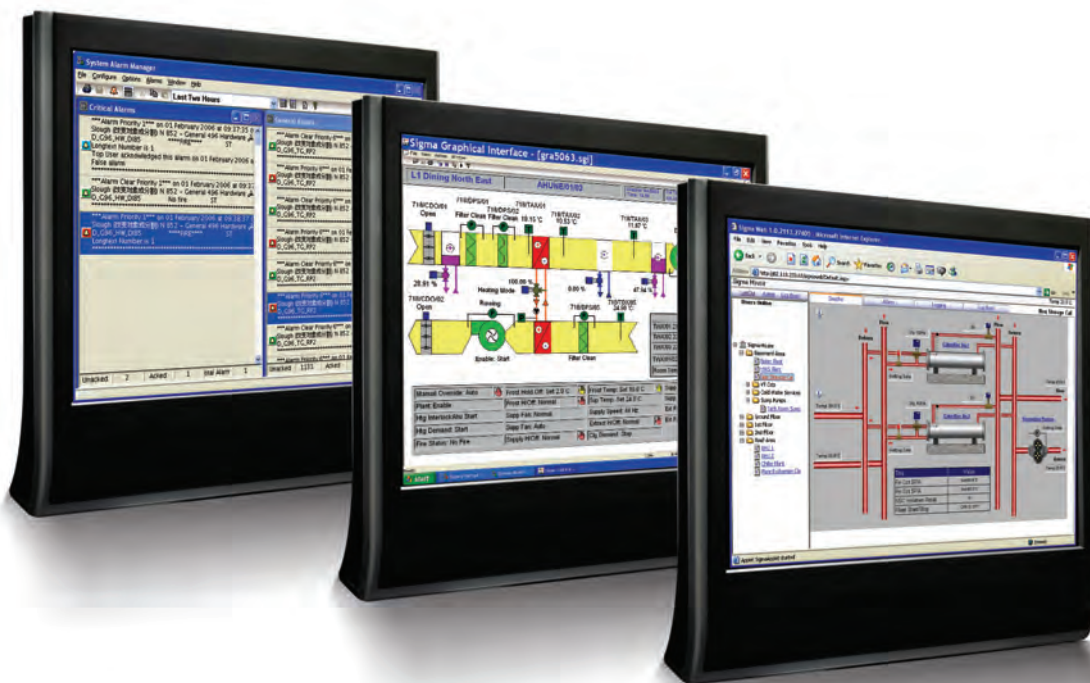


# Building Management

Satchwell Sigma



Make the most of your energy

**Schneider**  
Electric

# A platform for the future



Two International Finance Center, Hong Kong  
Integrated Sigma solution with over 100,000 I/O points

# Satchwell Sigma

Satchwell Sigma is an advanced Building and Energy Management solution incorporating state-of-the-art communications and 'open platform' integration technologies.

Based on IP connectivity (Internet Protocols) and industry standards Sigma is secure, fast and resilient. Sigma offers effective, flexible and easy-to-use tools for controlling your environment and building services with unsurpassed control and visibility on all levels of the building's operations. With its unique range of 'Bus-du-jour' communication options, extensive and proven third party integration and an impressive package of energy saving programmes and support options, Sigma provides complete control solutions which lead the market for delivering real, measurable benefits.

### Freedom to Build

Satchwell Sigma is designed to adapt easily to the changing demands of any building and to embrace new advances in technology, optimising your initial investment and giving complete freedom for the future. Full backward compatibility and standard communications options combine to minimise outlay for upgrades and system expansion.

### Future regulations

Rising energy and utility costs, new building regulations and growing environmental awareness are critical challenges for all building operators and owners. Sigma has been designed to meet the resulting demands for higher levels of environmental control, more system integration and increased reporting.

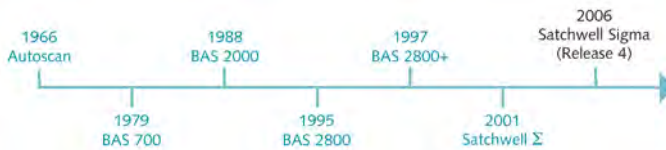
Satchwell Sigma is positioned to minimise the risks and maximise the potential benefits from these emerging standards.



### Σ (Sigma)

The 'sigma' symbol is used in leading edge manufacturing companies to express the capability of a process to produce output that is error free.

Building Management Systems (BMS) have always been our core business and we remain at the forefront of this technology.



# Satchwell Sigma

Satchwell Sigma has been designed using distributed intelligence accessible across the network through local interfaces at all levels of operation. This is where the user can configure and monitor plant performance, anticipate future trends, improve efficiency, analyse management reports and make any adjustments to give long term benefits.

## You Take Control

Sigma's management level provides the user with core access and control functionality:

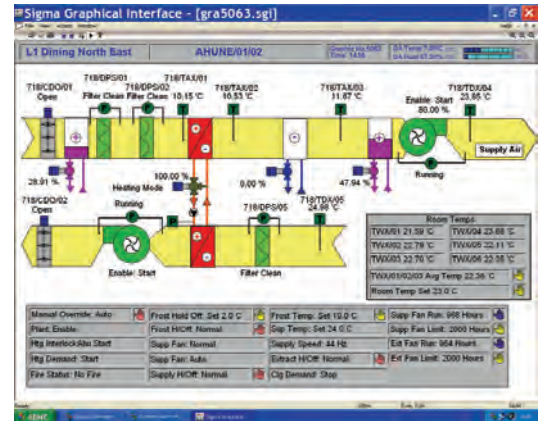
- Configuration of the system to match each user's exact requirements.
- The power to report any exceptions in the control operation.
- A complete operational history for extracting management reports and analysis.
- An overall picture of the current state through the intuitive graphics package.

## Everyday Tool

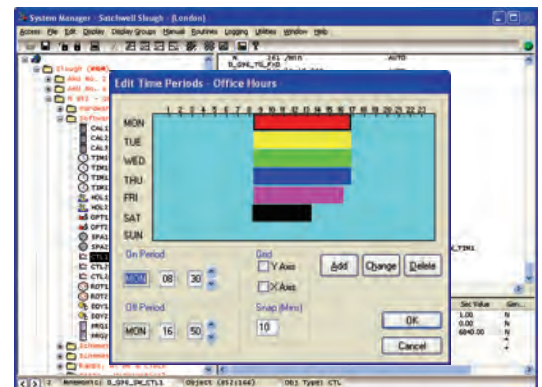
Powerful, event based graphics provide an intuitive interface with easy navigation around the building's environment, systems and plant. Advanced controls using graphic symbols and short form edit screens enable parameters to be easily modified. This ensures optimum working conditions and facilitates opportunistic energy savings.

## Choice of Management Reporting

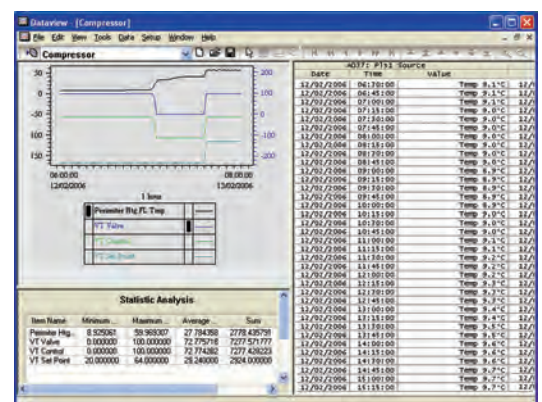
Active links between logged performance figures and data manipulation packages provide real-time visibility on system performance, energy usage and exceptional events.



**Graphic Interface** – easy-to-use graphical view of building and system conditions.



**Short Form Editor** – quick and easy changes to control parameters and schedules.

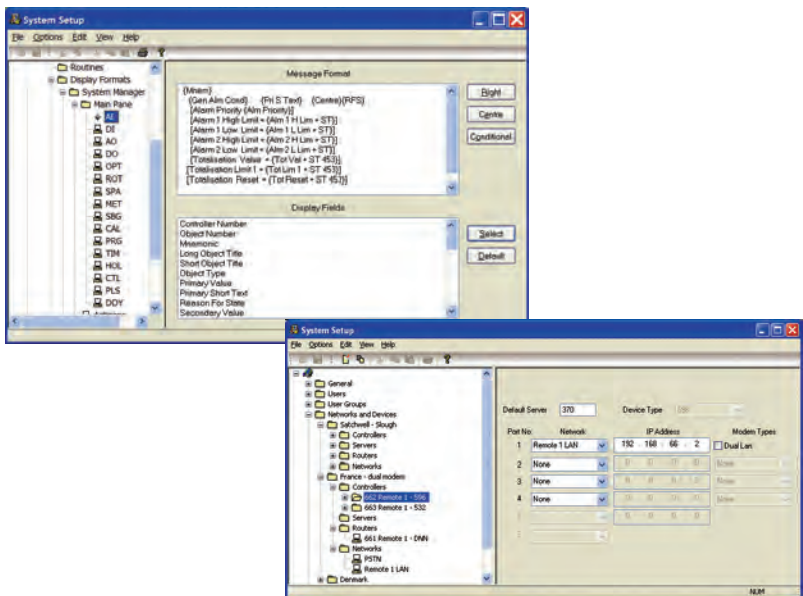


**Log Display** – all aspects of a building's performance can be viewed and analysed.

# Unsurpassed Control and Visibility

## User Configurable Engineering

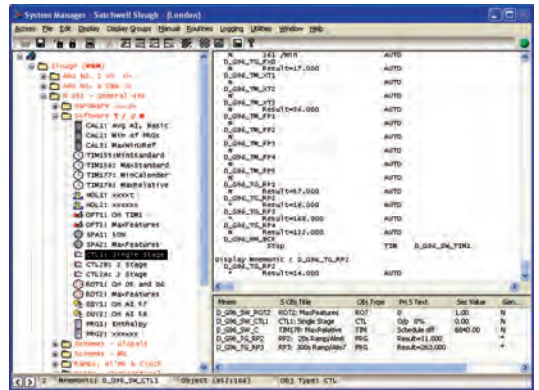
Sigma's unique Object Editor and standard configuration tools give users unparalleled opportunities to modify their own systems. Users can add or adapt controllers and objects from any client workstation while the system is operating. Sigma's System Manager makes navigating your building and finding your plant very easy and intuitive.



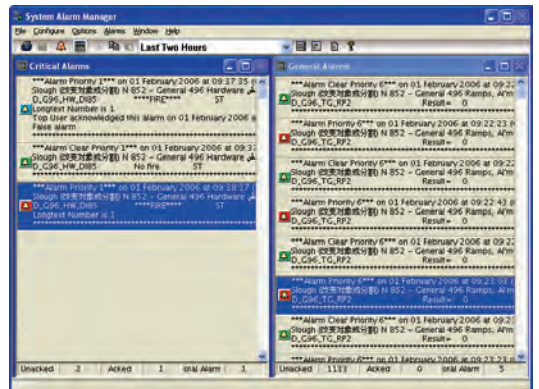
## 24/7 Visibility at All Levels

Sigma opens up access to information and control through a wide variety of user interfaces, PCs, PDAs, printers etc. via the buildings own communications network. From a simple LED and push button sensor, to a portable CE device, or ultimately to a full client server, Sigma's architecture ensures that multiple users can access different plant and building system areas at the same time.

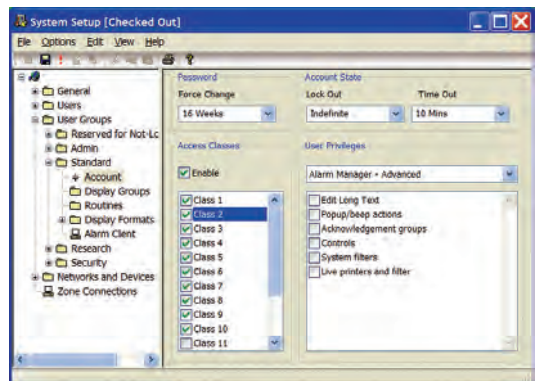
The information is accessible to you on any portable/mobile device anywhere in the world. The system has been designed to provide a client server architecture and is Internet ready with a browser-based user interface. You choose your method of access and how you want it displayed. Satchwell Sigma is fast and secure and allows you to remain in control, wherever you are.



**Index Navigation** – a structured tree overview offers easy navigation to individual plant items.



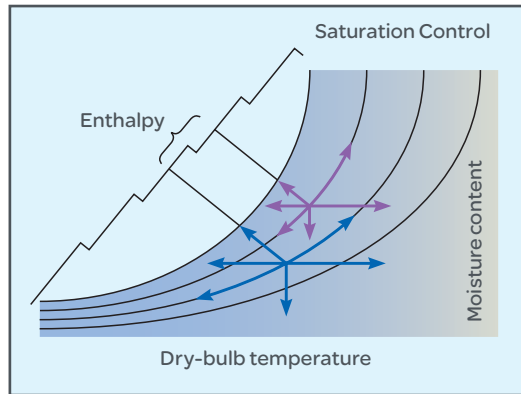
**Alarm Manager** – powerful and comprehensive, for quick and clear notification of plant alarms and history.



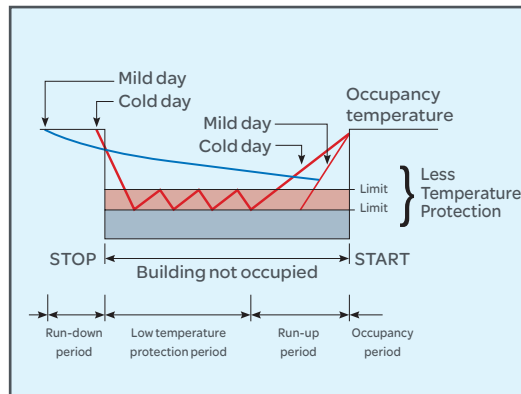
**System Set-up** – initial configuration of Satchwell Sigma is easy and intuitive.

# Improving Efficiency and Conserving Energy

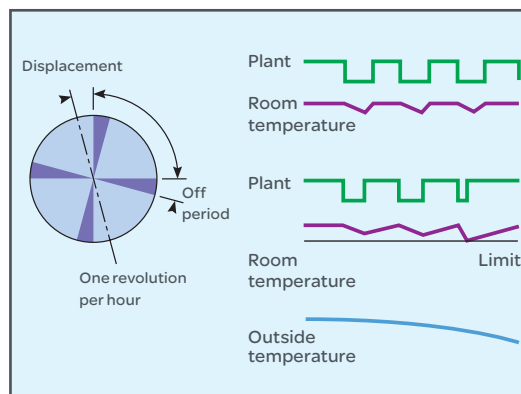
Satchwell Sigma has an extensive range of control strategies that offer practical energy saving solutions for all building services. Each controller contains a comprehensive suite of algorithms which efficiently monitors and controls plant to reduce energy usage and increase comfort.



**Enthalpy Control** – changes plant operation mode dependent on total energy in extract/outside air.



**Optimisation** – starts/stops the plant at the earliest/latest possible times to reduce energy consumption.



**Load Cycling** – provides cycling of electrical loads within established values, offering savings in electricity.



**Other applications include:**

- Time Schedules
- Relative Time Schedules
- Calendar Schedules
- Holiday Schedules
- Plant Rotation
- Multi-stage PID Control Loops
- Night Setback
- Zone Control
- Alarms
- Logging

# Open Platform for Seamless Integration

The Satchwell Sigma Open Systems platform delivers fast, robust and proven interoperability and integration between all your building services and third-party systems. Information and control is available to the entire network for optimum performance and is viewed as standard Sigma items on all local user interfaces.

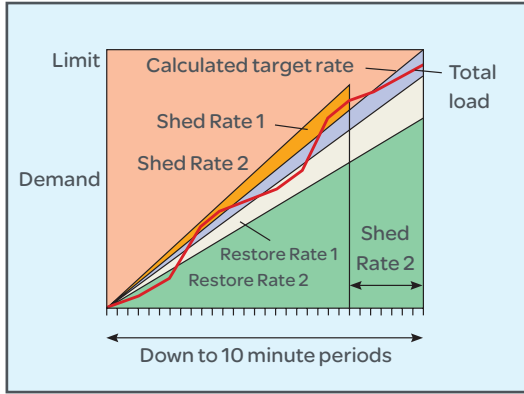
## Open Standards

Satchwell Sigma provides seamless integration solutions for management, automation and field levels and supports standard protocols such as BACnet, OPC, LON, DDE and ModBus. Sigma is compliant with CEN/TC247 standards and also provides support for proprietary protocols to connect to your legacy systems through an extensive range of Sigma Integration Controllers (ICs).



## Delivering the Intelligent Building

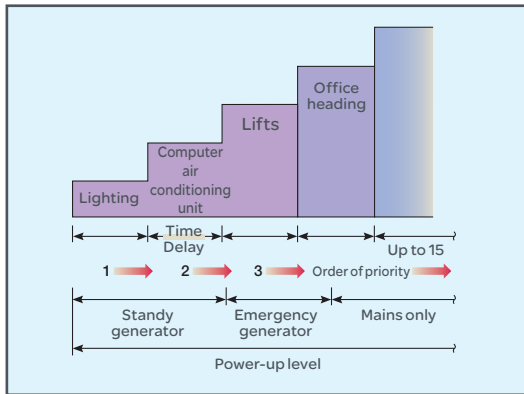
Manage all your building services - boilers, chillers, ventilation, fan-coil units, lighting, metering, lifts, intrusion, fire detection etc. – from a single, global and feature-rich environment. Third-party systems can exchange live information in real-time through Sigma's network, to provide co-ordinated control strategies, thereby saving energy and reducing costs. Integrated systems also benefit from the advanced Sigma features: live graphics, alarms, logging, multiple user interfaces including web browsers and pocket PCs, tight security, remote alarm management and back-up capabilities.



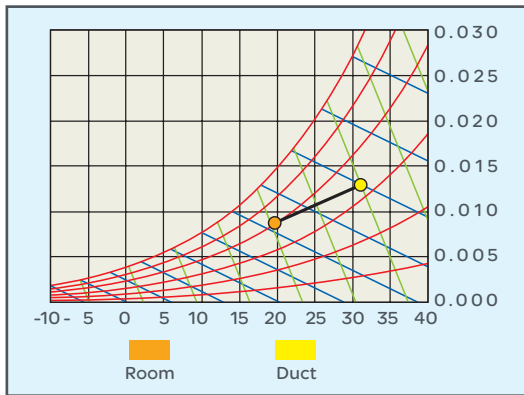
**Maximum Demand/Load Shedding** – ensures electrical power consumption is kept within predetermined limits.



A single coherent system becomes a reality using Satchwell Sigma to run a building efficiently, giving peace of mind that the plant is continuously under optimum control and confidence that spending is within budget.



**Standby Generator and Controlled Power-up** – ensures that building loads are managed in a controlled manner during standby generator operation.



**Active Psychrometric Charts** – displays real-time environmental air conditions in one or several areas. Offers a unique approach to understanding, analysing and fine-tuning AHUs.

# Scalable, Flexible Solutions Will Grow with Your Requirements

Satchwell Sigma provides solutions which can be tailored to your building's size, behaviour, your business and budget requirements. Flexible communications options, standard 'open' protocols and totally scalable architecture caters for building growth and future technology developments.

## Optimised System Design

Sigma's flexible system topology and intelligent controllers work in harmony to control plant and third-party systems. Network controllers automatically perform their control and monitoring tasks, and freely communicate 'peer-to-peer' as and when plant information changes. 'Event-based' operation ensures they function at their highest efficiency and that no unnecessary or repetitive information is transmitted which could adversely affect bandwidth availability.

Controllers only react with the management level if the plant goes out of limits or when adjustments are made through a user interface. Network traffic is minimised - making Sigma an ideal 'IT Citizen'.

## Client Servers

Server architecture shares common databases across the network, unlike multiple PCs, and automatically distributes adjustment information to other controller terminals. Access levels allow authorised users to review and configure plant. Multiple servers provide data alignment, redundancy and robustness.

## Easy User Access

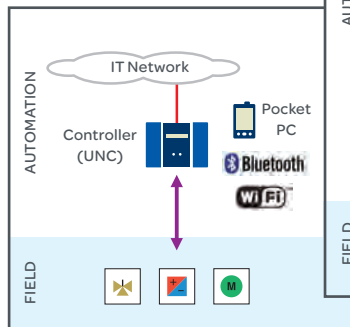
Information is accessible through a wide variety of user interfaces, PCs, PDAs, printers, mobile phones - via the building's own communications network or the internet, making it easy to monitor, configure and adjust plant operation.



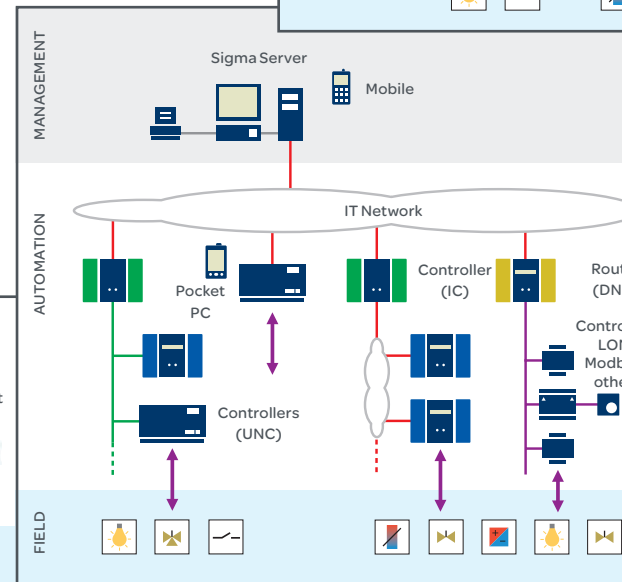
Satchwell Sigma provides an environment which contributes to the growth and productivity of your organisation.



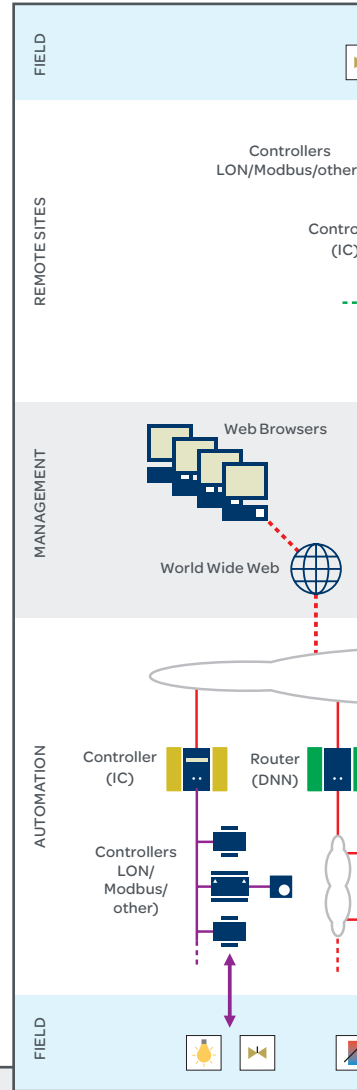
Small Installation



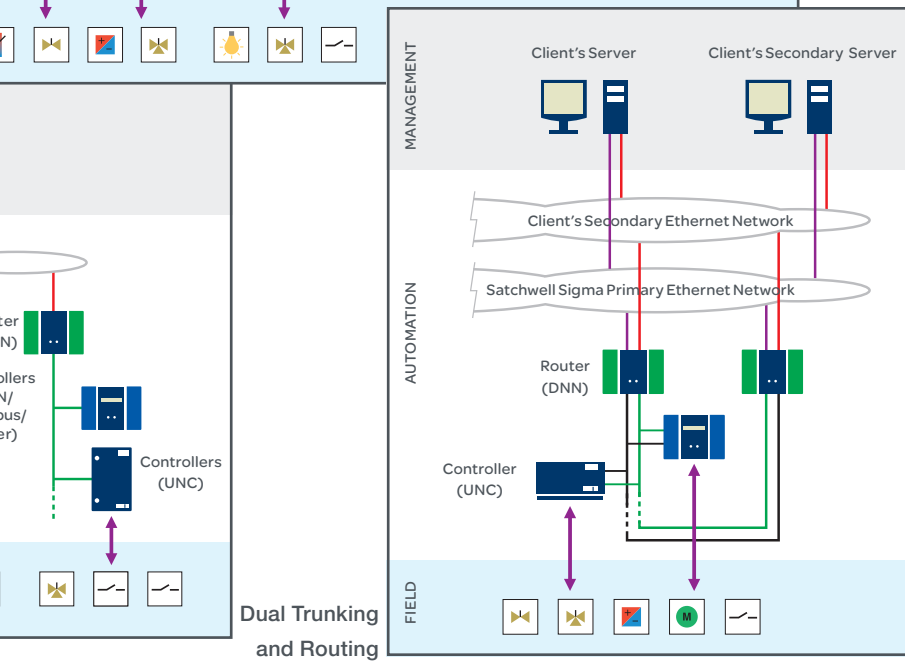
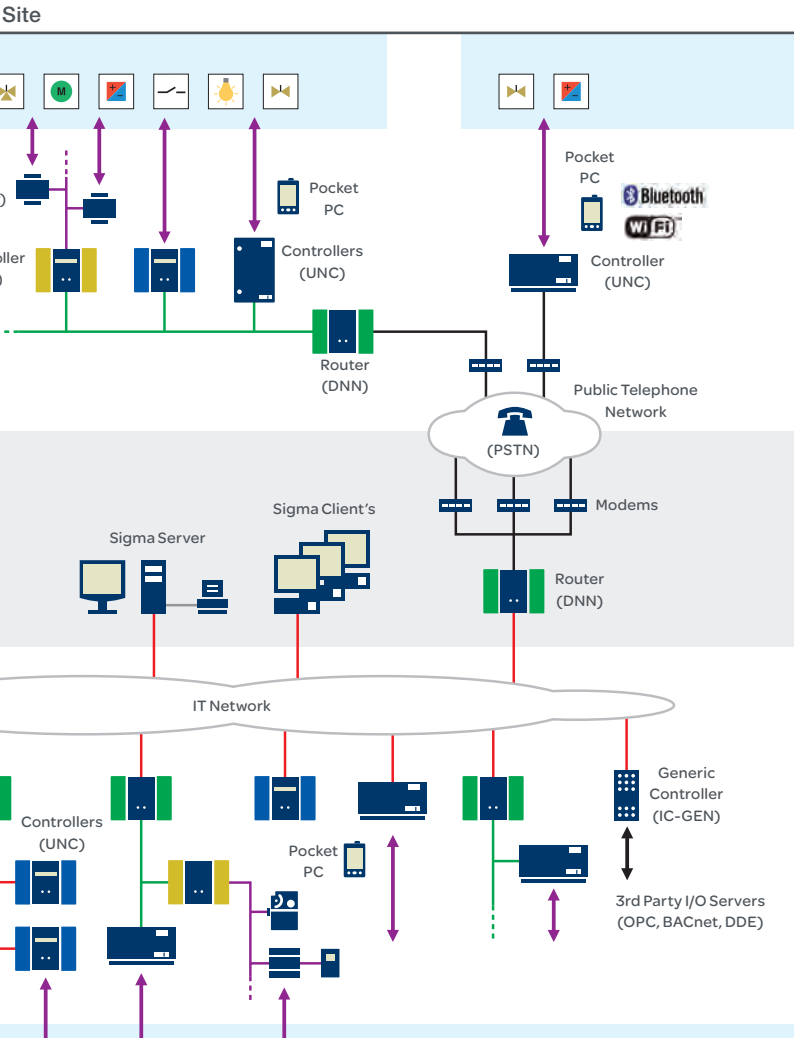
Medium Installation



Complex Installation with Remote







### Seamless Inter-operability

Satchwell Sigma's open systems platform allows the seamless integration of third-party building systems via standard protocols: sharing information and enabling plant interaction.

### Low Impact System Upgrades

This function allows the site controllers' operating system software (firmware) to be upgraded as a background task, without interrupting system operations. The new program software is received over the network and sent to a dormant area, where it is authorised and swapped in a matter of seconds when convenient and without visiting the site.

### True IP Addressing

Satchwell uses IP (internet protocols) addressing to target the delivery of data across interconnected networks, making it robust and easy to configure, and maximising the value of existing IT infrastructures.

### Bus-du-Jour

Satchwell Sigma has been designed to give flexible communications and network configurations. Extended 'Bus-du-Jour' communication options ensure Sigma can meet the changing needs of an organisation.

### Dual Trunking

Controllers can operate over two different communications networks in areas where guaranteed performance and resilience is critical. If one network should fail or become overloaded the system will automatically route information through the second network, increasing reliability and robustness.

### Contingency Logging

Provides an automatic record of the object data within the controllers, which can be displayed as a graph on any local network user interface - without the need to set-up logging in advance.

## Access and Control from Anywhere

Satchwell Sigma Compact and Web Editions bring you exceptional visibility on portable Windows CE devices and from Web browsers to further improve the day-to-day operation of your buildings. Override plant, display values and logs, and adjust operational parameters such as setpoints and schedules.

### Control On Portable Devices

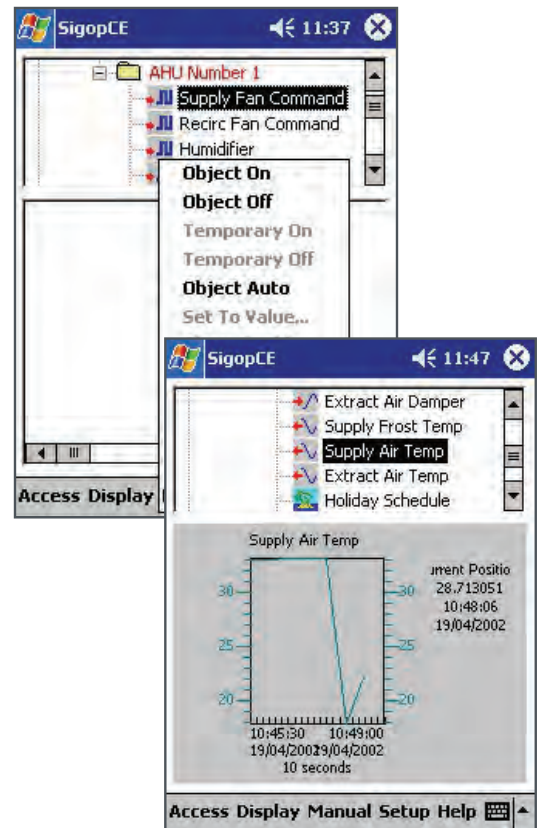
Compact Edition combines the standard communications technologies of the Sigma network and the portability of Microsoft Windows CE devices. Whether you are standing next to the plant you are servicing, or are sitting in a meeting room, you can display live values and adjust comfort settings - immediately and in total security, giving you exceptional freedom of movement.

- Display hours run, plant status, data and alarms using your own display formats.
- Override items of plant or return them to normal operation, inhibit or pre-cancel service alarms during maintenance work.
- Modify time or holiday schedules, adjust setpoints, alarm limits and control loop parameters, using highly intuitive screens.
- Analyse controllers' contingency logs, and adjust logging parameters to quickly assess operational behaviour of specific plant items.

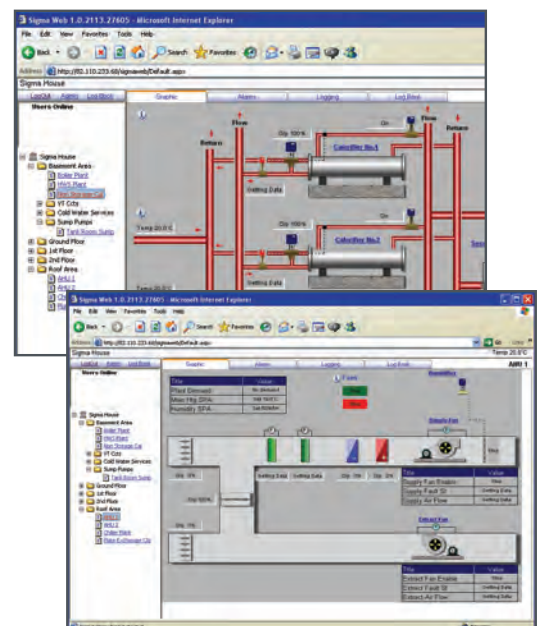
### Control Over the Web

Web functionality is a standard feature of Satchwell Sigma. Display and adjust the operation of your plant in real-time from any computer fitted with a standard web browser, such as Microsoft Internet Explorer. Authorised users can access Sigma information on dedicated web pages or within existing web pages. Satchwell Sigma Web Edition can be tailored to fit your specific needs.

- Display the operation of your plant and buildings as live and intuitive graphics.
- Analyse and display history held in the Sigma controllers as graphical trends, directly into your favourite web browser.
- Override and modify the operation of specific plant items through contextual menus displayed in your web browser.
- Adjust time or holiday periods, setpoints and alarm parameters through interactive and intuitive menus.
- Embed specific Sigma information on pages of your existing intranet or website, or consolidate key information about your buildings in concise tables.



Satchwell Sigma Compact Edition ... go mobile and stay in touch with your plant and buildings, wherever you are.



Satchwell Sigma Web Edition ... unleash the network potential of Satchwell Sigma from anywhere in the world.

### Control Through Your Mobile

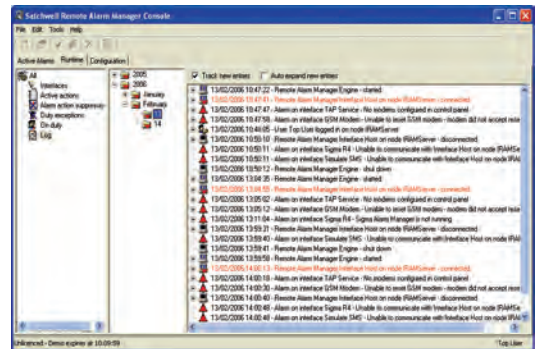
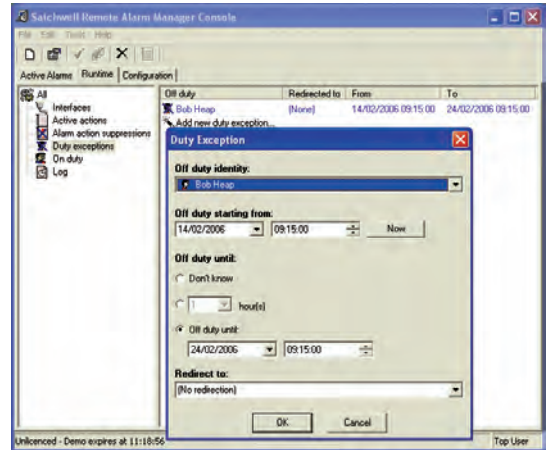
Alarm information will come to you by short text messages (up to 200 words) so that you are made aware of the problem and can take corrective action.

### Remote Alarm Manager

This sophisticated information and tracking software ensures duty engineers are informed promptly of alarms requiring action. Alarm messages are sent to the relevant mobile device, computer or fax, ensuring that the duty engineer is made aware of the plant condition, enabling corrective action to be taken without delay.

This unique software routes and filters alarm information to the relevant personnel through a choice of notification devices. The security features track message receipt and maintain a full alarm history data-base. Should the system be unable to communicate with any source system or device, its self-diagnostic programme generates an alarm.

Satchwell Remote Alarm Manager optimises plant performance by enabling faults to be rectified before they become critical and by reducing system downtime. Selected alarms, transactions and logs are saved to an ODBC compliant data-base for third party extraction.



# Confidence in Data Integrity and System Performance

Satchwell understands that some mission-critical processes require specific measures. Building on its unique expertise in managing a variety of critical projects, Satchwell Sigma offers a range of unique capabilities to mitigate business risks and meet regulatory compliance.

## Network Resilience Options

For critical section of the network, Sigma devices (routers and controllers support a dual-trunk topology, with automatic failure or overload detection and automatic switch-over: if the primary network fails, the secondary network is automatically used and normal transmission is maintained.

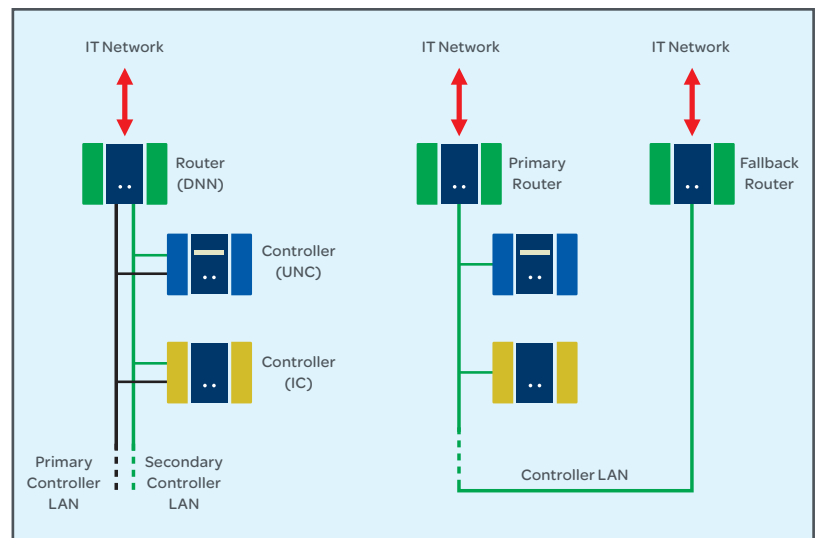
Similarly, Satchwell Sigma also supports alternate routing: if the communication path between a controller and its associated router becomes unavailable, an alternate route is automatically used.

## Redundant Data Access

Satchwell Sigma stores all historical data (alarms, trends, transactions) on the Sigma Servers in tamper-proof binary files. Sigma can also store the logged data to ODBC compliant databases such as SQL, in real time. The ODBC option provides a de-facto backup feature on critical data and a mechanism to access historical information from external applications.

## Automated Documentation

A critical aspect of witnessing and configuration management is the associated documentation. The Sigma Advanced Toolkit allows project managers to automatically generate 'as-is' reports of the current system attributes and settings.



This approach simply eliminates potential human error and allows the creation of secured documents. In addition, the content can be easily exported to standard applications such as spreadsheets, to form the basis for witnessing documents. The major benefits are a quicker and more secure flow of project documentation and a significant reduction for the need of Site Operating Procedures.



In facilitating regulatory compliance, Satchwell Sigma helps you bring facilities on line faster and reduces business risks.

### Advanced Security Option

In the Pharmaceutical industry, quality is more than a goal. It is an absolute necessity. Meeting 21CFR Part 11 requirements is an essential step in the validation process.

With a proven track record on numerous pharmaceutical projects, Satchwell has demonstrated its ability to successfully manage a wide range of validation projects. In conjunction with industry leading engineering practices, the Satchwell Sigma Advanced Security Model (ASM) is a major component in attaining and maintaining regulatory compliance.

### Advanced User Management

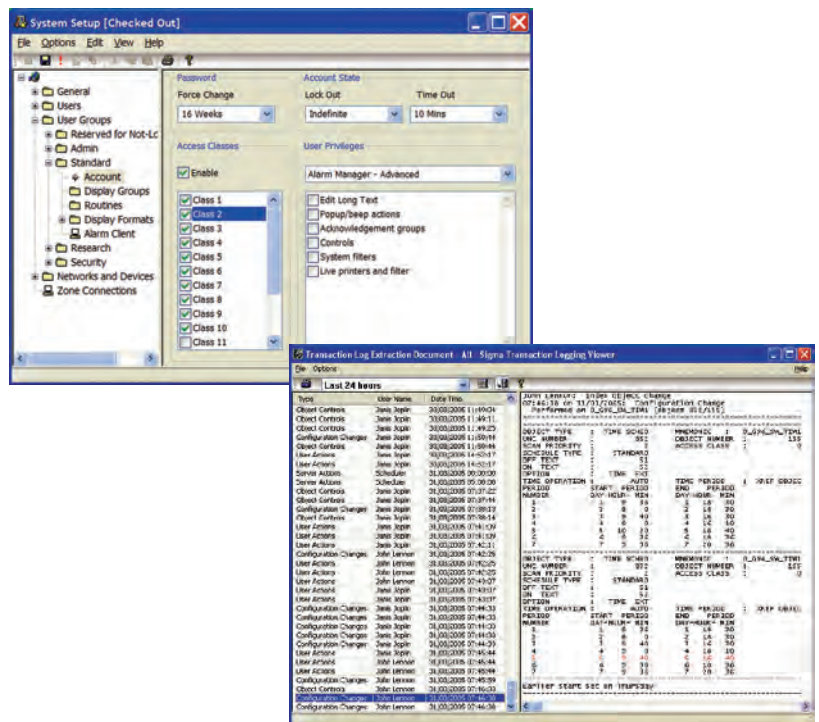
In addition to mandatory change on first logon, passwords can be time limited thereby ensuring that security is never jeopardised.

### Advanced Audit Trail

Change requests to master data require the user to provide a 'reason for change' text, which is stored in the audit trail, together with time, date, user ID and before/after values.


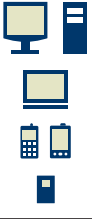










### Other ASM features

- MD5 user credentials encryption
- Automated archiving of audit trail
- Enforced synchronisation of controller databases
- Generation of electronically-signed reports



# The Total Solution

A flexible system architecture, with modular components, versatile communications options and third party integration, provides the platform for a future-proof, integrated building energy management system.

Product		Symbol	Purpose	Features	Specifics
Human Machine Interfaces (HMI) with associated software  Bluetooth WiFi			Local interrogation, setting of plant and system configuration (network, security, displays, controls, alarms and logging)	Local/remote through LAN/WAN/WAP Intranet/Internet	Options: Remote Alarm Management (RAM), Advanced Security (ASM), real-time log export (ODBC), scheduled batch log export (Flexima), automated documentation tools (ATK)
Automation Controllers  UL ARM			Distributed process automation (UNC 532, 632)	Fixed distributed I/Os, extended 'bus-du-jour', downloadable operating system, dual trunking	<ul style="list-style-type: none"> <li>• 32 fixed I/Os</li> <li>• Ethernet/ARCNET comms with optional redundancy</li> <li>• Local data backup</li> </ul>
			Distributed process automation (UNC 496, 596, 696, 796)	Fixed distributed I/Os, extended 'bus-du-jour', dual image Hot Swap, downloadable operating system, dual trunking	<ul style="list-style-type: none"> <li>• Up to 96 Flexible I/Os</li> <li>• Ethernet/ARCNET comms with optional redundancy</li> <li>• Local data backup</li> <li>• Inbuilt UPS (x96)</li> </ul>
Dynamic Routers  UL ARM			Structured network management (DNN)	Extended 'bus-du-jour', Dual Trunking on backbone and controller LANs	<ul style="list-style-type: none"> <li>• Structured network topology Ethernet/ARCNET comms</li> <li>• Dynamic routing between networks</li> <li>• Support for WAN topologies (up to 3 PSTN modems) optional integral UPS</li> </ul>
Integration Controllers  UL ARM			3rd party process automation (IC, IC-GEN)	Extended 'bus-du-jour', 3rd party I/Os, LonWorks, OPC, DDE, BACnet, ModBus, Dual Trunking	<ul style="list-style-type: none"> <li>• Mapped I/Os up to 1,000 objects</li> <li>• Proven interoperability</li> <li>• 3rd party points inherit standard BMS functionality</li> <li>• 3rd party integration for standards interoperability (DDE, OPC)</li> </ul>
Field Controllers  Echelon Modbus			Remote process automation (Unifac Pro, MN 100/200, Bonsai, MN VAV, Xenta)	Unitary controllers including LonMARK devices	FCU controllers, VAV controllers, Zone controllers

## Innovative Remote Management Services

We offer Sigma users tailor-made support solutions and technologies, including advanced analysis, field support and 24/7 assistance. Working in close partnership, we can help you achieve significant further reductions on operating and energy bills.

## Support For Life

Sigma reconfirms and reinforces our life-time commitment to our users, simultaneously enhancing the value of your existing investments while delivering the benefits of the latest technology.

# Sigma Installations Around the World



## Commercial

Paddington Central, London; Empress State, London; River Plaza, Paris, France; Oslo Atrium, Norway; Burjuman Centre, Dubai; Dubai Media City; Three Pacific Place, Hong Kong



## Finance

HSBC, London; Lehman Brothers, London; Crédit Foncier de France, Paris, France; Two International Finance Centre, Hong Kong; National Bank of Cyprus, Limassol



## Government

National Assembly of Wales, Cardiff; Department of Trade and Industry, London; Ville de Rixheim, France; Dubai World Trade Centre; Guangzhou; South Communication Building, China; Stadt Remscheid, Germany



## Healthcare

Dudley Hospital; Coventry Hospital; Odense University Hospital, Denmark; Hospital Louis Pasteur, Cherbourg, France; Buskerud Central Hospital, Drammen, Norway; Monash & Moorabin Medical Centers, Melbourne, Australia



## Education

Exeter University; Edinburgh University; University of Portsmouth; Aarhus University, Denmark; NTNU Trondheim, Norway; Melbourne University, Australia



## Leisure

Riverside Stadium, Middlesborough; Sage Music Centre, Gateshead; Vadum Pool, Denmark; Dead Sea Hotel, Jordan; Lindeman Island Resort, Queensland, Australia; Four Seasons Hotel, Hong Kong; Formula 1 International Circuit, Bahrain



## Industry/Utilities

SEW Usocome, Strasbourg, France; Vesterålkraft District Heating, Sortland, Norway; Asko Warehouse, Oslo, Norway; Husky Shanghai Technical Centre, Shanghai, China; Cadbury Schweppes, Minworth, Skelmersdale; & Milton Keynes



## Pharmaceutical/ Life Science

Sanofi Aventis, Newcastle; Galderma Research, Nice, France; Lonza, New Hampshire, USA; Wyeth, Newbridge; County Kildare, Ireland; Abbott Laboratories, Sligo, Ireland; Abbott Laboratories, Longford, Ireland



## Retail/Transport

Harrods Department Store, London; Bur Juman Centre, Dubai; Penrith Plaza Shopping Centre, Sydney, Australia; Beijing Vantone Shopping Centre, China; Macarthur Square Shopping Centre, Sydney, Australia; John Lennon Airport, Liverpool



Over 1,000 Satchwell Sigma sites have already been installed, from small to large, in all types of commercial, public and industrial buildings, and in all sectors of the economy.

Sigma is reliably delivering safe, comfortable, economic and secure environments to building owners, managers and users worldwide.

Take a look at some of our new projects and the customers we have migrated to Sigma, and supported over the years.

## Office locations for UK

### Ashby-de-la-Zouch Head Office

Smisby Road,  
Ashby-de-la-Zouch  
Leicestershire  
LE65 2UG

Tel: +44 (0)1530 417733  
Fax: +44 (0)1530 415436

### Maidenhead

Braywick House East  
Windsor Road  
Maidenhead  
SL6 1DN

Tel: +44 (0)844 994 0317  
Fax: +44 (0)1628 741101

### London

3rd Floor  
120 New Cavendish Street  
London  
W1W 6XX

Tel: +44 (0)844 994 0317  
Fax: +44 (0)203 107 1611

### Warrington

Europa House  
Gemini Business Park  
310 Europa Boulevard  
Warrington  
WA5 7XR

Tel: +44 (0)1925 401000  
Fax: +44 (0)1925 401166

### Scotland

Units 1-6  
Technology Building  
James Watt Avenue  
Scottish Enterprise Technology Park  
East Kilbride  
G75 0QD

Tel: +44 (0)1355 233732  
Fax: +44 (0)1355 23940

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## Office locations for Ireland

### Belfast

Units 1 & 2  
40 Montgomery Road  
Belfast  
BT6 9HL

Tel: +44 (0) 2890 705545  
Fax: +44 (0) 2890 702215

### Cork

Unit 38,  
Eastgate Drive  
Little Island  
Cork

Tel: + 353 (0) 21 435 4388  
Fax: + 353 (0) 21 435 4398

### Dublin

Block A, Maynooth Business Campus  
Maynooth,  
County Kildare  
Ireland

Tel: +353 (0)1 651 0640  
Fax: + 353 (0)1 651 0641



As standards, specifications and designs change from time to time,  
please ask for confirmation of the information given in this publication

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