time, change of state, and a combination of any parameters related to a particular piece of equipment, that quantifies when that equipment is not operating to specification. For example, if you have an air conditioner or chiller that is supposed to be able to cool a room by 1 degree every 5 minutes, it could be considered in a "faulted" state if after 30 minutes it has only cooled the room by 2 degrees. The chiller in this case is not necessarily broken, but there is something preventing it from operating at ideal efficiency. That can be quantified as a "fault".

Faults allow users to be notified when such conditions occur, in order to more quickly diagnose and correct potential issues with their equipment and machinery. Faults can be applied to

virtually ANY type of equipment or machinery, including packaging machines, extruders, wind turbines, robots, and many more. Facility AnalytiX' Fault Diagnostic Engine detects when a fault is active and references the relevant diagnostic model along with advanced algorithms to weigh the probable causes of that fault based on the specific symptoms that are present on the equipment at that time. Possible causes are then presented to the user in an intuitive tabular format, in the order of most likely to least likely causes.

Faults are defined within the Silverlight Workbench using the powerful ICONICS Rules Editor, with full equation parsing and syntax checking. The Rules Editor integrates with ICONICS' Expression Engine to offer a wide variety of functions in different categories including arithmetic, relational, logical, bitwise, string and date/time, allowing for ultimate flexibility in defining faults.



Defining Faults in the Silverlight Workbench

The table below offers some examples of the types of faults that Facility AnalytiX is capable of detecting for standard building automation equipment:

Equipment Faults

Air Handling Unit	<ul style="list-style-type: none"> • Too many mode switches per hour • Outside air enthalpy too low for mechanical cooling
Boiler	<ul style="list-style-type: none"> • Boiler is running when it should be shut down • Hot water pump not synchronized properly with boiler • Boiler cycling on/off too frequently • Hot water supply temp too low/high
Chiller	<ul style="list-style-type: none"> • Compressor cycling on/off too frequently • Water pumps not interlocked properly • Compressor and condenser fans not interlocked properly
Cooling Tower	<ul style="list-style-type: none"> • Fans cycling too frequently • Poor fan temperature control • Small range causing issue with heat rejection • Fans and condenser pumps not interlocked properly

VAV

- Maximum air flow (CFM) is greater/less than than setpoint value, when setpoint has not been changed for X minutes
- CFM is outside 10% threshold of setpoint value while in heating mode
- Room temperature is not within X% of setpoint, when setpoint has not been changed for X minutes
- Room temperature is higher/lower than cooling/heating setpoint

Create Your Own...

- Facility AnalytiX' flexible framework empowers you to add your own equipment faults and diagnostic models as they relate to your particular industry or application.

Diagnostic Models Drive Advanced Algorithms for Fault Analysis

Diagnostic Models are used to determine the most likely causes for a fault under given conditions. They consist of symptoms and causes, which are laid out in a tabular matrix format so that users may adjust how they relate to one another. The numbers within the matrix affect the weighting that Facility AnalytiX assigns to the various causes, and can correspond to probabilities from equipment manufacturers' users manuals or specifications for example. Some users may elect to fine-tune probabilities based on specific knowledge captured from maintenance technicians.

A symptom is any state of condition related to specific equipment that the user/manager would consider cause for concern or "alarm". A cause is a reason for a resulting symptom that would create concern or "alarm". Causes and symptoms vary greatly by equipment type, which is why Diagnostic Models are typically defined on a per equipment type basis. A number of Diagnostic Models are included with Facility AnalytiX, but users are of course free to create their own models as desired.

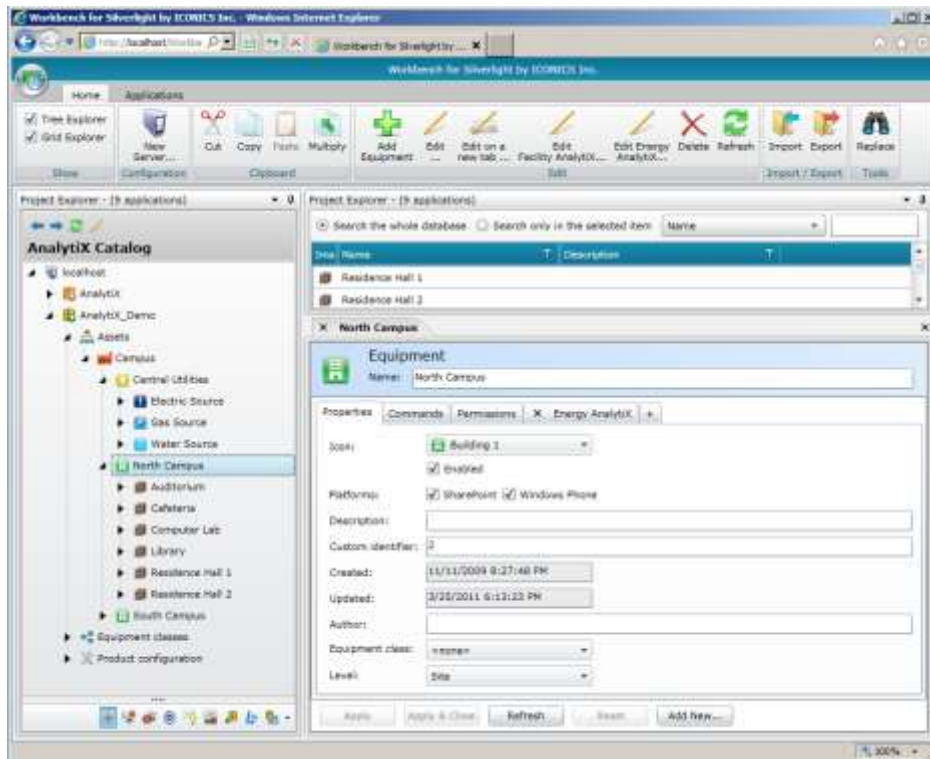
Diagnostic Symptoms	High airflow alarm	High discharge temperature alarm	High zone temperature alarm	Low airflow alarm	Low discharge temperature alarm	Low zone temperature alarm
Zone temperature sensor drift/failure	0 (0%)	0 (0%)	1 (9%)	0 (0%)	0 (0%)	1 (9%)
Airflow (DP) sensor drift/failure	1 (17%)	0 (0%)	0 (0%)	1 (11%)	0 (0%)	0 (0%)
Discharge temperature sensor drift/failure	0 (0%)	1 (33%)	0 (0%)	0 (0%)	1 (33%)	0 (0%)
Damper stuck or failed	1 (17%)	0 (0%)	0 (0%)	1 (11%)	0 (0%)	0 (0%)
Damper actuator stuck or failed	1 (17%)	0 (0%)	0 (0%)	1 (11%)	0 (0%)	0 (0%)
Reheat coil valve stuck or failed	0 (0%)	1 (33%)	1 (9%)	0 (0%)	1 (33%)	1 (9%)
Reheat coil valve actuator stuck or failed	0 (0%)	1 (33%)	1 (9%)	0 (0%)	1 (33%)	1 (9%)
AHU Supply air too warm	0 (0%)	0 (0%)	1 (9%)	0 (0%)	0 (0%)	1 (9%)
AHU Supply air too cool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Sample Diagnostic Model for VAV

Web-based Configuration within the Silverlight Workbench

Facility AnalytiX is built on top of the powerful AnalytiX Catalog in the Silverlight Workbench. This allows users to configure Facility AnalytiX Assets right within an ISA-95 compliant hierarchical tree structure that mimics the layout of their plant, building, campus or enterprise.

With Web-based configuration, Facility AnalytiX is easy to setup and deploy, integrating with the most popular BAS, SCADA and building systems. An extensive library of standard HVAC equipment diagnostic models speed setup and configuration, while a rules based editor lets you easily customize and add new equipment diagnostic models.



AnalytiX Catalog Workbench Silverlight Configuration Environment

The AnalytiX Catalog is a centralized repository for integrating business and manufacturing intelligence systems in the Silverlight Workbench. It provides a tree structure in which you can build your enterprise in the form of physical locations and business units, and organize equipment such as buildings and machinery in one centralized system for analysis by the ICONICS AnalytiX suite of products. The ISA-95 compliant tree structure provides a functional hierarchy for navigation and for data roll-ups. Physical devices along with logical areas of responsibility can be identified in the hierarchy. The asset tree provides a way to organize data sources (OPC, database, Web services) and physical entities in a logical hierarchical structure. For example, rather than OPC data sources being organized based on the address space of the server itself, these data sources can be organized based on the geographic/physical locations of the associated sensors (for example, by site, building, floor, and machine).

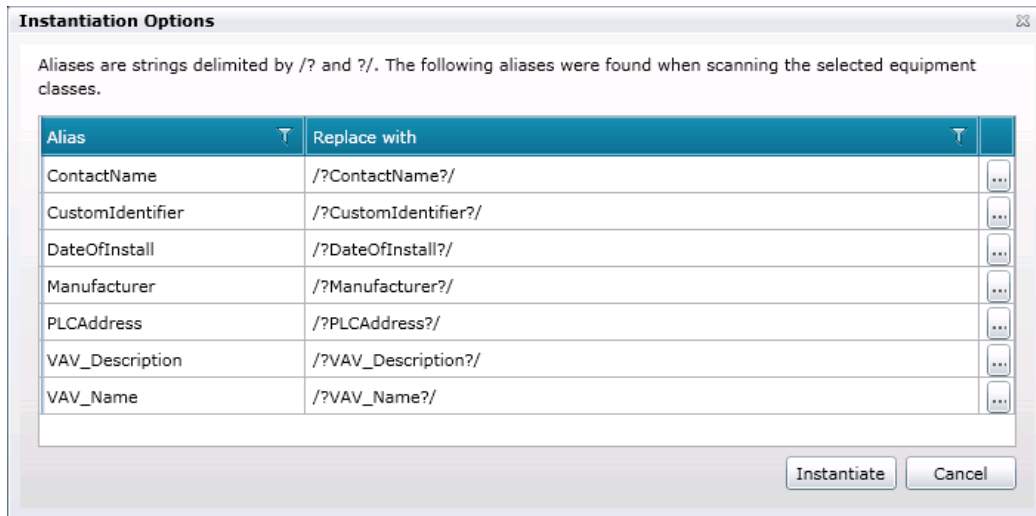
Facility AnalytiX integrates with the AnalytiX Catalog and Silverlight Workbench for defining assets, faults, diagnostic models, relationships between those assets, security on those assets, and a powerful command infrastructure for rich visualization in the runtime environment.

Equipment Classes: The AnalytiX Catalog also introduces a time-saving concept called Equipment Classes, which allow you to “template” any asset or equipment type for rapid deployment. Facility AnalytiX users can define equipment classes for different types of equipment for example, which might include boilers, chillers, air handling units, cooling towers, or VAVs from a variety of different manufacturers. Users can also template machines, meters, or even entire buildings or campuses for rapid deployment.

The screenshot shows a web-based configuration interface for an 'Equipment class'. The window title is '/?VAV_Name?/'. The main heading is 'Equipment class'. Below this is a 'Name' field containing '/?VAV_Name?/'. There are five tabs: 'Properties', 'Commands', 'Permissions', 'Facility AnalytiX', and '+'. The 'Properties' tab is selected. The 'Properties' section includes: 'Icon' (a dropdown menu with 'VAV' selected), 'Enabled' (a checked checkbox), 'Platforms' (checkboxes for 'SharePoint' and 'Windows Phone', both checked), 'Description' (a text area with placeholder text: '/?VAV_Description?/ /?DateOfInstall?/ /?PLCAddress?/'), 'Custom identifier' (a text area with placeholder text: '/?Manufacturer?/ /?CustomIdentifier?/'), 'Created' (a date/time field showing '6/14/2011 10:01:02 PM'), 'Updated' (a date/time field showing '6/15/2011 3:50:12 PM'), 'Author' (a text area with placeholder text: '/?ContactName?/'), 'Derived from' (a dropdown menu with '<none>' selected), and 'Level' (a dropdown menu with '<none>' selected). At the bottom of the window are five buttons: 'Apply', 'Apply & Close', 'Refresh', 'Reset', and 'Add New...'.

Configuring a VAV Equipment Class in the AnalytiX Catalog

When instantiating an Equipment Class the user is presented with a list of parameters that the Equipment Class expects. For a Building-level template this might include pieces of information like Building Owner, Construction Year, Floor Space, and so on. For an equipment-level template it might include properties like Manufacturer, Description, Contact Name, Date of Install, and PLC address. This powerful concept of parameterization is what provides for such flexibility in Facility AnalytiX data analysis capabilities, and enables users to analyze their information from a virtually unlimited number of angles.



AnalytiX Catalog Instantiation of a VAV Equipment Class

Context-sensitive Commands to Quickly Navigate Your Enterprise

The same powerful AnalytiX Catalog that you build in configuration mode also drives much of the rich visualization for Facility AnalytiX on the runtime side. This is achieved using a flexible “Command” infrastructure to send information, displays, alarm views, reports, and much more from the AnalytiX Catalog tree to a desired destination web part. Commands can be made available at any level of your ISA-95 hierarchy and support the concept of inheritance as well to simplify configuration. The following Commands are presently supported:

Commands

Load Facility AnalytiX Data	Sends a new configuration to the Facility AnalytiX Viewer Web Part to visualize faults and probable cause information. Requires a connection to a Facility AnalytiX Viewer Web Part.
Load Energy AnalytiX Data	Sends a new configuration to the Energy AnalytiX Viewer Web Part to visualize energy cost, consumption or carbon information. Requires a connection to an Energy AnalytiX Viewer Web Part.
Load Display	Loads a GraphWorX64 Silverlight display and allows to optionally pass Global Aliases or Local Aliases to the display. Requires a connection to a GraphWorX64 Viewer Web Part.
Load Trend Display	Loads a TrendWorX64 Silverlight trend and allows to optionally pass Global Aliases to the trend. Requires a connection to a TrendWorX64 Viewer Web Part.
Load Alarm Display	Loads an AlarmWorX64 Silverlight alarm grid and allows to optionally pass Global Aliases to the viewer. Requires a connection to an AlarmWorX64 Viewer Web Part.
Set Global Aliases	Sets Global Alias themes to quickly change context.
Write Value	Writes any value to any data point accessible on the ICONICS application server network.
Open URL	Opens any URL in a new or specified target window.
Run Report	Executes a report directly from the Navigator using predefined parameter values. Once completed, use the Report Browser Web Part to view the report.

Load Report	Loads a report with predefined parameter values in the Report Executor Web Part. Users can make changes to parameter values before executing the report. Requires a connection to a Report Executor Web Part.
Load Executed Reports	Loads the contents of the specified ReportWorX folder in a Report Browser Web Part. Requires a connection to a Report Browser Web Part.
Run Transaction	Executes a BridgeWorX transaction to perform a desired workflow directly from the Navigator.
Make Phone Call	Makes an outgoing phone call from your mobile device to the specified phone number. Requires MobileHMI on a Windows Phone 7 device.
Send SMS	Sends an SMS message from your mobile device to the specified destination. Requires MobileHMI on a Windows Phone 7 device.
Send E-Mail	Sends an E-Mail message from your mobile device to the specified destination. Requires MobileHMI on a Windows Phone 7 device.

Connect to Virtually Any Building or Factory Infrastructure

ICONICS software provides the ability to integrate information from a broad range of equipment and systems used throughout your buildings today. ICONICS' continued integration of open communications standards extends your options for equipment suppliers now and in the future.

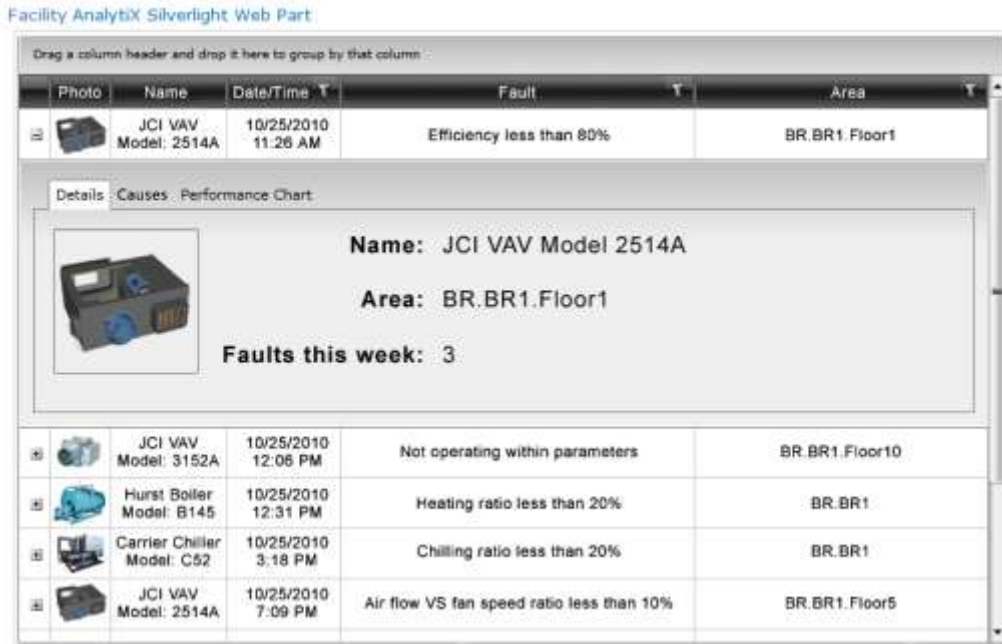
Facility AnalytiX provides the infrastructure you need to diagnose and analyze your equipment. It aggregates and calculates derivations and provides very intuitive point-and-click roll up. With Facility AnalytiX you literally just “Plug-Us-On” and instantly integrate to almost any equipment that is already networked in a facility. In many cases no construction is necessary if sensors are already in place.



ICONICS Platform Services – Universal Connectivity Layer

Powerful Visualization Dashboards Guide Corrective Actions

Facility AnalytiX offers predictive software for equipment diagnostics by automatically guiding operators and maintenance personnel to the probable causes of equipment inefficiencies, with powerful visualization capability. Configure side-by-side comparison charts with ease to quickly and visually pinpoint trends on similar types of equipment, comparably sized facility spaces, varying equipment operational states, and a wide variety of other parameters so that you can easily identify the abnormalities.



Facility AnalytiX Viewer Web Part

It is easy to configure runtime views, charts, and reports. Users simply point to their desired calculations or queries for their desired asset or level, and then configure the look and feel, layout, and style of the chart or grid component from there, choosing from a number of predefined options. Stay informed from anywhere, at any time, any place!

Facility AnalytiX leverages ICONICS PortalWorX for its visualization, built on top of the powerful Microsoft SharePoint 2010 platform. Within this framework, Facility AnalytiX data is just one of the valuable pieces of information that can be integrated into your role-based portals and dashboards. PortalWorX offers a wide variety of Silverlight web parts to integrate your ICONICS application data alongside other third-party information in a single, unified view. The key Facility AnalytiX web parts are summarized below, but for more information on ICONICS PortalWorX, please download the PortalWorX Product Brief from the ICONICS website at www.iconsics.com.

Facility AnalytiX Viewer

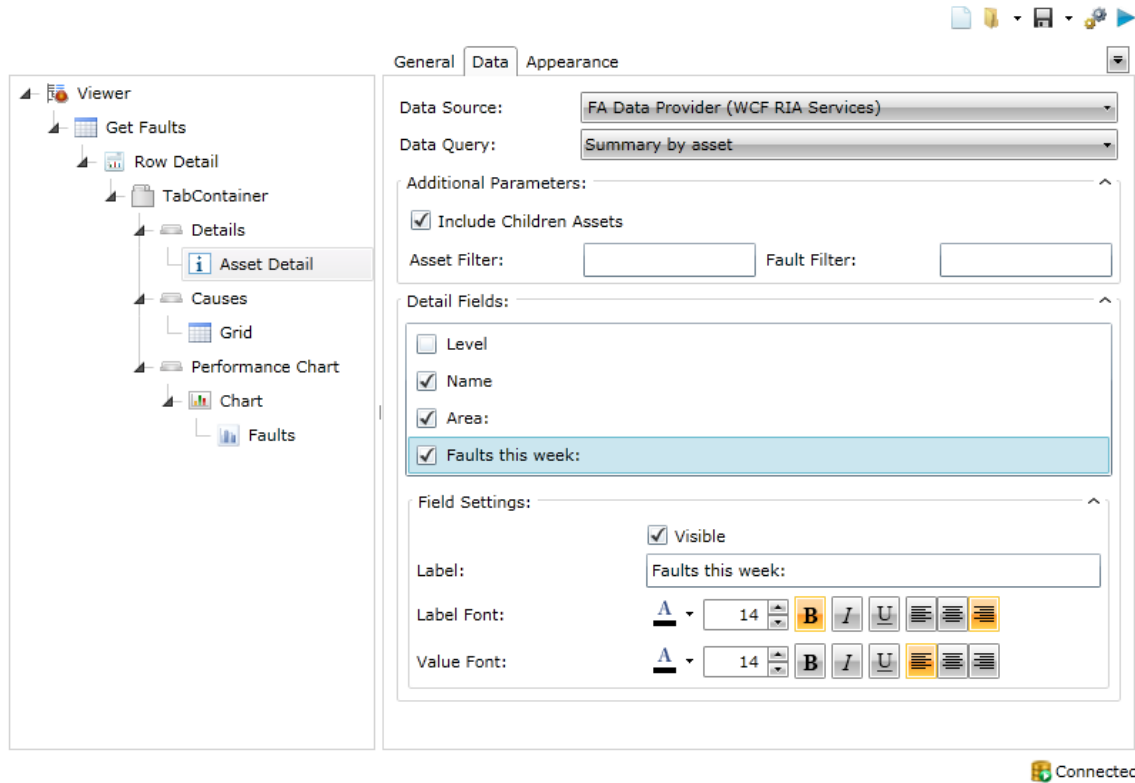
The Facility AnalytiX Viewer Web Part is an extremely flexible Silverlight component that allows users to build intuitive fault detection and diagnostics dashboards through a point-and-click interface. Configuration is simple yet powerful and supports a wide variety of chart types, layouts, grids and options. Users have the option to specify a default overview configuration that should be loaded whenever they visit their role-based Facility AnalytiX dashboard, but it is easy to switch between various charts and grids using the powerful Navigator Web Part based on the AnalytiX Catalog.

Drill down into equipment faults to uncover savings opportunities and optimizations. Charts support both vertical (asset-based) and horizontal (query-based) drill-down to enhance the ease with which users can identify areas of inefficiency. Visualize faults in a grid format or in a wide variety of chart types for enhanced analysis, and compare current data to historical data to gauge improvement over time.



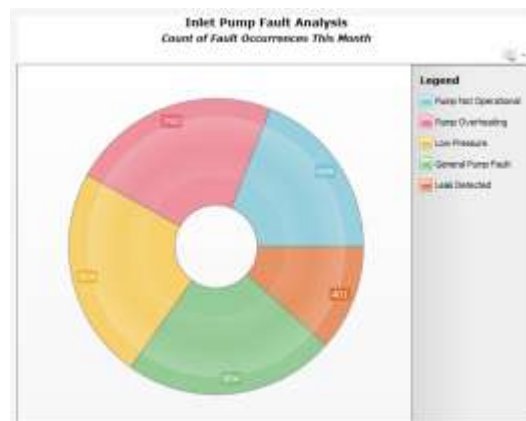
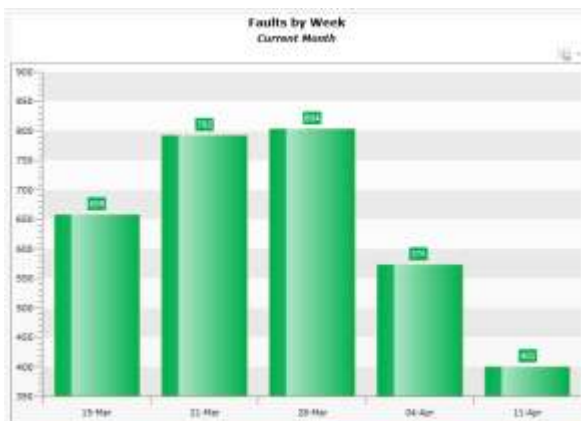
Facility AnalytiX Viewer Examples

Configuring the Facility AnalytiX Viewer is easy. Simply point-and-click to add charts, grids, panels, tab controls, and other details to the configuration, in order to compose a rich visualization control with information that is laid out in an intuitive fashion. Each visual item can be mapped to a query or calculation from Facility AnalytiX in order to expose faults, probable causes, or any other information collected by the system.



Facility AnalytiX Viewer Web Part in Configuration Mode

Here are just a couple of additional examples of the types of powerful charts that can be built using the Facility AnalytiX Viewer:



The following specification table lists the features and visual elements supported by the Facility AnalytiX Viewer:

Facility AnalytiX Viewer Specifications

General	
Supported Visual Elements	Chart, Grid, Tab Container, Panel, Detail Panel
Layout Options	Horizontal, Vertical, Embedded within other elements (Charts within Panels, Grids within Tabs, etc.)
Global Configuration Settings	Title, Created By, Created Date, Modified By, Last Modified Date, Description, Default flag (specifies which configuration should be loaded by default)
Toolbar Options	New, Load from File, Load from Database, Save to File, Save to Database, Viewer Settings, Configuration/Runtime mode switch
Time Range Options	
Now	Data initializes with the current time as the Start or End Time
Inherited	Start and/or End Time is inherited from the parent level
Relative to Start/End	Applies an offset (forward or backward) to or from the Start or End Time in Hours, Days, Months, or Years
Preset	First Day Current Week, First Day Last Week, First Day Current Month, First Day Last Month, Last Day Current Week, Last Day Last Week, Last Day Current Month, Last Day Last Month
Custom (Fixed)	Specify a fixed time to be used by default
Offset	All times above support an optional offset (forward or backward) in Hours, Days, Months, or Years
Auto Update	Automatically updates the chart/grid at the specified interval
Asset Selection	
Inherited	Inherit Asset information from parent or override at any level
Child of Inherited Asset	Show data for one of the children of the inherited asset. Allows to specify an index corresponding to which child should be shown by default (1 st , 2 nd , 3 rd , etc.)
Specific Asset	Show data for a specific asset from the AnalytiX Catalog
Child of Specific Asset	Show data for one of the children of a specific asset. Allows to specify an index corresponding to which child should be shown by default (1 st , 2 nd , 3 rd , etc.)
Show Runtime Panel option	Shows current asset selection in runtime and allows to switch dynamically between assets
Charts	
Linear Chart Types	Line, Stacked Line, Spline, Stacked Spline, Area, Stacked Area, 100% Stacked Area, Spline Area, Stacked Spline Area, 100% Stacked Spline Area, Step Line Area, Range, Spline Range, Stick, Candle
Column Chart Types	Bar, Stacked Bar, 100% Stacked Bar
Scatter Chart Types	Scatter, Bubble
Radial Chart Types	Pie, Doughnut
Horizontal Chart Types	Bar, Stacked Bar, 100% Stacked Bar
Drill-down Support	Asset-based (Vertical) or Custom (Horizontal)
Chart Appearance Options	
Legend	Visibility, Position, Item Orientation, Item Markers
Data Sampling	Function (Average, First, Last, Max, Min, Sum, Keep Extremes), Threshold

X-Axis	Visibility, Title, Show Labels, Label Format, Layout Mode, Step, Label Step, Label Rotation, Ticks Distance, Step Label Level Count, Step Label Level Height
Y-Axis	Visibility, Title, Show Labels, Label Format, Step, Label Rotation, Fixed Range (Min and Max values)
Chart Series Options	
Override Chart Type at Series Level	Allows to overlay different types of series on the same chart
General Settings	Visibility, Title, Line Color, Thickness, Fill Color, Foreground Color, Item Animation Duration, Series Animation Duration
Point Markers	Visibility, Marker Stroke Color, Thickness, Marker Fill Color, Marker Shape
Labels	Visibility, Format, Show Connectors, Show Zero Value Labels, Distance from Point, Support for Images
Tooltips	Visibility, Format
Data	Bound to any available Facility AnalytiX calculation or query
Grids	
Rows	Background Color, Alternate Background Color (for banded rows support)
Column Options	Visibility, Header Title, Width (in pixels or relative), Background Color, Header Font (Color, Size, Style, Alignment), Cell Font (Color, Size, Style, Alignment), Content Type (Value, Image), Sort (Ascending, Descending, None)
Filtering Options	Equal, Less Than, Less Than or Equal, Greater Than, Greater Than or Equal, Not Equal, Starts With, Ends With, Contains, Does Not Contain, Is Contained In
Grouping Options	Group By any column, with optional default sort order
Data	Bound to any available Facility AnalytiX calculation or query
Panels	
Layout Orientation	Specifies if objects within the Panel will be stacked vertically or horizontally
Asset Detail Panels	
Field Settings	Visibility, Label, Label Font (Color, Size, Style, Alignment), Value Font (Color, Size, Style, Alignment)
Asset Image	Visibility, Stretch (None, Fill, Uniform, Uniform to Fill), Width, Height
Data	Bound to any available Facility AnalytiX calculation or query
Appearance Options (Available within all visual elements in the Viewer)	
Title	Text, Format, Color, Size, Style, Alignment
Subtitle	Text, Format, Color, Size, Style, Alignment
Border	Color, Thickness
Background	Color

Navigator

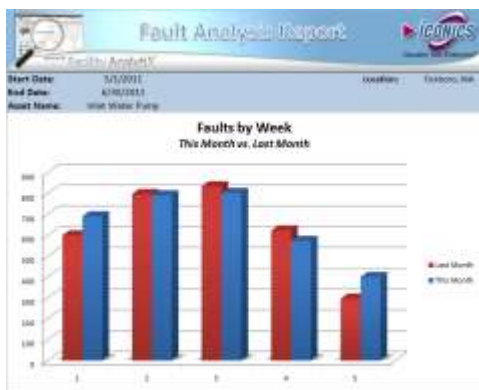
Navigate your ISA-95 asset and equipment hierarchy using an intuitive tree format, with context-sensitive commands to communicate new data to related web parts. For a complete list of the commands that are provided as part of the Navigator runtime, see the section above titled “Context-sensitive Commands to Quickly Navigate Your Enterprise”. The Navigator generally acts as a “provider” web part because it provides data to “consumer” web parts such as the GraphWorX64 Viewer, TrendWorX64 Viewer, Report Executor, and so on. To establish a connection between the Navigator and one of its consumer web parts, simply use the Connections menu in edit mode of the SharePoint web part.

The Navigator Web Part can also browse and execute reports natively via the ReportWorX provider, if ReportWorX is installed and accessible from the ICONICS application server.



Scheduled Reports Help Pinpoint Equipment Inefficiencies

With Facility AnalytiX it is easy to configure powerful and detailed reports that expose information from the Facility AnalytiX database. Start from one of the preconfigured reports or customize your own report format using the flexibility of Microsoft Excel combined with the power of ICONICS' ReportWorX reporting tool.



Facility AnalytiX leverages the award-winning ReportWorX technology to turn data into actionable information in the form of reports. ICONICS brings you the most advanced reporting tool available today, taking maximum advantage of Microsoft's powerful technologies. ReportWorX, based on Microsoft .NET, enables you to push data into your reports and to control the report execution frequency and delivery format (Excel, PDF or HTML). Once generated, the reports can be automatically sent to local or remote disk drives, redundant printers, PDF files, Web servers, Fax machines, or multiple users via E-Mail.

ReportWorX allows for the execution of fault reports that highlight recurring trends in equipment failures or inefficiencies, based on scheduling triggers within ICONICS Unified Data Manager. The criteria by which reports can be triggered include:

- Manually based on direct operator commands
- Periodically based on time and/or date
- Based on alarms or events
- Based on real-time OPC tags
- Expressions or calculations
- Based on NT events
- File system and database value changes

Facility AnalytiX charts, grids and reports help personnel to make intelligent decisions about where and when to allocate their maintenance technicians to optimize the performance of their assets. Scheduling routine or preventive maintenance on a piece of equipment before it actually fails can drastically reduce downtime and costs to repair, making a huge impact on your bottom line!

Leverages Microsoft Technology and ISA-95 Asset Hierarchy

Facility AnalytiX integrates with the following Microsoft technologies to bring a variety of benefits as part of ICONICS' Fault Detection and Diagnostics solution:

Feature	Benefit
ISA-95 Asset Hierarchy	Speed up deployment time by integrating with your existing ISA-95 asset structure
Microsoft Silverlight	Rich visualization and charting components for thin-client, IT-friendly deployment
Microsoft .NET Framework	Web services to enhance the computing experience with highly integrated communications and information
Windows Server 2008 Platform	Leverage the foundation on which Microsoft has built all of its latest server-class products
Role-based Collaboration Dashboards using SharePoint	Visualize faults and probable causes within a consistent, unified, single version of the truth
Microsoft SQL Server	Comprehensive data management platform with open database technology for 3 rd party integration
Windows Communication Foundation (WCF)	Secure, reliable and transacted messaging and interoperability
Microsoft SQL Server CLR stored procedures	Exposes rich data retrieval and drill-down capability via database stored procedures

System Requirements

Facility AnalytiX 10.6 requires the following hardware and software components. System requirements may vary based on application size, system performance requirements, and loading factors.

Operating Systems Supported

Facility AnalytiX 10.6 presently supports the following systems:

- Microsoft Windows Server 2008 64-bit
- Microsoft Windows Server 2008 R2

Minimum Hardware and System Requirements:

Component	Requirement
CPU	Dual core 64-bit processor or better
Memory ¹	4 GB of memory required (6 GB recommended)
Hard disk	At least 20 GB of free hard disk space required (at least 50 GB is recommended to allow for SQL Server database growth)
Drive	8X speed DVD-ROM for installation
SQL Server ²	Microsoft SQL Server 2008 R2 (Express Edition is also supported)
SharePoint	Microsoft SharePoint 2010 (all editions are supported)
Excel	Microsoft Office Excel 2003 or above (required for ReportWorX only)
Web Server	Microsoft Internet Information Services (IIS) 7.0 or later
Web Clients ³	Via Silverlight Web Parts: Internet Explorer 7 or later, Firefox 3 or later, Safari, Chrome

Note 1: It is recommended that the system page file size be a minimum of four (4) times the size of installed (physical) RAM.

Note 2: The user also has the option of designating a remote SQL Server, in which case the user will not be forced to install SQL Server locally.

Note 3: SharePoint 2010 supports other browsers with known limitations. Please consult with the Microsoft online documentation for a list of those known limitations.

About ICONICS

Founded in 1986, ICONICS is an independent software developer of award winning real-time visualization, data historians, automation intelligence and suite of analytics software solutions. ICONICS products are installed in 70% of the Fortune 500 companies around the world, helping customers be more profitable, agile, efficient and sustainable.

ICONICS is a long time Microsoft Gold Certified Partner and Winner of the very prestigious Microsoft Partner of the Year Award, providing advanced software for many end users and technology suppliers. ICONICS has over 250,000 applications installed in multiple industries worldwide.

ICONICS cultivates an international culture of innovation, creativity and excellence in product design, development, technical support, sales and service. World headquarters are located in Foxborough, Massachusetts, USA.

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