

Uniclass L764		EPIC M4
CI/SfB (68.7)	X	



intelligent heating, ventilation, air-conditioning and lighting controls

# System Planning Guide



# Take control of the home environment . . .

Why do we need intelligent HVAC and lighting controls technology in a house?

Until recently, the ways of controlling heating and lighting systems in houses had not changed for decades. Basic time-clocks and thermostats were used for heating systems, and plastic light switches and rotary dimmers for lighting. As supplied and installed by the traditional plumbing and electrical contractors, these technologies are mature, well-understood and have remained virtually unchanged for around 50 years.

However, radical changes have taken place elsewhere, particularly concerning people's expectations from their homes. Put simply, people demand more from their home today than in years gone by, be it a new build property or a renovation.

## The reasons are clear

- The rapid development of the internet and mobile communications; everyone has a mobile phone and a computer at home – people are accustomed to using these devices for more and more functions.
- The increasing popularity of underfloor heating; by its very nature, a zoned, room-by-room approach to heating is much more challenging to control than ordinary radiators.
- The growing use of home air-conditioning. People expect and enjoy air-conditioning in the office, car, supermarkets and stores. They increasingly want it for their home too. These systems need more than a simple thermostat to control them properly, especially when working in conjunction with a home heating system.

- The rise of dramatic mood and ambience lighting in houses. With ideas taken originally from the theatre, and more recently, used in other buildings, like restaurants, museums, meeting rooms, and elsewhere, the same techniques are now commonly applied in residential properties. Clever controls are essential in achieving these effects.
- The need for security in the home, with intruder and access control systems capable of interacting in harmony with lighting systems.
- Greater concerns about safety in the home, especially with the use of fire and smoke detection systems.
- Lifestyle changes to home entertainment, especially with the growth of new digital, multi-room distributed audio, home cinema and sophisticated satellite TV systems.

Within this context, fifty-year old technology is rightly perceived as out-dated, energy wasteful and fundamentally inadequate.

## There is an alternative.

© Richard Wadley and  
Mayflower Designs



Hi-tech home entertainment systems are changing lifestyles.



Internet development and mobile communications are raising expectations.

## with the intelligent choice

# smart<sup>K</sup>ontrols

**smart**ontrols specialises in state of the art, intelligent controls for HVAC (heating, ventilation, air-conditioning) and lighting in residential dwellings.

We provide a design, supply and commissioning service for our element of the work. Then we liaise closely with other trades – plumbers, electrical designers and contractors – and also with any other 'technology' specialists (home entertainment, network cabling or security professionals). This approach ensures that a fully integrated house is created, complete with sophisticated controls technology which is simple and intuitive for anyone to use.

With thousands of UK installations already completed, **smart**ontrols is a leader in the sector with an established, well-proven pedigree. Our projects have featured all types of homes from modern, two-bedroom apartments to townhouse developments and family homes. From period properties and carefully nurtured, barn conversions to hi-tech, state of the art smarthouses and many other equally grand designs.



**smart**ontrols feature project: HVAC control, Berkeley Homes, Petersham.



© CBDA

**smart**ontrols is the future-ready solution in HVAC and lighting controls.

# Heating systems

Heating systems in houses generally split into two different categories; radiator or radiant panel heating and underfloor heating.

## Wet radiator systems

The conventional method of controlling radiator systems is to use a timeclock and motorised zone valve to control the timed operation of each area in the house, with mechanical thermostatic valves (TRVs) on each radiator to control the temperature of each room. This approach has the benefit of being familiar and widely understood by generations of tradesmen, but suffers from fundamental disadvantages;

- Using timeclocks and zone valves mean that each zone must be separately plumbed back to the boiler, which adds complication, cost, and takes up valuable space for multiple pipe runs.
- TRVs are very crude regulators of the room temperature. They are mounted in the worst possible place for the job that they are designed to do – right next to the heat emitter – and they can be noisy if the system is not properly designed.



smartcontrols feature project: wet radiator control, country mansion, Hampshire.

In contrast, the **smartcontrols** solution uses discrete temperature sensors (called thimble sensors – see pages 5 and 16) which can be sited away from the radiators to properly measure the room temperature. These are connected to a zone controller, (which can be wall mounted or alternative variants can be hidden from view). The zone controller manages both temperature and time control for the room (each room is now effectively a separate zone). All of the zone controllers are connected to our low-voltage communications network; also sitting on this network cable are our unique intelligent actuators.

These are smart, motorised valves which either mount on the radiators or are concealed on the pipe which feeds the radiator. These intelligent actuators will open and close under the command of their associated zone controller.



Intelligent actuators eliminate the need for zone valves.

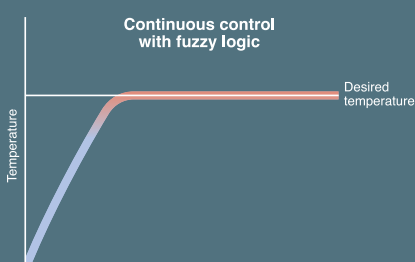
This ensures:

- More accurate temperature regulation.
- Simpler plumbing. Zoning occurs at each radiator. The intelligent actuator performs time and temperature control functions in one package with no need for separate zone valves.
- Each room can be controlled individually for timed operation and temperature, from the wall (using a zone controller or touchscreen panel), or from a PC.
- The associated pumps and boilers are controlled by other **smartcontrols** modules, and run only when needed.

## Thermostats vs continuous control

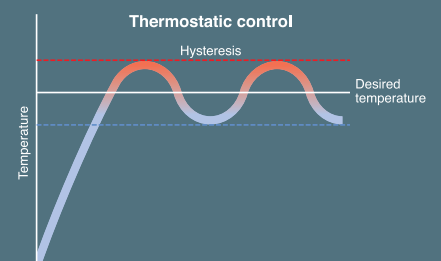
### Thermostatic control

Thermostats are **On/Off** control devices: when they get too cold, they turn ON; when they get too hot, they turn OFF. As a result, the room or medium controlled by the thermostat will always be too hot, or too cold, and the temperature will cycle about this point.



### Continuous control

Continuous control is a process used in smartModules where the temperature is measured using a sensor, and compared against a required temperature electronically. A complex algorithm, using fuzzy logic, calculates the precise amount of heat needed to keep the temperature at the required value. By controlling the position or duration of opening of a valve, it can, thus, modulate the amount of heat sent to the heat emitter (e.g. radiator or the underfloor loop).



# Heating systems

## Wet underfloor systems

Conventionally, wet underfloor heating consists of loops of plastic pipe buried in the floor, fed by distribution manifolds which are connected to the primary heating pipes.

At each manifold, thermo-electric actuators, switched by wall-mounted thermostats, allow water to flow in each loop. As the room temperature drops, the thermostat 'makes' its electrical contact, and the valve allows flow to the floor. As the temperature rises, the thermostat 'breaks', and the valve closes, shutting off the flow to the floor. Timed operation of the system is normally achieved by isolating the whole manifold using a zone valve driven by a timeclock.

This approach is far from perfect:

- Thermostats result in temperature cycling around the desired temperature (see *thermostatic control inset, page 4*) which is more pronounced with underfloor heating, because of the large thermal mass of the floor.
- Manifolds, zone valves, timeclocks and other boiler loads (eg, domestic hot water) need to be hardwire-linked together to make sure everything works when it should – this can get complicated and rarely works well.

The **smartcontrols** approach allows the thermo-electric actuators supplied by the underfloor heating manufacturer to be retained. Thermostats, timeclocks and wiring centres can be deleted, and replaced by discrete temperature sensors (called thimble sensors – also see *user interface section, page 16*) for wall mounting, and a small 'smartBox' control panel mounted next to the manifold.

## Key smartcontrols benefits

- Temperature regulation is much more accurate (see *continuous control inset, page 4*).
- The manufacturer's control valves can be retained, but controlled in a continuous rather than on/off manner.
- Control of the manifold water temperature, and control of the manifold pump can be achieved via another smartModule.
- The manifold zone valve is no longer needed, as the thermo-electric actuators now act as time and temperature controls.
- Each room can be controlled individually for timed operation and temperature, from the wall (using a zone controller or touchscreen), or from a PC.
- The associated pumps and boilers are controlled by other smartModules, and run only when needed.
- Floors with a stone finish can be kept warm using a floor sensor (see *inset right*).



© Nu-Hert

A typical, wet underfloor heating system.



**smartcontrols** operate thermo-electric actuators at the distributed manifolds for an underfloor heating system.

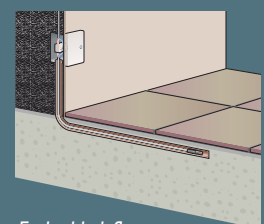
## Sensors

Normally, radiators or underfloor heating are controlled by air temperature sensors. These should be mounted at normal switch plate height (between 0.8 to 1.5m from floor level) so that they are able to read a representative temperature. Mounting air sensors near the floor or ceiling will not work as effectively.



Thimble-sized, wall-mounted sensors are unobtrusive.

For floors with a stone or tiled finish, particularly in bathrooms, it is recommended to fit a sensor buried in the floor, underneath the final finish tiles or slabs, in addition to an air temperature sensor. This allows the floor to be kept warm, even when the air temperature is satisfied. Although this will result in the set air temperature being exceeded, many people find this preferable to walking on a cold stone floor (especially if they have stepped out of a bath or shower).



Embedded, floor sensor.

# Heating systems

## Electric underfloor systems

In electric underfloor heating systems, the manifold controller is simply replaced by a smartModule controlling a noiseless solid-state switching device. This modulates the power to the heating element laid in the floor.

It is essential in most cases for floor sensors (see sensors inset, page 5) to be fitted to every floor zone, in addition to the air sensor. Unlike wet heating, where the temperature of the water is carefully controlled, and hence it is impossible to generate dangerous surface temperatures, electric heating elements can cause the floor to become uncomfortably warm or for the surface to crack. Using floor sensors, **smart**controls can set both minimum and maximum temperatures for the floor.



© DEVI

## Electric radiant panel heaters

For electric radiant panel heaters, the same approach can be used with a smartModule controlling a noiseless solid-state switching device, effectively modulating the power to the heater.

Using embedded sensors **smart**controls ensure the floor temperature remains comfortable.



© DEVI

Electric underfloor heating offers an alternative to wet systems.



## Pools, spas and smartModules

smartModules can also be used to control the temperature in swimming pools and spa pools, allowing all the features of display and adjustment that the **smart**controls system can provide to maintain hot water temperature.

Pool temperature control.

## smartModules for other monitoring applications

smartModules can be used, in conjunction with the appropriate sensors or systems to monitor or control almost anything. For example, they can be used to monitor fire alarms, water and gas leak detection, CO or even air quality. These applications can be fully integrated within a **smart**controls intelligent system.

*High risk areas, like kitchens, or whole homes can be monitored for fire alarms, smoke detection, gas leaks, etc.*



© Hekker

# Heating systems



*smartcontrols feature project: underfloor heating control, Threshing Barn, Surrey (shown on Channel 4's 'Grand Designs').*

## Advanced control features

All **smartcontrols** systems contain advanced control features, originally developed for use in large, commercial buildings, and now available in the home.

### Optimum start

A **smartcontrols** system automatically 'learns' how quickly each room heats up, and starts the heating at just the right time to ensure comfortable conditions for the prescribed operating times. This feature automatically adapts as the weather changes, saving considerable amounts of energy.

### Weather compensation

For 'wet' systems, more stable control and better comfort is achieved by varying the heating water flow temperature as outside conditions change; the warmer the weather, the cooler the water temperature.

For these reasons, **smartcontrols** systems are always fitted with an outside air temperature sensor.

## Fabric protection

When a particular zone, or the house itself, is not in use, then it will be held at a lower temperature setting to protect the building fabric (and its contents) against damage caused by condensation. For sensitive artworks, wood panelling, etc, a **smartcontrols** system can also incorporate relative humidity-based (RH) fabric protection – an approach originally developed by **smartcontrols** for National Trust properties.



*RH-based fabric protection is favoured in stately homes and period properties.*

**smartcontrols**  
feature project:  
HVAC control, luxury  
apartment, Belgravia.



# Heating systems

## Domestic hot water

The domestic hot water (DHW) system, supplying hot water to baths, showers etc, may be a storage or instantaneous system connected to the main heating boilers, or a stand-alone system heated by gas or electricity. Whichever method is used, smartModules may be installed to control operation of the equipment.

The most common system uses a storage cylinder (or several in parallel) fed from the primary circuit of the boiler system. With conventional controls, a cylinder-mounted thermostat causes an on/off valve to open, allowing primary water to flow in the coil of the cylinder. When the cylinder reaches temperature, the thermostat will shut the valve. A timeclock interrupts the power supply to the valve.



*smartkontrols simplify domestic hot water control.*

Whilst this arrangement works in a small, basic house, as properties grow in size, control problems multiply as well. Multiple boilers may be fitted, which will need to be interlocked with timeclocks from the heating and hot water systems. Often secondary DHW circulation pumps are used, to ensure that hot water is available instantly at any tap, and these also require controlling.



*Effective hot water control with smartkontrols.*

## A smartkontrols solution minimizes any unnecessary complications

- A dedicated smartModule controls the operation of the existing on/off valve. The thermostat is replaced by a sensor.
- The smartModule can also control the secondary pump, if fitted.
- The hot water service can now be controlled individually for timed operation and temperature from the wall (using a Zone Controller or touchscreen) or from a PC.



## Towel rails

Towel rails are traditionally plumbed into the primary circuit feeding the hot water cylinder. The theory being that after a bath, the DHW cylinder would be calling for heat, and hence the towel rail would be hot. Although this works well enough in houses with a single bathroom, today the combination of multiple bathrooms and secondary DHW circulation mean that the DHW cylinder will frequently 'top-up' its heat content. This results in the towel rails running almost continuously, and if they are large architectural rails, causing significant overheating of the house.

### In such situations, smartkontrols recommends:

- The use of a separate towel rail circuit with a zone valve or pump.
- This valve/pump can be controlled by a smartModule, giving timed operation of the rails; normally, two on/off times for the rails will suffice.
- If the appropriate user interface is used, a 'Dry the Towels' button can be created for towel drying out-of-hours.
- Electric towel rails can be switched in the same way.

*Wet or electric towel rails can be effectively brought under intelligent control.*

# Heating systems

## Boilers and other heat sources

Originally developed for larger commercial buildings, the **smartcontrols** system can thus cope with any arrangement of boiler plant, twin-head pumps, modulating control valves, etc.

Any type of boiler can be controlled (gas, oil, electric, condensing, modulating, combination etc) and multiple boilers can be sequence controlled and duty-rotated to ensure even running hours.

The plant room may be fitted with heat detectors, gas safety valves, etc. Whilst other alarm signals may need to be interlocked with the plant (eg, a low pressure alarm from the heating pressurisation unit). Each piece of equipment can be effectively wired to the 'smartBox' control panel. This panel contains the smartModules associated with the boiler plant, and all necessary starters, relays, breakers, etc.



*Each piece of equipment is wired to a smartBox control panel.*

## Ground-sourced heat pumps

Ground-sourced heat pumps can be controlled with smartModules in the same demand-driven manner.

## Demand-driven operation

In a **smartcontrols** system, the boiler system (or heat pump) does not need a timeclock to tell it when to run – it is demand-driven.

Each of the loads on the boiler system is represented by a smartModule, eg, each heating zone (room) in the house, the domestic hot water service, any swimming pool loads, would all be controlled by a smartModule. The load smartModules all decide whether they need heat or not, and signal to the boiler via the communications network. The smartModule controlling the Boiler plant works out when, and at what temperature to run the boilers to satisfy the loads. In this way, the boiler plant only runs when it needs to, thus saving energy and unnecessary wear of the plant.



*Any type of boiler can be controlled.*



*The smartBox control panel.*

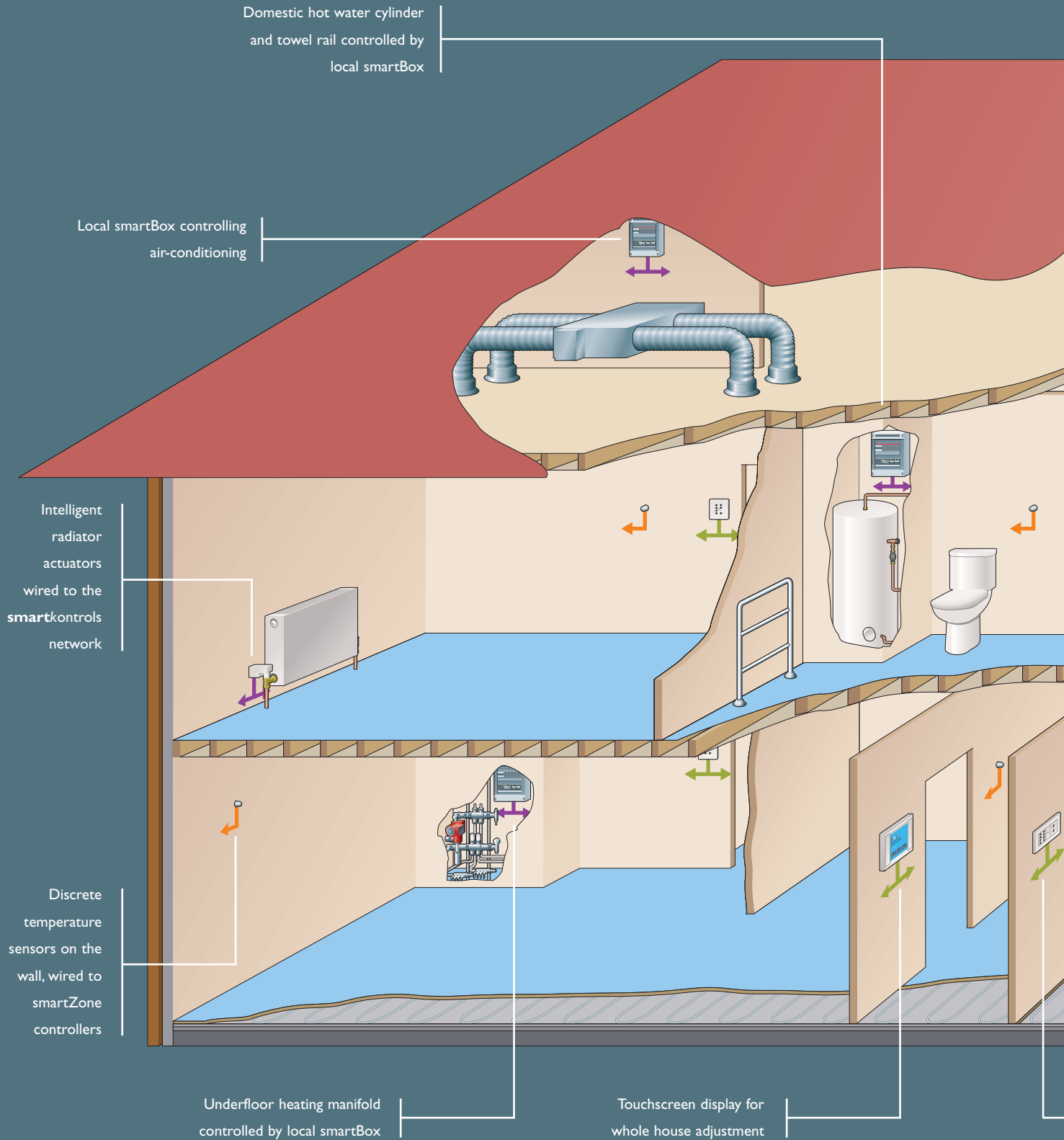
## smartBox – control panels that you can live with in a house

Larger houses with their extensive heating, hot water systems, pools, etc, can often have plant rooms that resemble small commercial installations. The temptation for a mechanical designer is to specify the type of control panel that you therefore find in a typical commercial installation.

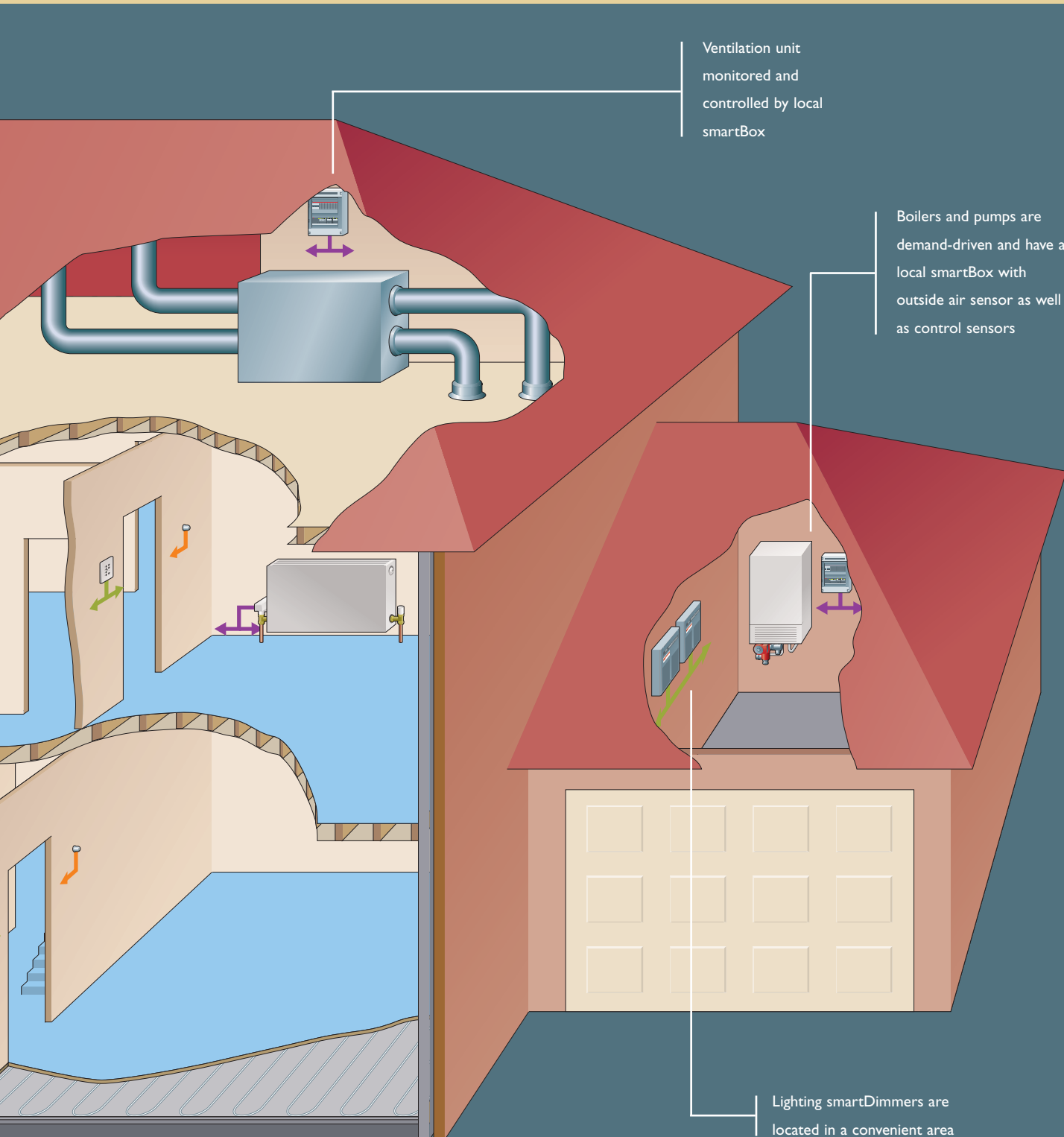
Made from painted steel with a hinged door, this type of 'wardrobe' panel takes up a huge amount of space. It is also very expensive to build, because all of the engineering controls and indicators have to be custom-built onto the door.




The modular 'smartBox' approach from **smartcontrols** solves these problems. Made from moulded plastic, the consumer-unit styled enclosures typically take up half the space of an equivalent steel panel. Also, all of the smartModules come with their own built-in indicator lamps and override buttons – thus they eliminate the need for any custom switches and lamps.

# The intelligently-controlled home



All network and sensor wiring is low-voltage using Belden 8205 cable. Exact configuration and type of wiring will be specified on bespoke wiring drawings prepared by **smartcontrols** for each project.



-  HVAC communication network
-  Lighting communication network
-  Sensor wiring

# Air-conditioning control

## 'Split' or DX systems

Increasingly, home owners are specifying comfort cooling systems for their properties – this is not, strictly speaking air-conditioning, because it does not control the 'condition' (ie, temperature and humidity) of the air, only the temperature. Instead, these systems, from manufacturers such as Daikin, Mitsubishi, Sanyo, Toshiba, etc, consist of indoor units (which absorb the heat) connected to outdoor units (which reject the heat to atmosphere). Sometimes the systems are capable of running in reverse as heat pumps, which also allow the house to be heated. All of these systems come complete with their own built-in controls, and their own user interface.

However, these types of system are often fitted in conjunction with separate heating systems (eg, underfloor heating). If the two systems are kept separate, with their own independent user controls, confusion and mis-setting of the two systems will almost certainly occur, resulting in the heating system 'fighting' with the cooling system. This will cause discomfort and generate huge, wasted energy bills.



*smartcontrols feature project: air-conditioning control, Clanrickarde, Ireland.*

The **smartcontrols** approach works by controlling both systems from a single sensor, and single user interface. The user sets the temperature (and times) that he wants to use, and the **smartcontrols** system decides whether heating, cooling or no action is required, just like the climate control system in a modern car.

- Uses the same sensor as the heating.
- Retains the manufacturer's user interface for maintenance, but makes it inaccessible to the end user.
- Typically, a small 'smartBox' panel with the smartModule fits beside each indoor unit, which connects to the communications network.



*Concealed VRV ducted air-conditioning unit brings comfort cool air into the space.*

## Fan coil / chilled water system

Some larger properties use chilled water systems, with a chiller producing the chilled water being pumped to fan coil units in each room. Some fan coil units are capable of heating and cooling. The **smartcontrols** solution is similar to our approach for split systems:

- the smartModule directly controls the three-port valve on the fan coil (or two valves for a 'four-pipe' unit).
- a small 'smartBox' panel with the smartModule fits beside each fan coil unit, and another at the chiller to control the chiller and its pumps.

Full air-conditioning needs an air handling unit which is capable of controlling humidity (humidifying the air by adding water or steam, dehumidifying by sub-cooling and reheating the air). Such units are common in commercial and industrial buildings, and with its experience in this sector, **smartcontrols** can provide the control solution, if required

*Air or water-cooled chillers can be easily controlled by a smartcontrols system.*



# Ventilation control

All houses need ventilation; sometimes this is achieved by passive trickle vents above windows, but often some form of mechanical ventilation may be needed. Simple bathroom extracts can be driven from the lighting circuit, but increasing use is now made of heat recovery ventilation units. These units comprise a supply and extract fan, and a heat exchanger which takes heat from the extract air and pre-heats the incoming fresh air.

Simpler units can be set to run continuously, but more comprehensive products have trickle/boost modes, bypass dampers for summer use (to allow free cooling of the house) and auxiliary heating/cooling coils.

These types of unit require:

- A small 'smartBox' panel with a smartModule which can fit beside the ventilation unit.
- Boost/trickle control can be linked to house 'away/holiday' mode.
- By-pass or auxiliary heating/cooling can be linked to desired temperatures in the house.

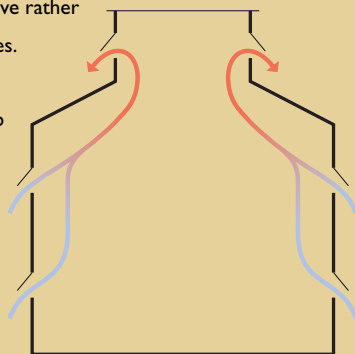


Whole-house heat recovery ventilation units can be controlled with a **smartcontrols** system.

## Natural or passive ventilation schemes

Some houses employ natural or passive rather than mechanical ventilation techniques.

Using the buoyancy of warm air to create the 'stack effect', enhancing ventilation through an atrium or wind tower. Such schemes employ automatic opening windows or vents at low and high level, which must be inhibited during high winds, etc.



Typical natural ventilation airflow pattern.

Typically, our solution features:

- A small 'smartBox' panel with the smartModule situated near to the motorised windows.
- A weather station with wind speed and direction can inhibit the opening of windows under certain conditions.
- A rain sensor may also be needed.

**smartcontrols** can enhance the effectiveness of natural or passive ventilation schemes.



© Heber

# Lighting control

A **smartcontrols** lighting control system offers wide-ranging advantages and incredible versatility in contrast to conventional light switching.



## Scene-setting

Modern scene-setting is an increasingly popular technique for creating the right ambience in principle rooms. The different light sources in a room are split into several different circuits; for instance, the central light on one circuit, uplighters on another, table lamps on another and so on. Each circuit can be turned on/off and dimmed up and down independently.

Conventional wiring would employ a row of switches, or dimmers, one for each circuit. To create a required scene (or 'mood'), the user would have to adjust each dimmer to a predetermined level – clearly, with six or eight circuits in a typical reception room, this would be totally impractical, and would create huge and unsightly switch congestion on the wall.

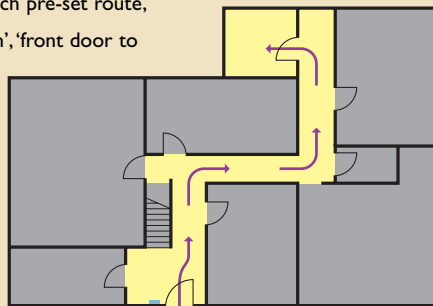
## Intelligent lighting control from **smartcontrols** offers a vastly superior approach

- Each room has a simple smartWallplate in place of the light switches. These come in a variety of styles, usually having four buttons allowing four different preset scenes to be recalled – much like the preset tuning buttons on a car radio.
- Each of the preset scenes can have any combination of circuits, set to any dimming level.
- The scenes could be for 'dining', 'watching TV', 'reading', 'party' or any other activity.
- Multiple plates (of different types, if required) can be used in the same room (for rooms with several doors, for instance).

## Route lighting

This technique allows a series of lights to be turned on (at predetermined levels) to light the route from one room to another at the press of a button. This approach is particularly useful when entering a darkened property, or going downstairs in the middle of the night. Corridors, stairwells and the destination rooms themselves can also be pre-lit.

With **smartcontrols** a route plate can have dedicated buttons for each pre-set route, eg, 'front door to kitchen', 'front door to master bedroom', etc.



## Whole-house functions

By using the **smartcontrols** unique multi-press functions, lights can be turned on and off all over the house. Suppose the homeowner is asleep in bed, and hears a noise downstairs; from the bedside lighting plate, one press will turn on the bedroom lights, two presses will turn on all 'public' areas, but not other bedrooms whilst three presses will turn on all the (designated) lights in the house. The 'off' button can be set to mirror these actions in reverse.

## Integrated blind and curtain control

In a **smartcontrols** system, lighting can be linked to interact with blinds and/or curtain operation, all from a smartWallplate. The blind or curtain motor is wired back to a smartDimmer panel. Within the dimmer panel are as many blind/curtain smartModules as needed, each one capable of controlling two blinds/curtains. Thus, the blinds/curtains can be made part of a lighting scene, which is especially useful in dedicated home cinema rooms or other feature areas of the house.

## Security interlocks

**smartcontrols** lighting control can be effectively interlocked with the property's security system. This enables all the house lights to be brought on if the security alarm is triggered. In addition, when the alarm is set, the lights can 'play back' learnt scenes in real time, eg, close curtains, etc, in order to simulate occupancy. This feature can also be used to bring on all the lights if a fire alarm is activated.

*A typical route lighting path.*

# Lighting control

## Infrared control

All smartWallplates have built-in infrared receivers. A wireless infrared handset can therefore be used. This can either be a **smart**kontrols unit or a combined lighting and audio-visual device.



*A hand-held transmitter can be used for remote lighting control.*

## Minor rooms

Areas of the house, such as cloakrooms, WCs, and utility areas can, of course, be wired with conventional light switches. Consideration should be given, however, to fitting one of the simpler intelligent smartWallplates (on/off, or on/off with rotary dimmer) so that the whole-house functions and security aspects of a lighting control system can apply equally in these areas.

## Gates, driveway lights, external lights

These items can all be controlled with a **smart**kontrols system, along with other miscellaneous items such as, water features, gas fires, garden watering equipment, etc.

## Presence detection and daylight linking

These functions can be achieved using the ceiling-mounted Multi-Sensor. Rooms can be lit automatically upon entry, and light levels in a room can be automatically kept constant if desired by monitoring natural light levels and adjusting dimmers accordingly.

## How does **smart**kontrols lighting control work?

Lighting control is based upon two components. SmartWallplates, which fit in place of conventional light switches, and smartDimmers, which are panels containing the dimmers for each individual circuit. The smartDimmer panels are remotely mounted behind the scenes, in a cupboard, riser, audio/visual equipment room, garage, etc.

- The smartWallplates signal to the smartDimmers over a low-voltage communications network, commanding the appropriate scenes, routes, etc.
- The smartDimmers switch or dim each circuit.
- The smartDimmers are typically noiseless in operation, but they do generate some heat. The cupboard must therefore allow for natural ventilation.



*Use intelligent lighting control to adjust mood and ambiance.*

## How is the wiring different?

It is no more involved or expensive than conventional wiring, but it is different. In a conventional scheme, the lights are typically wired from a distribution board to a lighting 'ring' for each floor. Wires then drop to each wall switch to create the different circuits. With a **smart**kontrols system, each lighting circuit is wired back to the centrally-mounted smartDimmer panels (smartDimmers can be located at several locations in the house, for instance, one on each level). The smartWallplates are wired in low-voltage data cable (single, twisted pair) back to the smartDimmers. It is possible to re-use mains cable wired to a conventional switch for the lighting network connection, although retro-fitting this type of system usually involves significant disruption to room decoration. Developers can exploit the unique ability of **smart**kontrols to run a lighting network over 'twin and earth' conventional mains cabling. Apartments and houses can be pre-wired using conventional cable in a 'star' configuration. They can then be upgraded to intelligent lighting if the incoming new owner so desires.

# User interfaces and integration

## Keep it simple and elegant

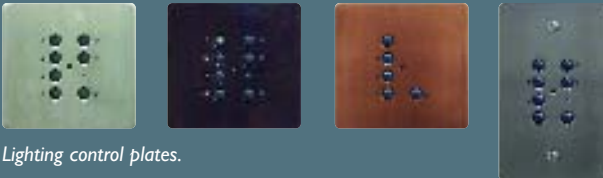
The user interface for any home automation system is the most important part. Get it wrong and the house will be difficult to live in, the walls will look a mess and the homeowner is likely to be significantly unimpressed. **smartcontrols** offers a wide range of different options to suit different types of property, application and interior design tastes. Remember when specifying an interface that different systems require different attributes; for lighting, an easy-to-remember and consistent allocation of buttons is essential. For HVAC, there is no natural visual or audible feedback from the controlled system to identify what is happening – so the user interface must provide that feedback.



© Heiler

### smartWallplate

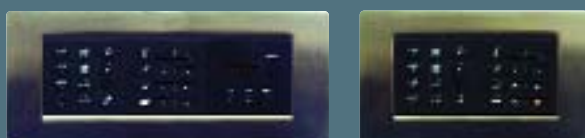
These flush-mounted plates are available in a variety of finishes and versions with a range of buttons, sliders and knobs. They can be double-ganged in combined lighting and HVAC control plates, or with audio and access control systems. LED buttons indicate operation of the HVAC settings, however, HVAC time functions must be set elsewhere in the property.



Lighting control plates.



Combined lighting, HVAC and blind control plates.



Combined lighting, AV and blind control plates.

### smartZone controller

Available for HVAC control, this compact, light-switch sized unit either features an integral temperature sensor or it can be connected to a remote sensor. It offers good visual information through an LCD display of current temperature, and allows easy adjustment of both temperature and time functions. These controllers are available in a white or graphite plastic finish, and can be concealed within smartBox enclosures out of sight, if required.



smartZone controllers in a concealed smartBox unit.



### Temperature sensors

Two choices exist: thimble sensor or wallplate. Thimble sensors can be mounted without a backbox. Wallplate sensors mount on a single gang box or integrate with lighting/HVAC plates. Both types are available in a wide variety of finishes.

# User interfaces and integration

## smartTouchscreen

Lighting, HVAC and other systems can all be operated from one touchscreen which is the same size as a double-gang, UK-size switchplate. They can be supplied in a variety of finishes.



*The versatile smartTouchscreen.*

## Third party touchscreens

These touchscreens available from manufacturers, such as, AMX, Crestron and others, feature standard software drivers for **smartcontrols** systems. A comprehensive range of drivers for other systems (audio, video, security etc) allow multiple system integration and operation from a single interface. A range of different sizes and touchscreen styles are available.



*Typical AMX touchscreen.*

## Remote control

The smartEText module works with the GSM modem to access a cellular phone network and allow SMS text messaging of the HVAC, and/or lighting control systems from a mobile phone. It can use any standard cellphone to 'text' the house (but only the homeowner's nominated phones will work).

The messaging features allow lights to be turned on or off, and setting of the holiday mode for the HVAC system. The house then texts you back to tell you what it is going to do, and when. If the owner is returning home unexpectedly, then this capability can prove incredibly useful.



## Wireless interfaces

### Infrared handset

These simple to use, remote control devices are available to control **smartcontrols** lighting, blinds and HVAC systems.

### Third party, universal infrared handset

These more advanced remote control units can combine lighting and other functions (eg. home cinema/audio)

## smartServer whole-house controls

This embedded, hardware-based webserver serves up HTML pages onto an ethernet LAN. It can use any standard browser to view the pages (eg. PC, PDA, wireless web tablet) and is capable of managing the whole house lighting, HVAC times and temperatures, holiday settings from any PC in the house. It also works across the internet if desired, allowing the homeowner to control operation of these systems from anywhere in the world.



*The smartServer web-browser interface.*

## Integration with other technologies in the house

With so many different electronic systems now being installed in the typical house, getting the user interface right is crucial. Although not specialists in audio, video, security system design and installation, **smartcontrols** is experienced in working alongside other specialists and dedicated custom installation companies. This ensures an integrated approach to the way the house eventually works for the homeowner. Often, these companies are, like **smartcontrols**, members of CEDIA (the Custom Electronic Design & Installation Association) which works to uphold high standards in the supply and installation of electronic systems within all types of home.

For more information visit [www.cedia.co.uk](http://www.cedia.co.uk)



# The smartkontrols service



System commissioning in action by a **smartkontrols** engineer.

## Four steps to successful controls specification

- If developing an integrated home automation system, then ask **smartkontrols** to recommend a suitable partner or alternatively contact CEDIA for a list of specialist custom installers in your area.
- Consider all electronic systems which are likely to be installed in the building as early as possible.
- Consider carefully what each internal wall elevation will look like to avoid the risk of 'wall acne' with multiple wall interfaces.

“ Don't dismiss integrated wallplates and touchscreens as 'too complex' – the alternative may be a rash of dissimilar plates on the wall, and a pyramid of remote control devices. ”

**smartkontrols** provides a specialist service to ensure the correct application of its products. As with all new approaches, the current group of tradesmen may be unfamiliar with the system, and will often require technical guidance and reassurance so that they can play their part in installing and commissioning the associated systems in the house. Conversely, **smartkontrols** has no wish to duplicate the efforts of the traditional teams already on site. For these reasons, the company has developed its own package to provide design, supply, commissioning and after-sales support.

## Design

**smartkontrols** works from floorplans of the property (and a site survey if required) plus drawings and details of the proposed mechanical and electrical services to be installed. These usually include lighting circuit design and schematic details of the HVAC installation. **smartkontrols** will then produce design drawings which take two forms:

- Floorplan layouts showing the positions of all smartBox, smartDimmers and wall-mounting items.
- Schematic wiring diagrams showing all the wiring which is necessary for the system.

## Supply

**smartkontrols** supplies all the necessary components to site for installation by other parties, typically an electrical contractor. This work is well within the capabilities of any competent electrician. Full drawings are supplied and all the terminations are simple screw terminals.

## Commissioning

When the electrical installation is complete, and all the connections are made, power on, and the mechanical services have been pre-commissioned (boilers and pumps run, wet system filled and bled, air-conditioning charged and ready to run), **smartkontrols** will attend site to perform live commissioning and hand over the site.

## After sales support

Once operational, **smartkontrols** continues to look after the system. Every installation is fitted with a GSM modem, which allows us to dial-up the system to check performance and diagnose faults. **smartkontrols** offers maintenance contracts for extension of the initial dial-up service, and for all on-site support.

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