Smart Homes

General Considerations

Smart homes come in all shapes and sizes from penthouse flats to rambling country estates.

Private residences provide one of the most challenging environments for the installer of lighting control systems. It is not that the installation or technical requirements are particularly onerous, but that there can be few areas where the client will pay such close scrutiny to the operational flexibility and usability of the control system.

A System for the Individual

The design of the user interface (control panels) in such properties needs to reflect the individuality and very personal taste of the owner. The iCan™ range of control panels can be built into virtually any style of panel and the buttons assigned to any function, for example channel raise and lower, on/off, or scene set. Alternatively they could be fitted with rotary knobs, or virtual faders. Sophisticated 'Drill down' area control can be installed using LCD touch screens. By special quotation, the buttons can be provided in special colours or even custom shapes.

A Total Lighting System

The optimum way to provide an integrated solution for a private house is to control all of the lighting from a single networked system. This provides a high degree of individual control, but with the facility for overall master control to maintain a common look and feel.

Such a system will provide the flexibility to control scenes, toggle on/off functions and raise and lower individual circuits. Many of these functions may also be achieved using simple hand held remote control units.

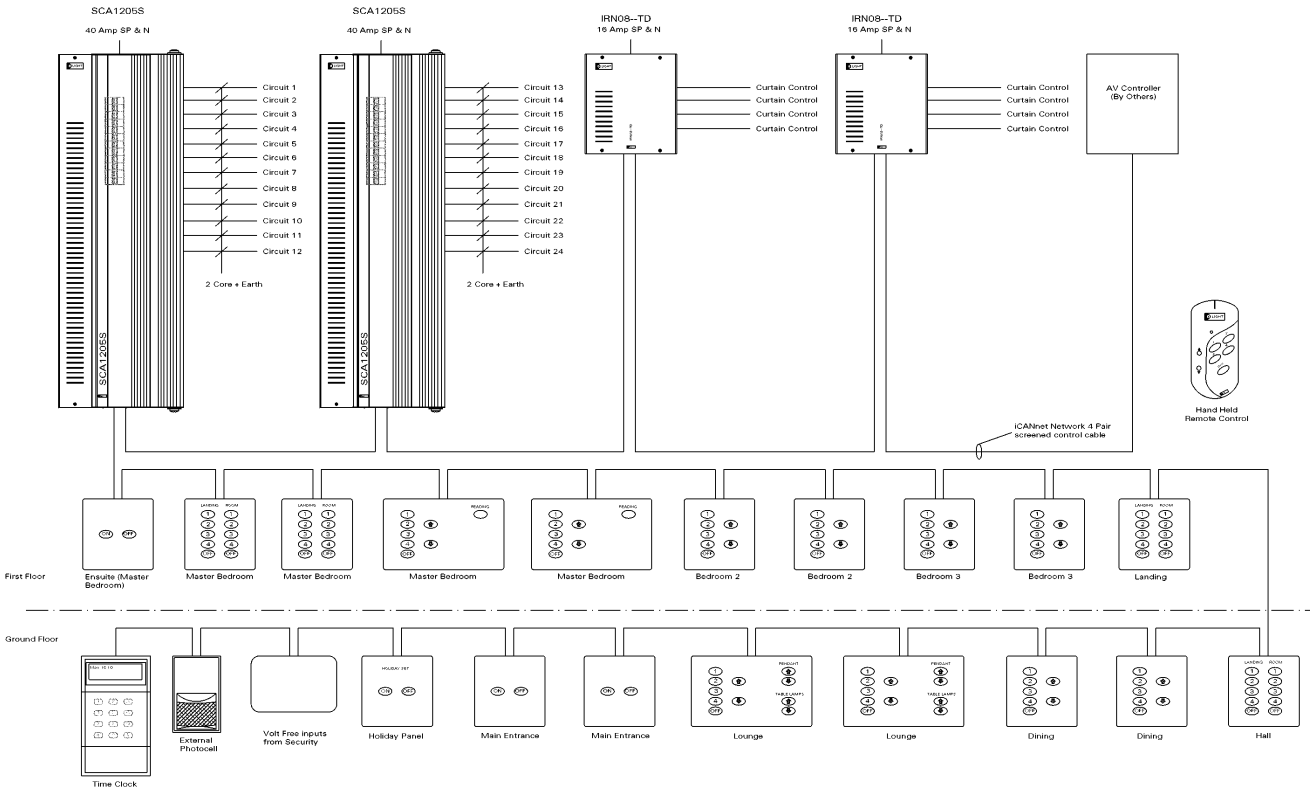

Figure 1

An Integrated System

Smart homes will also incorporate other intelligent systems that will need to seamlessly interface with the lighting control. These will typically include audio-visual and security facilities. It is perfectly possible to control the lighting system from these systems, for example from an audio-visual touch screen, but the primary lighting control for each area should always be a dedicated lighting control panel. As with all other installations, whilst it may be nice to have one controller for everything, it should be borne in mind that lighting is critical. If the A-V equipment is 'down' for maintenance, lighting will still be required. Although there may be several AV facilities in an installation each with some form of user control, there is normally only one central 'brain' and only one interface is required between it and the whole lighting system. It is also possible to integrate curtain and blind control into the system.

Integrated systems would normally consist of a series of source controllers (dimmers), volt-free relay outputs for control of blinds or curtains, a time-clock, a photocell (for exterior lighting), one or more master on/off panels at the main entrance(s), individual room control panels and appropriate interfaces.

Lighting Control for Individual Rooms and Areas

Individual rooms or spaces will have need specific control requirements. Some examples of this are:

Master Bedroom

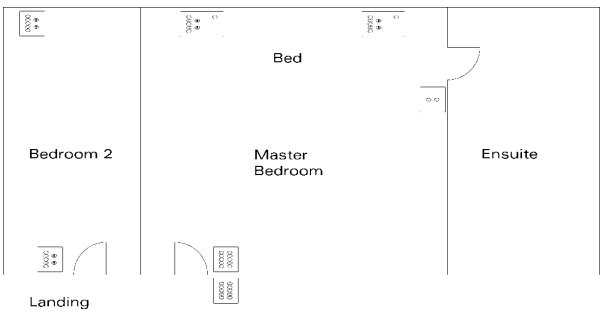

Figure 2

Bedroom lighting scenes would be controlled from any of the three positions with an additional panel for on/off control of the en-suite area. The control panels would, however, be quite different in their operation. The panel by the door would have two rows of buttons, one row providing a set of scenes for the bedroom and the other two way control of the landing lighting.

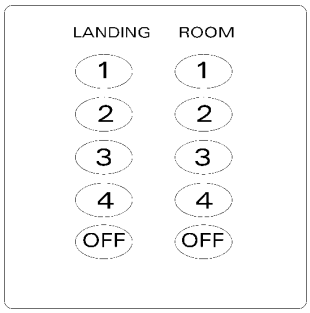

Figure 3

The two panels, one on either side of the bed, would effectively each be master panels with four scenes plus a master raise/lower control. Additionally they would each have a single on/off button with a toggle function for control of the reading light on that side of the bed. While the reading light would be outside the control of the scene buttons on the bedside light, they would be switched off by the off button on the door panel. Each of the bedside panels would also have two buttons for curtain

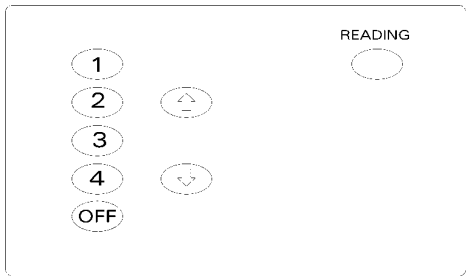

Figure 4

open/close control.

The control panel for the en-suite room would be a simple two-button on/off panel. This would not, however, just control the lighting but also the power to the extract fan. Switching the lights on would turn on the fan. Pressing the off button would fade the lights out immediately and at the same time start a timer which would delay switching the fan off for a pre programmed time.

Of course this facility would also apply to other toilet areas.

Main Living Areas.

In many domestic residences a number of lighting points may be provided for plug-in freestanding lights such as up-lighters. These would, however, need to be incorporated into the control system and dimmed. Power outlets would be provided which would have to be physically differentiated from the normal 13A sockets. 5A socket outlets are generally used for

this, avoiding the possibility of non-dimmable appliances such as vacuum cleaners being plugged in and subsequently damaged by a dimmed supply.

Control panels for these areas would rely mainly on traditional scene setting with master raise/lower controls. Within these scenes, however, the client may regularly wish to alter the levels of one or two circuits, main pendant and table lamps for example.

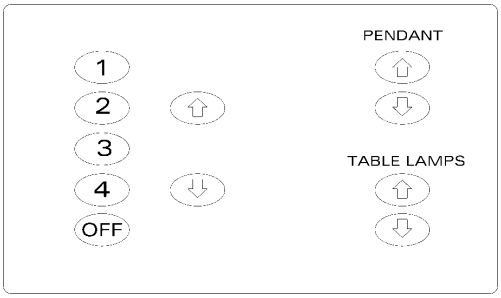

Figure 5
To accommodate this, individual sets of raise/lower buttons should be provided and curtain raise/lower controls where appropriate.

Home Theatre

In this space the A-V system takes centre stage so the lighting control panel now acts as a simple back up to the show control. The dimming is, however, an essential part of the show. Whilst all the commands would be sent from the A-V handset or touch screen, they would be interpreted by the A-V controller and the appropriate lighting or curtain control commands communicated to the lighting system. Therefore whilst the lighting and curtain control might well remain under the lighting system control it would appear to the user to be a seamless part of the audio-visual installation.

External Lighting

Garden, facade or other external lighting could also be easily included. This would turn on by a photocell, as it was getting dark. All except essential security lights would be faded out at (say) midnight, over-riding the PE cell, under the control of an electronic time clock. Alternatively the photocell function could be replaced by an astronomical time clock that would track the natural dusk cycle throughout the year. However an astronomical time clock will not be able to take into account unusually dark or bright days.

Security

If all the lighting in the house is controlled by one system then it is possible to have a master 'off' button by each of the main exits, which would ensure that all the lighting in the house is turned off. The corresponding 'on' button would, however, only control relevant access circuits in the hall and doorways. In addition to the normal exit control panel there would be one holiday panel located next to the security alarm panel. When holiday mode is selected the lighting will be triggered by the timeclock to select a series of evening/night-time settings which would mimic the normal operation of lighting whilst the residents are away. The system will also have an interface, usually a simple volt free trigger, which will receive a signal from the security system and trigger a sequence of lighting states mimicking an occupant turning lights on. This can prove to be a more reliable deterrent than the normal sound alarms.

Source Controller Considerations

Source controllers (dimmers) can make a small buzzing noise, particularly when dimming low voltage fittings. In office environments, the small amount of background noise (computer fans and other machinery) will cover this. However, in a domestic situation complete silence may well be demanded, for example when reading. To achieve this either extreme care should be taken when choosing fittings and control. For maximum silence, high quality low-voltage transformers in the fittings and the iCAN™ range of adaptive source controllers are recommended.

Other Information

See Section 4 How a Dimmer Works

See Section 5 What is Scene Setting?