

## About Schneider Electric

As a global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation, and data centres/networks, as well as a broad presence in residential applications. Focused on making energy safe, reliable, and efficient, the company's 114,000 employees achieved sales of more than 18.3 billion euros in 2008, through an active commitment to help individuals and organizations "Make the most of their energy".

The Installation Systems & Control Division of Schneider Electric provides solutions that represent the best in lifestyle and innovation for offices, hotels and homes. These solutions include award-winning products in the areas of building and home automation, structured cabling, and designer switches and sockets. They help the finest architectures around the world to achieve more with less.

[www.schneider-electric.com](http://www.schneider-electric.com)

**Sympholux**  
LIGHTING CONTROL



# Light energizes yet consumes.

That's why we must create a symphony with the right lux in the right places.





In a world dominated by concerns about global warming and carbon footprints, being more environmentally responsible in designing, building and managing properties is now a top priority.

Delivering measurable corporate, economic and social benefits, 'green' or sustainable building practices are already widely embraced.

## The big questions are: How can we be 'greener' but still enjoy life to the full? And how can we achieve more while using less?

With lighting accounting for around **30%\*** of commercial buildings' electricity consumption, it's not enough to change to energy-efficient lamps that will only slightly reduce your power needs. You need to equip your building with proven Lighting Control.

Lighting Control isn't just about reducing light. It's about providing adequate lighting when and where required while reducing wastage via an inter-connected microprocessor-based control network delivering optimal light and energy.

By switching to one of Schneider Electric's three incredibly energy-efficient Lighting Control systems, you could slash your fuel bills by as much as **60%\*** without compromising lighting quality.

Ready to start saving? Then simply read on...

\* Source: KNX

# Why install Lighting Control in your building?

Be smarter and greener

Achieve ultra-effective operation and management

Enhance comfort, morale and productivity

Create inspiring aesthetics



# Be smarter and greener

Lighting eats up more electricity than any other essential business system. Optimizing natural light and implementing dimmers, timers, occupancy and motion sensors will both cut your business's energy costs and minimize the amount of harmful emissions you add to the air we breathe. Best of all, by using a Schneider Electric Lighting Control system, you can see exactly how much money you are saving on a daily, even hourly basis.

## Savings that make dollars and sense

Our Lighting Controls will save your company as much as **60%\*** on operating and maintenance costs by:

- Automatically deactivating lights in unused spaces
- Minimizing heat from lighting and reducing loading on your HVAC system by dimming lights and automatically controlling blinds
- Harvesting daylight while simultaneously balancing light levels and optimizing room temperature
- Reducing group re-lamping via enhanced lamp failure reporting
- Simplifying the installation and implementation of flexible, co-operative applications

And the added value doesn't stop there! It is conservatively estimated that when renting or reselling premises, the value of your building value will increase **tenfold\*\*** for every \$1.00 per sq.ft. you save as a result of 'greening' your operations.

\* Source: KNX

\*\* Source: NRDC - based on a 10% market capitalization rate





# Achieve ultra-effective operation and management



## Easy to install, use...

Easy to plan, install, use and maintain, centralized system consolidates all your HVAC, lighting and other needs in one. Best of all, with no hard-wiring, programming is incredibly quick and hassle free.

## ... and change!

As buildings last for several decades, it's inevitable their interiors will experience some size and usage changes. By integrating Schneider Electric Lighting Control, you can modify and regroup without the costly, time-consuming and disruptive knocking down of walls or ripping up and replacing obsolete cabling.

# Enhance comfort, morale and productivity

Your business can only ever be as profitable as the people it employs. Research proves that better-lit offices foster more productive staff who are less likely to disrupt operations by taking sick days or leaving for a competitor.

A Light Right Consortium research study in Albany, NY demonstrated a **15-20%\*** increase in user comfort in offices equipped with better lighting and personal dimming controls. The study also showed that workers with individual dimming controls were much more motivated and consistent over time than those without.

\* Source: Light Right Consortium research study in Albany, NY



# Create inspiring aesthetics

## Set the scene for success

As a **hotelier**, you'll already know how pre-setting and high-powered dimming of downlighting, case and effects lighting in lobbies impresses arriving guests. You'll also expect lighting in your meeting and ballrooms to be sufficiently versatile to brightly light business functions by day and more subtly illuminate intimate get-togethers by night.

As a **retailer**, you'll want to ensure repeat custom by always enticing visitors with a unique experience. You'll also want a palette of attractive color schemes that will make it easy to create irresistible displays that will have patrons coming back again and again.

As a **bar owner** or **restaurateur**, you'll see your establishment's chic ambience and glamorous image reflected in the delighted faces of returning regulars night after night.



## Beautify your architecture with lighting

To be truly effective, lighting control of buildings or spaces must satisfy three unique needs. Firstly, appealing aesthetics are essential for retailers. Secondly, internal ergonomics dictate how lighting can and should be used. And last but not least, energy-efficiency issues mean fuel should not be wasted on over-illuminating unused spaces. In 'branding' entire cities, designers must use lighting control to evoke emotion and enhance buildings' attractiveness for tourists.







# Orchestrate a Symphony of Lux!

To create truly mesmerizing music an orchestra must play in perfect harmony. Lighting works exactly the same way. To this end, Schneider Electric Lighting Control empowers you with the same high-level of command as a conductor leading an orchestra.

A global lighting leader, our pioneering Sympholux solution enables you to orchestrate optimized light and energy savings via three different platforms – KNX , C-Bus and DALI.



# Sympholux

L I G H T I N G   C O N T R O L



**KNX**

**C-Bus**

**DALI**

Sympholux enables you to optimally balance light and energy because Schneider Electric remains the only Lighting Control expert who offers you harmonious orchestration via three platforms:

**KNX: The standard in interoperability**

**C-Bus: The expert in ambience lighting**

**DALI: Optimizing individual control and centralized management**

No matter what your building type, location, budget or unique application and needs, no one is more perfectly placed to provide you with an optimized solution than Schneider Electric.

Eager to find out what benefits our systems can deliver for your building, office, data center, infrastructure project, hotel, shopping mall or factory? Then simply turn the page!



## The standard in interoperability

### KNX Fact File:

- The world's only EN50900-compliant Lighting Control system\*
- Over **15** years' specialist electronics experience
- Supported by over **110** manufacturers worldwide
- Accepted in over **80** countries
- More than **21,000 ETS** programming tool users
- **130** training centers in **24** countries
- More than **100,000 KNX**-enabled buildings worldwide

### KNX Made Simple:

KNX consolidates all previously separately operated functions in one, greatly simplifying the intelligent and flexible control of:

- Individual and automatic lighting
- Shutters and blinds
- Time-controlled functions
- Detection and control systems
- Heating/air-conditioning systems and weather stations
- Building management and central monitoring systems
- Easy integration of third-party fire, pumping, security and Heating Ventilation and Air Conditioning (HVAC)
- Power monitoring systems

### KNX Benefits:

- Developed and supported by **one organization** of manufacturers and users
- **Open protocol** compatibility with a vast choice of products/applications
- Full **3rd party** integration
- Total **multi-functionality** of products and media
- **Single-system**-specific configuration software
- Extensive **worldwide training**

### KNX Expertise:

- Open protocol compatibility with a vast choice of products and applications:
  - Building Management System (BMS) integration
  - Third-party integration

\* The only European standard for electrical installation technology for houses and buildings, EN 50090 uses the KNX system as its benchmark.





**C-Bus™**

## The expert in ambience lighting

### C-Bus Fact File:

- Over **15** years' specialist electronics experience
- **Number 1** system in Australia and New Zealand
- Installed on all **7** continents
- More than **30,000** installations worldwide
- **Multiple design award winner** in Asia Pacific, US and Middle East
- Over **15,000** C-Bus software downloads annually

### C-Bus Made Simple:

Originally pioneered for intelligent lighting solutions, C-Bus's enhanced protocols now control an increasing range of applications including:

- Intelligent shutters and blinds
- Individually- and automatically-controlled lights
- Heating and air-conditioning systems
- Time-controlled functions
- Audio Video systems integration
- Detection and control systems
- Building management integration and central monitoring systems

### C-Bus Benefits:

- Fully **topology independent**
- Industry standard **CAT5e** cable
- Highly reliable and robust, **cost effective** per-node control
- Simple commissioning and **installation**
- **Easy-to-reconfigure** distributed intelligent local programming
- **High-power and architectural dimming** functions
- **Consistent switch and C-Bus** product look and feel

### C-Bus Expertise:

- High-powered 20A multi-channel dimming
- Wide choice of award-winning input units and control terminals combining functionality and aesthetics



## Optimizing individual control and centralized management

### DALI Fact File:

- Fully IEC 62386-compliant
- Supported by over 40 lighting source manufacturers worldwide
- Single-cable bus communication to all DALI-linked devices
- Simple 3-in-1 lighting, control and emergency design

### DALI Made Simple:

Our groundbreaking Schneider DALI (Digital Addressable Lighting Interface) greatly simplifies control and monitoring of electronic ballasts, transformers, LEDs and emergency exits, etc.

### DALI Benefits:

- Single-system control of lighting and emergency lights from multiple manufacturers
- Delivers full dimming of ballasts, groups and lines
- Comprehensive monitoring and energy saving at each device level
- Simple wiring, configuration, maintenance and reconfiguration
- Ethernet backbone linking multiple DALI networks into a single system

### DALI Expertise:

- Individual lighting control of individual workstations
- Individual device status and energy monitoring
- Monitoring of emergency lighting fittings



A proven performer...





# The Olympic Stadium, Beijing, China

When Beijing's extraordinary "Bird's Nest" National Stadium opened the 2008 Olympic Games, it instantly became a global architectural icon. After celebrating the closing of the Games, the "Bird's Nest" played host to the 2008 Summer Paralympics. It continues to provide a magnificent showcase for national and international sporting, cultural and entertainment events

## Project Fast Facts

Total land surface:	258,000 sq. m.
Seats:	80,000
Cost:	US\$423,000,000
Designer:	Herzog & DeMeuron of Switzerland and the China Architecture Design Institute
Groundbreaking:	2003
Opening:	2008



# A Gold Medal-winning performance in Beijing

## Major Challenges Faced

Key problems faced included duplication of operations in ground level and 4th floor centers controlling functions such as individual lighting/event scene changes and emergency lighting.

System flexibility and reliability during events, compatibility with the KNX backbone, fast activation/deactivation via a single control panel and future scalability for extra input and output modules were other issues that had to be resolved.

## Key Strategies Implemented

The different strategies leveraged included central control and monitoring, time schedule, remote, motion, light level and timer control. Scene control was used to operate landscaped and façade lighting during events, with scene and dimming controls installed in VIP and press rooms. Time schedule, timer and light level control were used in outdoor plazas and landscaped areas. Time schedule control was installed in the car park area while emergency lighting control was interlocked with the automatic fire system. Other system features included input zone control in the duty room and occupancy sensors in rest rooms.

## How KNX Helped

All communications networks on each floor were linked to the main KNX backbone network. Faster master control from the central PC was achieved via a fiber backbone Ethernet network.

In all, the project used around 1,700 devices, including 260 motion sensors. Additional equipment included over 400 local key input units, and more than 300 lighting control panels which controlled approximately 4,000 back of house, façade, landscaped and public seated area lights.

## KNX Product Deployment

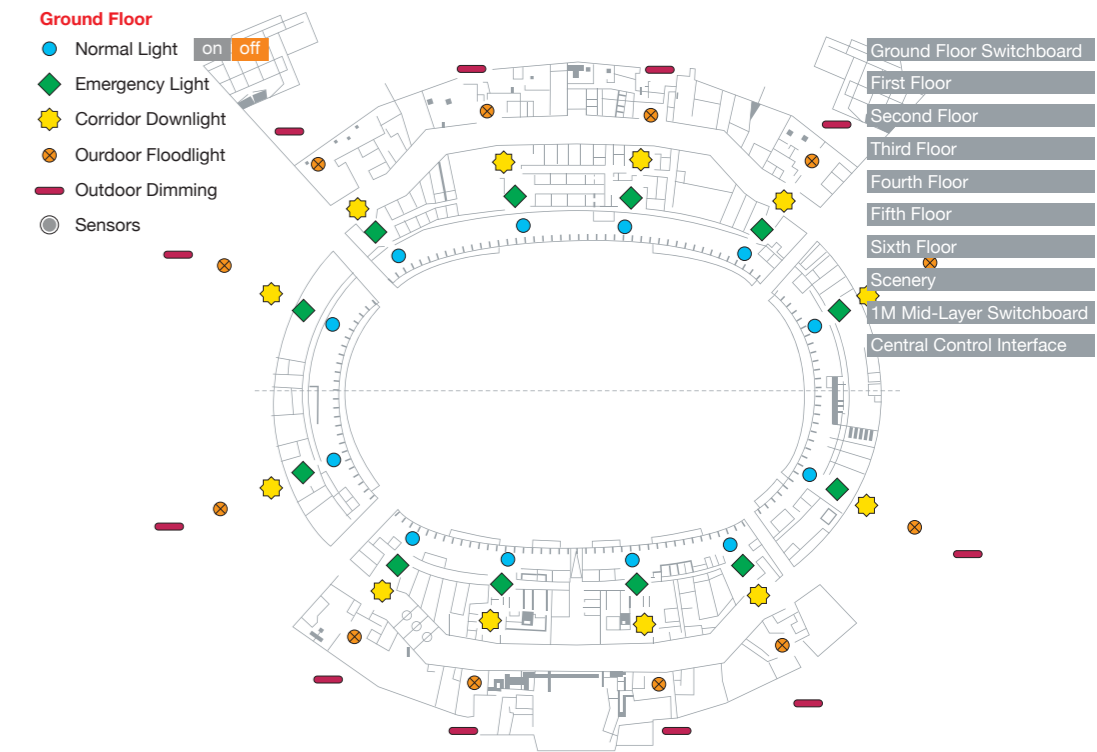
- Central Control with WinSwitch Visualization in central control room
- Corridor Lighting Control with 0-10V Dimmers to facilitate Energy saving features
- Exterior, Emergency, Rooms and Viewing Deck, Staircase and other Surroundings Lighting Control with KNX On/Off relays (16A)
- Interface to Fire System with Binary Input Units for Emergency Fire Protection Procedure
- Automatic Lighting Control for Toilet using latest **ARGUS Presence detectors**
- Local Bypass/Overwrite Control with **System-M Push-button** within distribution panels



## Integration with the Building Management System (BSM)

- KNX System is integrated to BMS with OPC Server
- OPC is open connectivity in industrial automation and the enterprise systems that support industry

## Winswitch Interface



All public areas were controlled by one station, while the stadium as a whole was divided into back of house, landscaped, façade and terraced lighting. A total of six zoned controls (underground, mess floor and ground to 7th floor lighting) and two (ground floor and 4th floor) central control rooms were used.



# The Bahrain World Trade Center, Arabian Gulf

The vibrant Gulf state's first truly intelligent building, the 50-storey Bahrain World Trade Center boasts a full complement of ultra-sophisticated smart features. Soaring over 240 meters high above the Sheraton Hotel, its two iconic sail-shaped towers offer spectacular views of both Manama and the turquoise waters of the Gulf beyond. Home to three 29m diameter horizontal-axis wind turbines, the towers are integrated atop a three-storey podium whose superb facilities include a new boutique shopping mall, restaurants, a business center and a carpark.

## Project fast facts

Floor count:	50
Elevator count:	4
Cost:	US\$150,000,000
Architecture and Designs:	ATKINS
Groundbreaking:	2004
Opening:	2008





## Ensuring a bright future in Bahrain

### Major Challenges Faced

The developer had to ensure instantaneous synchronized activation and control of lighting in both the towers and the podium area via a centralized PC. To achieve uniform switching and dimming, their project team eventually engineered some 20 state-of-the-art communication networks.

### Key Strategies Implemented

- Created a lighting switching control system for communal areas and an energy management system for all external lighting
- Installed dimmers and scene controls in each entrance lobby
- Enabled facilities management control and monitoring by integrating with the Building Management System (BMS)
- Time-scheduled energy management control of carpark lights
- Controlled lighting within the Sheraton Hotel lobby underneath the two towers

### How C-Bus Helped

C-Bus was chosen over its rivals because of its easy scalability and the superior convenience of its Cat. 5 communications cables. The system's star topology-based communication backbone also streamlined the integration of different types of input, output and other components. This was especially advantageous when adding additional coverage areas to existing system locations. Highly flexible, C-Bus's backbone communications also enabled the installing of ceiling-mounted one or two-module Remote Lighting Control Panels in areas inaccessible to regular Lighting Control Panels.

### C-Bus Product Deployment

#### Key C-Bus Inputs

- **E-series C-Bus** wall stations override controlled lighting circuits
- A combination of C-Bus 5753L and 5753PEIRL, **ceiling-mounted 360 motion sensors** control lighting was used in corridors and lift lobbies
- C-Touch provides architectural dimming & scene control



#### Key C-Bus Outputs

- A combination of 12- and 4-channel active and passive C-Bus relays switch lighting circuits
- A combination of 4 channel 2A, and 4 channel 5A dimmers provide **architectural dimming**



#### Networking

- A combination of C-Bus network bridges and Ethernet Network interfaces ensured internal networks within each building could be installed serially over network bridges
- Each of the two serial networks were then interfaced to a dedicated PC over the Ethernet Network Interface (CNI)

#### Facilities Management

- A C-Bus Schedule Plus software loaded on a C-Bus PC server runs a C-Bus to BACnet gateway integrated to the BMS PC client over Ethernet controls, monitoring and managing all C-Bus devices from head-end

#### Integration With The Building Management System (BMS)

- C-Bus integrates with BMS over BACnet

# HSBC Global HQ, Hong Kong

Six years in the building, HSBC's Lord Foster-designed Hong Kong global HQ has long been a global architectural icon. Soaring 180 meters high, the 44-storey complex has four basement levels and includes 30,000 tonnes of steel and 4,500 tonnes of aluminum. This was one of the first commercial properties in the world to conserve energy through extensive use of natural light in interiors. Mounted on top of the building's atrium, a bank of giant mirrors reflect sunlight down into the plaza below. Preventing direct sunlight from entering the building and causing heat gain, externally-mounted sun shades double as natural coolants. Sustainability is further enhanced through the use of sea rather than fresh water as air-conditioner coolants.

## Project Fast Facts

Floor area:	99,000 sq.m.
Number of floors:	44 floors
Cost:	US\$671,000,000
Architect:	Norman Foster
Groundbreaking:	1979
Opening:	1985





# Delivering dazzling returns in Hong Kong

## Major Challenges Faced

HSBC had previously used General Electric Lighting Controls to activate/deactivate electric lights for around 15 years. Because this system was limited to being activated/deactivated via desk phones, operators and maintenance teams could only control and monitor operations via text mode in a central computer. To meet HSBC's phone control and lighting energy needs, Schneider Electric is now installing a two-phase lighting phone control and multi-sensory system. The project is scheduled for completion in 2011.

As the new phone control function had to utilize the existing format, the old system could not be deactivated when C-Bus was installed. As the building also operates 24/7, all installation had to be undertaken in off-peak hours. When the new system was fully installed, the old system remained operational for several weeks.

## Key Strategies Implemented

Phase I will see a C-Bus system integrated with a Citect server and PABX phone control to provide a complete automatic Lighting Control solution for end-users.

During Phase II, multi-sensors will be installed to detect light levels and motion, also automatically controlling loads.

## How C-Bus Helped

All lighting in HSBC's 40 office storeys will be controlled by a C-Bus system integrated with Citect server and custom-made PABX phone control. All lights in the upgraded building will be switch-free and controlled by C-Bus via desk phone.

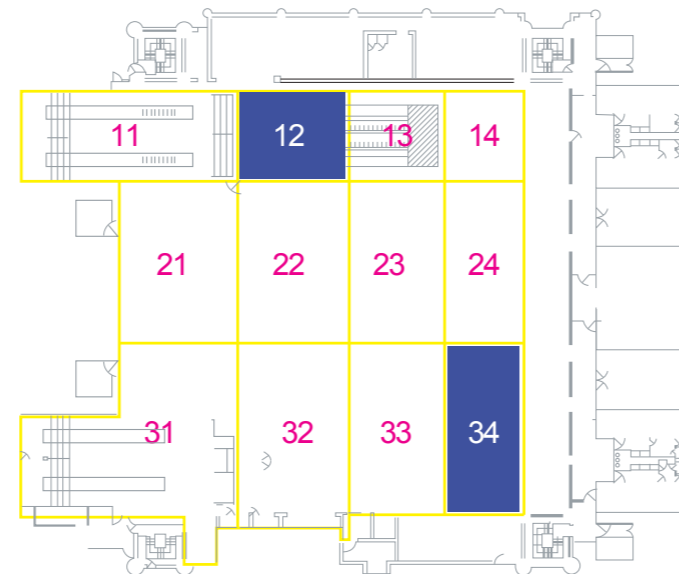
Once upgraded, the entire building will offer the following user-friendly features:

## Graphic User Interface (GUI)

Control located in the basement control room, GUI will enable maintenance staff to:

- Zonally control all lighting
- Graphically monitor all lighting

## Graphic User Interface



## Telephone Control

- Command Code with no pre-set time
- Command Code with pre-set time (e.g. hourly intervals, etc)
- End-users can control lighting via their desk telephones
- Maintenance staff can control lighting via a GUI interface via the building's central PC

## Scheduler Control

- Enables maintenance staff to control lighting and save energy by activating/deactivating circuits according to the pre-set time in the central PC
- For added flexibility, end-users can over-ride scheduler commands via their desk telephones

## Local Control

- A DLT switch installed in the manager room provides local control

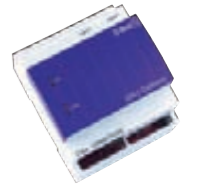
## C-Bus Product Deployment

### Phase I

- CNI was connected via a PC
- 4-, 8-, 12-channel relays were installed in the banking hall, atrium and meeting rooms
- DIN rail-mounted auxiliary input unit was installed in stair case(s)

### Phase II

- **C-Bus/DALI gateway** will be installed to control internal office lighting
- Around 800 to 1,000 **5753PEIRL multi-sensors** will be installed throughout the office
- A Pascal/automation controller will be used to provide logic control
- **DLT Input units** will ensure local control within the manager room





# IKEA, Malaysia

From its humble beginnings in 1943, IKEA has blossomed into a multi-billion dollar home furnishings business with over 128 stores in 29 countries. In opening its Malaysian store in 2003, IKEA implemented a state-of-the-art integrated building management system (IBMS). The ultimate aim was to provide an unparalleled level of Lighting Control that maximized energy efficiency while further enhancing IKEA's unique shopping experience.

## Project Fast Facts

Area:	33,450 sq.m. over three levels plus an additional two levels of underground car parking.
Fitting:	3,000 individual lighting circuits
Architect:	TJ Ong Architect
Developer & Owner:	Ikano Pte Ltd
Consulting Engineer:	DC Consulting Engineers
Systems Integrator & Electrical Contractor:	C-Bus Installer: A&S Building Tech Sdn Bhd (BMS) CBH Engineering Sdn Bhd
Year:	2003



## Ensuring IKEA feels right at home in Malaysia

Spanning some 33,450 sq.m. over three levels and offering two floors of underground parking, this IKEA store is the largest dedicated home furnishing retailer in Malaysia and the biggest IKEA store in Asia. As a result, IKEA needed a reliable and cost effective lighting control solution to manage such large premises.

In satisfying IKEA's needs, Schneider Electric had to control and monitor over 3,000 individual circuits. A long-distance data cable was also essential in covering the whole area and ensuring energy efficiency for back of house and rest rooms.

### Key Strategies Implemented

Accessed via a central security room PC, the C-Lution interface monitors 3,000 individual lighting circuits, enabling easy command and control of lighting in individual areas. Building services staff utilize C-Lution's 'scheduler' feature to pre-set the activation/deactivation of specific lighting such as IKEA's 50m-tall signage - the tallest in Malaysia.

All auxiliary input units are connected to Merlin Gerin breakers which monitor tripping at many sub DBs via a SCADA screen, thus enabling faster breaker status restorations by maintenance crews.

### How C-Bus Helped

C-Bus was chosen because its up to 1,000m-long data cables could easily cover the large store area. C-Bus was specified as both IBMS and Schneider Electric's C-Lution/CITECT end-user software because of its exceptional real-time control and monitoring capabilities.

All lighting from IKEA's carpark to in-store display areas are controlled via a C-Bus Graphic User Interface (GUI), time schedule and local override panels. The GUI also simplifies life for the building's operations and maintenance teams, while the use of motion detectors and scheduling ensures IKEA's office areas and rest rooms are equally energy-efficient.

Reporting back to the C-Bus network, light level sensors on individual floors have been utilized to eliminate unnecessary lighting costs. Further savings are generated by the fact that building services staff can pre-set time schedules on a daily, weekly or monthly basis. Monitoring the main and secondary switchboards and distribution boxes, water tank and chiller room, C-Bus also provides valuable additional information on tripping, pump status and volt reading; instantly alerting and enabling building services staff to identify and restore system failures quickly and efficiently.

### C-Bus Product Deployment

- CNI for control room
- **Auxiliary input unit** for plant room
- Relay for shop, car park and office areas
- Dimmer for meeting room
- **PIR sensor** for rest room
- **Light level sensor** for perimeter zone
- Key unit for offices and meeting room



# The CISCO Building, India

Covering four buildings, a club house and a 7-storey car park across 600,000 sq.ft., Cisco System's campus-style R&D Center in Bangalore is its largest in India.

Working on a converged concept, the facility was also India's first intelligent building, integrating iBMS, CCTV, lighting and access controls, plus security, fire alarm and power monitoring systems. Linkage is provided via a common IP Network connected to a remote Cisco server leveraging a BACnet Protocol.

## Project Fast Facts

Workstations	2,500
Electrical Consultants:	RSP Architects Planners & Engineers India Pvt Ltd
Cost:	US\$850,000
Groundbreaking:	2008
Opening:	2008





## Illuminating IT insights in India

### Major Challenges Faced

Since the campus operates 24/7, programmers must be able to enter the office at any time. As a result, the lighting control system needed to leverage different energy efficiency strategies to reduce operational costs. The campus's lighting control used Cisco's own IP phone. Because Cisco wanted to achieve Green Building Certification, all lighting, IBMS, security, CCTV, access control systems had to communicate via the IP network and be monitored and controlled via a Cisco Server using a BACnet Protocol. The need to integrate all lighting and Audio Visual systems was another issue that had to be resolved.

### Key Strategies Implemented

- Daylight harvesting
- Office scheduling
- C-Bus PIR Sensors in cabins/meeting rooms
- Scene/mood creation in conference/boardrooms
- Monitoring of all buildings via a central pc/server
- Lighting control via IP phone
- Interface with Cisco server/third-party systems via a Citect SCADA system
- Real-time control & monitoring of the system via a server
- Energy saving report generation

### How C-Bus Helped

- 50% saving in average lighting-related energy consumption
- Customized auto-switch activation/deactivation eliminates end-user involvement
- Enhanced system monitoring and control via a centralized PC/server.
- Occupancy-sensor-based auto-switch activation/deactivation of lights in cabins
- 19-month payback of entire C-Bus system

### C-Bus Product Deployment

- 325 **C-Bus Analogue Dimmer** L5504AMP systems dim FTLs & CFLs across the entire building
- 400 C-Bus L5512RVF/P relay modules control all on campus lights
- 750 C-Bus 5753L occupancy sensors activate/deactivate lights in all on-campus cabins
- 500 C-Bus 5031PE light level sensors help enhance daylight harvesting in individual workstation areas
- 450 **Neo 4 Key Button** panels provide dimming and blind control in meeting and conference rooms
- 40 Ethernet network interfaces connect the C-Bus Network to the Cisco Server
- 100 C-Bus 5753PEIRL multi-sensors have been installed near windows in cabins
- 40 Standalone sensors control light in rest rooms
- 3 PC interfaces have been integrated with Audio Video systems
- 2 Citect SCADA and CGATE systems with unlimited licenses centrally control and monitor light usage







Image courtesy Hilton Adelaide

# The Hilton Hotel in Adelaide, Australia

The award-winning 380-room Hilton Adelaide is ideally placed for the city's vibrant Central Market and entertainment and dining hubs. The hotel's recent Lighting Control project was recognized on a national scale after it was honoured in Australia's National Electrical and Communications Association (NECA) awards.

## Project Fast Facts

Interior Designer:	Carr Design Group
Lighting Designer:	The Flaming Beacon
Consulting Engineering:	AECOM
Builder:	Mossop Group
Electrical Contractor:	Laser Electrical
Year:	2004



## Shedding fresh light on hospitality in Adelaide

### Major Challenges Faced

With its luxurious accommodations and state-of-the-art meeting facilities, Hilton Adelaide is widely regarded as one of South Australia's leading hotels. As a result, efficient, reliable and flexible Lighting Control was a must during the hotel's refurbishment of its grand ballroom and conference/meeting facilities. Additional issues included a very short timeframe and the need to enhance energy efficiency by incorporating the new system with Schneider Electric's TAC Building Management System (BMS) interface.

### Key Strategies Implemented

**Stunning Scenes**  
Custom-designed and configured for the hotel and its guests' specific needs, Schneider Electric's system enabled scenes and modes to be adapted according to events and times of day. Dramatic mood transformations were further enhanced by theatrical lighting circuits and integrated dimmers.

### More Business-friendly

The hotel's popular ground floor Victoria Room incorporates one-touch C-Bus technology mood lighting and scene control. The pre-function area also features a decorative dimmable C-Bus operated fluorescent light box table for serving coffee, tea and beverages.

### Enhanced Energy Efficiency

In conference rooms, C-Bus 360° multi-sensor monitors, occupancy and deactivates the lights 30 minutes after the last person leaves. The hotel's Building Management System (BMS) also seamlessly interfaces with C-Bus. Ultimately, both systems enhance HVAC and lighting energy efficiency during scheduled events.

Each area's touch-screen enables manual and automated control of lighting, messaging and blinds while the balcony function room's blind control incorporates automatic time scheduling to minimize thermal transfer.

Integrated within the door access control system, the C-Bus touch-screen can automatically unlock closed doors enabling guests to exit the room.

### Infinite Dimming Possibilities

Hilton Adelaide's recently added C-Bus Infinity Professional and Architectural dimmer range was specifically designed for Level One function areas' track lighting. C-Bus 12 channel Infinity dimmers also enable:

- Universal dimming
- Modular interchangeable cards
- Onboard circuit and RCD protection
- DMX controllable lighting
- Multi-purpose control card 0-10V / DSI / DALI / relay

### Grand Entrance

The hotel's majestic, 550-seat Grand Ballroom features stunning circular architectural fittings and dichoric lights. Perfectly complementing this lighting, a powerful C-Bus touch-screen system enables the creation of the perfect ambience for every event in all three of the ballroom's seating configurations.

Staging Connections are another area in which C-Bus excels by ensuring AV stage lighting professionals can have full control of house lighting during each event. Fully DMX compatible, C-Bus's architectural dimmers also provide seamless mood transitions for any function from the stage lighting desk.

### Additional Benefits

A coffee and message status function that alerts staff about important calls and upcoming coffee breaks without interrupting proceedings is another C-Bus plus.

### Total Control

Empowered by a Schedule Plus graphical software front-end computer link, the hotel's Level One Business Lounge is yet another C-Bus control hub. In addition to allowing the Lounge Manager to access, monitor and adjust the lighting levels, this central location enables various modes to be implemented, greatly enhancing flexibility for meeting room users.

### C-Bus Product Deployment

- **C-Bus Colour Touch Screens** in all 14 functions rooms
- Conference room C2000 switches, power and data outlets with unique ID labeling
- 360° multi-sensors in conference rooms
- **Infinity Professional and Architectural Dimmers** in function areas and ballrooms



# Industry House, Australia

Covering several major sources of revenue, The Australian Government's Department of Industry, Tourism and Resources is one of the most important ministries in the country. In moving to its new home at Canberra's 15-storey Industry House, the Department wanted to create international standard benchmarks for energy-efficient lighting control. Hence it's choice of the DALI system.

## Project Fast Facts

Location:	Canberra, Australia
Architect:	Guida, Moseley Brown Architects
Lighting Designers:	Rudds Consulting Engineers
Year of Construction:	2006
Year of DALI installation:	2006



## Adding to government efficiency

### Major Challenges Faced

As a Canberra landmark, Industry House's design had to satisfy Australia's new Building Code's rigorous flexibility, user-friendliness and energy-efficiency standards.

In keeping with the Department's innovative and environmental aims, the system provides ultra-advanced lighting control features such as scheduled, manual, computer and occupancy control and easily adjustable scenes, sequences and daylight harvesting.

Integrating both general and emergency lighting via a single monitored system, and enabling rewiring-free software upgrades, the DALI solution is incredibly easy to maintain and effectively future-proof.

### Key Strategies Implemented

In addition to providing easy installation, powerful and flexible control and easy maintainability, the DALI Control system satisfies all of the following requirements.

#### Scheduled Occupancy

Each BM2500 controller/gateway includes a real-time clock with automatic leap year adjustment. A location setting enables automatic adjustment for daylight saving by calculating sunrises and sunsets, with external flagpole and façade lighting activated an hour before sunset and deactivated 30 minutes after sunrise. Shared internal foyers are scheduled in line with expected occupancy levels.

#### In and Out of Working-hours

Offices and workstation areas are controlled with versatile 'push' switches that provide different functionalities for both office and after-hours operation by determining both time of day and input profile. During office hours, switches act as single-button dimmers, while after-hours the buttons on/off toggle has an override that deactivates unneeded lights.

#### Sequences

Buildingwide sequences in shared areas such as meeting rooms and toilets that gradually reduce lighting before deactivation met the mandatory requirement of preventing any occupant from being plunged into immediate darkness. Lights are then restored by after-hours override switches or computers.

#### Occupancy Control

As a busy government departmental hub, Industry House features a full spectrum of meeting rooms whose lights are automatically activated when someone enters and can be easily adjusted for meetings and presentations. An intelligent BM2500 system determines if lights are activated and automatically adjusts lighting levels in line with occupancy sensors.

#### Daylight Harvesting

To minimize energy wastage, each floor has two rows of perimeter-mounted automatic daylight harvesting sensors incorporating DALI ballasts and provides automatic dimming to compensate for natural light levels. In normal operations, the sensors automatically dim activated lights. The BM2500 system's override feature also sets designated light levels and offers a 'burn-in' function to ensure optimal lamp operation before dimming.

#### Emergency Lighting

By providing updated status reports for ballasts and emergency and evacuation lighting, Industry House's DALI Australian Safety Standard-compliant system eliminates the need for a separate monitored emergency system.

#### Maintenance

Industry House's Lighting Control system is easily maintained via a combination of DALI and a BM2500 controller/gateway, with all DALI devices scanned and SMS-, email- or pager-flagged by the BM2500. Access to status information is available via the building's LAN and also over WAN/Internet via a built-in web server.

As all DALI ballast settings are backed up by the BM2500, ballast replacement involves a simple, one-click operation with replacement ballast settings addressed and automatically restored by the controller.

### How DALI Helped

Industry House's lighting is run via a true distributed control system which combines 143 DALI loops onto 73 BM2500 controller/gateways on an Ethernet network. Around 6,600 DALI ballasts, inverters, relay modules, emergency luminaires and exit signs are used to control light sources. The BM2500s are located on each floor in distribution boards adjacent to the two cable risers. Each BM2500 unit controls two DALI loops via Tridonic DALI-SCI interfaces and includes 16 occupant control inputs using switches, occupancy sensors integrated with the access control system.

Easy installation and commissioning are other major DALI advantages. The system's 5-pin 'soft-wiring' feature cuts labor costs, while distributed architecture ensured individual sections could be tested and commissioned as each area was made ready for tenants.

Industry House's distributed international standard-compliant DALI system delivers powerful and flexible control plus easy maintenance. As a result, Australia's Department of Industry, Tourism and Resources has an energy-efficient system whose advanced features will provide years of useful benefits.

### DALI Product Deployment

- Tridonic PCA EXCEL one4all T5 ballasts
- Tridonic EM emergency lighting modules
- Tridonic DALI-PS and DALI SCI
- Monitor BM2500 controller/gateway
- Spire exit units



# Siam Paragon Shopping Mall, Thailand

Located in the heart of Thailand's capital city, Siam Paragon is the country's first true mega shopping complex and the biggest mall in Asia. As such it more than lives up to its slogan "The Pride of Bangkok". Renowned for its magnificent and elegant ambience, the vast development entices shoppers with flagship stores from a host of leading high-end international luxury brands.

## Project Fast Facts

Shopping Area:	500,000 sq.m.
Cost:	US\$450,000,000
Designer:	J+H Boiffils
Opening:	2005
Number of escalators:	85
Number of elevators:	24



## A brilliant choice for shoppers in Bangkok

### Major Challenges Faced

Siam Paragon's automation systems ensure highly efficient, 24/7 management, operation, control and monitoring of lighting in its shopping, department store and car park areas. C-Bus Lighting Control and Management System was carefully chosen as a cornerstone of the mall's electrical system. As more than 5,000 individual circuits had to be controlled, the system's 1,600 C-Bus units are located throughout the building in key areas such as electrical shaft and server control rooms.

### Key Strategies Implemented

C-Bus networks connected to a central server via a PC interface enabling centralized control and monitoring are strategically located on each of the complex's 24 floors.

C-Bus standard switches providing multi-purpose lighting control were recommended and installed in the server room. Ultimately, all of Siam Paragon's fluorescent, halogen, incandescent, neon and other decorative lights are controlled by C-Bus.

Scattered across strategic locations, 400 key input switches enable local switching control by both the building's overall building operator and individual technicians. As these microprocessor-driven and addressable switches can be programmed to control any lighting circuit within the C-Bus network, changes can easily be carried out via reprogramming rather than time-consuming physical rewiring.

In the mall's basement level control room, a PC server running C-Gate and Schedule Plus Software manages and monitors over 6,000 dynamic C-Bus points. The Schedule Plus-enabled system also allows the building operator to view system configuration and topology network status. Configured to schedule events for all C-Bus units in the mall, Schedule Plus enables the automatic activation of all lighting scenes with minimal human intervention.

### How C-Bus Helped

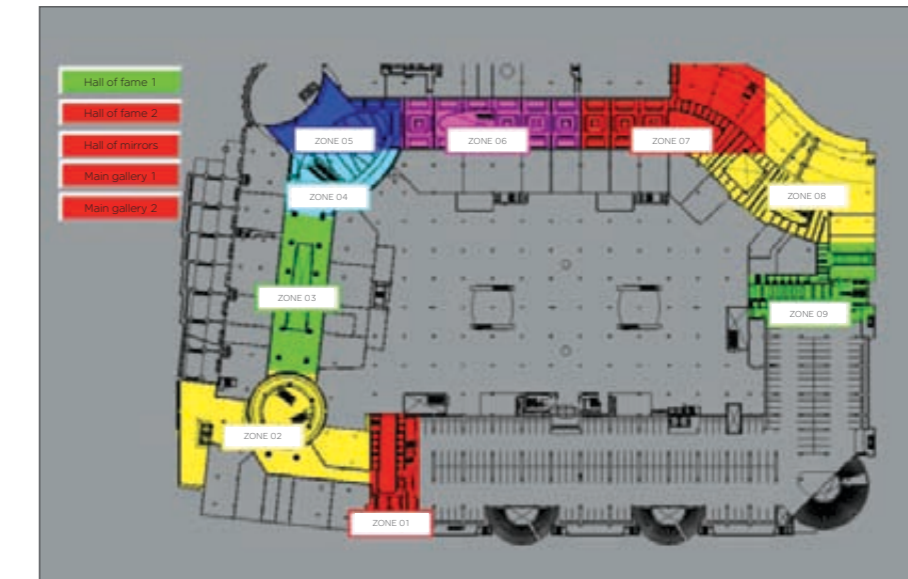
The many benefits of employing C-Bus control and management system at Siam Paragon were as follows:

- Centralized lighting management control using a Schedule Plus Software ensures all lighting circuits can easily be controlled and monitored via PC
- Timely scheduling and scene setting. Daily routines, special events and maintenance processes in areas such as car parks, corridors and the mall itself can all be pre-programmed to run automatically
- Local switches can be programmed to activate/deactivate any lighting circuit and also provide more than one switching location per circuit
- The minimizing of unnecessary lighting redundancy measurably reduces operating costs

### C-Bus Product Deployment

- C-Bus device 6,400 circuits
- Relay 4 channel 20A
- Standard switch 4 key
- Power supply
- PC interface

### Winswitch Interface





## The Oval Office, Hamburg Germany

The Oval Office in Hamburg, designed by the architects Nps Tchoban Voss, is named for its elliptical form. The complex boasts around 26,000 sq.m. of office space. The challenge for Schneider Electric was to develop an efficient concept for controlling the lighting and light scenes (including by remote control). Schneider Electric's answer was a comprehensive KNX installation and the switch range.



## The Oslo Opera, Norway

The new opera house in Oslo is a further milestone showcasing the philosophy of the unconventional Scandinavian designers in architecture and constructed landscapes. Rather than creating an ironic, narcissistic, prestigious building the Snohetta architects centered their concept around the user. Schneider Electric installs a solution with KNX technology for controlling a variety of different building functions.





# UKE Hospital, Hamburg Germany

In February 2009 the architecture team of Nickl & Partner Architekten AG, Munich, successfully completed the vast University Hospital Hamburg Eppendorf project. With 16 hospitals, 750 beds, 16 operating theatres and 3,500 patient rooms spread across 85,000 sq. m., the hospital complex is the most modern in Europe. Its huge KNX installation with switches and socket outlets specially designed for use in a hospital setting is equally technologically advanced.



Kim Yong Kiwan, Seoul on behalf of Hankuk Processed Glas Inc, Gimhae, Korea on behalf of Vetrotech Saint-Gobain International AG Bern, Switzerland



# The Ferrari Showroom, Seoul Korea

The floors, ceilings and walls of the Ferrari showroom in Seoul are made entirely from glass and metal. The sports cars from Modena with their traditional red colour can really look their best in this bright and transparent environment. The KNX bus system controls light scenes and thus helps present the cars in the best light possible!



# Our list of references speaks for itself

## AUSTRALIA

Australian Industrial Property Organization Building  
Australian Jockey Club Royal Randwick Racecourse  
Barossa Valley Resort Hotel  
Central Building-257 Collins Street  
County Court  
EDS Australia Centre  
Edith Cowan University  
Hilton Hotel  
Mercedes Benz National Headquarter  
No.63 George Street  
Observatory Tower Apartment Building  
Queensland Academy of Science, Maths and Technology  
Rialto Tower  
Rundle Mall  
State Education Building  
St Basil's Aegean Village Aged Care Complex  
St George Leagues Club  
St. Johns Retirement Village  
Spicers Paper Ltd  
Stadium Australia  
Subiaco Oval  
Swinburne College of TAFE  
Sydney Opera House  
Taronga Park Zoo  
Toyota Tsusho Distribution Centre

## CHINA

Beijing Fortune Building Hotel  
Beijing Golf Apartment  
Beijing House  
China Science Research Institute  
F1 Formula Conference Center  
Guangdong Electric Power Design Institute  
Grand Hyatt  
Hangzhou Liqun Mansion  
Shanghai Ding Shan Lake Villa  
Shanghai One  
Shanghai Skyway-Hotel  
Shenzhen Sheraton Hotel  
Skyline Mansion  
Tianjin Eco City  
Taihu Region Management Bureau  
Zhong Tie Mansion

## HONG KONG - SAR

Baptist University Sir Run Run Building  
China Graduate School of Theology  
Civil AID Headquarter  
EMSD Headquarter  
Gold Coast Hotel  
Hong Kong Design Centre  
Hong Kong Landmark Mandarin Oriental Hotel

HSBC Main Building  
ICAC Headquarter  
LKF Hotel  
Mandarin Oriental  
Mangrove West Coast  
Princess Margaret, Infectious Disease Center  
Science Park Buildings 1, 2, 6 & 9  
Tang Shiu Kin Hospital  
Tin Shui Wan Wetland Park  
Tuen Mun Hospital, Rehabilitation Block

## INDIA

Ashoka Hotel  
CISCO R&D Centre  
Controller & Auditor General office  
John Deere Technology Centre  
MCD Civic Centre  
Taj Palace Hotel  
Westin Hotel

## INDONESIA

Bakrie Tower  
BCA Tower  
Best Western Hotel Bali  
Best Western Hotel Jakarta  
BSD City  
Cyber Two Tower  
Eminance  
Gading Nias Residence  
Gading Serpong Residence  
Gandaria City  
Garda Otto Building  
Graha Energy  
Grand Indonesia  
Hotel Marriot  
Jakarta International School  
Kempinski Residence  
Pacific Place  
Palma Tower  
Singapore Embassy  
Talavera Office Tower  
The Haven  
The Kuningan Place  
Water Place Residence

## JORDON

Castle Hotel

## KOREA

ABC Samsung Head Office  
Centum City Apartment  
Marriott  
Sheraton Walkerhill

## KUWAIT

Australian Embassy  
Al Maidan Hospital  
Amaiah Residence  
Gust University  
Movenpick Hotel

## MACAU - SAR

Grand Façade of the Ruins of St. Paul's Tourist Centre

Ho To Stadium  
Legislative Assembly of Macau  
Macau Hockey Centre  
Macau Polytechnic University  
Macau University A1 Lecture Block  
Tennis Academy and Bowling Centre

## MALAYSIA

Aman Suria  
Bandar Setia Alam  
Cheras Heights  
Cheras Perdana  
Cititel Hotel  
Cyber Heights  
Cyberjaya Homes  
Damai Ria  
D'Melor  
Duta Nusantara  
Flora Murni Development  
Four Seasons Langkawi, Kedah  
Greenville, Shah Alam  
Hartamas Regency  
IKEA  
Juta Mines Condominium  
Keringat, Cheras  
Kiara Residence  
KLCC Convention Centre  
La Grande Kiara  
Mandarin Oriental Hotel  
Penthouse of Kia Peng Apartment  
Pullman Hotel Putrajaya  
Royal Chulan Hotel  
Serdang Heights  
Saima Mall  
Serena Hotel  
Sheraton Hotels & Towers  
Standard Chartered Bank, Head Office  
Westin Hotel

## MALDIVES

Banyan Tree Hotel Maldives Resort  
Huvafen Fushi Resort

## OMAN

Australian Embassy  
Ministry of Defence  
Saud Bahwan Residency  
Saud Bahwan Regency  
Saud Bahwan Plaza  
Tender Board  
Yemen Embassy

## PAKISTAN

Abam Co Ltd  
Arif Habib Securities, Head Office  
Avari Tower Hotel  
Avari Towers  
Bohra Community Center, Auditorium  
Bolan Bank  
British Petroleum  
British Petroleum, HIVE Room  
City Center  
Creek Vista Club House  
Crescent Steel & Allied Products  
Dawood Foundation  
Dean's Trade Centre  
Dewan House  
Dewan Office, Beach Luxury  
Faysal Bank  
Faysal House  
Habib Bank Limited  
International Watch Company Building  
JW Marriott  
KingSon Watch Company  
Lake View City  
Marriott Hotel  
Milac

NIB Bank, Spencer Building  
Nokia Siemens Network  
Pak-Arab Refinery Limited  
Pakistan Security Printing Press Corporation  
Paragon Constructions Office  
PEMRA - Pakistan Electronic Media Regulatory Authority, Auditorium  
Rangoonwala Community Center, Auditorium  
Rolex Showroom  
Saima Mall  
Serena Hotel  
Sheraton Hotels & Towers  
Standard Chartered Bank, Head Office

## PHILIPPINES

Hamilo Resort  
Hanjin Philippines Headquarters  
JP Morgan Chase  
JP Morgan Chase II  
Marriott Hotel  
SMX Convention Center

Texas Instrument  
Vida Hotel

## QATAR

Commercial Bank Qatar  
Cultural Village  
Grand Hyatt  
Grand Regency Hotel  
Holiday Villa Hotel  
Khalifa Stadium  
New Ramada Plaza  
Pearl Qatar

## SAUDI ARABIA

Africano Village  
Holiday Inn Jeddah  
Mercedes Benz Showroom  
Prince Nawaf Palace  
Sheraton Khobar  
Zuhair Fayes Consultant Offices

## SINGAPORE

Amaryllis  
Amber Residences  
Andrew Road Bungalow  
Atrium of Orchard  
Azuri of the Sentosa Cove  
Bedok Ria Crescent  
Bellevue  
Botanika  
Butter Worth Condo  
Cairnhill Crest  
Cairnhill Residence  
Caribbean  
Carlton Terrace  
Changi Beach Club  
Changi Water Reclamation Plant  
Coral Island  
DLV  
Draycott Eight  
Fernhill Condo  
Fernhill Grove  
Gateway Hotel  
Goldenhill Park Condominium  
Goodwood Residences  
Hebron Presbyterian Church  
Hélios  
Hindhede Cluster Housing  
IKEA of Tampines  
ION  
Keppel Harbour Caribbean Condominium  
LILY  
Marina Mandarin Hotel  
Nanyang Academy of Fine Arts  
No.6 Mimosas Phase

No.8 Muswell Hill  
No.8 The Draycott  
No.10 & 10A Bukit Tunggal Road  
No.11 Berrima Road  
No.11 Maryland Drive  
No.18 Newton  
No. 35 Regal  
No.36 Lorong Pisang Batu  
No 38 Draycott Drive  
NUS Lecture Theatre  
Ocean Front Condo  
One North Residence  
One Shenton  
Parc Emily  
Paterson

Police Coast Guard  
Riverine  
Setia Mansion  
Sim Green Condominium  
Singapore Cricket Club  
Singapore Indoor Stadium  
Solitaire  
St. Ignatius Church  
St. Regis Apartment  
St. Regis Hotel  
Starville  
Subaru Show Room  
Tessarina Condominium  
The Arc  
The Coast  
The Light  
The Light of Cairnhill  
The Serenade  
The Tomlinson Apartment  
The Vermont Condo  
Turquoise  
UOB Office  
Vision Crest  
Waterfalls

## SRI LANKA

Asha Central Hospital (Pvt) Ltd  
Durdans Medical & Surgical Hospital (Pvt) Ltd  
Hedges Court Residencies  
Ice Land Residencies  
Nawaloka Hospitals PLC  
Serene Pavilions (Pvt) Ltd  
Span Tower  
Summer Land Residencies  
Trevoze Residencies

## SOUTH AFRICA

Coca-Cola Dome  
Coca-Cola Park Football Stadium

Coega Development Corporation  
Gabarone Football Stadium Botswana  
Lermitage Hotel & Villas  
Nelson Mandela Stadium  
Olympic Towers  
Pearl Valley Golf Estate  
Peter Mokaba Football Stadium  
Pezula Restaurant  
Pomoko Towers  
Protea Hotel Wanderers  
Royal Bafokeng Football Stadium  
Sandton Convention Centre  
United Emirates Executive Lounge, Thambo Airport

## TAIWAN

China Airlines Building  
Grand Forward Hotel

## THAILAND

Bliss On The Park  
Bumrungrad Hospital  
Carrefour Hypermarket  
Central World Hotel  
Daradhevi Hotel  
Hard Rock Café  
Intercontinental  
Karon Villa Phuket Resort  
Le Meridien Chiang Mai  
Le Meridien Hotel  
Mandarin Oriental Dhara Dhevi  
Orenten Hotel  
Phuket Acadia Hotel  
Royal Phuket Marina  
Sheraton Grand Sukhumvit  
Sathorn Terrace  
Wind Ratchayothin

## BARHAIN

Al Ali Mall  
Crown Plaza  
Financial Harbor  
Royal College Ireland Medical City  
Seef Mall  
World Trade Centre

## UAE

Cricket Stadium Dubai  
Crown Plaza  
Dubai Airport Terminal 3  
Dubai Airport Free Zone  
Dubai Festival City Residence  
Dubai International Financial Centre  
Dubai Logistic City Headquarter  
Dubai Silicon Oasis Headquarter

Emaar Business Park  
Emirates Bank Headquarter  
Emirates Engineering Center  
Emirates Rugby Stadium  
Emirates Staff Accommodation  
Intercontinental Dubai  
Kempinski Hotel  
Le Meridien Grosvenor House  
Madinat Jumeirah  
Monarch Hotel  
Motor City Area 1 & 2  
One & Only One Royal Mirage  
Park Hyatt  
Park Rotana, Abu Dhabi  
Renaissance Hotel  
Sama Tower  
Shore Line Apartment  
Waterfront Tower  
World Trade Center Residence

## UNITED KINGDOM

Cardiff Arms Park Stadium  
City of Manchester Stadium  
Darlington Stadium  
Eastlands Stadium  
Hull Stadium  
Imperial War Museum  
Kodak Headquarter  
Millennium Stadium  
New Wembley Stadium  
South Leeds Stadium

## VIETNAM

BITEXCO Financial Tower  
BMW Showroom & Office Building  
Diamond Bay Convention Center  
Hung Vuong Plaza  
Indochina Tower  
Movenpick Hotel  
Olalani Da Nang Resort  
Sofitel Metropole  
The Building of Ministry of Finance Centre  
The Manor HCMC Apartment  
Transonnhat Airport Terminal  
Vietcombank



# Why orchestrate with Schneider Electric

The only Lighting Control specialist who can optimize your lighting with a choice of customizable KNX, C-Bus and DALI platforms, Schneider Electric offers you unparalleled levels project commissioning to after-sales support. Backed by a long history stretching back to Merten/KNX's joint-founding of the EIB system to the introduction of C-Bus and Dali, we also offer you the widest possible range of consultancy expertise.

With a full range of aesthetically pleasing products, functions and award-winning input units, you can always count on us to deliver the optimal solution for your unique Lighting Control needs without compromising the integrity of your interior design.

Firmly committed to delivering quality at every stage of the supply chain, we only distribute through the best-qualified and trained system integrators. Detailed end-user support documentation and multi-level product training introductory lectures are still more ways we will add to your peace of mind. And in the unlikely event you have a problem, the well-trained after-sales staff at our Customer Care Center will always get back to you with an answer incredibly quickly.

Like to start saving energy on your next project? Your nearest Schneider Electric representative will be delighted to help you formulate your next step.

