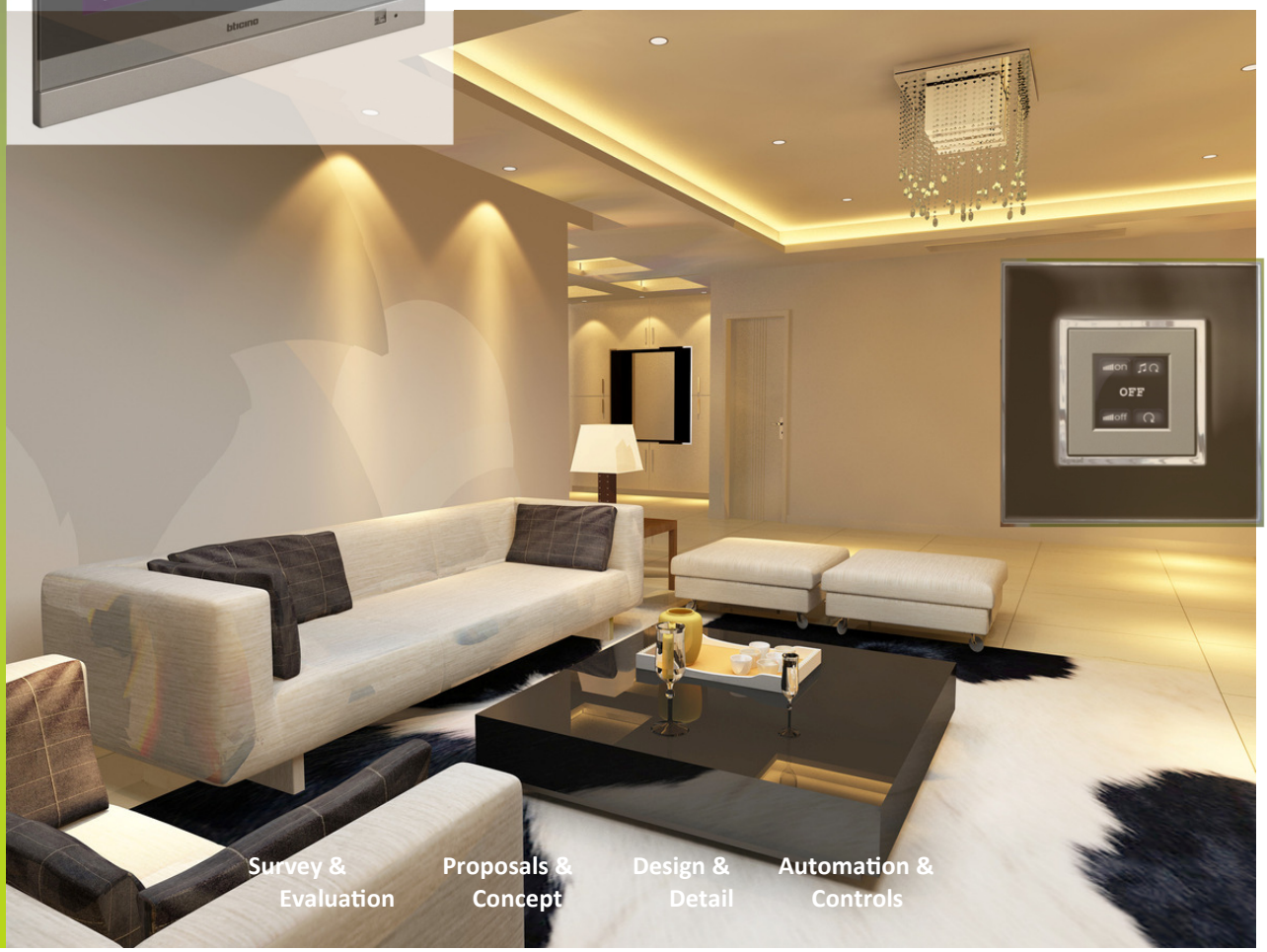
LIGHTING GUIDE FOR HOME AUTOMATION

BIANCHI LIGHTING LIMITED

GUIDE FOR HOME AUTOMATION

Lighting Principals and Integration for Dimming and Home Automation



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Survey & Evaluation **Proposals & Concept** **Design & Detail** **Automation & Controls**

1. Why bother with Lighting Controls and integration

The way we use the rooms in our houses and lifestyle generally, is under constant change. We used to live in smaller rooms with a coal fire on one wall, and a central lighting pendant. Currently, we look at open plan areas which are multi function.

Lighting needs have changed with lighting required for a task as well as ambient light. This change means a number of circuits are required, where previously it was just one.

In History, 1920's to 1950's we had a small room, light in the centre with one switch. Dimming was considered **POSH or unobtainable.** Today, there are very few without it.

In History 1970's to 1980's we have dimming, an array of ceiling downlights, some with 2 dimming circuits for Open Plan living. A raise in complexity.

In History 1990's to 2000's More open plan living, spaces with multi-task use, Kitchen, dining, Living, space is at a premium. More switched and dimming circuits, More complexity.

Currently. New technology allows, for the first time, light sources small enough to hide in furniture and within architecture for use in multi-use spaces. It allows you to create lighting effects based on how you use a specific space. To achieve these effects means moving away from multi individual 'switches', to switches which create 'events' .

Area Types

- Multiple Circuits.
- Multi use Open Plan living. Lighting for each specific task needed

Managing Multiple Circuits

Especially for open plan areas, that then also link to outside spaces and circulation spaces, conventional switching requires a bank of switches, all appearing the same. It becomes a challenge to recall which switch does what function, especially for the older generation or guests not familiar with the room layout. The switch array therefore needs to be simpler and more intuitive.

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2: Changes in Technology and it's Impact on the Home

The lifestyle change to open plan, means there is a need to control the same lighting circuits from a number of switch points. This was previously limited only to the hall and stairs areas. When dimming control is added, a conventional switch system breaks down.

Changes in technology;

Due to net Zero, general energy concerns, resulting in the banning of more traditional light sources LEDs are now the prevalent light source of choice. In making these changes the duration of the LED;s performance and thermal management issues needs planning and consideration.

The technology used in LEDs offers options that were not previously available. These include:

- Dim to Warm.
- Tuneable White for Human Centric Lighting .
- RGBW (dedicated Red, Green , Blue and White), for dedicated white and colour options.

The complexity required of controlling LED's means that in many cases, traditional phase dimming of the power supply can make the light emission unstable leading to the following issues@

- LED flickering especially at low levels.
- Irregular and uneven dimming rates between luminaires on the same circit.
- An inability to control multi channel LEDs

To manage high currents and energy losses in the circuits, In cases, it is necessary to use Zero point Switching devices in the electrical circuits.

LED light quality, light depreciation values and failure fractions play a part in switching and dimming compatibility means the humble switch is now required to do more.

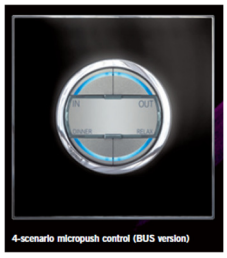
The switch now has to maintain its simplicity, but also be able to:

- Switch multiple circuits
- Switch from multiple locations
- Recall 'Events'
- Master On-OFF functions

2: Changes in Technology and it's Impact on the Home.

Using a large array of switches and dimmers, creates confusion and complexity. Automation separates the switch action from the final light event.

A lighting 'Event' can recall the selection of a number of circuits, all with differing dimming rates, and can sequence with some delays, the order in which the lighting is to be applied. The switch button communicates with the main lighting system, so a button can intelligently communicate with all lighting units and switch locations on the entire system. Buttons can be linked to background music, blinds and curtains, heating and CCTV Systems



Within a standard single plate size.

EVENTS can be created using any circuit or combination of circuits, connected to the whole house

Where to use it

- Multiple Circuits.
- Multi use Open Plan living. Lighting for each specific task needed.
- Master 'Off' at exit points.
- Restaurants– distinction between lighting for tables, bar etc.
- Timed events via daylight or time control

Separates:

The Action of the switch, from the electrical Connection.

- Programmable Switches
- Timed Events
- AV, Music and Cinema
- Blinds and Curtains
- Heating Controls

3. Definitions and Types of Home Controls

Home controls have been split into groups defined by CEDIA. These groups are simplistic in their nature and overtaken by the abilities in new technology.

The Groups are stated as Follows:

Group 1 TRADITIONAL. Traditional Swtching and individual Dimming of a circuit

Group 2 STANDALONE and Peacemeal Control. Standalone Control of a limited number of circuits in one room.

Group 3 PROPRIETRY Limited integration with other devices, Typically closed Source data bus.

Group 4 INTEGRATED AUTOMATION . Can integrate with other system e.g. Heating and CCTV May be closed or Open Source data bus. Open Source means the Data bus is common with other manufacturers opening options of supply routes.

Group 5 Full Integration Autonomous Operation Seamless integration of controls with sensors monitoring movement in the building with pre-determined actions by the system to anticipate your needs

1 Traditional Home Cost ..£

- Standard wall switched and dimmers.
- Switches and dimmers within a confined space.
- Thermal Constraints
- Load Limitations

3. Definitions and Types of Home Controls

Home controls can be spilt into one the following groups:

2 Peace meal Automation
Cost ££

- Standalone Individual control of devices. Mainly accessories.
- Some wireless devices
- Some with a smartphone app.
- No integration possible.
- Switches now act as signalling devices

Integrated Accessories Cost £££ 3

- Some Wireless (wi-fi) or Bluetooth integration via apps
- Comfort system events can be created
- Most work via a smartphone app.
- Limited integration possible
- Maintenance Issues

This area represents the most challenging and confusing group to clients. These are commonly Closed systems, linked to only one manufacturer. These products are subject to obsolescece , limited product offering, and buyout by larger groups. These may be offered as cheaper alternatives to Open systems. This represents buyer beware section of the market.

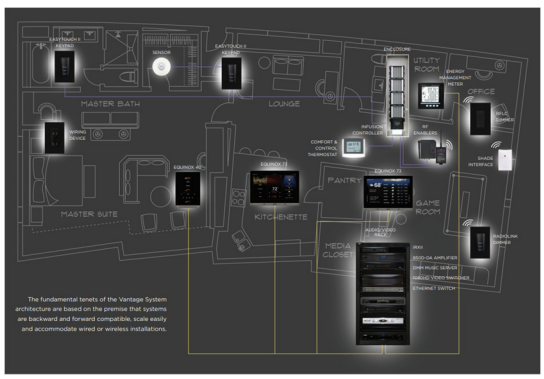
2. Definitions and Types of Home Controls (Cont.).

4 Full Integration Cost ££££

Wall switch communicating via data.
Wall switch touchscreens , wall events and dimmers.
Accessories allow connection, or 'events' with other systems
Capable of integration with heating and multi room music.
No app control integration with other systems
Wi-fi and internet connectivity

5 Ambient and Invisible Cost £££££

Wall switch communicating via data.
Wall switch touchscreens Multi function switches and dimmers.
Direct app control allows seamless connection, creating 'events' with other systems
Capable of distributed audio and Video
integration with heating and security
Wi-fi and internet connectivity
Seamless voice and AI integration



3. Lighting for Spaces using Controls

There is a very distinct difference when actually living with each step increase in each of the automation levels described previously. Equally there is also a jump in cost and installation.

So, here's a general guide

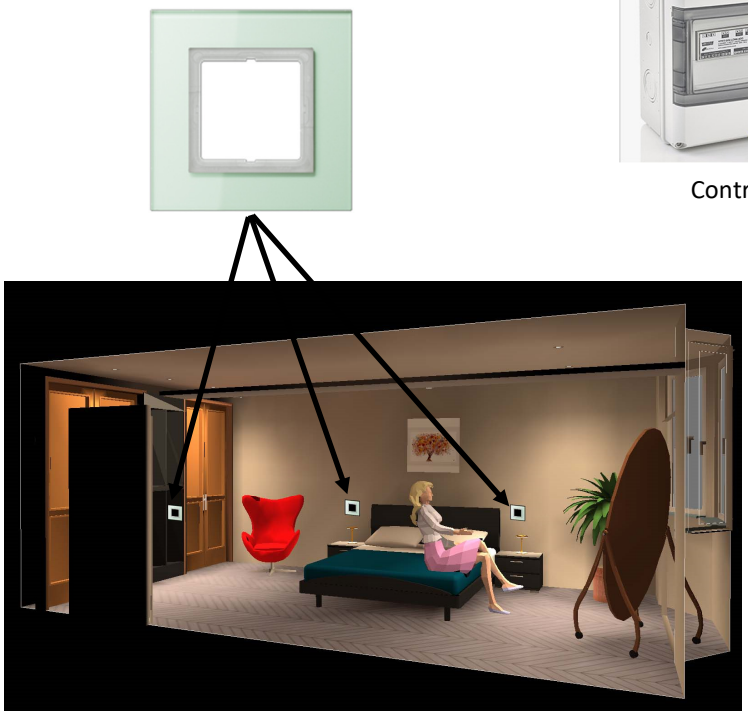
a) Bedrooms in a Level 1 house. (Simple)

Presumes Standard room, no en-suite, No High level Automation anywhere else.

To achieve: Switching Dimming by the door, and each side of the bed.

Suggestion Level 2 Control with signalling
Requires space for a small control box enclosure at the board or local to the room.

Control Box



3. Lighting for Spaces using Controls

Costs and the technology has greatly improved for Level 4 Automation. This is now affordable for those with the opportunity and vision for its use.

b) Open Plan Living , Hall and Exterior Entrance

Presumes multi circuits for different tasks.

To achieve: Events suited to each task. E.g. TV Snuggle up. Dining, Reading Etc. Added 5A sockets for table Lighting.

Suggestion : To avoid over lighting of areas not needed for the task in hand, it is best to consider, dividing up circuits within the space. Level 4 Controls, allows these circuits to be grouped and recalled in different configurations.
To avoid large unmanageable switch arrays in Level 1 automation, At level 4, Data is used to manage the selection of circuit groups, and recall these groups with the flexibility needed.

Example of a TV Event

Events control Plate

4 to 8 Events

Retains group On / Off and Dimming +/- control plate.

Example of a Dining event

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4. Suitability of Controls

Controls are used to minimise vast arrays of wall switches, to simplify the use of lighting and to provide easy pre-set or combination of switch arrangements to meet the needs of the user, or also, to offer a greater degree of circuit control and dimming that cannot be achieved using conventional electrical wiring.

Recent app improvements allows users to set levels of security authorisation, and allow changes or modification to be performed by the user to suit him/ herself.

When to use **CONTROLS**

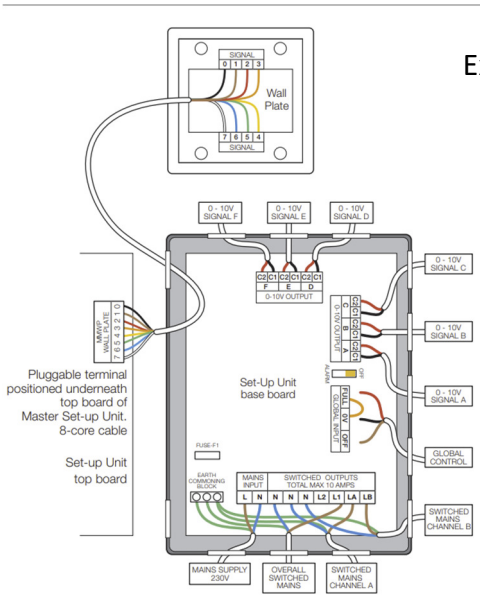
- Where the space is multi-use, e.g. Dining, TV and cleaning
- To group circuits in large spaces
- To create interest in architectural features using automated switch cycles
- For Lighting and Blind Control
- To combine Lighting and Heating.
- To control Lighting and Sound

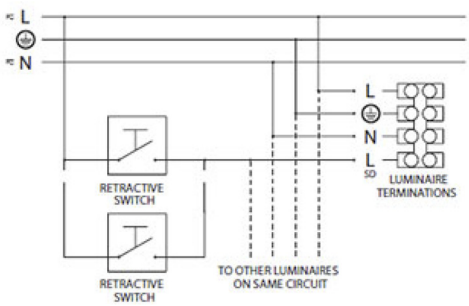
Systems are scalable, so budget can be controlled, but the higher the integration level the more budget may be needed, as the greater the degree of integration into the fabric of the building, equally the more demand there is on the knowledge of the installing contractor. Collaboration is Key.

Level 2 Controls Typical Wiring.

Note this is subject to change based on site requirements

Example of 2 Options

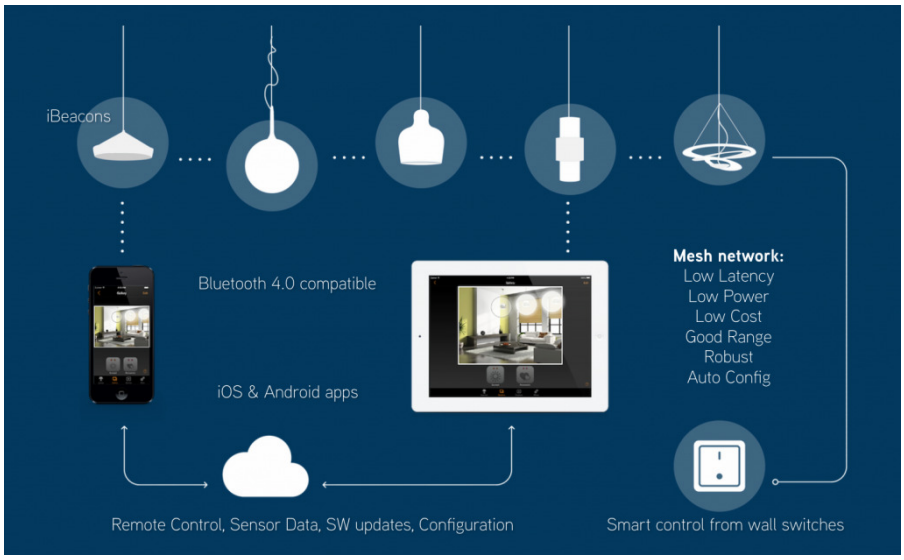




4. Suitability of Controls

Level 3 Controls Typical Wiring.

Note this is subject to change based on site requirements

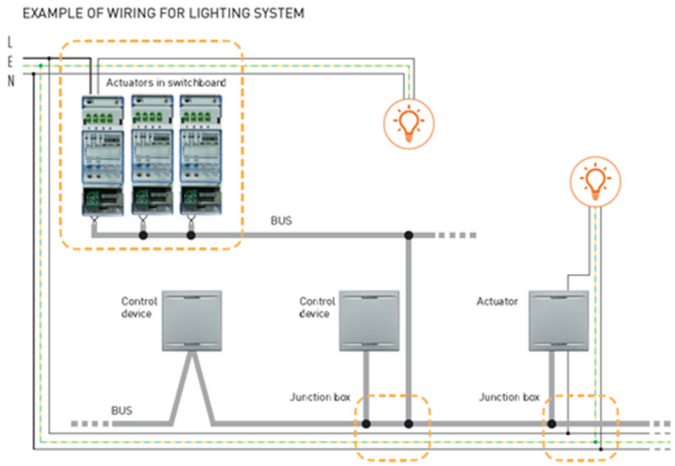


Level 3 controls are best for retro-fit installation of controls.

These are typically wireless, and we recommend MESH control. So each unit both received and transmits data

Level 4 Controls Typical Wiring.

Note this is subject to change based on site requirements

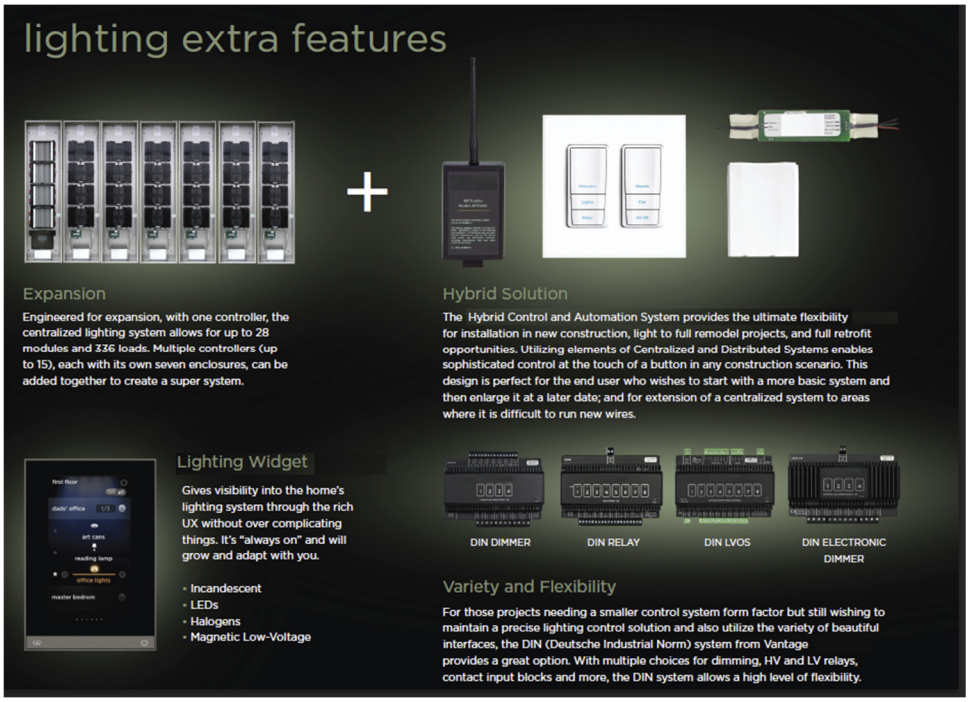


Greater diversity and aesthetic appeal of all wall switches, some internally illuminated for finding them the night.

4. Suitability of Controls

Level 5 Controls

This tends to be outright custom, with all manner of integration. Level 5 controls are best for AV Cinema Rooms, Music Studios, new installations only



5. Summary

Having a budget in mind, and an idea of how integrated you wish the Home Automation System to be is key to the success and usefulness of the system in meeting your expectations.

The internet and a home network appears to be a common solution offered by many manufacturers. However, Many devices using many systems that all require an internet connection will have an effect on the home network.

This represents a credible concern and needs to be mitigated in homes of the future.

Getting the **RIGHT ADVICE,** at the **RIGHT TIME,** with the **RIGHT BUDGET** will result in the **RIGHT SMILE** when you get home.