Fairvalley House, Rowledge, Surrey

When engineer Peter Dobson retired, he immediately went back to work on the family's brand new home in Hampshire he wanted the house to incorporate the latest in energy-efficient home automation.

Local planning authorities place substantial emphasis on environmental issues; and energy efficiency remains a key consideration for all. Indeed, planning permissions for Fairvalley House mandated not only a limit to maximum energy consumption, but also regulated the minimum percentage contribution from renewable sources such as solar heating. It was therefore vital that the new home's building automation system should manage and monitor all energy inputs and outputs; lighting, heating and electrical. The heated indoor swimming pool was a focus of particular attention.

smart-house – a bus for intelligent buildings
The smart-house solution from Carlo Gavazzi promised to be the most open and capable system. It is capable of transmitting multiple digital and analogue signals over several kilometres, via an ordinary 2-wire cable. Modular design

and a simple operating principle enable even novices to implement its use in new or existing applications. Moreover, there is a wide range of smart-house modules available, including digital and analogue I/O, PC interfaces, HMIs and modems; and all connect to the same two-wire cable which is used to exchange data between modules and between a central controller and modules.

The home automation system for Fairvalley House is more extensive than the average home, spanning five bedrooms, living room, games room, kitchen/breakfast room as well as bathrooms, workshop, garage, plant room and indoor swimming pool.
Sixteen zones are currently allocated, divided into two areas: one for essential systems such as fire alarms and lighting, which are supported by a backup power generator and controlled directly on the bus; the other for nonessential systems including pool heating, forms a separate set of zones.

Fourways, Painswick, Cotswolds

The installation utilised smart-house products such as light switch keypads, movement detectors, light intensity sensors, dimmers, relays and temperature displays. The smart-house controller has further integration possibilities with third party products via a Modbus interface, over a serial or Ethernet connection. At the house, the controller links with a Cytech security system featuring door access control. The security system can also send SMS or voice messages when an alarm is triggered.

The lighting system uses a third party touch panel interface, which also controls the heating (via smart-house relays and temperature sensors), audio and video. Special drivers were used to enable the smart-house to communicate with the Opus audio touch screen controller, whilst smart-house protocol is used to switch on lights according to inputs from PIR and motion sensors.

Routine scheduled on off sequences are augmented by the use of external sensors to switch internal lights on at dusk. Also a holiday mode was implemented, where activity of

certain lighting circuits is recorded and replayed when the homeowner is away, this is set when the alarm system is armed. Furthermore, the house lights can flash in the event of a smoke detector alarm in addition to an audible signal. Water leak detectors were also installed and similarly linked to the house lights.

Smart-house's two-wire bus also controls the new under floor heating along with a heat recovery system. Heating is controlled per floor and can be set back at night or when the home is unoccupied. Optimising control of the heat recovery system helps to maximise cost savings as well as reducing environmental impact.

The smart-house two wire bus system made planning easy and provides plenty of flexibility for last minute changes and future expansion.

Highclere, Weybridge, Surrey

Simple two-wire connection
Heating and lights are controlled by smart-house. Its two-wire bus, communicates between components and also supplies them with power, resulting in a quicker installation, lower complexity and cleaner lines. It offers safety benefits, too. Because the smart-house network operates from low-voltage DC power, there is no AC mains supply to the switches and other devices used to control the system. Occupants are therefore separated from the AC lines that distribute power throughout the lighting and heating circuits.

Climate control
Room temperatures can be set individually with separate settings according to whether the room is occupied or not. The system can turn down the temperature in an unoccupied room to save heating, and enables the entire house to be put into a low-energy "sleep" mode, for example, when the family are at work or abroad. To save further energy, the controller offers a night setback function, and the control bus even allows heating to be turned on and off remotely, via mobile phone or the World Wide Web. In addition there are smart-house temperature controllers with display units in

every room. These slim and unobtrusive units can display outdoor temperature as well as current room temperature, additionally providing the ability to set wanted room temperature and night setback.

Security
In addition to heating and light, the smart-house system is connected to the house's intruder detectors. The system can be programmed so that house lights flash when there is a security breach, as well as sounding the alarm. Switching lights on and off in each room at two-second intervals is psychologically distracting and makes it extremely difficult for an intruder to search for valuable keys, jewellery and information such as credit card details. It also draws attention to the house from outside, further deterring any intruder from their actions. The system could also playback loud music or alarm sounds in each room, to further persuade the intruder to leave. Naturally, the Police can be notified automatically, along with key-holders and other designated people.

Sutton Coldfield, West Midlands

Increasing fuel prices are encouraging homes to be more energy conscious and in turn is giving rise to new opportunities for electricians & installers. The technology to automatically control and co-ordinate domestic heating, lighting and general electrical systems, the national focus on energy management has catapulted the idea of self-regulating energy efficient homes right to the top of the agenda.

Using proven control and networking components combined with your choice of switches and fittings. The occupants will experience added convenience as well as savings in energy costs. Even the home entertainment system is networked, as well as networked wall outlets for HDTV and PC/Internet connection.

The house senses change in daylight levels, as well as the presence of the occupants. Walk into an empty room, in the early evening for example, and the lights are automatically switched on and adjusted to the best dimming level to make use of any daylight available. Leave the room, and the lights are switched off. This saves a huge proportion of wasted electricity, without requiring any thought from the occupant. Temperature sensors linked to radiators in each room allow independent control over the temperatures in various "zones"

in the house, to save fuel costs. The system can turn down the temperature in an unoccupied room to save heating, and enables the entire house to be put into a low-energy "sleep" mode, for example during daytime hours when the occupants are out at work or school.

Almost anything is possible, from adjusting lights and heating to drawing curtains, playing music throughout the house, and even turning on the kettle when the owner's car pulls up outside. In fact, a complete "welcome home" routine can be programmed. Other sophisticated features of the Smart House controller include 7-day record and playback, which allows the house to learn aspects of the occupants' routines and automatically adjust settings to suit each day of the week. The heating system can learn to turn on at a later time on Sunday mornings, for example.

Perhaps more importantly, given today's complicated lifestyles, the system can be tuned to the needs of shift workers or multi-occupancy dwellings by controlling individual rooms independently.

The Oaks, Chatham, Kent

"The key to success was to use everyday technology such as the iPad and iPhone to easily communicate and control the home from anywhere ".

A newly built luxury home near Chatham, Kent comes complete with a Carlo Gavazzi smart-house home automation system to controll its lights and heating. The Oaks, a 14-room architect-designed house has six bedrooms, plus a bar, indoor pool and gymnasium, and outdoor tennis courts.

As well as automation, the Oaks installation reflects another trend in today's electrical installations: that new light sources are fast replacing traditional incandescent lamps. Here, energy-saving LEDs provide the lighting throughout. Each room has a wall mounted dimmer switch, and accent lighting is provided through programmable wall sockets, giving the owners a selection of scenes for each area of the home. External lights are also activated by the smart-house system, for example in the tennis courts. In addition, master light switches have been installed in the main bedroom and in the entrance hall, enabling all lights to be extinguished when the owner turns in for the night, or goes out.

Heating is provided by an under-floor hot-water system. Using manifolds controlled by smart-house input/output modules, temperature can be set independently by thermostats in each room. smart-house keypads for the control of lighting, blinds and heating have been designed to fit standard wall plates, with a wide choice of finishes and styles for the homeowner.

At the Oaks, the smart-house controller is linked into the home's wireless Internet router, and this provides further flexibility for the owners. They are able to review and adjust all the system setting from their iPhone and iPad using the SHApp app from Carlo Gavazzi. Wherever in the house there is a Wi- Fi connection they can manage lights, scenarios, temperatures, alarms and timers using easy taps and gestures. The iOS service is delivered over a secure Modbus connection and offers a number of advantages over the existing secure Web server built into the controller; such as dimming lights directly and showing timer countdowns.