Intelligent Building Management System
Tapping the Building Information with Unizon

Computer-based control systems are the essential management tools of most modern buildings and these control systems are typically operating on a standalone basis. As such, it failed to realise the full potential of the control systems and a great amount of information relating to building performance remains untapped. Many facilities managers are trying to capitalize on those data and find means to integrate the control systems in order to improve on the building operational efficiency and customer services. And Unizon is the solution.

Unizon is the intelligent building management system solution that exploits the latest in computer technologies to unleash the power of seamless integration of building controls.

Unizon helps the building owners and facilities managers:

- to delight the tenants with workflow efficiency,
- to upgrade the building market value with intelligent system management,
- to create and manage new sources of revenues such as tenant shared services,
- to lower the building costs which include energy billing, and
- to increase the operational efficiency through enhancing workforce mobility and response.

The Unizon Intelligent Building solution offers a suite of hardware and software that integrates the latest XML, ASP and Java technologies and designed to cater for the ever-increasing building management needs with maximum flexibility and superb performance, and provides secured multiple level access.

The Unizon Real-Time Database (RTDB) which consists of points, graphics and alarm definitions, as well as communication drivers that are directly associated with the various building facilities or sub-systems (such as BAS, security system, CCTV, fire alarm system, lighting control system etc.) is accessible through the client workstations or any PC with web browser installed for remote data monitoring and control.

Unizon is designed for owners, properties managers, system engineers, occupants and tenants to access the respective building information at anytime and anywhere.

Building Information is just a few clicks away from the office or home.
KEY FEATURES

- **High-performance software architecture**
  Unizon's client-server architecture uses 32-bit, pre-emptive multitasking and multi-threading technology to reach a high level of performance and ensure reliability and data integrity. The system's kernel serves as a background task and is composed of a number of software modules such as alarm server, I/O communication driver, network manager, trend logger and printer, that are executed simultaneously to provide reliable, real-time data collection and processing.

- **Data interoperability**
  Unizon has more than 150 readily available I/O drivers to support the common industrial control systems and equipment such as PLCs, Lonworks devices, and BACnet compliant controllers. In addition, the system is open for all types of systems integration by offering a driver development kit that enables user to write specific communication drivers for any proprietary system.

  For OPC compliant systems and controllers, Unizon supports both the OPC client and server interfaces. As an OPC client, Unizon can connect to any OPC server. As an OPC server, Unizon can supply data to applications acting as clients.

- **Redundancy configuration**
  Unizon server operates as a proxy server that collects data from all the various control stations on the network and provides this data on request to the client workstations.

  To ensure the highest level of system availability, Unizon includes hot-backup capability as standard. The hot-backup mode consists of two identical Unizon Servers connected to the same I/Os or control subsystems. One server is running in master mode and samples data while the other remains in standby.

  If the master fails, the backup server automatically takes over all functions, including communication over the network. Once the master recovers, the backup station stops sampling data and updates the historical database on the master station. This mechanism ensures that the historical database on the master station remains complete.

- **Database connectivity**
  Unizon provides a comprehensive set of tools for exchanging data with other applications. The system provides a highly flexible means of connecting to popular database applications through the Microsoft ODBC interface. This enables easy configuration of data exchange with other applications and databases, including Microsoft's SQL Server, Sybase, and Oracle.

  The system also allows the user to build event-driven SQL or ODBC queries to read data from database tables, as well as write the system's real-time and historical data to SQL tables.

- **Web enabled solution**
  Adherence to the Internet industry standards such as ASP and Java for running portable applications over the web. Unizon easily integrates building data with corporate-wide information systems. Users can now combine various data with maintenance data, building operation cost and tenants services, giving the managers and decision maker a real-time snapshot of the entire enterprise from one common and familiar interface.

  Unizon can be associated with any standard web server. The system can smoothly integrated into the existing Internet/Intranet corporate strategy or can use standard Windows-based servers for standalone applications. Internet-standard security devices such as firewalls and other types of encryption solutions can also provide enhanced security.
SYSTEM FUNCTIONS

Security and Data Segregation Access Control
Unizon allows the system administrator to assign each user to one or more user groups according to the user's position and role in the organization. Each control subsystem associated data such as point information, graphic pages, layer and menu item, is also associated with a set of groups. And Unizon offers security feature to control the contents of each page according to user authorization levels (engineers, operators, technicians and so on).

For large enterprise network applications, the user definition and authorization configuration files can be located on the network file server and can be shared by all stations across the network.

For Internet access, the Web user enter his/her name and password before accessing the application. Unizon also allows system integrators/developers to limit the features that a user will be able to perform from a Web browser. For example, the ability to perform control operations can be completely disabled for all users, by each user, group of users or page by page.

Graphic User Interface
Unizon is a vector based graphic display system. To logically separate the different building elements and present different types of control system and floor plan in a structured manner, Unizon offers a layered graphic structures. Each graphic can consist of up to 64 layers, and each layer can include different floor zone or process equipment. For example, the user can design the process’ equipment in one layer, while drawing the electrical scheme and wiring in another. Unizon enables or disables specific layers display based on the user’s authorization level. For instance, a security operator does not need to be involved in electrical and communication details, while an electrical technician does not need information about security alarm conditions. This layer mechanism guarantees the highest level of security such that when specific users do not have access to some commands, the command objects simply become invisible.

For detailed CAD graphic display, Unizon’s unique zooming feature allows the user to draw the entire drawing such as floor plan in one large picture and then zoom in on a selected area for more detail – without redrawing the picture. Unizon allows over 2048 zoom levels to look into a display. And the display can be logically divided into 500 different zones.

Dynamic and Historical Trend Charts
Unizon trend charts provide graphical views of process behavior and operational trends dynamically or over a period of time. User can freely scroll the charts over the time axis or zoom in on the time interval to see rapid changes in the process behavior. Its rich set of display options, such as a user-defined grid, cursor type, free scrolling of time axes and zooming capability reduces the application development time and simplifies its operation.

Unizon’s charts provide user-defined control limit settings that show out-of-range values in different colors. This way, operators can see and analyze critical situations in the processes. To present the chart’s data in a numeric form, the operator can invoke the chart Data Box and examine the precise values at the cursor position. Up to 16 variables can be displayed in a single chart window.
Web-Client Data Access

Unizon comes with a standard Wizard tool which allows the users to build Web-enabled applications without knowing HTML or Java. The Wizard toolkit converts existing Unizon applications to HTML pages that include Java applets for image objects, alarm summaries and online charts, allowing the user to interact with the application through the Web.

Unizon features real-time alarm web monitoring based on pre-defined specifications; and displays online current and past activities in accordance to the chart definitions specified. This feature provides additional benefits for remote control applications and applications where frequent casual access is required.

For applications where viewing of historical display of data over the web is critical, Unizon offers historical cache mechanism to improve the performance with minimum load on the server and asynchronous historical data download. As a result, the Trend is always responsive to the web user.

Web data access simply require a standard Web browser and a TCP/IP connection to the Unizon server either through a corporate network, an Intranet, a router or a gateway or a simple direct modem connection (dial-in).

Alarm Summary and Pop Up Display

Unizon can display alarms in more than one summary windows and critical alarms can also appear in pop-up windows above any image displayed on the computer screen to warn the user of the problem.

Users can create several alarm summaries with different types of alarm grouping, so that the operator will be able to identify the type of alarm according to the segregation. Alarms in the summary can be classified according to several groups (family, severity, class and zone), and insignificant events and information can be masked for operator convenience.

In addition, Unizon generates system messages under the event summary that provide operators with information concerning internal system events, such as communication drivers’ failure, network communication errors, and others.

Advanced Alarm Management

In order to respond to the strict requirements for a foolproof alarm management, Unizon extends a huge number of functionality through the implementation of an optional advanced alarm management software module which supports the followings:

- Delayed alarms
- Selective or hierarchic inhibition
- Alarm comment logger
- Multiple alarms reporting channel, such as vocal email, SMS and fax
- Complete and secured Web access of on line and historical alarms
- Access to the alarm database in MDB format
- Multiple printer supported (both local or network)
Unizon offers a suite of management application software package to give the user the complete building asset information management solution. The management application can be offered as an e-portal services package. The management applications cover:

Utilities Management
To date, all building control systems are looking at energy management and green environment from a global perspective. By integrating information from the various building subsystems, managers are able to plan, benchmark and optimise energy management strategies; and to monitor and manage the condition of the indoor air composition and flow of the respective building space.

The utilities management covers:
- energy consumption profile,
- IAQ profile and
- optimisation and control planning.

Security & Life Safety Management
The safety and security control software covers life safety management, crisis management, access control intrusion alarm control and video surveillance monitoring via the integrated solution with security management system and fire alarm system. It allows the users to survey the secured area through a standard web Browsers.

Facilities Management
The Facilities Management will provide a common pool of management resources for the properties manager and officer to facilitate effective building management. It also empowers the building occupant to book the common facilities and extending the air conditioning and lighting operation through the building common intranet. This online booking of shared facilities and extension of working hours eliminates the need for manual processes, reduces paper work and improves productivity.

Other management functions includes:
- maintenance management,
- inventory management,
- property management, and
- asset tracking.

Asset Management
The asset management application is specifically tailored for the asset and property manager to improve the yield of the properties by effectively controlling the building operational cost and budgetary.

The asset management functions includes:
- billing management,
- lease management,
- yield management, and
- budgeting.

Customer Relationship Management (CRM)
The Customer Relationship Management objective is to network the tenants and visitors with the properties management team. Through the CRM, a more harmonious relationship is established between the building users.

The CRM management will handle capturing, processing and tracking of all user/fault requests, log and track all the equipment change, upgrade and new equipment request, monitor and track the service level agreements associated with the building equipment, hardware and building services. All tenant information including contact information, tenant representative, etc will be available to allow quick retrieval of tenant information during fault reporting.

The CRM package includes:
- tenant profile,
- complaints & feedback management,
- work request processing,
- campaign management, and
- knowledge base management.
Deploying wireless solution to estate management is the trend of the new millennium; there is a need for estate maintenance team to access the building sub-systems information in the field or on the move in order to shorten the service response time. This is the challenge to the intelligent building management system.

Unizon embraces wireless technologies to increase the productivity of the building maintenance and engineering workforce by allowing facilities and services related information to be delivered to the mobile workforce in real-time. The mobile workforce is able to retrieve real-time critical data from the Unizon upon alarm notification and deliver the updated work status to the Unizon host system via PDA or wireless touch pad devices.

The Unizon mobile workforce application is the result of integrating the various building control sub-system and computerised maintenance management system. These integrated data are made available on the web server for immediate remote review and action with wireless data gateway connectivity.

**Unizon PC Server Requirement**

Minimal Unizon server configuration:

**Hardware**
- Pentium III 200MHz or above
- 128 MB RAM minimum
- 20 GB available harddisk space
- CD ROM drive
- Video Display 800 x 600 minimum
- Parallel port for security plug

**Software**
- Microsoft Windows NT 4.0 or Windows 2000
- TCP/IP, Fixed IP address is required for a web server
- Web server, Example: Microsoft IIS
- Java 1.1 enabled web browser
- HTML editor (OPTION)