

# Lighting and Energy Controls

for Education Buildings



**CP Electronics**  
A brand of **legrand**

## Positively Controlling the Future

The purpose of schools and universities is to ensure positive educational experiences and the best possible start in life for their students. One of the main contributing factors to this is having educational buildings that are not only safe but also inspiring. Creating effective learning environments often requires the combination of multiple elements like sufficient space, good acoustics and effective use of light. The utilisation of natural and artificial lighting can be hugely important in the engagement and morale of the students and staff using these spaces.

With over 50 years of experience in lighting and energy controls, CP Electronics has gained invaluable expertise working across a range of sectors, delivering various tailor-made solutions. With an experienced team and a broad product range, we've worked closely with schools and universities to consult, advise, design and deliver the most suitable and effective installations for any educational facility.

This guide on lighting and energy controls for education buildings will focus on the best ways to create effective learning spaces in schools and universities, from simple and quick install standalone sensors to advanced control systems that take learning to the next level.

Legrand UK and Ireland has been manufacturing in the UK since 1980 and our five manufacturing sites create mechanical, electrical, electronic and digital solutions. Around 80% of UK sales come from products manufactured in the UK.

## Reference Standards and Guidelines

When specifying and designing lighting solutions for education buildings there are a range of regulations, standards and guidelines that should be considered.

A number of these will be referenced throughout this document and predominantly form the minimum required functionality.

- Department for Education - School Output Specification Technical Annex 2E: Daylight and Electric Lighting
- The LIA - Lighting Control Guide
- BREEAM
- WELL Building Standard

In addition to these, expertise gathered over many years of working on education projects will add a further dimension in terms of best practice, use cases and tried and tested solutions.

## Design Considerations

There are many design considerations, some of which are a legal or regulated requirement and some that are the client's preferred option, all of them bound by budget constraints.

These design considerations need to encompass not only the current installation but also the future maintenance and development of the site.

When looking at any lighting design, consideration needs to be given to the legacy of the project and the end user. This is both from a usability point of view and the ongoing maintenance that may be required. BREEAM places emphasis on the fact that the design should be simple to understand and easy to use.

Usability of the space is important, consider who will be occupying the area and what their specific needs are. Having a flexible system and partner that has experience in meeting specific and diverse requirements can ensure the efficiency and longevity of the building.



# Delivering Beyond the Project

## Commissioning

Our team of experienced commissioning engineers will help to optimise the performance of our lighting controls, maximising potential energy savings.

In turn your client will be better equipped to use and adapt product features around their needs. This also eases the burden on your organisation's resources, allowing you to focus on handing over your project as efficiently as possible.

- On completion of project commissioning, we will provide the all-important Commissioning Certificate for your project handover.
- Our commissioning service includes a 12 month return-to-site warranty and is supported by our standard product warranty.
- We can also provide additional post commissioning support, including a 'soft landings' option, giving your client a premium project handover experience.

## Maintenance Contracts

With an increasing demand for sustainability, lighting controls play a key part in saving energy. Ensuring these systems are maintained and fully functional is vital for buildings to meet targets.

- Experienced CP Electronics engineers work proactively with you to ensure that the lighting control solution provides a comfortable environment and operates efficiently and reliably around the clock.
- Our maintenance packages help with annual cost planning within agreed budgets, effectively reducing the frequency and therefore cost of ad-hoc call outs.
- Whilst a space may evolve over time, our products and systems make adaption easy, and our technical service offerings are second to none.

**Contact us for more information:** +44 (0)333 900 0671



# Lighting a Variety of Spaces

Similarities exist throughout all types of education buildings and facilities, with the basic lighting requirements being consistent whether you are working with a nursery or a university.

Typically, the case for more complex control arises in secondary schools and universities, as these are generally larger spaces with a variety of differing environments. Additionally, there is a greater need to showcase achievements and impress as they look to draw students to join.

Spaces like reception areas, corridors and standard classrooms are common in any education building, with regulations and standards in place to ensure the welfare of students is a universal priority.

Energy efficiency is another key aspect to consider when building or refurbishing a site, with an increasing emphasis on sustainability and cost saving, lighting and energy controls play a key part in a greener future for educational buildings.



\*Tech Annex 2E ADS - L0.1

## Reception Areas

The reception area is often the initial point of contact in any school and creating a memorable first impression can be key to attracting students. Despite the importance of reception areas and the impact they can have on visitors, the minimum requirements are quite simple - automated lighting to turn the lights on and off based on occupancy and daylight dimming when sufficient natural light is available.

Therefore, the opportunity to create engaging entrances to these buildings is at the discretion of the facility, with many choosing to use lighting to effectively showcase student artwork or a trophy cabinet for example.



\*Tech Annex 2E ADS - L0.1

## Offices

Whilst the importance of creating effective learning spaces for the students cannot be underestimated, the people administering the teaching cannot be forgotten. Teachers and support staff spend most of their time in the classroom working with the students but there are periods where they utilise office spaces to plan, mark and assess work, therefore creating an effective environment. Universities usually have a higher demand for office spaces where lecturers can work and study outside of scheduled teaching time.

Often these areas are used infrequently offering the opportunity for greater energy savings by automatically turning lighting off when unoccupied.





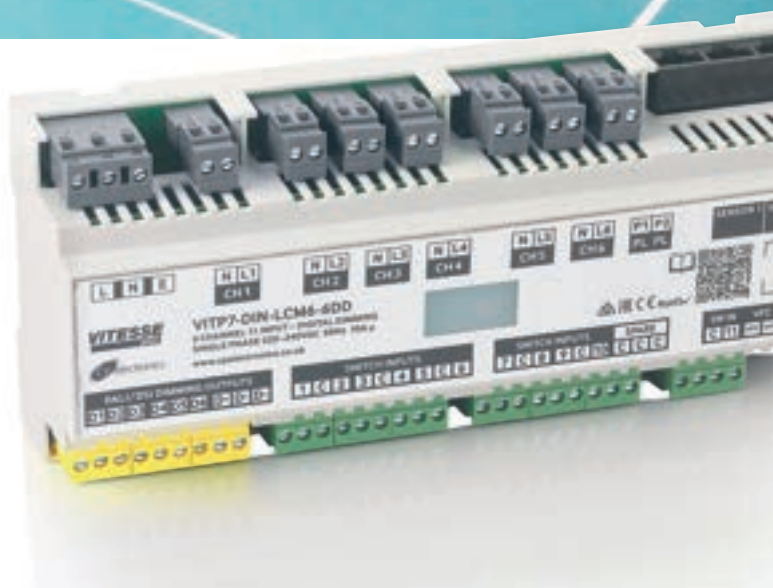
## Sports Halls

Typically, sports halls are multi-use areas and are the location for more than just PE lessons. They are used for exams, theatre and stage productions and competition level sports events.

Due to their size, sports halls are a major consumer of energy, even when energy efficient LED luminaires are installed. They are often used infrequently throughout the day and it is therefore even more important that these areas benefit from controls to turn lighting off when no one is present.

The sports hall is an area where the client should really look to provide flexibility above the recommended simple auto on/off solution.

Light levels for competitive sporting events will often be increased compared to general day to day use. During events where spectators are present, it may be necessary to achieve different light levels on the pitch compared to the seating areas.



An emergency override should be considered if the area is used for events. This would be either manual or ideally by an automatic interface to bring lighting to full level in the event of fire alarm activation for example.



\*Tech Annex 2E ADS - L0.2

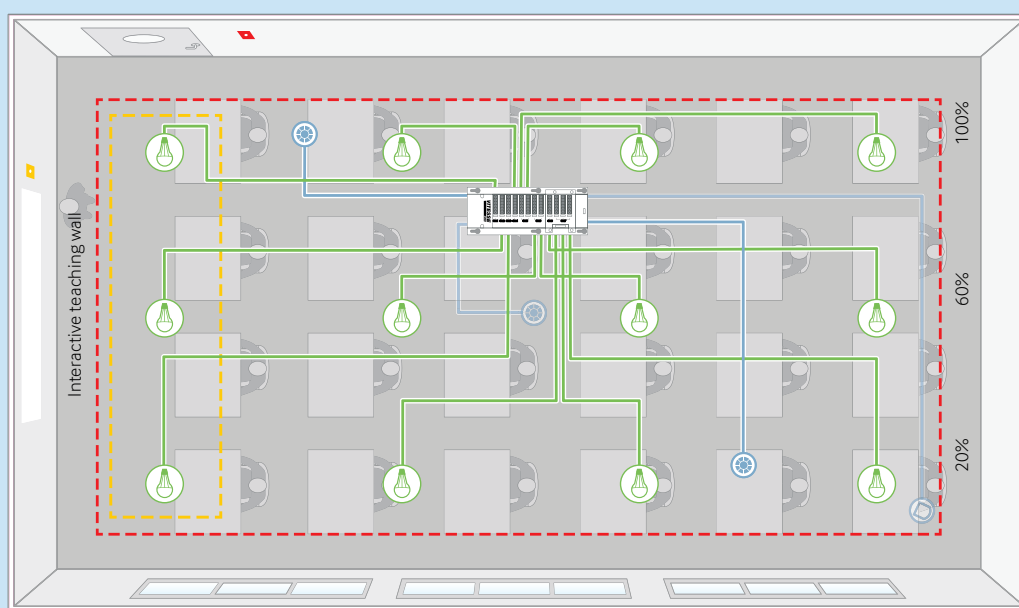
### Classrooms

Classrooms are an evolving space, from the days of benches and chalk slates to interactive teaching walls and Human Centric Lighting, the accurate control of brightness and warmth of colour are now increasingly important. These areas need to be flexible to suit varied modern teaching methods whilst maintaining a pleasant environment for the students to flourish. Add to the mix the increased importance for energy efficient spaces that focus on comfort and low running costs, and you start to bring together a complete room or building solution.



There are many types of classroom, and the requirements change often based on the age, ability and particular needs of the students. When looking at the lighting control for a school, one solution does not fit all. There are numerous considerations to be aware of for each level of education with guidelines set by the Department for Education (DfE).

The DfE sets out the requirements that enable the developer to achieve the recommended standards. There is also the need to design an installation that meets the needs of the end user, this is covered by BREEAM. This may therefore mean that the DfE guidelines are the minimum level that a facility is looking for. Individual education authorities will also have their own additional standards that will need to be covered, discussed and satisfied.



### Example Classroom Installation



The most common installation option for a classroom is shown in the adjacent diagram with three rows of luminaires working together in absence mode via a single switch and the interactive teaching wall independently switched. The window row of luminaires will dim in daylight or as shown here graduated dimming can be used to offer increased energy efficiency.

-  Light Fittings
-  Presence Detectors

-  Microwave Detectors
-  Vitesse Plus

-  Main Switch
-  Interactive teaching wall switch



## General Corridors

Lighting corridors and other areas of circulation like stairwells is important to consider when planning a building. Corridors are used to navigate from classroom to classroom safely and effectively, but often these spaces are used irregularly or on a short term basis.

Effective lighting control can help ensure energy efficiency is optimised, while still providing safe function and performance of these essential yet momentary spaces.



\*Tech Annex 2E ADS - L0.3

## Science Labs / Workshops

Science labs and workshops are often places where students get to be creative and experiment, however, these spaces can present potential health and safety concerns. Ensuring tailored lighting and control measures are in place in these rooms will ensure that the chances of accidents are reduced significantly. Controls can be utilised to ensure lighting is at the correct level and provide individual lighting for specific areas.

Using our Vitesse Plus 7 system offers 'absence recovery', so if the lights time out, we provide a 10 second action of presence detection. This removes the risk of people having to move (in the dark) towards the switch to reactivate the lighting.



\*Tech Annex 2E ADS - L0.2



\*Tech Annex 2E ADS - L0.4

## Other Spaces

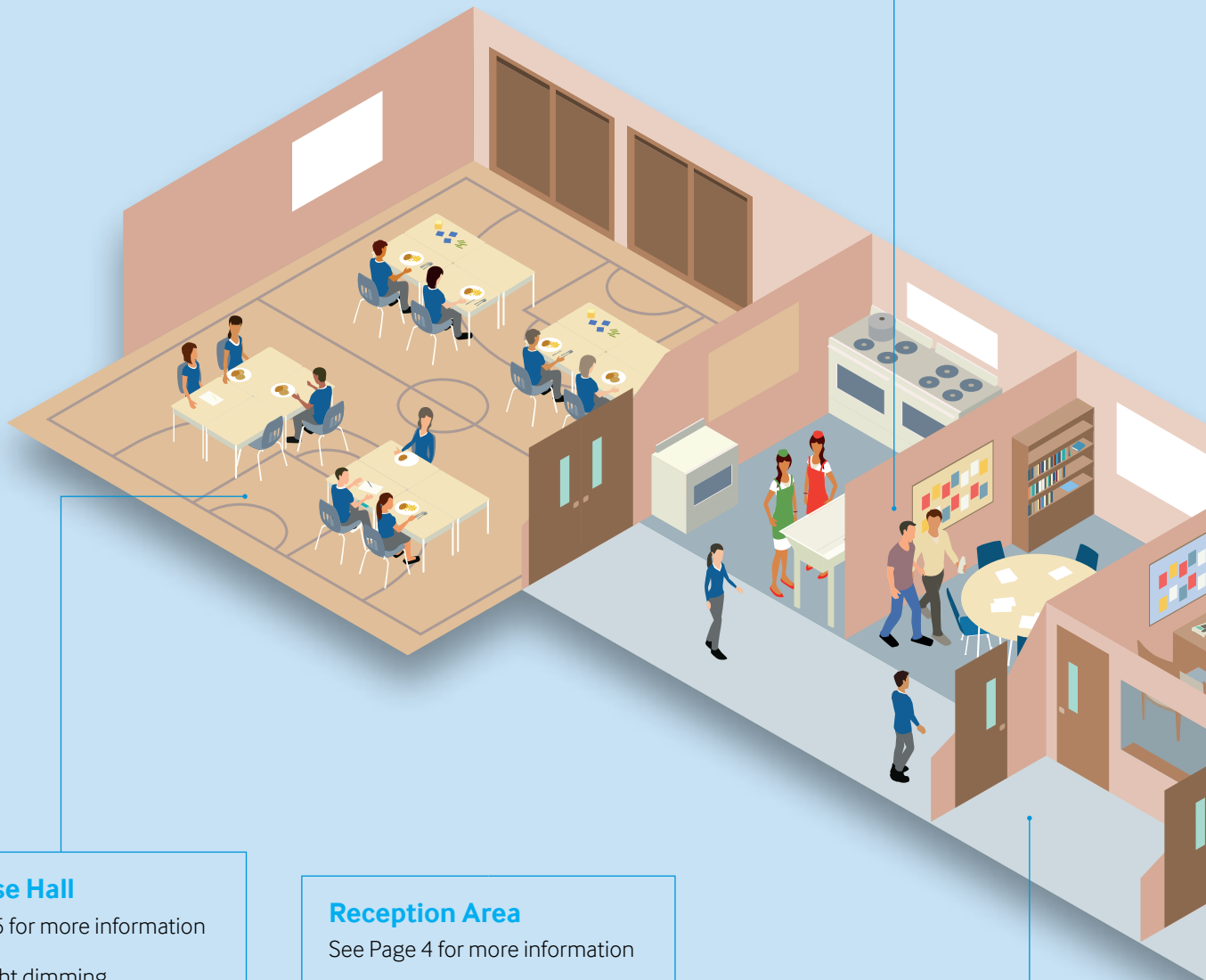
Other common spaces found in education buildings include toilets, changing rooms and SEND (special educational needs and disabilities) classrooms. Often in toilets and changing rooms, the key is to ensure lighting covers all relevant spaces, including cubicles, which may require additional sensors to account for doors and walls.

SEND rooms can have a range of additional features to make the spaces as inclusive and effective as possible. We have previously been asked to gradually raise the lighting to 100% rather than turning on instantly to create a more soothing environment.

# Nursery and Primary Schools

Although on first glance the requirements for lighting in primary schools may appear simple, the significance of the impact light can have on the children's learning should not be underestimated.

The type and intensity of the light, reduction of flickering and management of energy usage can all be controlled with the right products and systems in place – creating a stimulating environment for learners and enhancing the efficiency of the building.



## Multi-use Hall

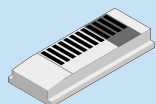
See Page 5 for more information

- ✓ Daylight dimming
- ✓ Presence/absence detection



VITM4 or VITP7-MB-DD

- ✓ Scene setting



VITP7-MB-DD



VITP7-4SC

## Reception Area

See Page 4 for more information

- ✓ Presence detection



BVITM6-S  
or VITM4-S



EBDSPIR-PRM

- ✓ Daylight dimming - where natural light is available



BVITM6-S



EBDSPIR-DD

## Toilet/Changing Room

- ✓ Presence detection
- ✓ Control extractor fan and water solenoid valve



EBDSPIR-PRM-2CH



## Staff Room

- ✓ Absence detection
- ✓ Daylight dimming



BVITM6-S



EBDSPIR-DD

## Corridor

See Page 4 for more information

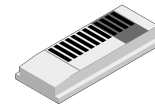
- ✓ Presence detection
- ✓ Daylight dimming



MWS3A-PRM or  
EBDSPIR-PRM

## Nursery Classroom

- ✓ Daylight dimming
- ✓ Teaching wall controlled separately
- ✓ Zoned areas to suit the different needs of the room



VITP7-MB-DD

## Primary Classroom

See page 6 for an example classroom installation.

- ✓ Absence detection
- ✓ Teaching wall controlled separately
- ✓ Daylight dimming to window row
- ✓ Absence detection available



VITP7-MB-DD

- ✓ **Required** is the basic requirements as per the DfE School Output Specification - Technical Annex 2E: Daylight and Electric Lighting.
- ✓ **Considerations** are our recommended solutions based on experience of delivering effective and efficient installations.

# Secondary Schools

Secondary schools are increasingly complex spaces and consideration needs to be given to the teaching and learning requirements of each of these diverse areas.

From interactive whiteboards to dangerous tools and equipment, the developing curriculum has led to a wide range of subjects that require more than a simple on/off to ensure the engagement and safety of pupils.

## Sports Hall

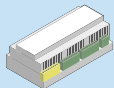
See Page 5 for more information

- ✓ Presence/absence detection
- ✓ Daylight dimming - where natural light is applicable
- ✓ Auto off
- ✓ Teacher override via key switch



EBDHS-PRM /  
EBDHS-DD

- ✓ Scene setting
- ✓ Fire alarm interface



VITP7-DIN-LCM6-6DD



VITP7-4SC-W



VITP7-MINPIR

## Toilets, Changing Rooms and Showers

- ✓ Presence/absence detection



EBDSPIR-PRM /  
EBDSP-PRM-IP

- ✓ Control extractor fan and water solenoid valve



EBDSPIR-PRM-2CH

## Corridor

See Page 7 for more information

- ✓ Presence detection
- ✓ Daylight switching - where natural light is available



MWS3A-PRM

- ✓ Daylight dimming



MWS3A-DD or  
EBDSP-IR-DD

## Reception Area

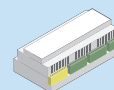
See Page 5 for more information

- ✓ Presence detection
- ✓ Daylight switching - where natural light is available



EBDSPIR-PRM

- ✓ Feature lighting
- ✓ Scene setting



VITP7-DIN-LCM6-6DD



VITP7-4SC-W



VITP7-MINPIR



### Science Labs and Workshops

See Page 7 for more information

- ✓ Absence detection
- ✓ Daylight dimming to window row
- ✓ Manual switch on/off (health and safety)



VITP7-MB-DD



VITP7-EBDMR

### Special Educational Needs and Disabilities (SEND)

See Page 7 for more information

- ✓ Manual on/off
- ✓ Scene setting



VITP7-MB-DD



VITP7-4SC

### Classroom

See Page 6 for an example classroom installation

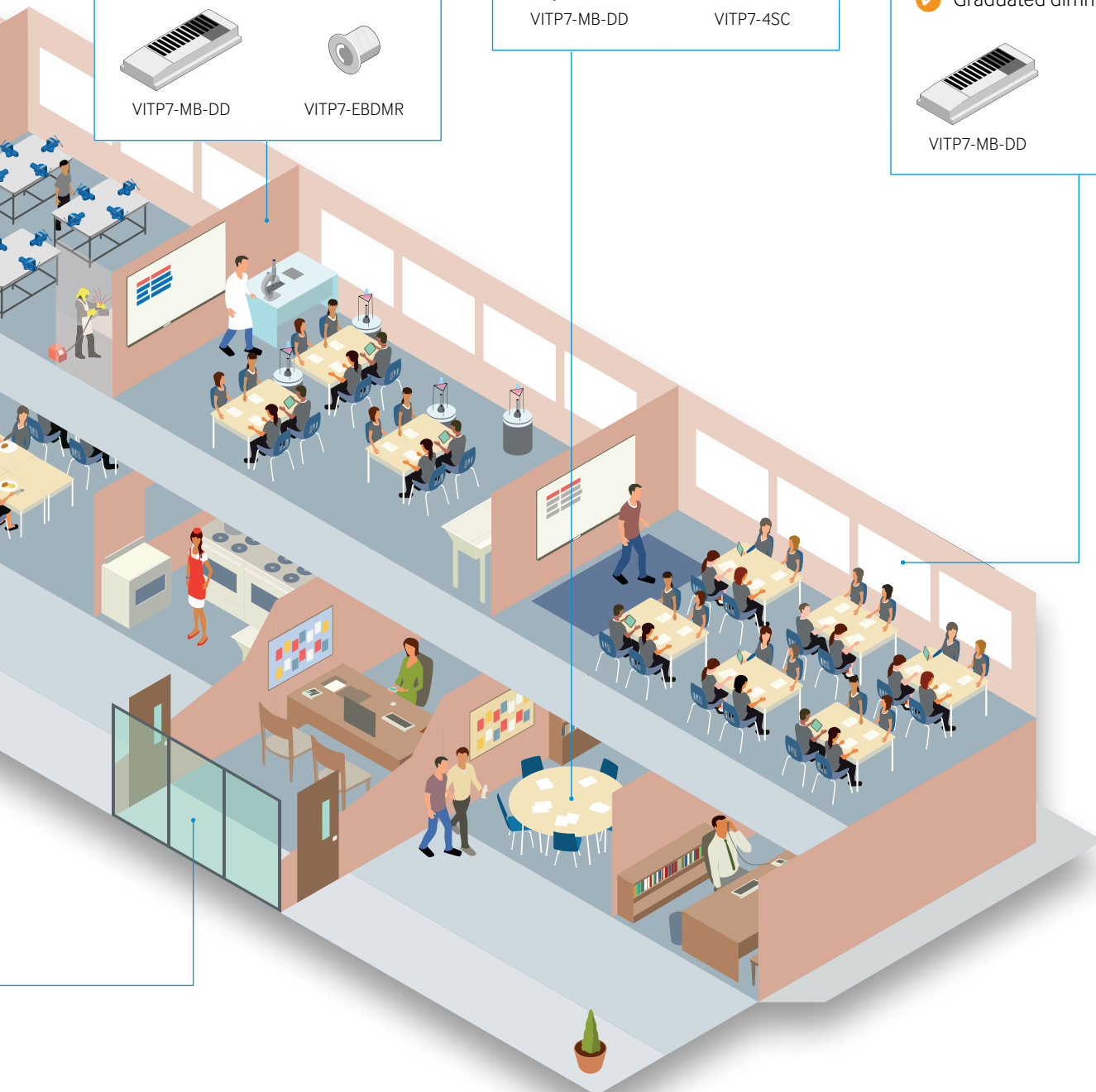
- ✓ Absence detection
- ✓ Daylight dimming to window row
- ✓ Teaching wall controlled separately
- ✓ Graduated dimming



VITP7-MB-DD



VITP7-EBDMR



- ✓ **Required** is the basic requirements as per the DfE School Output Specification - Technical Annex 2E: Daylight and Electric Lighting.
- ✓ **Considerations** are our recommended solutions based on experience of delivering effective and efficient installations.

# University and Further Education

Universities must compete to secure student numbers and therefore income and funding. It is imperative to create spaces that both attract students and stimulate learning and achievement.

Offering a range of facilities alongside well designed lighting and energy controls within universities can promote safe, sustainable and inspiring learning environments, creating an attractive proposition to students and investors.

## Dining and Social Areas

- ✓ Presence detection
- ✓ Teacher override via key switch



VITP7-MB-DD



VITP7-EBDMR

## Sports Hall

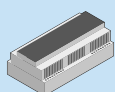
See Page 5 for more information

- ✓ Presence detection
- ✓ Daylight dimming - where natural light is applicable
- ✓ Auto off
- ✓ Teacher override via key switch



EBDHS-PRM  
/ EBDHS-DD

- ✓ Scene setting
- ✓ Fire alarm interface
- ✓ Reduce lighting level in spectator area during competitions



EBR-HW-DALIG64



EBR-EBDHS-DALI



EBR-4SC

## Reception Area

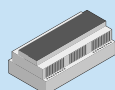
See Page 4 for more information

- ✓ Presence detection
- ✓ Daylight switching - where natural light is available



EBDSPIR-PRM

- ✓ Feature Lighting
- ✓ Scene Setting



EBR-HW-DALIG64



EBR-4SC



EBR-EBDHS-DALI or  
EBR-MINPIR-DALI



### Science Labs and Workshops

See Page 7 for more information

- ✓ Absence detection
- ✓ Daylight dimming to window row
- ✓ Manual switch on/off (health and safety)



VITP7-MB-DD



VITP7-EBDMR

### Learning Resource Centre (LRC)

- ✓ Presence detection
- ✓ Teacher override via key switch
- ✓ Daylight dimming - where natural light is applicable



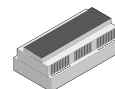
VITP7-MB-DD



VITP7-EBDMR

### Lecture Theatre

- ✓ Scene setting
- ✓ AV/DMX interface
- ✓ Multi-point user control - from lectern / doors



EBR-HW-DALIG64



EBR-EBDHS-DALI



EBR-4SC

### Offices

See Page 4 for more information

- ✓ Absence detection
- ✓ Daylight dimming - where natural light is applicable



VITP7-MB-DD



VITP7-EBDMR

### Corridor

See Page 7 for more information

- ✓ Presence detection
- ✓ Daylight switching - where natural light is available



MWS3A-PRM

- ✓ Daylight dimming



MWS3A-DD or  
EBDSPR-DD

✓ **Required** is the basic requirements as per the DfE School Output Specification - Technical Annex 2E: Daylight and Electric Lighting.

✓ **Considerations** are our recommended solutions based on experience of delivering effective and efficient installations.



### Schools as Public Spaces

Local authorities and independent schools recognise the benefits of using facilities for the local community. This out of hours use is also seen as a way of sharing costs and potentially increasing revenue. Sometimes this requires going beyond the DfE guidelines and creating an environment that suits various needs.

Based on this, consideration needs to be given to the use of the spaces during this out of hours period. For example, it may be that increased light levels are required in an evening or additional emergency luminaires are needed to light the space. Once again flexibility is the key for the client and end user.

### Accommodation – Universities

The quality of student accommodation has improved immensely in recent years and has moved away from a simple bedsit arrangement. The aim is to draw in more students, and this is often achieved by offering a much higher specification of accommodation. Some buildings will offer a mix of accommodation providing the students with options to suit varying budgets and taste.

A typical accommodation cluster will consist of a corridor with up to 10 individual bedrooms and a communal kitchen / living area. There are also smaller units available with two or four bedrooms and a communal kitchen / living area. For the student that wants to push the boat out, some accommodation units offer split level mezzanine apartment style living, with up to two bedrooms and private kitchen/living area.





There is a greater emphasis on the communal areas where breakout spaces include study zones, cinemas, games areas, gymnasiums and even swimming pools. Often full catering facilities are also provided allowing students to sign up to meal packages from the restaurant.

The main foyer is sometimes used as a focal point with architectural mood lighting and scene setting to suit different needs and events. This can either be automatically time controlled or manually selected by the onsite team.

Similarly, the gymnasium and cinemas will almost certainly have a requirement for scene setting and occupancy control that goes beyond the standard switch at the door recommendation.

The corridor lighting is usually switched on/off automatically via presence detectors. Alternatively partial switching or dimming is used to allow a permanent low level of light increasing comfort whilst maintaining efficiency.





## Service

Our knowledgeable people are always here to help, ensuring we can provide solutions and deliver ongoing support. Our dedicated network of engineers gives us the capability to offer a complete service throughout a project's entirety, from initial consultation to final sign off.



## Knowledge

With a reputation spanning 50 years, CP Electronics' loyal team utilises industry expertise to build and maintain long term professional relationships. Our experts provide sector specific solutions and deliver projects to the highest standard.



## Competence

With an experienced team we have developed a vast customer base, meaning we have the capability to meet your unique requirements. Our investment in research and development, ensures our ability to strengthen our product offering and innovate as the industry moves forward.



## Value

We pride ourselves on our products being tried, tested and dependable, providing a five year warranty on all CP Electronics product ranges. With ease of installation being a key feature in our offering, time and cost savings are made by reducing the amount of time needed on site.

### Energy Efficiency in Buildings

These products form part of a wide range of devices to enable Energy Efficiency in Buildings – A structured and holistic approach to reducing the carbon footprint and increasing sustainability of businesses.



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